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7

2017
issue 2

AD ALTA

Journal of Interdisciplinary Research

AD ALTA: Journal of Interdisciplinary Research

Double-Blind Peer-Reviewed

Volume 7, Issue 2, 2017

Number of issues per year: 2

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MAGNANIMITAS Assn.

QUAERE 2018

The Czech Republic
Prague, HUB | Hradec Králové
June 18 - 22, 2018

vol. VIII. - VIRTUAL ECONFERENCE

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ADDRESS: CESKOSLOVENSKE ARMADY 300, 500 03, HRADEC KRALOVE, THE CZECH REPUBLIC, TEL.: 498 651 292, EMAIL: INFO@MAGNANIMITAS.CZ

ISSN 1804-7890, ISSN 2464-6733 (ONLINE)
AD ALTA IS A PEER-REVIEWED JOURNAL OF INTERNATIONAL SCOPE.

DOUBLE-BLIND PEER-REVIEWED
2 ISSUES PER VOLUME.

PUBLISHED IN DECEMBER 2017

AD ALTA: JOURNAL OF INTERDISCIPLINARY RESEARCH USES THE RIV BRANCH GROUPS AND BRANCHES, BUT THE JOURNAL IS NOT A PART OF RIV. THE RIV IS ONE OF PARTS OF THE R&D INFORMATION SYSTEM. THE RIV HAS COLLECTED AN INFORMATION ABOUT RESULTS OF R&D LONG-TERM INTENTIONS AND R&D PROJECTS SUPPORTED BY DIFFERENT STATE AND OTHER PUBLIC BUDGETS, ACCORDING TO THE R&D ACT [CODE NUMBER 130/2002], THE CZECH REPUBLIC.

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AB	HISTORY
AC	ARCHAEOLOGY, ANTHROPOLOGY, ETHNOLOGY
AD	POLITICAL SCIENCES
AE	MANAGEMENT, ADMINISTRATION AND CLERICAL WORK
AF	DOCUMENTATION, LIBRARIANSHIP, WORK WITH INFORMATION
AG	LEGAL SCIENCES
AH	ECONOMICS
AI	LINGUISTICS
AJ	LITERATURE, MASS MEDIA, AUDIO-VISUAL ACTIVITIES
AK	SPORT AND LEISURE TIME ACTIVITIES
AL	ART, ARCHITECTURE, CULTURAL HERITAGE
AM	PEDAGOGY AND EDUCATION
AN	PSYCHOLOGY
AO	SOCIOLOGY, DEMOGRAPHY
AP	MUNICIPAL, REGIONAL AND TRANSPORTATION PLANNING
AQ	SAFETY AND HEALTH PROTECTION, SAFETY IN OPERATING MACHINERY

MUTUAL RECOGNITION OF ELECTRONIC IDENTIFICATION MEANS UNDER THE EIDAS REGULATION AND ITS APPLICATION ISSUES

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Abstract: The author deals with the issue of mutual recognition of electronic identification means under the eIDAS Regulation which is intended to ensure cross-border identification and authentication to online services offered by Member States. The author also reveals whether the legal order of the Slovak Republic reflects the changes that have occurred in the field of electronic identification and authentication and whether it creates a sufficient legal environment for potential foreign users of Slovak public administration electronic services.

Keywords: eIDAS Regulation, electronic identification means, identification, authentication, assurance levels, public online services.

1 Introduction

The adoption of Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC (hereinafter referred to as the "eIDAS Regulation") represents new legislation concerning identification and authentication of persons in cyberspace of the European Union.¹ The eIDAS Regulation is directly binding and enforceable in the territory of the Slovak Republic as well as in other Member States of the European Union (hereinafter referred to as the "Member State"). Therefore, the implementation in the Slovak legal system is not necessary. However, it should be noted that from 1 July 2016, the eIDAS Regulation will only apply to the extent of trust services (electronic signature, electronic seal, electronic time stamp, etc.). With respect to the provisions governing the mutual recognition of electronic identification means, it should be noted that the obligation in question will only come into effect on 29 September 2018.² The aim of the eIDAS Regulation is to ensure that for access to cross-border online services offered by Member States, secure electronic identification and authentication is possible.³

2 Mutual recognition of electronic identification means – fundamental terms

In order to understand the concept and the process of the mutual recognition of electronic identification means, it is necessary to clarify fundamental terms relating to such a concept.

Pursuant to Article 3 (4) of the eIDAS Regulation, electronic identification scheme means a "system for electronic identification under which electronic identification means are issued to natural or legal persons, or natural persons representing legal persons." Conditions to be met by the electronic identification scheme are stated in Article 6 (1) of the eIDAS Regulation. The electronic identification scheme is closely connected with the electronic identification means but this concept needs to be seen in a wider context. The electronic identification scheme provides two services, which are:

- a) issuance of electronic identification means,
- b) securing the authentication process.

Pursuant to Article 3 (2) of the eIDAS Regulation, electronic identification means is defined as "material and/or immaterial unit containing person identification data and which is used for authentication for an online service." The purpose of the electronic identification means is the authentication of person to use the online service in another Member State. It is, for example, electronic data from personal and travel documents, certificates, lists of cancelled certificates, etc. On the most general level, it is an electronic identity card. However, the purpose of the eIDAS Regulation is not to recognize electronic identity card as such but to recognize the electronic identity contained therein.

The eIDAS Regulation also defines electronic identification. Pursuant to Article 3 (1) of the eIDAS Regulation, electronic identification means "the process of using person identification data in electronic form uniquely representing either a natural or legal person, or a natural person representing a legal person." In the light of aforementioned, it is possible to identify following entities under the eIDAS Regulation:

- a) natural persons,
- b) legal persons,
- c) natural persons representing a legal person.

Person identification data are defined as a "set of data enabling the identity of a natural or legal person, or a natural person representing a legal person to be established."⁴ The minimum data set for a natural person shall contain under the Commission implementing regulation (EU) 2015/1501 of 8 September 2015 on the interoperability framework pursuant to Article 12(8) of the eIDAS Regulation all of the following mandatory attributes:

- a) current family name(s),
- b) current first name(s),
- c) date of birth,
- d) a unique identifier constructed by the sending Member State in accordance with the technical specifications for the purposes of cross-border identification and which is as persistent as possible in time.

In addition to the above attributes, the minimum data set must contain one or more of the following additional attributes:

- a) first name(s) and family name(s) at birth,
- b) place of birth,
- c) current address,
- d) gender.

The eIDAS Regulation also defines authentication. Pursuant to Article 3 (5) of the eIDAS Regulation, authentication means "an electronic process that enables the electronic identification of a natural or legal person, or the origin and integrity of data in electronic form to be confirmed." In that regard, it is ensured that within identity proving of person and his authentication to online services are used unmodified data with confirmed integrity. Furthermore, it is ensured that such a data is the same as the data set stored on the electronic identification means. In other words, no one has changed information in the process of transmission through information systems.

Assurance levels characterize the degree of confidence in electronic identification means in establishing the identity of a person, thus providing assurance that the person claiming a particular identity is in fact the person to which that identity was assigned. The assurance level depends on the degree of confidence that electronic identification means provides in claimed or asserted identity of a person taking into account processes (e.g. identity proofing and verification, and authentication), management activities (e.g. the entity issuing electronic identification means and the procedure to issue such means) and technical controls implemented. Pursuant to the

¹ Identification (declaration of identity) and authentication (confirmation of the declared identity). More on the issue of identification and authentication in: ANDRAŠKO J.: *Electronic identification and authentication in the context of electronic public administration services*. In CER Comparative European research, 2016, Iss. 2, p. 75-78.

² Article 52 (1) (c) of the eIDAS Regulation.

³ The eIDAS Regulation created a cross-border authentication system based on nodes. Pursuant to Article 2 (1) of Commission implementing regulation (EU) 2015/1501 of 8 September 2015 on the interoperability framework pursuant to Article 12(8) of the eIDAS Regulation is node defined as "a connection point which is part of the electronic identification interoperability architecture and is involved in cross-border authentication of persons and which has the capability to recognise and process or forward transmissions to other nodes by enabling the national electronic identification infrastructure of one Member State to interface with national electronic identification infrastructures of other Member States."

⁴ Article 3 (3) of the eIDAS Regulation.

eIDAS Regulation, three types of assurance level are defined, in particular:

- a) assurance level low,
- b) assurance level substantial,
- c) assurance level high.⁵

3 Mutual recognition of electronic identification means – conditions

When an electronic identification using an electronic identification means and authentication is required under national law or by administrative practice to access a service provided by a public sector body online in one Member State, the electronic identification means issued in another Member State shall be recognized in the first Member State for the purposes of cross-border authentication for that service online, provided that the following three conditions are met.⁶

3.1 The first condition

The first condition for the mutual recognition of the electronic identification means by other Member States is that electronic identification means has to be issued under an electronic identification scheme that is included in the list published by the European Commission pursuant to Article 9 of the eIDAS Regulation. In other words, it must be said that the electronic identification scheme has to be notified under the eIDAS Regulation.

The process of electronic identification scheme notification is carried out in several steps. In the first step, the Member State will provide at least 6 months prior to notification under Article 7 (g) of the eIDAS Regulation the description of the electronic identification scheme to other Member States and the European Commission (pre-notification). After that, a peer review of electronic identification schemes will take place, which can take up to 3 months.⁷ Such a review shall ensure that the electronic identification scheme complies with the interoperability framework and meets the requirements for assurance levels under the eIDAS Regulation.⁸ Member States can initiate the review through the Cooperation Network.⁹ The peer review will end with the issue of an official opinion which discusses whether the electronic identification scheme meets or does not meet the required standards. If the official opinion is positive, the notifying Member State will issue a formal notification to the European Commission. The European Commission is required to publish the notified electronic identification scheme in the Official Journal of the European Union within 2 months of notification. After notification, Member States have pursuant to Article 6 of the eIDAS Regulation 12 months to start recognizing electronic identification schemes. A clear overview of the time frame of the electronic identification scheme notification process is given in the following table.

Table 1: The time frame of the process of the electronic identification scheme notification

The time frame of the process of the electronic identification scheme notification	
1	Providing a description of an electronic identification scheme to other Member States Article 7 (g) of the eIDAS Regulation <i>At least 6 months before the notification</i>
2	Peer review <i>May take up to 3 months</i>
3	Notification of the national electronic identification scheme to the European Commission Article 9 of the eIDAS Regulation <i>Within 2 months of the notification shall be published in the Official Journal of the European Union</i>
4	Publication of an electronic identification scheme in the Official Journal of the European Union Article 9 (3) of the eIDAS Regulation <i>Mutual recognition shall commence within 12 months of publication</i>
5	The obligation to mutually recognize electronic identification schemes

Source: Own arrangement

The first Member State that provided a description of the electronic identification scheme was the Federal Republic of Germany (hereinafter referred to as the “Germany”) on 20 February 2017.¹¹ On 28 June 2017, the Cooperation Network issued an opinion that the documents describing the German electronic identification scheme (German Electronic Identity Card) demonstrate the fact that the German electronic identification scheme qualifies for notification under the eIDAS Regulation at an assurance level high. In the case of the official notification and publication of an electronic identification scheme in the Official Journal of the European Union, citizens of Germany will be able to authenticate into online services provided by other Member States.¹²

It is necessary to point out that Member States should not be obliged to notify their electronic identification schemes to the European Commission.¹³ The choice to notify the European Commission of all, some or none of the electronic identification schemes used at national level to access at least public online services or specific services is up to Member States.¹⁴ In the context of the notification or non-notification the electronic identification scheme it should be noted that Member States will be obliged to recognize electronic identification means notified in accordance with the eIDAS Regulation from September 2018. In other words, if for example, the citizen of Germany wants to use the online service provided by the public authorities of the Slovak Republic and Germany has notified the electronic identification scheme in accordance with the eIDAS Regulation, the citizen of Germany has the right to authenticate for the use of such a service.¹⁵

3.2 The second condition

The second condition for the mutual recognition of the electronic identification means by another Member State is to ensure the assurance level of the electronic identification means (electronic

⁵ Details of the minimum technical specifications, standards and procedures setting out the assurance levels are regulated by Commission implementing regulation (EU) 2015/1502 of 8 September 2015 on setting out minimum technical specifications and procedures for assurance levels for electronic identification means pursuant to Article 8(3) of the eIDAS Regulation.

⁶ Article 6 of the eIDAS Regulation.

⁷ *Ibid.*, Article 12 (6) (a) in connection with Article 2 (b) of Commission implementing decision (EU) 2015/296 of 24 February 2015 establishing procedural arrangements for cooperation between Member States on electronic identification pursuant to Article 12(7) of the eIDAS Regulation.

⁸ For the interoperability framework that is created for the purpose of interoperability of national electronic identification schemes see Article 12 of the eIDAS Regulation.

⁹ Available at: <https://ec.europa.eu/cedigital/wiki/display/EIDCOOPNET/eIDAS+Cooperation+Net+work>.

¹⁰ More on the issue of the Cooperation Network and peer review in Commission implementing decision (EU) 2015/296 of 24 February 2015 establishing procedural arrangements for cooperation between Member States on electronic identification pursuant to Article 12(7) of the eIDAS Regulation.

¹¹ Available at: https://www.bsi.bund.de/EN/Topics/ElectrIDDDocuments/German-eID/eIDAS-notification/eIDAS_notification_node.html.

¹² Italian Republic also officially pre-notified the national electronic identification scheme - SPID (Sistema Pubblico per la gestione dell'Identità Digitale). It is the first national electronic identification scheme to be notified under the eIDAS Regulation that is led by the private sector. Available at: <https://ec.europa.eu/digital-single-market/en/news/first-private-sector-eid-scheme-pre-notified-italy-under-eidas>. Republic of Croatia is preparing for process of notifying an electronic identification scheme called NIAS - National Identification and Authentication System in February 2018.

¹³ From the point of view of eGovernment evaluation, it is important for the Slovak Republic that the Slovak electronic identification scheme will be notified.

¹⁴ Preamble (13) of the eIDAS Regulation.

¹⁵ Member States should remain free to use or to introduce means for the purposes of electronic identification for accessing online services. They should also be able to decide whether to involve the private sector in the provision of those means.

identity card or other token of a person who wants to use an electronic service in another Member State) corresponding to an assurance level equal to or higher than the assurance level required by the relevant public sector body to access that service online in the first Member State, provided that the assurance level of that electronic identification means corresponds to the assurance level substantial or high.¹⁶

In other words, public sector body from the Member State A requires substantial or high assurance level for access to its online service. If the citizen of Member State B has the electronic identification means at the same or higher assurance level as required by the public sector body of the Member State A, the condition is fulfilled.

3.3 The third condition

The third condition for the mutual recognition of the electronic identification means is that the relevant public sector body uses the assurance level substantial or high in relation to accessing that service online.¹⁷

An electronic identification means which is issued under the electronic identification scheme included in the list published by the European Commission pursuant to Article 9 of the eIDAS Regulation and which corresponds to the assurance level low may be recognized by public sector bodies for the purposes of cross-border authentication for the service provided online by those bodies. In other words, it is up to Member States if they recognize the electronic identification means which corresponds to the assurance level low.

It is necessary to point out that access to online services and their final provision to the applicant is connected with the right to use such services under the conditions laid down in national law. In other words, even if a person can be electronically authenticated to access the online service of another Member State, he does not automatically have the right to use a particular online service, since such authorization may be subject to the condition of citizenship or permanent residence in specific country, and so on.¹⁸

4 Application issues

The fact that from 29 September 2018, the Slovak Republic will be obliged to recognize electronic identification means (notified according to the eIDAS Regulation) for the purposes of access of citizens of the European Union to Slovak public administration electronic services, gives a rise to many technical and mainly legal issues. Questions of a legal nature reveal if the legal system of the Slovak Republic reflects the changes that have occurred in the field of electronic identification and authentication and whether it creates a sufficient legal environment for potential foreign users of Slovak public administration electronic services.

4.1 Online service

The most important issues include the absence of a definition and absence of a defined range of online services. The eIDAS does not define the term online service but it mentions it in several places. It is clear from the provisions of the eIDAS Regulation that any service, whether public or private that is provided by using information and communication technologies (in particular the Internet, computing, etc.) can be considered as online service. Based on the above, a distinction can be made between public and private online services.¹⁹

From the provision of Article 6 (1) of the eIDAS Regulation indirectly implies that a public online service can be understood as a service provided online by public sector bodies.²⁰ The eIDAS Regulation does not define online service provider in detail but in general, it can be said that it is a natural person or a legal entity as well as an organizational component of the state. Online services providers may be considered (i) public sector entities or (ii) private sector entities.²¹ The crucial fact is that these entities require remote identification and authentication of the person by accessing their online service through an electronic identification means that is part of the electronic identification scheme notified under the eIDAS Regulation.

Furthermore, the term public service is also used in the eIDAS Regulation. Pursuant to the preamble (12) of the eIDAS Regulation “one of the objectives of this Regulation is to remove existing barriers to the cross-border use of electronic identification means used in the Member States to authenticate, for at least public services.” The eIDAS Regulation does not define the term public service in more detail.

From the perspective of Slovak legal order, it is necessary to point out that the definition of public online service is absent. Therefore, it is necessary to find the most suitable equivalent to the term public online service in Slovak legal order. I am of the opinion that under the conditions of the Slovak legal order, the term public administration electronic service may be considered the most appropriate equivalent of the term online service provided by public sector body. Even though the term public administration electronic service is broadly used, the real meaning is unclear. The term in question is mostly connected with the issue of the eGovernment which is regulated by Act No. 305/2013 Coll. on the Exercise of Public Authorities Competences in Electronic Form and on changes and amendments to certain acts (hereinafter referred to as the “e-Government Act”). The main aim of the e-Government Act is to embody official electronic communication as a primary form of communication between persons (individuals and legal entities) and public authorities as well as between public authorities themselves.²²

Provisions of e-Government Act apply only to cases when the decision issued is relating to rights, interests protected by law and obligations of natural persons or legal entities. Furthermore, the provisions of e-Government Act are limited to proceedings which result in issuing a decision as an individual legal act.²³ The e-Government act defines official electronic communication and other institutes necessary for exercise of public authority in electronic form, however the definition of the term public administration electronic services is absent.²⁴

²⁰ Pursuant to Article 3 (7) of the eIDAS Regulation public sector body means:

- (i) a state, regional or local authority,
- (ii) a body governed by public law or
- (iii) an association formed by one or several such authorities or one or several such bodies governed by public law, or
- (iv) a private entity mandated by at least one of those authorities, bodies or associations to provide public services, when acting under such a mandate.

In the case of the term a body governed by public law the eIDAS Regulation refers to the term public institution stated in Article 2 (1) (4) of the Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC.

²¹ Identification and authentication through the electronic identification means (e.g. an electronic identity card) is not limited only to online services provided by public sector bodies. There is an assumption that in the future private sector entities will also be able to accept the electronic identification means like electronic identity card or other means issued by the state to access their online services.

²² Official electronic communication is defined as electronic communication where the official electronic message which consists of an electronic application and official electronic documents, including attachments, is transmitted.

²³ The e-Government Act applies to public authorities. The term public authority (as institution) is broader than the term public administration authorities. More on terminology and structure of public administration authorities in: ANDRAŠKO, J., ŠURKALA, J.: *The concept of local self-government in the Slovak Republic. In Administrative law and process*, 2015, Vol. 12, Issue 2, p. 321-332. Available at: <http://aplaw.knu.ua/2015-2.pdf>.

²⁴ More on the issue of electronic services in: ANDRAŠKO, J.: *Theoretical aspects of public administration electronic services. In Bratislava law review*, 2017, Vol. 1, Issue 2, p. 119-128. See also: SOPÚCHOVÁ, S.: *Predpoklady fungovania e-governamentu v Slovenskej republike. In QUAERE 2015. Hradec Králové: Magnanimitas*, 2015, p. 659-668.

¹⁶ Article 6 (1) (b) of the eIDAS Regulation.

¹⁷ *Ibid*, Article 6 (1) (c).

¹⁸ E.g. public administration electronic service related to welfare services or in the case of the introduction of electronic elections in the National Council of the Slovak Republic or in the bodies of territorial self-government.

¹⁹ Preamble (2) of the eIDAS Regulation “this Regulation seeks to enhance trust in electronic transactions in the internal market by providing a common foundation for secure electronic interaction between citizens, businesses and public authorities, thereby increasing the effectiveness of public and private online services, electronic business and electronic commerce in the Union.”

The only legal act defining the term public administration electronic service is Act No. 275/2006 Coll. on Information Systems of Public Administration (hereinafter referred as the "ISPA Act"). In accordance with Section 2 (1) (s) of the ISPA Act are public administration electronic services defined as "electronic form of communication with liable parties²⁵ in the handling of submissions, notifications, access to information and their provision or public participation in the administration of public affairs".

It is necessary to point out that it is clear from the definition of the term public administration electronic services pursuant to the ISPA Act that the term in question does not apply only to decisions relating to rights, interests protected by law and obligations. The term in question defined in the ISPA Act includes submissions, notifications, access to information and their provision as well as public participation in the administration of public affairs. It can be said that in the case of the ISPA Act definition of the term public administration electronic services, there is a wide range of acts that can be done by persons in electronic communication with liable parties.

It is necessary to bear in our minds that not all public administration electronic services are relevant in the context of the eIDAS Regulation. Only those public administration electronic services are relevant where the identification and authentication of a person is required by use of an electronic identification means to access such a service. In the Slovak republic can be relevant at least those online services that we authenticate with an electronic identity card.²⁶

4.2 Slovak online service

In order citizens of other Member States could use online services provided by Slovak public sector bodies (hereinafter referred to as the "Slovak online services"), successful authentication through their national electronic identification means is required. The eIDAS Regulation does not explicitly specify to which Slovak online services can citizens of Member States authenticate themselves.

In my opinion, only those Slovak online services can be considered where identification and authentication are required and to which we can authenticate through the Slovak electronic identity card.

As mentioned above, successful authentication into Slovak online service by citizen of another Member State does not automatically authorize him to use of such a service. The access to online services and their final provision to the applicant is connected with the right to use such services under the conditions laid down in national law. In these cases, we talk about authorization. Successful identification and authentication is a prerequisite for authorization. Authorization is the permission to act in accordance with the privileges that are attached to that person.

In the light of aforementioned, it is necessary to select Slovak online services in two ways. Firstly, it is necessary to define Slovak online services where identification and authentication is required. Secondly, Slovak online services that can be really provided to citizens of other Member States have to be defined. As mentioned before, in many cases a legitimate condition (permanent residence, nationality, etc.) is established and such a condition prevents actual provide of such a service.²⁷

4.3 Assurance levels

Security in public online services is one of the key factors affecting the use of pertinent services. Security aspects do not represent only a technical dimension but also a legal one. According to the eIDAS Regulation, specific levels of assurance (low, substantial or high) shall be established for:

- a) electronic identification means,
- b) public online service,

Ad a)

There is a methodology for determining the assurance for the electronic identification means in the Slovak legal order, in particular Annex no. 6 of Regulation No. 55/2014 Coll. on Standards for Public Administration Information Systems (hereinafter referred as the "Annex 6").²⁸ Aforementioned legal framework is out of date in the Slovak Republic and in contrary to the eIDAS Regulation. The eIDAS does not contain provisions that would interfere with the national methodology for determination of the assurance levels. However, it would be appropriate to repeal the Annex No. 6 and replace it with a new methodology that would duplicate the methodology for determination of the assurance level under the eIDAS Regulation.

Ad b)

Under the third condition for mutual recognition of electronic identification means, the relevant public sector body uses in relation to access their online service assurance level substantial or high. This condition implies that the relevant public sector body and thus the Slovak online service provider is obliged to set a specific assurance level for access to the online service. In general, different assurance levels may be set for access to different Slovak online services. The eIDAS Regulation does not specify how the assurance level for a particular online service should be determined. The procedure for determination of the assurance level for access to the online service should be regulated at national level.

In that regard, it is necessary to find out which electronic identification means is used for purposes of identification and authentication to a specific Slovak online service. After that, the assurance level of electronic administration means will be set.

In practical terms, for Slovak online services where authentication can be made only by an electronic identity card, the assurance level will be set at a high level, as it can be assumed that the Slovak electronic identity card should have the highest assurance level according to the eIDAS Regulation.

Another situation can arise in cases where it is possible to authenticate to particular Slovak online service by another means (e.g. name and password). Here is a lower assurance level.

In the case if it is possible to authenticate to particular Slovak online service by an electronic identity card (assurance level high) and at the same time by another means (assurance level substantial) the final assurance level is set according to the lower level.

The eIDAS Regulation does not define specific entity which is liable for determination of the assurance level to particular online service. I believe that in the case of the Slovak Republic, the entities in question should be the providers of Slovak online services.

4.4 Sanctions

The legal order of the Slovak Republic will also have to deal with the legal liability for non-compliance with the eIDAS

²⁵ The list of liable parties is stated in Section 3 (3) of the ISPA Act. These parties are also known as administrators of information systems of public administration.

²⁶ The most used official authenticator in the Slovak Republic is electronic identity card. Such an authenticator is made up from identity card and electronic chip. More on the issue of electronic identity card in: ANDRAŠKO, J.: *Elektronický občiansky preukaz a iné spôsoby autentifikácie pri prístupe k elektronickým službám verejnej správy*. In QUAERE 2017. Hradec Králové: Magnanimitas, 2017, p. 235-244.

²⁷ The conditions for using a particular Slovak online service by citizens of other Member States must not be discriminatory. I advocate that we can restrict access to Slovak online services for the purpose of determining the condition of permanent residence, nationality, etc., if this is not contrary to European Union law.

²⁸ This methodology refers to the repealed Act No. 215/2002 Coll. on the Electronic Signature and to amend and supplement certain acts and to the STORK (*Secure identity across borders linked*) methodology, which refers to the repealed Directive 1999/93/EC of the European Parliament and of the Council of 13 December 1999 on a Community framework for electronic signatures.

Regulation obligations. It is still unclear what sanctions can be imposed on Slovak online service providers for failing to allow the citizens of the European Union to authenticate and use a particular public service. The current legislation also does not reflect the situation where the provider of Slovak online service does not provide or provides an improper assurance level for specific public online services. I am of the opinion that it is necessary to adopt a generally binding legal regulation or to amend the existing related legislation that would regulate specific obligations and liability issues in relation to the determination of the assurance level under the eIDAS Regulation.

5 Conclusion

Adoption of the eIDAS Regulation is an important milestone in the lives of all European Union citizens. For the first time, a common legal framework has been created to enable cross-border authentication into online services provided by other Member States, whereby a citizen can use the domestic electronic identification means.

Mutual recognition of electronic identification means brings many challenges for Member States. Meeting these challenges can help to improve and increase in efficiency the delivery of eGovernment services so that citizens can identify and authenticate themselves simply, safely and with sufficient confidence.

The Slovak Republic over a long period creates the conditions for its citizens to be identified and authenticated for the use of eGovernment services but by adoption of the eIDAS Regulation it must ensure that citizens of other Member States who have notified electronic identification scheme under the eIDAS Regulation can authenticate to online services provided by Slovak public sector bodies.

Tasks that the Slovak Republic and other Member States must meet by 29 September 2018 concern in particular the creation of a node, the definition of online services to which citizens of other Member States can identify and authenticate and which they can actually use. It will be also necessary to establish assurance levels for online services provided by public sector bodies.

Meeting the abovementioned tasks will also result in many changes in the legal order. These changes will in particular affect the e-Government Act, which is the basic legal framework governing the identification and authentication of persons in cyberspace.

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Primary Paper Section: A

Secondary Paper Section: AG

RELATIONSHIP BETWEEN DIMENSIONS OF CREATIVITY, DEPENDENCY AND INDEPENDENCY FROM THE FIELD, NEED AND ABILITY TO ACHIEVE COGNITIVE CLOSURE

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Abstract: The issue of cognitive structures in the system of psychological philosophies is wide-spectral and inspected from various aspects of inter-individual differences. The focal question of theme is a process; which people use to acquire assurance in the complex of unsorted information which they meet with everyday. In terms of our work we focused on latter, unexplored relationships of need and ability to acquire this assurance in regard with dependence-independence on field and level of creativity. Our research haven't acknowledged any statistically important relationships between figural dimension of creativity, the need of acquiring assurance and the ability of reaching it, except of statistically important positive relationship between the independence on field and the ability to acquire enclosure.

Keywords: Need of enclosure, the ability to achieve closure, creativity, independence on field.

1 Introduction

Cognitive sciences represent a set of several scientific fields that deal with the process of learning, coding, handling and subsequently using the information received from various aspects. Cognitive psychology presents a subdivision of cognitive psychology that deals with inter-individual differences in cognitive processes (in perception, feeling, memory, attention, cognition and speech) of individuals. It is based on the conviction of several authors that the level and quality of individual cognitive processes are not homogeneous. This is demonstrated by research based on an examination of the abstract intelligence, similarly to the tests aimed at estimation of a latent level of individual cognitive abilities and processes. A specific area of cognitive processes is represented by processes of coding and storing the received information connected with decision making. Over the last twenty years, the concepts of the need and ability to achieve a cognitive structure are highly dominant in this specific area. The concepts of the need for cognitive structure and the ability to achieve it are based on the issues of cognitive structuring. Cognitive structuring assumes that every person is daily exposed to many stimuli affecting individual which must be regularly selected and filtered into a meaningful whole. The meaningful whole is represented by the cognitive structures. These are classified categories of received information which may be schemes, scenarios, prototypes as well as common words and sentences. Modern studies clearly show that some people can create cognitive structures easier and can also separate adequate information from inadequate or inconsistent and are better while constructing the cognitive structures. These people can make decisions faster. Our study aims to expand the connection between the need and the ability to achieve a cognitive structure with the cognitive styles of dependence and independence from the field. The issue of cognitive structures in the system of psychological philosophies is wide-spectral and in abroad, but also in Slovakia, is very well embedded and inspected from various aspects of inter-individual differences. One of the first who markedly developed and committed to the issue of cognitive structures were Frenkel-Brunswik (1949), Bunder (1962) and Neuberger and Newson (1993). They described how huge amount of unsorted impulses, which people filter with two basic strategies, have impact on them every day. One of these strategies is creating the cognitive barriers - when impulses are completely filtered and don't enter the process of coding and saving the information to long-term memory. The second strategy is the process of cognitive structuring, when relevant information is selectively filtered from irrelevant and afterwards saved to long-term memory in the form of meaningful structure. Then it is connected with already existing cognitive structures.

The work of Neuberger and Newson (1993), which was linked to the work of Thompson et al. (1989), who created the PNS (Personal need for structure) scale, had a great success and started series of following works of authors like Bar-Tal et al. (1994, 1997, 1999), Sarmány-Schuller (2000, 2001, 2002), Sollárová and Sollár (2003) etc., who widened the knowledge of concept of cognitive structures with new constructs: the need for cognitive structure and the ability of acquiring it. Bar-Tal et al. (1994) states that need for cognitive structure and the ability of reaching it represent the basic components of the whole process of acquiring the assurance by creating meaningful cognitive structure. The need of cognitive structure represents desire of every individual to evade uncertainty by creating the cognitive structure. The ability to achieve cognitive structure is unfolded by the extent of how individual believes that one can use the process of processing information, which is consistent with his level of need for the cognitive structure. People with high need of cognitive structure are capable:

1. evading the information, which can't be categorized or grasped to their already existing cognition (created cognitive structures), and/or
2. organizing their cognition to fulfilling their already existing cognitive structure.

Three years before publishing the work of Neuberger and Newson, Bar-Tal and his colleagues and also Slovak authors, was publishing work of Kruglanski (1990), who used term concepts of the need and the ability to achieve closure instead of concepts of the need and the ability to achieve cognitive structure. He defined the need for closure (NFC) as a desire to get any answer to assigned topic within the process of deciding, which reduces confusion and chaos from assigned topic. All of this in consequence eases absolute decision in the process of deciding. A year after Neuberger's and Newson's work Kruglanski with Webster (1994) made single-dimensional scale NFC (42 items) with 5 facets:

1. preference of order (life orderliness);
2. preference of prediction (the ability to predict what happens next);
3. decisiveness (to be decisive, to be able to decide stably in various situations);
4. discomfort from ambiguity (of perceived impacts);
5. rigidity (unwillingness to change already achieved attitudes).

According to them the whole theoretic construct of NFC is formed from 2 components: tendency to achieve closure (meaningful whole) as fast as possible and tendency to remain (even rigidly) at achieved closure.

Neuberger with his colleagues (1997), among whom was also a co-author of PNS scale Thompson, accepted the concept of the need for closure and proposed bi-dimensional NFC structure instead of former single-dimensional NFC structure. In first dimension they linked items from facets: preference of order, preference of prediction, discomfort from ambiguity and rigidity; the second dimension was made from items of decisiveness facet. The first dimension was supposed to represent the tendency to achieve closure as quickly as possible; the second to represent the tendency to remain at already achieved closure. This whole new interpretation of two dimensions achieved in factor analysis was critically assaulted and discussed in the next series of works (more in Kruglanski, De Grada, Mannetti, Atash and Webster, 1997; Neuberger, West, Judice and Thompson, 1997) until the year 2006, when Roets, Van Hiel and Cornelis proposed an alternative interpretation. According to it the second dimension is not different from the first in representing the tendency to remain at already achieved closure, but in having items which represent in the context of the ability to decide; and thus with their meaning they get through rather more to the ability to achieve closure in the process of deciding (the scale AACSS, which was made by Bar-Tal, 1994), than to the need for closure. Roets and Van Hiel (2007) managed to confirm this new alternative perspective in a study, in which they created very new revised version of the NFC scale, where items from facet

decisiveness were replaced by items expressing more the need, rather than the ability. Therefore, we decided to use the revised version of NFC scale instead of PNS survey.

1.1 The need and the ability to achieve closure in connection with dependency and independency from field

From the both concepts - the need for cognitive structure and its ability to achieve it, only the need was inspected in connection with cognitive style of dependency and independency from the field by the academic community; by the authors Sarmány-Schuller and Sollár (2002), who haven't confirmed the assumption of statistically important relationship between the need for cognitive structure (measured by PNS) and dimensions of cognitive style-dependency and independency of field.

According to Ruisel (2004), the cognitive style could be defined as a way of exploring the objective reality which is about perception, choice, saving and coding accepted impulses. Cognitive style –dependence and independence from the field – was created and exactly defined by Witkin et al. (1962). Ruisel (2004) states that individual who is independent from the field, is able to notice less conspicuous characteristics of the impulse, can better reorganize accepted information for more effective saving, is recalling and prompter generalising of accepted or already saved information. Bahar (2003) and Tinajero and Paramo (1997) who were dealing with content character of cognitive structures and performance of recognizing abilities which state that participants independent from the field are better at solving performance tests than participants dependent from the field. They are better at solving various tasks which identify quantitative character of cognitive structures as academic achievement test or word association test.

As Macizo et al. (2006) states, the performance of the participants who are independent from the field is better. They can pay attention to a given stimulus also when distractors appear. On this basis, it can be assumed that the participants independent from the field are able to learn better thanks to more effective visual and auditory memory – moreover, they can filter relevant stimuli from irrelevant ones better. The hypothesis was tried to be proved by Jia, Zhang, Li (2014) having a sample of 168 students of Shandong Normal University. To test the ability to filter relevant information from irrelevant one, they used a procedure of introducing three different combinations of objects (little squares of various colours) inside the squares, in series, in rectangular (4° vertical and $7,3^\circ$ horizontal) background. Picture No. 1 shows that in all three combinations, the square with a fixative point + appears first. It separates the field scanned by the left hemisphere from the field of the right hemisphere, and the upper part from the lower one. About 600 or 700 milliseconds after the first empty square has been introduced, a full square appeared. This one contained visible objects (colourful little squares) whose colour and placement a participant was supposed to remember (colour and placement was determined by an arrow, or either the lower or upper part of the left or right quadrant of the whole square). Consequently, after 900 milliseconds, the participant was supposed to compare remembered colour and placement with the colour and placement of objects in a new test square. In case the colour and placement of the objects in the first square corresponded with the colour and placement of the objects in the following test square, the participant was supposed to press "F" button; if not, "J" button was supposed to be pressed. In the first combination, in the first and test squares, two colourful objects appeared – either in the upper or the lower part, symmetrically in the fields of the both hemispheres. In the second combination, in the first and test squares, two objects of different colours appeared up and down, symmetrically in the both fields of the hemispheres (which the participant was supposed to concentrate on and later compare them with the test square), and two distractors (which the participant was supposed to ignore). In the third combination, in the first and test squares, four objects of different colours appeared up and down, symmetrically in the both hemispheres – the participant was supposed to compare them and confirm their match. In parallel, during solving these tasks, activity of specific neuronal parts of the brain was scanned through an electroencephalogram. The results prove that the performance of participants dependent on

the field was significantly worse in the second task (combination) where distractors occurred, compared with the first task where no distractors existed. The performance of the participants independent from the field reached a similar level of success in the both - first and second tasks. An analysis of the encephalogram data through the method of contra-lateral delay activity shows that participants independent from the field processed the task with the distractors differently from those dependent on the field. The amplitude rate during solving the second task (two test objects and two distractors) of those who were dependent on the field was similar to the amplitude rate during solving the third task (four test objects and no distractor). The amplitude rate measured during solving the second task (two test objects and two distractors) of the participants independent from the field was similar to amplitude rate during solving the first task (two test objects and no distractor). We thus may deduce that the participants dependent on the field have a significant difficulty to keep their attention on deliberate relevant stimuli – when they consider them irrelevant – which is finally visible also on the activity of neuronal correlates. According to the authors, this ability to separate irrelevant stimuli from the relevant ones is determined by a level of selective attention of every individual.

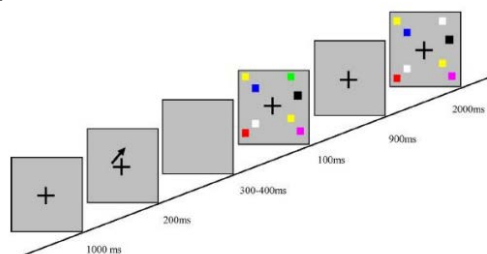


Fig. 1 Research procedures to test the ability to separate relevant information from irrelevant one used by Jia, Zhang and Li (2014) (Jia, Zhang, Li, 2014)

1.2 Need and ability to achieve closure linked with creativity

Likewise, in case of cognitive style - dependence and independence from the field, the connection between the need for cognitive structure and the ability to achieve it was researched by the same authors and in the same work of Sarmány-Schuller and Sollár from 2002; however, the authors didn't accept statistically important relationship between creativity, its dimensions and need for cognitive structure.

In past decades many definitions describing creativity have been made. One of the most famous and respectable is definition of Torrance (1966, in Jurčová 1983), who describes creativity as a process in which sensitivity is applied on problems and defects, gaps in knowledge and missing parts; or as a process of looking for a solution, estimating or formulating hypothesis. He states that creative individuals feel strong need to get rid of incompleteness and indefiniteness. They focus on details, see defects, test and communicate about problems they can't find answer to (complex of these processes and abilities is captured in Torrance's figural test, which measures figural fluency, flexibility, originality and elaboration). Fluency represents the ability to produce as many ideas as possible. Without high creativity they are often just very common, clear or even banal. Flexibility is the ability to cut off from the rigidity of thinking and flexibly create various ways of solving a problem, use multiple points of view and quickly change strategies. Elaboration which is typical also for people who are independent from the field is characteristic with its ability to work out details of solution, complete this solution and adjust its proportions. Such description of a creative individual, who focuses on details and works with them, creates natural space for reflection of its connection with independence from the field. Flach (1986) identified these connections between creativity and independence from the field. In their research, participants who were independent from the field had better results in tests of creativity such as "alternative uses test" and "new uses test" than

the ones independent from the field. We set following questions in our research:

RQ 1: Can we assume statistically important positive relationship between independence from the field and ability to achieve cognitive closure?

RQ 2: Can we assume statistically important positive relationship between independence from the field and the need for achieving cognitive closure?

RQ 3: Can we assume statistically important positive correlation between all dimensions of creativity and the ability to achieve closure?

RQ 4: Can we assume statistically important positive correlation between the need for cognitive structure and all dimensions of creativity?

RQ 5: Can we assume statistically important positive relationship between independence from the field and figural elaboration?

2 Method and Methodology

In the process of gathering research data itself we proceeded according to accurately determined instructions of relevant test manuals and available information from other researches.

2.1 Participants

The sample was formed by 148 participants from 18 to 19 years who attended grades with school-leaving exams. We chose this category not only because accessibility but also on the basis of relative stability of cognitive functions. The choice was occasional and we had 95 women and 53 men.

2.2 Measuring tools

We used revised version of Roets's and Van Hiel's (2007) NFC scale to estimate the level of need for closure. The scale is standardized in Belgium. We adopted it and translated, it is not standardized in our country. The scale is formed of 41 questions; every question is evaluated on 6 point Likert scale from 1 (total disagreement) to 6 (total agreement). Individual items are categorized into 5 differentiated dimensions. The first dimension is known as a preference of order and structure in respondent's life and hatred of chaos and confusion. The second dimension "preference of predictability" represents the desire of individual to predict future actions. The third dimension "decisiveness" is evaluated highly by those respondents who find themselves quickly deciding people. The items of fourth dimension "unconformity from ambiguity" are highly evaluated by people who need to have direct and clear answers in their lives. Fifth dimension's "rigidity" - highly evaluated by those who are not likely to change their knowledge by alternative attitudes. The coefficient of Cronbach's alpha within our research sample without removing any item had figure 0,808.

The ability to achieve cognitive structure - AACS created by Bar-Tal (1994). The survey is not standardized as well, and was adopted and translated. It is formed of 24 items evaluated on 6 point Likert scale from 1 (total disagreement) to 6 (total agreement). The survey is single-dimensional and measures how the participants perceive their ability to achieve certainty by creating meaningful conclusion (of whole). Fourteen questions are formulated the other way round, that is the reason why it is necessary to evaluate the answers reversely, in other words 1 = 6, 2 = 5, 3 = 4, 4 = 3, 5 = 2, 6 = 1. The coefficient of Cronbach's alpha within our research sample without removing any item had figure 0,790. We assume that the method was relatively reliable.

The dependence and independence from the field was estimated by Group Embedded Figures test (GETF) of Olman, Raskin and Witkin (1962). We used the Czech test version, which is not standardized in our country, but proceeds from standardized version of Witkin et al. (1962). The principle of test is to find simple shape in more complicated complex of figures. Number of these figures is 25 (only 18 are included) and they create 3 sets. The first set includes 7 simple practice figures which

participant has 2 minutes to solve. This set is not evaluated. The second and the third set include 9 items which are taken into account of overall result. Every participant has 5 minutes to fill in one set. Overall administration of the test lasts around 15 minutes.

The level of creativity was estimated by Torrance's test of figural creativity (Jurčová 1983) on the third task-(circles). This task measures 4 attributes: fluency, flexibility, originality and elaboration. The main goal of the task is to use 30 circles on two sides, the circles being the main part of anything the participant creates. Participants with high scores in figural flexibility should not suffer from rigidity of thinking, they should be able to promptly produce various ways of solving troubles, which they can change quickly if necessary. Figural originality is more typical with people who immediately create new, smart, humorous and very extra-ordinary ideas, which provided with high figural elaboration are elegantly formulated, elaborated into details and completed.

2.3 Design

The research was realized in September, October and November of 2017. Administration was realized during one 45-minute-long class. During the first 15 minutes we presented GETF test for estimating dependency and independency from the field to our participants. Afterwards, after filling in GEFT test we introduced the third task of Torrance's test of figural creativity to our participants, who were solving it for 10 minutes. After finishing we handed them: NFC scale and AACS survey, which were filled in 15 minutes. We used remaining 5 minutes for debriefing.

3 Results and discussion

Right before the identification of correlation coefficients phase itself we realized an analysis-existence of normal distribution of our research sample. In results we found out, that normal distribution of data doesn't exist within our sample. Significance level of nearly all variables was below 0,05, which means we used non-parametric tests.

In tables, E1 represents figural elaboration, F stands for figural fluency, Fx for figural flexibility, O for figural originality, GEFT independency from the field, NFC need for closure and AACS the ability of achieving it.

Our first research question was whether we could assume statistically important, positive relationship between independence from field and the ability to achieve closure. As we can see in Table 1, we identified statistically important, negative relationship (-0.138, $p < 0.5$) between the ability to achieve closure and independence from the field.

The second research question was whether we could assume statistically important, positive relationship between need to achieve cognitive closure and independence from the field. Sarmány-Schuller and Sollar haven't discovered statistically important relationship between need for cognitive closure and independence from the field in their research (2002). As we can see in the Table 1, we haven't discovered any statistically important relationship between need for closure and independence from the field neither, which confirms our hypothesis.

Table 1 Spearman's correlation coefficients between GEFT, NFC and AACS

	NFC	GEFT
AACS	,010	-,138*
NFC		-,064

*Significance level is $p < 0,05$.

The third question was whether there is any statistically important, positive correlation between the ability to achieve closure and figural dimensions of creativity. As we can see in Table 2, we haven't identified any significant relationship

between individual dimensions of creativity and need and ability to achieve closure. We have identified significant positive relationship of figural originality with fluency and flexibility and statistically highly important, negative relationship between figural fluency and flexibility with elaboration.

The fourth research question was whether we could assume the existence of statistically important, positive correlation between need for closure and figural dimension of creativity. As you can see in Table 2, we haven't identified any statistically important relationship between figural dimensions of creativity and need for closure, what is in accordance with the results of Sarmány-Schuller and Solár (2002).

Table 2 Spearman's correlation coefficients between dimensions of creativity, NFC and AACS.

	F	Fx	O	EI	AACS
NFC	-,094	-,093	-,080	,114	,010
F		,829**	,267**	-,351**	-,058
Fx			,285**	-,245**	,068
O				-,115	,056
EI					,135

**Significance level is $p < 0,01$.

The fifth research question was whether we could assume relationship between independence from the field, which requires the ability of identification of simple figure in the complex of figures, and figural elaboration, which is typical for people who work with details, formulate them elegantly and complete them into whole. As we can see results in Table 3, we have identified statistically highly important, medium strong, positive relationship between ascending independence from the field and figural elaboration.

Table 3 Results of Spearman's correlation analysis between dimensions of creativity and GEFT.

	EI	F	Fx	O
GEFT	,352**	,037	,020	-,027

**Significance level is $p < 0,01$.

On the basis of analogical relationship between concepts of dependence and independence from the field, need for closure and ability to achieve it, we assumed, that these three concepts, in case of identification of statistically important relationships, could be linked together and maybe also create even determining effect, which wasn't confirmed. On account of the first research question, statistically important, negative relationship between independence from the field and the ability to achieve closure was confirmed. Goodenough (1978, In Nákonečný, 1995) states that individuals independent from the field go along with "inner reference ambit" and those dependent from the field rather go along "external reference ambit", thus they are less active in accepting information. Perception of people who are dependent on the field is significantly determined by surrounding organization, which makes individual's identification of specific fragments in organization harder. Subject not dependent on the field has no problem with identification of fragment in the complex of more complicated organization, which points to slightly better level of space orientation skills. Among other things, Jia, Zhang & Li (2014) confirmed that individuals who are independent from the field are better in filtrating relevant information from irrelevant; which in their opinion is caused by the better selectivity.

According to Bar-Tal (1994, p. 46), the ability to achieve closure "represents ability, which individual uses to evade information, which can't be grasped and categorized to their already existing cognizance." This means that individual like this selectively chooses the information, which is consistent with their actual cognizance, attitude, prototype or prejudice, which makes them decide quickly without longer thinking. According to this finding we formerly assumed that individual independent from the field will be more effective in process of identification of relevant and consistent information than individual dependent from the field. Our results point to opposite tendency ($r = -0,138$, $p < 0,5$). It can be explained by the fact, that individual independent from the field probably doesn't notice only

information consistent and relevant to his/her attitudes, prejudices or prototypes, but also notices information less distinct, which isn't relevant and consistent with his/her existing knowledge structure. They don't decide quickly, rather slowly and they think more about specific problem. We could possibly assume, that if there was a performance type tool, which could be used for valid measuring the ability of achieving closure systematically, we would be able to identify much stronger, positive relationship between tool like this and ascending independency from the field. Insufficient discriminatory validity of AACS survey could even explain lower value of relationship between the ability to achieve closure and independency from the field; since the survey alone measures only whether the participant finds himself as a decisive person and thus quickly (heuristically) or slowly (systematically) deciding and it doesn't measure the process of filtering relevant and consistent information from inconsistent with actual scheme, prototype or scenario.

Similar interpretation of results holds true also for relationship between the need for closure and independency from the field. According to Kruglanski (1990), we can define the need for closure as every person's desire to achieve the answer to assigned topic, any answer which reduces confusion and ambiguity. Any answer means the answer achieved heuristically, the answer, which is possible to achieve as it works on the concept of the ability to achieve closure by filtering relevant and consistent information from that inconsistent (with existing attitude, scheme or scenario) or by substitution (replacing the answer with answer to another question). The results of analysis of relationship between need for closure and independency from the field demonstrated trivial, statistically unimportant, negative relationship ($r = -0,64$, $p = 219$). Despite the relationship being trivial, we can see, likewise in ability to achieve closure, tendency to inverse proportion between need for closure and independency from the field. Ruisel (2004), under the findings of Witkin et al (1962), states that individuals independent from the field prefer active studying and formulation of hypothesis, but mainly, they notice less conspicuous attributes of impulses within formulation of hypothesis themselves. We can possibly draw conclusion, that they also have stronger need to achieve closure systematically, not heuristically. Statistically unimportant, trivial, negative correlation achieved by us points out to this conclusion. The fact, that it is statistically unimportant and trivial could be caused by NFC survey's limit. NFC survey is formed of facets preference of order, preference of predictability, decisiveness, discomfort from ambiguity and rigidity. We can find out from the survey whether the respondent likes order in life, predictability of situations, whether he/she is decisive, hates ambiguity and whether he/she is rigid; however, what we can't find out from survey is whether he/she desires to achieve answer to assigned question at any cost, even heuristically. Again, we can assume, that if there was a tool with perfect discriminatory validity, the option of identification of statistically important, stronger relationship within representative aggregate.

Concerning the third question, the analysis didn't prove any statistically important relationships between single dimensions of creativity and the ability to achieve cognitive structure. As we can see the results in Table 4, concerning figural elaboration, significant relationship between ability to achieve closure was nearly confirmed. The reason why any statistically important relationship between figural dimension of creativity and the ability to achieve closure didn't occur can be wrong validity and reliability of Torrance's test of figural creativity. Since the norms, which serve as basis for evaluating figural originality and flexibility, are relatively invalid (in actual information and cultural progress) and require re-standardization.

Table 4 Results of correlation coefficients of AACS and dimensions of figural creativity analysis

		F	Fx	O	EI
AACS	corr. coeff.	-,058	,068	,056	,135
	Sig.	,241	,207	,249	,051

Analysis of fourth question, whether the statistically important, positive relationship between figural dimensions of creativity exists, revealed that there isn't such relationship within our sample, which is completely in accordance to our results obtained by Sarmány-Schuller and Sollár (2002). However, more detailed analysis of factors of need for closure and individual figural dimension revealed weak, but statistically important relationship between figural elaboration and facet decisiveness of NFC survey ($r = 0,166$, $p = 0,22$). Facet decisiveness of NFC survey contains items, which evaluates individual as generally decisive or indecisive. Some items of AACS survey basically research the same, which explains the relationship between AACS and NFC, to which points Bar-Tal (2013). By way of an example of fifth research question, we can see clear medium strong, statistically important relationship ($r = 0,352$, $p = 0,001$) between figural elaboration and independency from the field; which not only clearly confirms logical analogy between these two concepts, but also is used to explain these weak, achieved relationships between figural elaboration, independence from the field with need and ability to achieve closure to a certain extent. We assume, that these weak relationships, which we obtained, are based on the limits of surveys NFC and AACS themselves. These surveys don't have projective function unlike tests which measure independency from the field and figural dimensions of creativity and thus they don't measure directly whether the respondent tends to decide systematically more often, but only latently, through hypothetical attributes of people, whom we assume to decide strictly heuristically.

3.1 Limits

One of the main limits is weak representativeness of our research sample caused by not identifying normal distribution nearly in all variables, and thus excessive number of respondents achieving extreme values on the edges of Gauss's curve. Hardly controllable impacts like insufficient attention of participants or descending motivation directly proportioned with time needed to fill in test sheets. Using too long surveys AACS (24 items) and NFCS (41) which nowadays already have their shortened versions or wrong discriminatory ability of AACS survey, which doesn't discriminate between deciding with economic, moral or legal context.

4 Conclusion

Our results imply that independency from the field within our sample probably doesn't allow participants to decide quickly and without difficulties, oppositely, it forces them to slow, more elaborated and deep deciding, which reflects in them presenting themselves as people who decide longer and harder in AACS survey. However, on account of lower value of correlation coefficient and insufficient representativeness of population of our sample these interpretations have significant limits. This is why our future goal is to create more representative sample, i.e. more participants and more randomly chosen sample, to design new method of performance type, which would measure tendency in various situations of deciding more validly and decide quickly (heuristically) or slowly (systematically) with variously differentiated context.

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Primary Paper Section: A

Secondary Paper Section: AN, AM,

STRESS LEVEL COMPARISON OF PARTICIPANTS ACCORDING TO THEIR AGE, GENDER AND THE REGION

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Abstract: Background - Stress has become a natural part of our lives. To some degree, it plays a motivating role, on the other side, when it comes to its long-term influence, it is reflected negatively not only in human behaviour but also in physiognomy of a man. Phenomenon of the stress has been analyzed and discussed for ages (Lazarus, 1936, 1966; Glasser, 1984; McGuigan, 1999) and the scientists also deal with its diversified impacts regarding the age and gender of human beings. Method - The examination was executed with an apparatus based on HRV analysis (heart rate variability) that analyzes the heart frequency. During 3 minute period of time the apparatus analyses the course of pulse frequency, time deviations between particular beats of heart and the number of probable cardiac arrhythmias. The analysis is recorded in HRV tachograph in the course of all measurements. Based on the measured data, the following indicators have been calculated: the current stress level in organism, the level of activation of sympathetic and parasympathetic nervous system, index of exhaustion, balance in autonomous nervous system, experienced rate of psychic (emotional) and physical stress and the level of stress resistance. Result - There were no significant gender differences found in the rate of physical and psychic stress, still there was some percentual difference recorded between men and women. Considerable differences have been shown among respondents in the category - their place of living (region). Conclusion - Our treatise has been dealing with the comparison of the stress level in dependence on age, gender and dwelling place of respondents.

Keywords: Stress, physical stress, emotional stress, stress resistance.

1 Introduction

Stress not only impacts people psychically (by means of anxiety or depression), but also physically. Physical stress symptoms can be presented in forms galore - starting with peptic ulcers, up to serious cardiac problems (Minirth, Hawkins, Meier, Flournoy, 1986, p. 16). The stress also negatively correlates with the level of satisfaction at work (Jex, 1998, Kasáčová, 2002; Paulík, 2010; Maslach, Leiter, 1997) and labour performance (Jex, 1998; McGuigan, 1999). Stress and its overall impact on a life of people can cause, besides other things, reduction in the human production (Glasser, 1984; McGuigan, 1999). Selye (1974) defined the stress as "a non-specific answer of human body to the threat" (p.27). Through the endocrinological indexes he pointed out and described some biological answers of organisms to the stress itself. Selye elaborated his theory of general adaptation syndrome GAS that includes three stages:

- Alarm
- Resistance
- Exhaustion (Selye, 1983, p.4).

Cannon (1915) used this term in connection to external impacts that negatively influence the homeostasis of organisms. Coherence between external conditions that was designed by Selye in his theory was later described by Grinker and Spiegel who also added physiological and psychic characters of that impacts (1945). In Slovakia, Nákonečný (1995) defines stress as an influence of extremely strong stimulation during a long period of time or as a necessity to remain in insufferable situation which cannot be avoided. Vágnerová (1999) understands the stress as a state of extreme burden and consequently the threat for a human body. Hennig and Keller (1995) describe the stress as a psycho-physical reaction to any external and internal stressors. Brockert (1993) offers an alternative model and he says that stress as such starts to exist in the situations when human aims in their lives differ from their needs. This means that a human being does not live in natural coherence with one's own needs. Čírtková (2000) believes that stress is a conflict between external demands and the capability of particular person to face them.

In our treatise we understand the stress not only as a reaction to the influence of both internal and external stressors, but also as a state that is conditioned by cognitive processing of particular

stress reaction and the previous experience in close connection with situational factors.

2 Research questions

In accordance with our research design we have created the following questions:

1. What is the overall level of psychic (emotional) and physical stress and the exhaustion index in the group of all respondents in regard to the place of their living (region where they live)?
2. What is the relation between the age, the stress score, average heartbeat and the number of arrhythmias in the group of our respondents?
3. What are the differences between measured indicators in regard to the gender?

3 Methods and Methodology

3.1 Participants

There were 881 people from 24 districts of Slovakia participating in our measurements. In the following table we show the percentual distribution of respondents according to the districts of Slovakia.

Tab 1 Distribution of participants according to their place of living (region)

District	Number	Percentage
Myjava	44	5,0
Dubnica nad Váhom	37	4,2
Považská Bystrica	36	4,1
Holíč	45	5,1
Šamorín	35	4,0
Sereď	38	4,3
Malacky	43	4,9
Senec	38	4,3
Pezinok	41	4,7
Ružomberok	40	4,5
Námestovo	40	4,5
Čadca	38	4,3
Prešov	41	4,7
Humenné	35	4,0
Poprad	32	3,6
Zvolen	30	3,4
Lučenec	42	4,8
Banská Bystrica	33	3,7
Šaľa	37	4,2
Levice	31	3,5
Nové Zámky	30	3,4
Kropachy	37	4,2
Michalovce	37	4,2
Rožňava	21	2,4
Total	881	100,0

From the point of view of gender share we had 679 females (77.1%) and 202 males (22.9%) in our research. The youngest participant was just 14 and the oldest one 91 year old. The average age of all respondents was 49.88 (SD=16,186). The most numerous age category was between 30-49 followed by category 50-64 what was 69% out of all participants.

3.2 Design

In our measurements we concentrated on the following variables: stress score, average heartbeat, number of arrhythmias, exhaustion index, physical and emotional stress and the last but not the least was the stress resistance. Not a single tested person was on psychopharmacs, none of them used a cardiac stimulator (pacemaker). Our research-testing was

executed in the frame of Festival of Health in towns across whole Slovakia.

3.3 Measuring tools

Examination of all participants was done in 24 Slovak towns. The measurements took 8 hours a day, usually on the town squares. Any people taking psychopharmacs, antidepressants, antipsychotics were excluded from the test sample. The choice of participants was coincidental, we just relied on their interest in our measurements. The examination itself was organized in a following way. A participant was seated and instructed to calm down. Before the analysis itself, we were finding out whether they have not eaten or drunk any stimulative stuff or energy drinks recently. The whole examination took about 10 minutes. After answering all the questions, we put a sensor on their left forefinger. In the course of next three minutes we were observing measured parameters of a participant and the consequent data interpretation took about another 7 minutes.

3.4 Statistical analysis

We used a statistical program SPSS 21 for evaluation of all obtained data. Since the distribution of our sample was uneven we had to use nonparametric tests.

4 Conclusion

Basic analysis

What is the overall influence of the stress score in our sample *a*) as a whole, and *b*) when divided according to the regions and gender?

What is the total rate of emotional and physical stress and the exhaustion index in the whole sample and when divided according to the region?

Our sample comprised of 881 respondents. The first question was orientated on the total rate of emotional and physical stress and exhaustion index within our sample of respondents. Particular outcomes can be seen in the following tables.

Tab 2 Exhaustion index in the whole research sample

	Frequency	Percent
Extremely bad	129	14,6
Bad	368	41,8
Standard	318	36,1
Good	28	3,2
Extremely good	38	4,3
Total	881	100,0

As we can see in table 2, exhaustion index in the category *extremely bad* was reached by 14.6 % and in the category *bad* it was 41.8 % of our respondents. This means that more than one half of all respondents belong to the category of bad or extremely bad exhaustion index.

Tab. 3 Prevalence of physical stress in the whole research sample

	Frequency	Percent
low	69	7,8
normal	516	58,6
high	201	22,8
Extremely high	95	10,8
Total	881	100,0

Based on the obtained data we can see that the low and normal physical stress was measured among 66.4 % of respondents, the rest (33.6 %) belongs to the category *high* and *extremely high* physical stress.

Tab. 4 Prevalence of emotional stress in the whole research sample

	Frequency	Percent
low	222	25,2
normal	423	48,0
high	188	21,3
extremely high	48	5,4
Total	881	100,0

When comparing percentual share in the prevalence of emotional stress we have found out that the situation is very similar to the outcomes as in case of physical stress – the high and extremely high level of emotional stress was measured in 26.7% of respondents.

Comparison of these indexes from the point of view of the respondents' region we show in the following graphs.

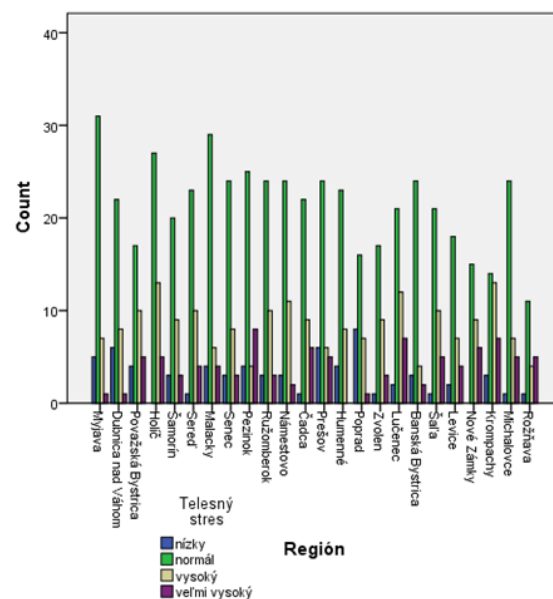


Fig 1 Percentual share of physical stress among respondents regarding their place of living

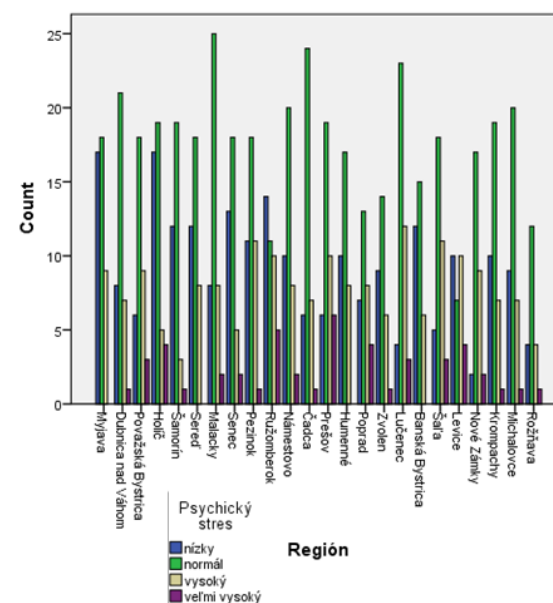


Fig 2 Percentual share of emotional stress among respondents regarding their place of living

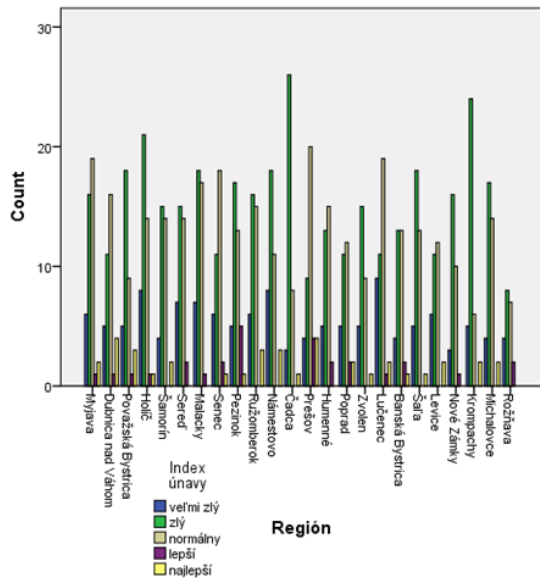


Fig 3 Percentual share of exhaustion index among respondents regarding their place of living

Tab 5 Comparison within groups

	Stress score	Physical stress	Exhaustion index	Emotional stress
Chi-Square	46,989	45,198	27,251	40,464
Df	23	23	23	23
Asymp. Sig.	,002	,004	,245	,014

a. Kruskal Wallis Test
 b. Grouping Variable: Región

As we can see, statistically significant differences between the groups can be found in category of the stress score and emotional and physical stress, too.

The highest rate of total stress was measured among respondents from Nové Zámky, Krompachy, Šala and Lučenec, on the other side of the scale, there were respondents from regions of Myjava, Banská Bystrica, Dubnica nad Váhom and Humenné with the lowest stress level. In the category of physical stress, the highest level of physical stress was reached by people from Nové Zámky, Krompachy, Lučenec, Lučenec and Rožňava, the lowest values were from Poprad, Myjava, Dubnica nad Váhom and Humenné. Highest numbers in the category of emotional stress were obtained from regions of Ružomberok, Prešov, Nové Zámky and Šala, on the other side were Šamorín, Senec, Myjava and Holíč. The difference in the category of exhaustion index between all groups was statistically negligible.

What is the relation between age, stress score, average heartbeat and number of arrhythmias in our sample?

Tab. 6 Mutual relations between observed categories

		Stress score	Average heartbeat	Number of arrhythmias
Age		,163**	-,217**	,053
	Sig. (2-tailed)	,000	,000	,113
	N	881	881	881
Stress score			,444**	-,303**
	Sig. (2-tailed)		,000	,000
	N		881	881
Average heartbeat				-,120**
	Sig. (2-tailed)			,000
	N			881

** . Correlation is significant at the 0.01 level (2-tailed).

As we can see in table 6, statistically highly significant relations were observed in all categories except the category *number of arrhythmias*. Significance shows highly influential relation because it is equal to zero. Even if there is highly significant relation ($r=-0,163$) between the age of respondents and the total stress score, we state that this is just a weak relation. There is statistically significant negative relation between categories of the age and the average heartbeat, still it is considered to be a weak relation ($r=-0,217$). This leads us to the conclusion that hand in hand with advanced age, the average heartbeat is decreasing. There was a statistically significant medium-strong relation observed between the stress score and average heartbeat ($r=0,444$) and a negative one between the stress score and number of arrhythmias ($r=-0,303$).

What are the differences in measured indicators regarding the category of age?

Tab 7 Differences between the groups in all observed categories Vestibulum

	Gender	N	Mean Rank	U test	Asymp. sig
Stress score	Woman	679	439,87	67813,000	,809
	Man	202	444,79		
	Total	881			
Average heartbeat	Woman	679	446,12	65105,500	,274
	Man	202	423,80		
	Total	881			
Number of arrhythmias	Woman	679	435,40	64777,000	,204
	Man	202	459,82		
	Total	881			

As we can see, there is no statistically significant difference between men and women in our sample. This phenomenon can be caused by non-balanced participation of both genders in our research sample.

Based on this fact, we were finding out whether there is any percentual difference in observed variables between male and female gender.

In the following tables you can find gender comparison in categories of physical, emotional stress and exhaustion index.

Tab. 8 Percentual comparison of the groups in the category of physical stress

		Physical stress				
		Low	Normal	High	Very high	
Gender	woman	Count	49	403	157	70
		% within gender	7,2%	59,4%	23,1%	10,3%
		% within physical stress	71,0%	78,1%	78,1%	73,7%
	man	Count	20	113	44	25
		% within gender	9,9%	55,9%	21,8%	12,4%
		% within physical stress	29,0%	21,9%	21,9%	26,3%
Total	Count	69	516	201	95	
	% within gender	7,8%	58,6%	22,8%	10,8%	
	% within physical stress	100,0%	100,0%	100,0%	100,0%	

As we can see, the overall percentual distribution in particular groups is approximately the same.

Tab. 9 Percentual comparison of the groups in the category of emotional stress

		Emotional stress				
		Low	Normal	High	Very high	
Gender	Woman	Count	160	329	153	37
		% within gender	23,6%	48,5%	22,5%	5,4%
		% within emotional stress	72,1%	77,8%	81,4%	77,1%

	Man	Count	62	94	35	11
		% within gender	30,7%	46,5%	17,3%	5,4%
		% within emotional stress	27,9%	22,2%	18,6%	22,9%
Total	Count	222	423	188	48	
	% within gender	25,2%	48,0%	21,3%	5,4%	
	% within emotional stress	100,0%	100,0%	100,0%	100,0%	

The same situation can be observed in the category of emotional stress, where the overall distribution is proportionally similar.

Tab. 10 Percentual comparison of the groups in the category exhaustion index

		Exhaustion index					
		Extremely bad	bad	standard	good	The best	
Gender	Woman	Count	86	285	257	24	27
		% within gender	12,7%	42,0%	37,8%	3,5%	4,0%
		% within exhaustion Index	66,7%	77,4%	80,8%	85,7%	71,1 %
		% of Total	9,8%	32,3%	29,2%	2,7%	3,1%
		Count	43	83	61	4	11
	man	% within gender	21,3%	41,1%	30,2%	2,0%	5,4%
		% within exhaustion Index	33,3%	22,6%	19,2%	14,3%	28,9 %
		% of Total	4,9%	9,4%	6,9%	0,5%	1,2%
		Count	129	368	318	28	38
		% within gender	14,6%	41,8%	36,1%	3,2%	4,3%
Total	% within exhaustion Index	100,0%	100,0%	100,0%	100,0%	100,0 %	
	% of Total	14,6%	41,8%	36,1%	3,2%	4,3%	

In this category is obvious that both genders differ – only 12.7 % of women reached extremely bad exhaustion index when compared to 21.3 % of all participating men. The outcomes in other categories are much closer to each other from the gender point of view.

5 Discussion

Based on the obtained outcomes we summarize that there were 881 participants from 24 districts of Slovakia in our research. Non-representative proportion of men to women in the research remains a possible threat regarding deformation of some outcomes. A typical feature across whole sample was an extremely high index of exhaustion; 14.4 % of respondents with *very bad* and 41.8 % with *bad* index of exhaustion. When taking a deeper look, we see 12.7 % of women and up to 21.3 % of men with very bad exhaustion index. Unfortunately, only 3.2 % of all respondents reached *good* and 4.3 % *the best* exhaustion index. These numbers are really alarming since the Institute of Public Health and the European Agency for Occupational Health and Safety officially announced that the stress was the second most frequent health problem across all Europe and the reason causing very high number of sick leaves. According to their findings, there is no difference between men and women, and our outcomes practically confirmed this information. There was no statistically significant difference between genders in any observed variables in the categories of both emotional and physical stress. The biggest and statistically most significant differences were found in the category – region of our respondents, or, in other words, the place where they live. Since we did not concentrate on the reasons for those differences, we cannot say where the origin of this problem lies. Generally, we

can confirm that the highest stress level, both emotional and physical one, was measured among respondents from regions of Nové Zámky and Saľa.

5.1 Conclusion and restrictions in our research

Our treatise brings transparent elaboration of indicators of exhaustion index, physical and emotional stress and the overall stress rate within observed sample. Obtained data describe contemporary situation in the frame of Slovakia.

Possible limits of our research:

- inadequate representativeness of the sample can be negatively reflected in the measurement outcomes,
- we were dealing only with volunteers who were willing to undergo this examination, so our outcomes might be a bit out of focus since those volunteers probably were people who particularly felt some problems regarding stress,
- another research limit was that we did not deal with the analysis of reasons causing stress among respondents.

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Primary Paper Section: A

Secondary Paper Section: AN, AQ, FP

APPLICATION OF OPEN DATA IN THE CZECH REPUBLIC

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The article was developed with the support of SGS project of Technical University of Liberec No. 3600/21194 "The use of Open Data for the purpose of implementing and managing Start – up projects and increasing corporate transparency".

Abstract: Open data represent a significant potential for a business development through strategic planning and innovation management. They can also serve as a tool for increasing transparency and reducing corruption. Yet, open data are still neglected and they are not given enough importance. This might be caused by insufficient information support of open data. The paper aims to analyze the current level of application of open data by a primary questionnaire survey on a sample of private sector companies and public sector organizations in the Czech Republic. The results of this paper represent a comprehensive overview of current open data applications by companies and organizations in the Czech Republic.

Keywords: application, Czech Republic, open data, primary survey, private sector, public sector

1 Introduction

Open data brings new potential for economic development. Wide range of data usage include, for example, strategic planning, innovation management, or corporate transparency. Open data may be important for research and development within businesses and across sectors. Last but not least, they can be an important source of initial information for a new business or project (for example, a start-up).

The digitization of the current market is evident from a number of initiatives. The most significant is Industry 4.0 which considers digital data sharing to be very important. Open data support and emphasizing its importance should in the future lead to streamlining business processes and also to creating more diverse partnerships, alliances or clusters. In the future, open data could, for example, help consumers with choosing the right product from a trustworthy company (with emphasis on its good reputation).

Different experience in working with open data is due to the different nature of subjects. In the public sector, data are published in a variety of forms and in the long-term period (which is determined by law). The work with them becomes an integral part of public organizations functioning. In the private sector, open data is a new tool, and therefore, the awareness of it is not at the level where it could be.

Some companies do not have enough information on the data-opening option, other companies cannot efficiently work with data and use their potential in a day-to-day process practically. Apparently, information support for open data in the private sector is not at a very high level. Current initiatives target mainly at the public sector, especially at governmental institutions. Various organizations often emphasize the positive effects of open data across sectors and market segments. However, there are also shortcomings in the use of open data in the public sector.

2 Problem formulation

The basic characteristics of open data is their availability. The data is freely accessible electronically to all businesses, institutions, and private entities. This enables their free distribution and the possibility of sharing with as many entities as possible. Specifically, these are data from a variety of areas of economics, economy, research, development, etc. (Open Knowledge Foundation, 2012)

In the Open Knowledge Foundation handbook (2012) it is stated that availability, redistribution, re-use, a lack of technology constraints, authorship and integrity are one of the basic

prerequisites for open data. It also states that the prohibition of discrimination against persons, groups or open data applications must be respected. The rules also apply to license requirements. The license must not restrict the dissemination of further work (or the same license must be used for the new document as for the original document). The authors of the handbook also claim that the rights associated with a particular dataset must apply to all users without the need for an additional license.

Berg (2013) claims that open data can be used by a variety of entities. The users of the open data are divided into five basic groups - open data suppliers, data aggregators, application developers, enrichers and enablers.

Suppliers publish open data freely. It may not be their primary goal; however, it is often a form of a company strategy. Data aggregators mainly process external data. Their main benefit is the added value of working with these data in the form of their further processing, cleaning or combining. Application developers are a very important component because they are the ones who provide data processing and make open data accessible. The primary goal of developers is to process data into usable applications as efficiently and organized as possible. Data enrichers collect and then create their own expertise. This creates added value for customers, making primary and austere open data more user-friendly. Enablers create tools, technologies or methods by which data are published and can become open. The supplier, the aggregator and the enricher can be identified in the private and public sectors. Application development and data access are typically provided by private companies (mostly in the field of information technology). (Berg, 2013)

Open data are widely used in open innovation. Open innovations represent a situation where a company is willing to share its knowledge and experience to some extent with other entities and continue to develop the innovation potential. In the open innovation model, shared data are crucial. Based on open data, experts can deduct or calculate the success or return of the planned innovation. They can, therefore, come to a conclusion on whether it is cost-effective to introduce the innovation. (Boček, 2012, Chlapek et al., 2012)

Open data have a significant impact on the development of the economic environment of a country as well as on individual companies. Open data provided by external entities may lead to build an optimal company strategy, to change strategies or to search for new business activities and opportunities. (Lathrop and Ruma, 2010; MV ČR, 2015) This supports the innovative thinking of corporate employees. Through open data, the suitability of the innovation and further the innovation itself can be adequately planned and managed. (Saebi and Foss, 2015) Furthermore, open data can serve as a tool for evaluating and searching for potential partners, increasing corporate transparency, or communicating with customers. (Open Knowledge International, 2016)

According to Chlapek et al. (2012), the most important objective of the public sector is to increase the transparency of activities of public organizations. Strengthening the reputation of public organizations is closely linked with the funding of these entities, which is ensured primarily through collected taxes. That is why the clarity and awareness of a number of orders is very important and increases the credibility of the country and public organizations.

3 Methods

The main research question is: To what extent and in what areas are open data applied by companies and organizations of the private and public sector in the Czech Republic?

The aim of the paper is to evaluate the current level of open data application in the Czech Republic with an emphasis on their use

in planning, management and decision making of companies and organizations of a private and public sector. The paper consists of the research of available sources on the given issue, the questionnaire primary survey and the analysis of the data obtained from the primary survey including the use of statistical methods.

Within the project, a primary research was conducted on the use of open data by the private and public sector in the Czech Republic. For this purpose, the questionnaire, which contained 15 questions, was created. The first part of the questionnaire was focused on identifying companies and organizations. Other questions divided respondents into those who know open data and those who had not worked with them yet. In conclusion, it was investigated for what purpose and what data companies and organizations use, provide and miss.

Before the survey itself and sending the questionnaire, a pilot study was conducted. This study was designed to validate and improve the questionnaire. Five companies were asked to complete the questionnaire and send comments. The observations received were incorporated into the questionnaire.

4 Problem analysis

The questionnaire was sent to 3,650 e-mail addresses, of which 981 were undelivered. For companies, a multi-step selection was made. It was determined how many companies were located in what regions and by this ratio the companies were randomly selected by the MagnusWeb application. This is the application in which data on business entities of the Czech Republic are collected. As the questionnaire contained a question of the size of the company in terms of number of employees, the same number of companies from each category was included in the survey, that is, the number of employees up to 50, the number of employees from 50 to 250 and the number of employees over 250. Altogether 3,000 companies were addressed.

Public sector organizations were selected according to the type of an entity. Ministries, public universities, regions and central state administration bodies were included in the basic set, so all these institutions were addressed. Other state administration bodies, interest groups, civic associations, unions, churches, foundations, charitable organizations and allowance organizations were selected at random. From each category there was addressed up to 10% of organizations. A total of 650 institutions from the public sector was included in the survey. The return of the questionnaire was a total of only 3.8%, i.e. 140 completed questionnaires. There were received 73 responses from the public sector, which is more than 11% return. Thus, the public sector survey output can certainly be considered valid. However, only 2.2% of completed questionnaires were sent back by private sector companies. It is, therefore, necessary to take the corporate sector with caution as with more questionnaire replies, the results could vary.

Table 1 provides a brief overview of the structure of companies and organizations responding to the questionnaire. The responses of the public sector with the highest return from the municipalities, regions and state organizational units prevailed. As far as the rest of the responses is concerned, the municipality was included once, the respondent apparently overlooked that this option was mentioned in the selection, one response came from the legal entity and one from the representative of the library. The private sector divided by the number of employees was represented by approximately the same proportion. The organizations such as other services, public administration, agriculture and government and self-government were most willing to fill in a questionnaire. In Table 1 only those other replies that were answered more than twice are given. Other respondents included fields such as regional development, IT, consultancy, sports and physical education, waterworks engineering or pharmacy.

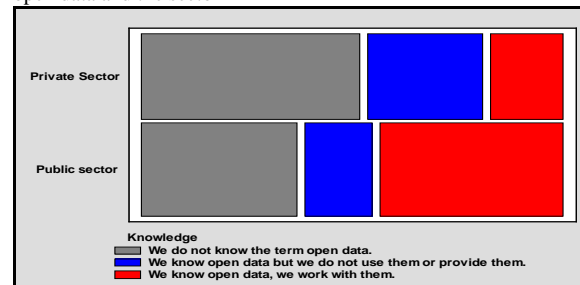
Table 1: Comprehensive information on the number of replies of addressed businesses and organizations

Company/organization	Division of companies/organizations	Company/organization field
Private sector: 67 (47.9 %)	No. of employees up to 50: 23 (34.3 %) No. of employees from 50 to 250: 27 (40.3 %) No. of employees over 250: 17 (25.4 %)	safety: 1 (0.7 %) tourism/leisure time: 1 (0.7 %) transportation: 2 (1.4 %) ecology: 1 (0.7 %) financial services: 9 (6.4 %) culture: 4 (2.9 %) other services: 17 (12.1 %) food industry: 2 (1.4 %) craft activities: 2 (1.4 %) social services: 9 (6.4 %) construction: 4 (2.9 %) technical services: 1 (0.7 %) education: 3 (2.1 %) healthcare: 3 (2.1 %) agriculture: 11 (7.9 %) manufacturing services: 2 (1.4 %) others: 68 (48.6 %) public administration: 17 government and self-government: 10 engineering: 5 electrotechnical industry: 4
Public sector: 73 (52.1 %)	civic association: 1 (1.4 %) registered church/religious group: 2 (2.7 %) foundation: 2 (2.7 %) charitable organization: 1 (1.4 %) public university: 1 (1.4 %) territorial self-governing unit (municipality/region): 37 (50.7 %) state organizational unit: 23 (31.5 %) allowance organizations: 3 (4.1 %) others: 3 (4.1 %): municipality: 1 legal entity: 1 library: 1	

Source: author's own processing

After the distribution of the respondents by sector, size, types and fields, the respondents were further divided according to their experience with open data. It appeared that 45.7% of the respondents had not met the concept of open data yet. The term of open data was familiar to 54.3% of the participants. However, only 32.1% actively worked with open data. The questionnaire revealed that open data were more familiar and useable in the public sector. Out of 45 responses of the respondents who regularly work with open data, there were only 12 companies. This assertion was confirmed by the test of the independence of variables between the knowledge of open data and the business or organization sector, whether it was the private or the public sector. In Table 2, Chi-square test values of the test are summarized which confirm that the variables are not independent. The public sector is more aware of open data, which is also noticeable from the graph shown in Figure 1.

Figure 1: Graph of independence test between experience with open data and the sector



Source: author's own processing

Table 2: Test of independence of variables – experience with open data vs. sector/field

Test	Statistical value	Degrees of freedom	P-Value
Chi-square	12.146	2	0.0023

Source: author's own processing

Attention was also paid to the independence between the experience with open data and a company size. Again, a Chi-square test was used and it confirmed that the variables are independent. The values are shown in Table 3. Businesses of all sizes work with open data.

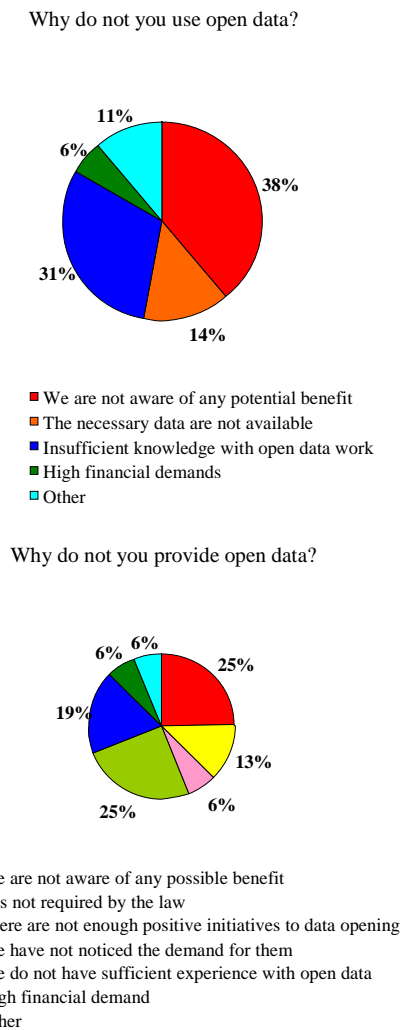
Table 3: Test of independence of variables – experience with open data vs. company size according to no. of employees

Test	Statistical value	Degrees of freedom	P-Value
Chi-square	1.614	4	0.8063

Source: author’s own processing

Figure 2 gives an answer to the question why the companies and the organizations do not use and do not provide open data. This question was given to such respondents who know open data but do not use it or provide it. The most common answer was that the companies were not aware of any potential benefits of open data. So, it can be assumed that it is a new tool that needs to get into the subconsciousness of companies and organizations first. Another very common answer was that the respondents did not have enough experience with open data. The public sector, which is more experienced in this issue, could provide better information about the availability of open data via media, the Internet or applications resulting from the use of open data.

Figure 2: Reason for not using and not providing open data



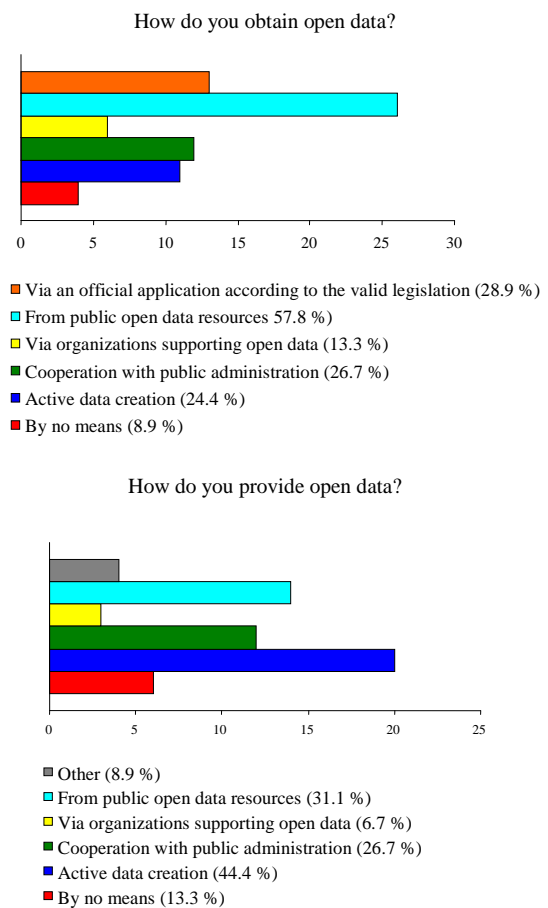
Source: author’s own processing

With the help of another question the respondents who work with open data were divided into different user groups. Some of

the respondents deal with more than one open data work. Out of 45 regular open data users, most companies and organizations provide data. This option was selected by 34 respondents, i.e. 75.6%. The second most common activity with open data is to make them accessible. 31.1% of the respondents, namely 14 companies and organizations, deal with the creation of tools that allow data to be opened and made accessible. Data aggregators were represented by 28.9%. Thirteen respondents deal with data collection and processing, followed by the creation of added value. Eight information enrichers who focus on making expert opinion to gained data also participated in the survey (17.8%). Application developers had the weakest representation in the survey only by 11.1%, that means four companies and one public sector organization.

The survey also focused on how companies and organizations gained and provided data. As can be seen from Figure 3, most respondents receive data from public sources, official requests under valid legislation, cooperation with public administration or active data generation. In the case of data provision, activities such as active data generation, provision from public sources or cooperation with public administration predominate.

Figure 3: How to gain and provide open data



Source: author’s own processing

Further, it was explored from which areas the companies and the organizations use open data and make them accessible. Table 4 summarizes the values obtained from the survey. The companies and the organizations mostly use data from statistics, public procurement, maps, business registers or legislation. Data providers, who only make data available and do not use it, selected the answer ‘other’. Another interesting answer was that thanks to the wide range of services offered, the company used almost all open data. The open data provided by respondents include budget, statistics, public procurement and election results. Also, in the case of making data accessible, some respondents chose the answer ‘other’ because they did not

make data accessible, but only used it. Other responses also included contracts, employment, social services and security or investment. One of the respondents stated that they only made accessible those data that were legally required by law.

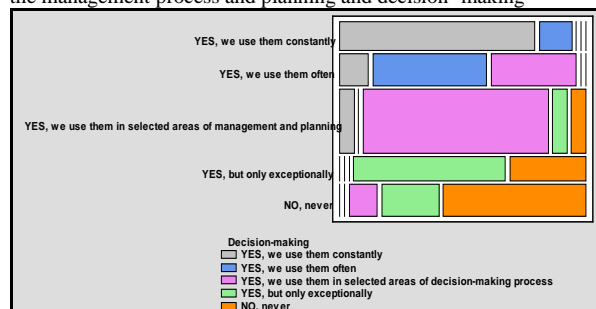
Table 4: Areas of data use and data accession

Data areas	Data use (no. of replies)	Data accession (no. of replies)
Maps	19	10
Land	4	1
Statistics	24	19
State budget/budget	13	22
Government expenditures	9	0
Business register	18	2
Legislation	15	5
Public transportation	8	2
Business	3	1
Healthcare	2	0
Education	9	4
Crime	2	2
Environment	13	4
Election results	11	11
Public procurement	19	19
Others	9	17

Source: author's own processing

Applying open data in the process of management, planning, and decision making is fairly common among active users of open data. 33.4% of the respondents applied open data in the management and planning process continuously or very frequently. In the decision-making process, representation was slightly lower, 28.9%. In selected areas of management and planning, open data were used by 35.6% of the companies and the organizations. Only 17.8% of the respondents never used open data in the management and planning process. Others, who know open data, only used them in exceptional cases. In selected decision-making processes, 37.8% of the respondents used open data. 17.8% of the decision-makers also stated that open data never helped them. Only in exceptional cases, 15.5% of the companies and the organizations used open data in the decision-making process. Using the Chi-Square Test of Independence of Variables, it was proven that the companies that used open data in the management and planning process usually did so for decision-making (statistical value – 77.976, P-Value – 0.0000). The conclusions are shown in Figure 4.

Figure 4: Proof of dependence between the use of open data in the management process and planning and decision-making



Source: author's own processing

Three open questions were used in the questionnaire. For example, in response to the purpose/method of using open data, these responses were as follows:

- for the need of self-government and state administration,
- in the performance of public administration,
- for the company's own and public information,
- for education,
- in the decision-making process,
- transparency.

It is clear from the answers that the companies and the organizations use data primarily to increase transparency and awareness. They do so to improve processes within the company and to share data with the public more effectively. However, there were also replies that the respondents do so for legislative reasons. These entities publish the data only because the law imposes it and because they had not revealed their benefits yet.

Another open question confirms the conclusions of the previous question. Respondents gave the answer to the question of the open data benefits. The companies and the organizations see the biggest benefit in transparency and awareness. Open data provide quick and almost immediate information. Another repeated response was to simplify the processing of requests for information under the current legislation. This fact shows that they publish the data because they are required to do so by one of the laws. A very frequent answer was that the companies and the organizations see no benefit in open data. This response clearly prevailed in the private sector. This may be caused by insufficient experience with open data. On the other hand, a positive opinion that open data are crucial for some businesses and organizations prevailed in the public sector organizations.

The last of the open questions addressed data issues that the companies and the organizations do not use or cannot use. The most common answer was that the companies and the organizations did not know about such data or that such data did not exist. The fairly common answer was that all the data they needed and wanted to use were available to them. Other businesses and organizations would appreciate more accessible information on public and state administration, public procurement, timetables, legislation, hazardous waste, labour offices, education, and crime. Some companies would also like to use more data from their customers, suppliers, subscribers and competitors.

At the end of the questionnaire, a question was laid to evaluate the main obstacles in gaining and the use of open data. The answers are summarized in Table 5. It shows the number of answers and the percentage out of 76 respondents who know open data and chose the given answer. The biggest problem is that the data are not regularly updated. Another obstacle can be seen in public and online data availability. A positive fact is that the least number of responses were given to the question of whether data is not in the required quality and format. This suggests that the companies and the organizations learn to publish data in a better form than just scanned documents, as is often the case today. Among other responses, for example, there appeared the view that an obstacle to open data is the general awareness of the possibility of their use and public awareness. The problem is also the lack of opening data anchoring in the valid legislation. At present, opening data is mostly a voluntary matter. However, there were also respondents who did not know any obstacles in obtaining or using the necessary open data or they were not aware of it.

Table 5: Obstacles in gaining and using the necessary open data

Answers	No. of answers	% of answers by respondents who know open data
Data do not exist	11	14.5 %
Data are not in an electronic form	18	23.7 %
Data are not publicly accessible	27	35.5 %
Data are not available online	24	31.6 %
Data are not current and regularly updated	31	40.8 %
Data are not consistent	15	19.7 %
Data are not in a required quality	10	13.2 %
Data do not have	10	13.2 %

a required format		
Financially demanding	12	15.8 %
Other	12	15.8 %

Source: author's own processing

The survey shows that open data is a tool that companies and organizations are currently learning to use. It seems that public sector organizations are one step ahead. However, even in the open data application, they still have to improve. In the field of open data, it would be advisable to get inspired by countries that are leaders in this branch. Great Britain and the US have been using this tool for quite some time and in a quality way. Companies and organizations in the Czech Republic could find the motivation there to use open data in their activities.

5 Conclusion

One of the major issues of primary research conducted through the questionnaire includes a low return on the answered questionnaires. Public sector organizations participated to a fairly large extent, the return on the questionnaire was over 11%. On the contrary, the companies in the private sector did not show much interest. In view of these results, it may be interesting and beneficial to investigate why companies do not engage in research and what would motivate them to participate in surveys more often.

Open data can be used as a competitive advantage. Based on these data, a company can control the processes inside its business, create and build its good name. In this way, the company has the opportunity to acquire new customers and build the loyalty of those existing. (Open Knowledge International, 2016) A wide range of data offers the potential for economic development of companies and the elimination of risks that may eventually lead to financial problems of the company or its extinction. Open data offers the possibility of reducing the risk, which should strengthen not only the development of the company but also the whole market structure. (Solom and Björk, 2012)

To find the level of open data application in the Czech Republic by the private and the public sector, the primary research was conducted in the form of a questionnaire survey. There were addressed 3,000 private sector companies and 650 public sector institutions. The main issue of the research conducted by email questionnaire is its low return. This was the case with this research, where the return was only 3.8%. For the public sector, results can be considered valid, as returns were over 11%. However, the private companies returned only 2.2% of the questionnaires. Conclusions made for the private business sector need to be treated with caution.

The research results show that open data are now more widely applied by the public sector. This is probably due to the little experience with open data that private businesses have.

Statistical testing of the obtained results demonstrated that companies of all sizes work with open data. This tool is applicable to small, medium and large enterprises. In addition, it was found that when the companies and the organizations use open data in the management and planning process they do it mostly in a decision-making process. This demonstrates the complexity of using open data.

The research has also shown that there is insufficient awareness of open data. The most common answer to the question why companies and organizations did not use data and did not provide them was that they saw no potential benefit in open data. It can therefore be assumed that without information support the development of open data will be complicated. The benefits of open data are often neglected. Increased awareness of open data could, therefore, lead to an increase in entities that would use open data. This is followed by the anticipated faster growth of the economy. Therefore, greater awareness of open data is

needed, with an emphasis on positive impacts on market development and also companies and institutions themselves.

In the Czech Republic, open data are at the beginning of development and their application is not sufficient according to research results. There is a lack of support from the Czech Republic and the European Union. This may result in a slower economic growth. Nor is achieved the innovation potential of the economy. Data sharing is perceived rather negatively, data potential for future growth is overlooked.

On the whole, open data should be more prominent across companies and organizations of all sectors to enable effective economic growth and increased transparency of economic processes. Public sector organizations are legally required to open data. For private sector companies, this aspect is missing, with the exception of the disclosure requirement for some industries and the financial statements for all companies. The incentive for data opening could, therefore, be their legislative support with an emphasis on the development of the business environment.

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Primary Paper Section: A

Secondary Paper Section: AE, AF

INNOVATION STRATEGIES USED IN ECONOMIC ACTIVITY

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Research project implemented as part of scientific research or development work and corresponding assignments that promote the development of young scientists and doctoral students in 2017: The influence of innovativeness on the development of enterprises in Poland with reference to the territorial division of the country.

Abstract: The purpose of the article was to analyze available innovation strategies used by entrepreneurs in running a business activity. In total, the work has a theoretical character, with a significant part of the material characterized by a tabular or schematic form. The first component of the work is a concise introduction to the subject matter, then the second part of the paper discusses the aspects concerning the definition of the word strategy. The third - the main part of the article, based on the subject literature, is devoted to the analysis of innovation strategies. This part of the study has been divided into four sub-parts, including: comparative analysis of innovation strategies by B. Twiss and Ch. Freeman; the fifth and sixth generation innovation model; introversion vs extraversion strategies as well as innovative development strategies. The whole of the considerations is concluded with a summary.

Keywords: *Economic Activity, Innovation, Strategies*

1 Introduction

Innovation strategies are a key concept not only in all theories of innovation, but are the main subject of reflection on the functioning and development of enterprises. This is because innovations are currently the main determinant of achieving a sustainable competitive advantage [19]. This in turn enables enterprises to achieve differentiated benefits, which in consequence may lead to business success, manifesting itself as: the market leader.

The creator of the term innovation - J. A. Schumpeter, believed that entrepreneurs will be forced to innovate to gain a strategic advantage. The observed situation in the modern economic arena can only confirm the rightness of the statement. Innovation, by Schumpeter, is understood as the creation of new profitable solutions [18], [22]. However, P.F. Drucker in his scientific journals describes innovation as a specific entrepreneurial tool - an activity that gives resources new opportunities for wealth creation [6].

Bearing in mind the arguments quoted above, it should be stated that having multi-faceted knowledge in the field of innovation is extremely important for students of economic faculties, entrepreneurs as well as all market participants. This article is an attempt to explore one of many important issues of innovation, namely, it is about innovation strategies. The aim of the study was to thoroughly analyze the innovation strategies used in business. The determined goal was decided to achieve by using the following research methods: literature analysis and comparative analysis.

2 Presentation of the Strategy Term

When characterizing innovation strategies, it is necessary to define what a strategy is. The Polish dictionary mainly refers to the military strategy, but it can be found the definition of strategy as a forward plan of action [7]. The word strategy itself comes from Greek, derived from the phrases *startos*, which means the army and *agein*, and that is - to command. At the beginning of the functioning, the term *strategos* referred to the leadership of the army and the creation of a battle plan. Nowadays, looking at the free market one can get the impression that the enterprises strategy is a kind of creating a plan to fight against competition.

A. D. Chandler defined the strategy as long-term goals that are related to the essential steps, and these are an important element in achieving the adopted goals [11].

Harvard professor and long-term editor of Harvard Business Review, Kenneth Andrews, stated that strategy is a pattern of decisions that are made in the company, that set goals and form the main policy with plans [1].

R. W. Griffin wrote that the correct strategy focuses on the following factors:

1. scope of the strategy - a set of markets on which the organization will compete;
2. distribution of resources - the way in which the organization distributes its resources among different uses;
3. a distinctive competence - what the organization does particularly well;
4. synergy - the way in which different areas of the company's activity complement or support one another [10].

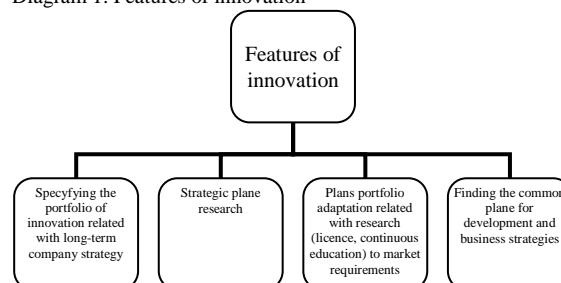
M. Romanowska stated that the implementation of the strategy is a series of tactical and operational activities that define the company's approach to the issues of investment, marketing, structures or procedures. The effect of such an action is to build an appropriate strategy and verify its course [17].

3 Analysis of Innovation Strategy

If the innovation strategy is related to a product, then its planning and implementation operates on the level of two types of strategies. The first of them is connected with innovative guidance, consisting in continuous and systematic introduction of new products to the foreign market. The second one refers to imitation, therefore reaction to the innovator's actions [12].

Innovation is strongly associated with the strategy, as shown in the chart 1 below. It should be noted that in every aspect relating to the characteristics of innovation, strategy or planning is an indispensable element. This proves that well-thought-out management policy and long-term plans can bring about results in the form of innovative success.

Diagram 1. Features of innovation



Source: Own study based on: [13].

The strategy is a very important factor in building success, and its omission may lead in extreme cases to the collapse of the business entity.

3.1 Comparative analysis of innovation strategies according to B. Twiss and Ch. Freeman

B. Twiss characterized eight types of strategies to promote innovation. The first of these is the offensive strategy, which is characterized by high risk, but in the case of success, the company can achieve substantial profits. An important element is the research and development department, which is focused on innovation. The marketing and production departments also play a relevant role here. The opposite of an offensive strategy is a defensive one. There is both low risk and low profits. The company is focused on minimizing costs. This strategy does not require the design and implementation of new products. The next element is the purchase of license, which allows the company to obtain technological innovations. The economic entity uses the experience, products and achievements of other enterprises, instead of working and developing their own. The strategy is

effective against business entities that have large financial resources.

Another strategy described by B. Twiss is the strategy of avoidance, in which the enterprise tries not to compete with the entity operating in the same market. The author also drew attention to the creation of the market, which refers to the creation of new products thanks to which completely new markets are being built. This situation is determined by the use of technological innovations. The creator also distinguished an independent strategy, which he referred to improving the existing product, thanks to the use of innovation. The effect of this is to replace the old product from the market.

An important element is also the acquisition of highly qualified personnel by employing employees/specialists from competing entities, thanks to which the company can use the knowledge of a business rival.

The last strategy is the one referring to the acquisition of other business units, which may involve the acquisition or merger of smaller entities [21].

Ch. Freeman presented a different concept in which he included six types of strategies. Freeman's idea is presented in table 1.

Table 1. Types of strategies according to Ch. Freeman

The type of strategy	Characteristics of the strategy
Offensive	Its task is to become a leader thanks to innovations such as the introduction of a new product or the modification of an existing one. This strategy is based on the following factors (or their penetration): contacts with representatives of special knowledge, own research facilities.
Defensive	The company is not pioneering in the production of a new product / process, but at the same time it is trying to follow the wave of technical innovations without lagging behind. This type of strategy is active (like offensive strategy) for innovation. The company observes and follows innovation pioneers in order to eliminate mistakes made by innovation leaders. Thanks to this approach, an economic entity can take over part of the newly created market by introducing an alternative to an innovative product.
Imitating	It is associated with the delayed following an entrepreneur using an offensive strategy. It depends on market conditions in which an imitating economic entity functions. In this strategy, solutions proposed by a competitive company should be quickly implemented. The strategy builds the advantage by achieving lower costs.
Subsidiary	In other words, it is referred to as a satellite, associated with the acceptance by an enterprise of the position of an active co-operator or other type of position that characterizes the enterprise as a subordinate to a stronger economic entity. Practically no own research works are carried out, no attempt is made to implement changes with the model of other entities. The partner's knowledge is used.
Traditional	In this strategy the product / process is practically not modified. The strategy is used by companies that do not see the need to change the product / process, because customers are satisfied with the existing state and competition does not put pressure on changes.
Bargain	It is related to the use of opportunities that arise in the event of a gap in the modified production sphere. Such a gap has not been

	noticed so far by the competition. The company that first sees this situation can function well for a long period of time. An important factor is research and development and long-term planning.
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Source: [9].

It can be seen that both B. Twiss and Ch. Freeman analyzed similar areas in part of their research. The table below presents the similarities and differences between the two authors.

Table 2. Comparative analysis of the concept of innovation strategy according to B. Twiss and Ch. Freeman

B. TWISS		CH. FREEMAN	
The type of strategy	Key words	The type of strategy	Key words
Offensive	Big risk, big profits	Offensive	Becoming a leader
Defensive	Small risk, small profits	Defensive	Following the pioneers
Purchase of a license	The use of knowledge of other enterprises	Imitating	Delayed following an offensive enterprise
Avoidance	No competition with other companies	Subsidiary	The use of partner's knowledge
Market creation	Introduction of new products creating the market	Traditional	No changes in the product
Independent	Improving an existing product	Bargain	The use of the gap in the modified production sphere
Acquiring qualified staff	Acquiring employees of other units		
Acquiring other entities	Mergers, acquisitions		

Source: Own study based on: [21]; [9].

The above comparative analysis shows that the common denominator for both researchers is the offensive and defensive strategy. However, it is related only to the convergence of names. B. Twiss and Ch. Freeman understood both strategies a bit differently. The first one referred directly to profits, while the second one to take a position on the market. A common ground can be the strategy of avoiding and using the partner's knowledge. In both cases, enterprises do not compete with each other on the market. It can be said that B. Twiss's theory is more aggressive, and two strategies may be testifying to this, which concern the employment of competition employees and the taking over of enterprises.

Within Twiss's offensive strategy, P.F. Drucker introduced the four types of it that are associated with being the strongest and taking a leadership position by the company. Undeveloped space that can be used should be searched. Another approach is to find and use a specialized ecological niche and economic change of properties of the product, market or industry [15].

3.2 Innovation model of the fifth and sixth generation

An interesting view on the innovation process was presented by R. Rothwell, who presented the fifth generation innovation model [5], [2]. It shows that innovation is a multifactorial process that operates due to the existence of dependencies between external and internal factors. These elements are co-organized by computer networks. A new factor appears in

Rothwell's vision, namely computer technology. The characteristics of individual generations are presented in Table 3.

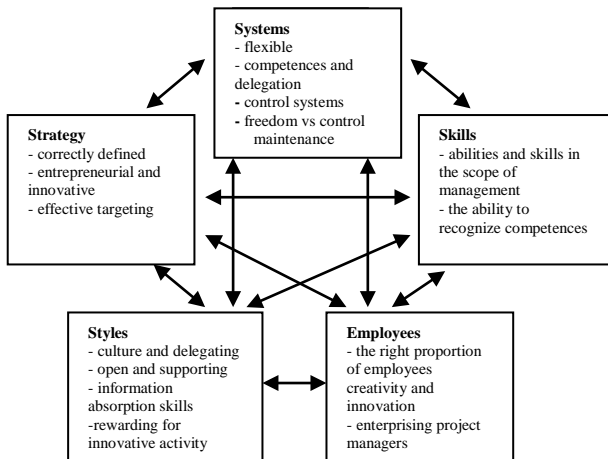
Table 3. R. Rothwell's innovation models

Generation	Basic features
First/Second	Linear model - supply model, demand model
Third	A related model, assuming the interaction of various elements and feedbacks of information
Fourth	Parallel model, internal integration of the business unit and cooperation with suppliers and recipients, emphasis on connections and alliances
Fifth	Integrated system based on network connections: flexible, based on response system related to the consumer, continuous innovation

Source: [20].

At the beginning of the 21st century, a significant change in the method of creating innovations by enterprises was noticed. The key is not only knowledge that is in the possession of an economic entity, but also the one that can be obtained from the environment. The new way of constituting innovation is referred to as the VI generation model. It is shown in Diagram 2.

Diagram 2. The VI generation model



Source: [4].

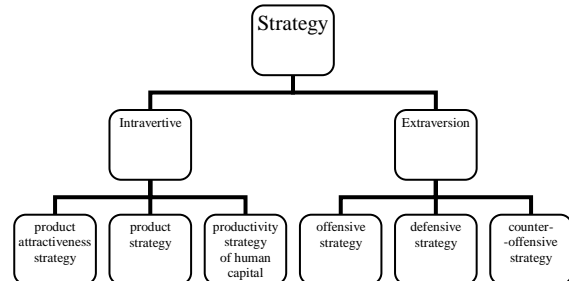
In the above-mentioned model, two elements are important: the internal potential of the company and the ability to acquire knowledge from the environment. The first factor is created by: systems, employees' skills, styles and strategies. It allows us to use the resources of the company. In the sixth generation model, it can be seen that there is a parallel interaction among all factors of the process of creating innovation.

3.3 Intravertive and extraversion strategies

In the space of research on innovations, there is also a division into two groups of strategies: intraversion and extraversion. The first one includes, among others, the product attractiveness strategy and product strategies that are important from the perspective of added value. The last element belonging to this strategy is the productivity of human capital and capital resources (resources involved, the so-called vector of resource development). The extraversion strategy refers to an offensive strategy related to entities that have a special position on the market, resulting from a significant competitive advantage (priority of using the sources of the innovative factor). In the aspect of extraversion strategy, there is also a defensive strategy that concerns market leaders protecting their position by striving to strengthen their position. The last element included in this kind of strategy is counteroffensive strategy, which leads (at a specific moment) to modification and development of products

in order to prolong their life cycle in the market, development of "hybrids" that aim to associate elements of existing and new technologies, transition to the higher level of sales compared to a competitor, financial exhaustion of competitors, as well as "acquisition" of key personnel of competing enterprises. The above groups are presented in the diagram below.

Diagram 3. Intravertive and extraversion strategy



Source: Own study based on the literature of the subject.

3.4 Innovative development strategies

Table 4 presents the synthesis of the typology of innovative development strategies. Therefore, the most important elements regarding the classification criteria, types of strategies were collected and there is also a short description of them.

Table 4. Synthesis of the typology of innovative development strategies

Classification criteria	Types of strategies	Characteristic
The goals of innovation	product, process and organizational	new products, new functional features, new processes, modernization of old processes, implementation of new organizational systems, increase in management efficiency
Factors of innovation	R + D	development of own R & D base, cooperation with external R & D units
	purchase of a license	purchases of domestic and foreign licenses
	staff training	creating own intellectual potential, occasional education; shortening the innovation cycle
Ways of implementing innovations	pioneer	isolated, bound, market leader
	imitative	isolated, bound, cost leader
A reference to ecological problems	cost reductions	cost reductions at the producer and operating costs at the customer's
	improving quality	production of ecological products
	greening	greening of products, processes, packaging
Market	customer education	permanent, occasional education, constant contact with the client, convenience in purchasing consumer goods, shares of "eco" products
	searching for new markets	
	maintaining old markets	

Source: [3]; [23].

As we can see, each of the abovementioned strategies does not function spontaneously, because specific relationships can be noticed among them. The enterprise (sector), defining and implementing a given innovation strategy, determines the fundamental factor in its implementation. The consequence of

such a process is the fact that the remaining factors of other strategies are subordinated to the overarching strategy [8].

In implementing the development strategy, it is important to analyze both the main and strategic goals. Establishing them will allow us to manage our innovation strategy in a better and more effective way. An example will be the analysis of objectives (table 5) in the Polish economy for the Mazowieckie Voivodship, which was selected due to the highest rate of innovation [14].

Table 5. Strategy goals tree

MAIN OBJECTIVE		
An increase in Mazovian innovation, leading to acceleration of growth and increased competitiveness on the EU scale		
STRATEGIC OBJECTIVE I Increase and strengthen cooperation in innovation and innovation development processes	STRATEGIC OBJECTIVE II An increase in internationalization focused on the development of innovation in the Mazowieckie voivodship	STRATEGIC OBJECTIVE III Increased effectiveness of support and financing of pro-innovation activities in the region
STRATEGIC OBJECTIVE IV	Shaping and promoting pro-information and pro-entrepreneurial attitudes conducive to creativity and cooperation	
STRATEGIC OBJECTIVE V	Development of the information society	

Source: [16].

In this case, the main goal will only be realized if the second-order goals are met, namely the strategic goals. Three of them refer to processes that effect in increasing innovation. The other two focus on providing the potential for innovation, which is built through shaping attitudes and developing knowledge in society. It is worth adding that each of the strategic goals has also assigned an operational objective.

4 Summary

Many modern enterprises, regardless of their size, owe their success to a large extent to innovativeness, and what is absolutely essential with it, is also an appropriate innovation strategy. Increasingly, the competitiveness of economic entities, and especially their competitive advantage, is determined not only by the possession of specific assets, but above all by the ability to use knowledge, experience, skills and technologies in such a way as to offer potential clients the better and more innovative products or services they desire.

It is important to approach system strategies in a systematic way. The result of such action is the integration between analysis and strategic planning. The sphere of these two elements is related to the company and its surroundings, which in effect provides a fundamental analysis of possible strategic situations.

The task of each company is to create a strategy for building and planning innovations, by analyzing development opportunities in obtaining new results and through investments in human capital and new technologies, etc.

It is worth paying attention to the fact that business strategies are an important element of innovation. Strategic management is a very important aspect in the functioning of entities on the market, because it requires advanced technology. Innovations implemented in such entities lead to changes in the model of implementation and investment of economic resources.

Summing up, on the basis of the theoretical analysis, it can be stated that the issue of innovation is multidimensional and extremely important for business entities operating on the market. In addition, when researching innovation strategies, it should be noted that there is still a need for further scientific research aimed at deepening the existing knowledge in this field.

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Primary Paper Section: A

Secondary Paper Section: AH, BC

COMPARATIVE ANALYSIS OF SELECTED DETERMINANTS OF INNOVATION IN EU COUNTRIES

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Research project implemented as part of scientific research or development work and corresponding assignments that promote the development of young scientists and doctoral students in 2017: The influence of innovativeness on the development of enterprises in Poland with reference to the territorial division of the country.

Abstract: Bearing in mind that modern economies are transforming at an incredible rate, and at the same time, permanent sources of development are weakening, innovations, and above all their commercialization, are what the EU countries see as an effective solution to the problem of achieving economic growth. When analyzing selected determinants of innovation, it is impossible to underestimate their role and importance. Consequently, the subject matter is relevant both from theoretical as well as practical point of view. The aim of the article is to deepen the definition and multifaceted examination of the relevance of selected determinants of innovation in EU countries. The essence of the research problem is therefore to examine the relationship between the level of innovation in EU countries and the following factors: GDP, number of applied patents, innovative products, or research and development expenditure. In the light of the theoretical research, the following were analyzed: the essence and definitions of innovation. The scientific effects of the study will be to broaden and consolidate current knowledge in this field, and the practical effects will be based on theoretical findings, even in identifying the most important determinants of innovation development in the EU countries.

Keywords: Analysis, Innovation, European Union

1 Theoretical approach to innovation: the essence and definitions of innovation

There are many definitions of the subject in the literature, so it is important to find their common ground.

When analyzing the definitions of innovation, it is worthwhile to present the meaning of the word itself, which is derived from Latin. Innovatio or innovare means novelties or newly introduced things.

In the first years of functioning, the term innovation was seen in the macroeconomic context. It was analyzed how technological development affects the development of the economy. Over time, professionals have shifted away from perceiving innovation in macroeconomic terms, and microeconomic analysis has begun, where technological development has been perceived as a process.

The analysis of the problem of defining innovation is as follows: among foreign authors it is necessary to mention: J. Schumpeter [21], F. Machlup [15], P. Kotler [13], R.W. Griffin [7], S. Jobs [5], P.R. Whitfield [24], R. Johnston [12], S. Shane [23], P. Drucker [1], [2], Ch. Freeman [4], E. Helpman [9], M.E. Porter [19]. In contrast, among Polish authors taking up this subject, one can distinguish, among others: Z. Pietrasiński [17], W. Grudzewski and I. Hejduk [8], A. Pomykalski [18], Z. Madej [10], A. Jasiński [11] and M. Goławska [6].

The concept of innovation was introduced by the Austrian economist Joseph Schumpeter at the beginning of the 20th century. His definition is the foundation on which the other terms are based, yet it is extremely versatile and current in the present day. The creator based the innovation on the following pillars [26]:

- introduction of new goods that consumers have not yet known or a new product of some kind;
- introducing a new method of production that has not yet been practically tested in the particular industry;
- opening up a new market, i.e. a market where a given type of industry of the relevant country was not previously introduced, regardless of whether the market existed before or not;
- gaining a new source of raw materials or semi-finished products, regardless of whether the source already existed or had to be created;

- Conducting a new organization of an industry, such as creating a monopoly or breaking it [20].

Schumpeter's theory can be summarized as the introduction of new methods. Typically, they were related to technology, but the use of imitation, i.e. the dissemination, implementation and use of new methods, was significant.

In addition to the above condensed presentation of the term innovation is Table 1, which contains the most popular researchers in innovation theory and the keywords that are included in their definitions. It can be seen that the basis of most of the analyzed definitions is "novelty" and "product" - (they occurred seven times), it becomes the main determinant of introducing the innovation in the enterprise. It is also worth noting that among the eleven selected researchers of this problem, much less frequent (because 4 times) the word "service" has appeared, and "improvement" only 3 times. Incidentally, such terms as "good", "idea", "imitation", "failure", "progress" and "commodity" were scattered.

Table 1. Keywords of the term innovation by selected authorities of economic sciences

Creator	Keywords
J. Schumpeter	novelty, product, commodity, imitation
F. Machlup	rejection of the word innovation
Oslo Manual	novelty, improvement, product, process
P. Kotler	novelty, good, service, idea, product
R.W. Griffin	development, novelty, product, service, use
S. Jobs	idea, lack of innovation system creation
P.R. Whitfield	workflow, problem resolution, novelty
R. Johnston	product improvement
W. Grudzewski & I. Hejduk	novelty, product, service, distinction from existing forms
Z. Madej	novelty, improvement, failure
Z. Pietrasiński	positive changes in products, services; progress

Source: Own analysis based on the literature of the subject; [14], [16], [22], [25].

2 The impact of selected factors on the level of innovation in EU countries

The impact on the level of innovation can be influenced by factors such as: GDP, number of patents applied, innovative products, or expenditure on research and development. The relationship between these factors is analyzed below. Table 2 shows these aspects on the example of EU Member States in 2012-2014. The highest average number of patents registered in Germany, it was 21.4 thousand and in France 9 thousand, while the lowest in Malta 5.19 and Cyprus 6.16. In Poland, the average for 2012-2014 was approximately 547. In terms of innovative new products for the market, the highest percentage was recorded in Ireland at 22.2 and in Austria at 21.9. The lowest percentage was recorded in Estonia 1.1 and Romania 1.3. Unfortunately, Poland also fell in the group of countries whose index was one of the lowest and amounted to only 5.2%.

Table 2. Selected indicators of product innovation and macro-economic measures for the EU-28 in 2012-2014

Country	Number of patents applied	Innovative products, new for the market (in %)	Innovative products, new for businesses (in %)
Austria	1912.56	21.9	8.9
Belgium	1528.65	22	9.8
Bulgaria	40.36	5.7	5.2
Croatia	17.48	8.2	10.6
Cyprus	6.16	14.9	8

Czech Republic	250.82	13.5	11.6
Denmark	1351.46	10.7	13.7
Estonia	25.28	1.1	9.9
Finland	1658.61	20.4	14.2
France	9000.66	18.5	9.2
Germany	21370.77	13.3	21.1
Greece	107.93	15	8.4
Hungary	215.23	7	4.9
Ireland	324.38	22.2	13.4
Italy	4289.89	15.5	9.2
Latvia	47.15	6.3	2.2
Lithuania	40.70	8.9	12
Luxembourg	64.50	18.4	10.3
Malta	5.19	8.1	11.5
Netherlands	3409.36	19	13.5
Poland	546.56	5.2	4.3
Portugal	119.25	14.5	13.9
Romania	86.21	1.3	2.3
Slovakia	47.14	7.5	5
Slovenia	129.90	17.5	7.7
Spain	1514.71	5.7	5.5
Sweden	3234.77	18.4	12.9
Great Britain	5377.64	10.8	16

Source: Own study based on [3].

Table 2. Continued

Country	GDP (million euro)	Expenditure on R & D (million euro)
Austria	323357.93	9652.97
Belgium	393339.00	9524.58
Bulgaria	42240.30	286.79
Croatia	43466.20	341.51
Cyprus	18384.20	83.75
Czech Republic	158611.97	2988.20
Denmark	259517.73	7714.80
Estonia	18861.10	331.16
Finland	202868.33	6676.03
France	2114049.7	47306.08
Germany	2836143.3	81098.01
Greece	183266.27	1430.67
Hungary	101840.73	1367.09
Ireland	183040.47	2822.81
Italy	1613230.3	21258.88
Latvia	22839.50	149.69
Lithuania	34980.10	335.87
Luxembourg	46878.13	598.98
Malta	7741.20	59.78
Netherlands	653640.00	12842.17
Poland	398359.90	3576.72
Portugal	170582.13	2270.28
Romania	142707.47	592.37
Slovakia	74273.27	621.91
Slovenia	36417.33	917.85
Spain	1034139.0	13074.72
Sweden	430594.63	13969.79
Great Britain	2124956.3	35087.50

Source: Own study based on [3].

When analyzing the level of new product innovation for enterprises, it should be noted that the leader in the ranking was Germany at 21.1% and Great Britain at 16%. The lowest recorded countries in this respect were Latvia with 2.2% and Hungary with 4.9%. Poland, as in the case of innovative products new for the market, came in second to last with 4.3%.

Considering the GDP level, the highest values were obtained in countries such as Germany (over € 2.83 trillion) and Great Britain and France, whose values were €2.12 trillion and €2.11 trillion, respectively. Table 3 presents the results of the

correlation coefficient between GDP and individual innovation indicators.

Table 3. Results of the correlation coefficient between GDP and individual innovation rates in the EU-28 countries in 2012-2014

Number of registered patents and GDP	0.88
Innovative products new for the market (in %) and GDP	0.15
Innovative products new for businesses (in %) and GDP	0.46

Source: Own calculations based on statistics.

Pearson's correlation coefficient for the relationship between the number of patents applied and the country's GDP was $r = 0.88$. Correlation is therefore plus / positive, and the relationship is very strong. In the case of the relationship between innovative products new for the market and GDP, $r = 0.15$, which proves that the correlation is plus / positive and the relationship is very weak. As for the correlation between the innovative product new for enterprises and GDP, it was $r = 0.46$; which means that it is plus / positive, and the relationship moderately strong. Figure 1 is a supplement to the analysis because the scattering between the examined data is shown.

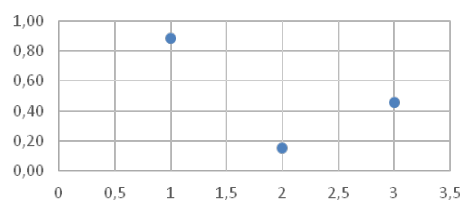


Fig. 1. The relationship between GDP and individual innovation rates in the EU-28 countries in 2012-2014

In the next stage, further dependencies were investigated, but this time they concerned R & D expenditure. The strength of the relationship between research and development spending and the three selected innovation indicators were also examined. It should be noted that, as in previous analysis, all positive correlation coefficients were obtained, so that in each analyzed case a positive correlation was obtained. The coefficient of the first tested relationship (i.e. between R & D spending and the number of patents applied) was $r = 0.98$; so the relationship is very strong. The analysis of the relationship between R & D expenditure and the innovative products new for the market was characterized by a correlation coefficient of: $r = 0.21$, and therefore a very weak relationship. The last tested relationship was between R & D spending and innovative products new for businesses. The correlation coefficient was at the level of $r = 0.55$, so the relationship between these features is strong. The analysis is detailed in Table 4 and Figure 2, which shows the scattering between the surveyed data.

Table 4. Results of the correlation coefficient between R & D expenditure and individual innovation indicators in EU-28 countries in 2012-2014

Number of applied patents and R & D spending	0.98
Innovative products new for the market and R & D spending	0.21
Innovative products new for businesses and R & D spending	0.55

Source: Own calculations based on statistics.

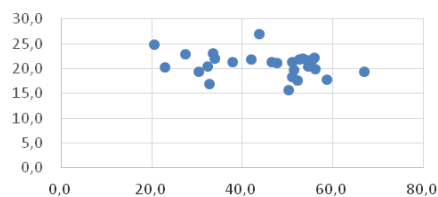


Fig. 2. The relationship between R & D expenditure and individual innovation rates in the EU-28 in 2012-2014

The above analysis suggests that in every case, together with increasing GDP or R & D expenditure, there is an increase in all tested innovation ratios. However, it should be borne in mind that in each case the relationships between the individual elements are strong. In many cases, the development of innovation may be linked to the economic situation of a particular country. Therefore, the economic factor may be significant, but its complement should be, for example, the knowledge and experience of human capital. It can be stated that this idea and the involvement of employees together with adequate financial contribution are the appropriate catalyst for the formation of new products / processes.

3 Summary and conclusions

Innovations are present in every aspect of life today. They reflect the dynamic changes taking place in the world. One can get the impression that every successive product or every next thought is related to innovation, and consequently the meaning has to some degree been depreciated. This word is often used by marketing agencies, which in the dynamically developing markets are trying to overtake the competition.

Comparative analysis of selected determinants of innovation in EU countries has been started with three indicators of innovation, namely: the number of patents applied, innovative products new for the market and innovative products new for enterprises. The research period was limited to three years (i.e. 2012-2014) and the innovation rates were reported by twenty-eight EU countries. The stated purpose of the discussions was achieved by applying statistical analysis, with particular emphasis on the use of Pearson's correlation coefficient. The study was divided into two phases. The first focused on demonstrating the strength of the relationship between GDP and (separately) the three selected indicators of innovation. On the other hand, the second part of the analysis was to determine the scale of dependence between R & D expenditures and again the three variables mentioned above.

Correlation analysis allowed us to identify the most important innovation determinant of all the surveyed ones. The strongest correlation was with the number of patents applied. For both in the first case, when examining the correlation index between the number of patents and GDP, and in the second case when the number of patents applied and the R & D expenditure were analyzed, correlation coefficients showing a very strong correlation between the tested variables were obtained. There was a positive correlation, so both features grew or diminished in the same direction.

Moderately strong relationship depicted innovative products new for businesses and GDP and R & D expenditure. On the other hand, the lowest correlation coefficient results were obtained when comparing innovative products new for the market and GDP and R & D expenditure. So there was a very weak connection between these features. Therefore, on the basis of the obtained results, it can be stated that the innovative products new for the market are the least important determinants.

The proposed analysis does not exhaust the totality of the examined matter, but it is an indication of the rightness to continue further and extend the research in this field.

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Primary Paper Section: A

Secondary Paper Section: AH, AE

CORPORATE CULTURE AS AN IMPORTANT FACTOR IN THE IMPLEMENTATION OF KNOWLEDGE MANAGEMENT

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Abstract: Knowledge and knowledge management are now increasingly seen as a critical part of the corporations. The increase development needs of corporate knowledge as well as innovative activities, whilst underlining the need and importance of corporate culture, because the content of the corporate culture consists of basic assumptions, values, norms of behaviour that are shared within the corporation and externally are manifested through behaviour and artefacts. That's why the corporate culture inherently clearly affects the level and success in implementing knowledge management. This article aims to highlight the importance of corporate culture in building knowledge management and point out key elements that influence corporate culture supporting knowledge sharing.

Keywords: Corporate culture. Corporation. Knowledge. Knowledge management.

1 Introduction

Knowledge management has emerged as one of the most important area in management practices and is established as a basic resource for firms and economies. Peter Senge believes that the only competitive advantage in the world's future will be the knowledge owned by corporation, as well as the ability of the corporation to continue learning (Duffy & Jan, 2000). Knowledge management is regarded as collection, distribution and efficient use of knowledge resources. It is a process of knowledge creation, validation, presentation, distribution and evaluation. Knowledge management is a multi dimensional construct with a large number of interrelated attributes. However, its three components or attributes that are commonly found in the literature are: knowledge acquisition or adaptation, knowledge dissemination or sharing and responsiveness to knowledge or knowledge use.

The knowledge management practices in the corporations depend on some prerequisites. One of the important precondition for effective knowledge management is corporate culture. Thus, one needs to understand what the culture of the corporate is, and one needs to understand whether or not this culture will enable knowledge management or hinder knowledge management. Furthermore, an excessive focus on technical issues rather than social aspects, results in poor knowledge management practices or altogether failure to comply the practices in the corporations. Specifically, there is lack of empirical evidence about what are the specific cultural variables that support knowledge management processes and help in development of knowledge culture (Oliver and Kandadi, 2006).

Consequently, this necessitates understanding the success and failure of knowledge management within corporations by identifying and assessing the preconditions that are necessary to flourish the endeavour. Many scholars and practitioners (Lopez et al., 2004; Kulkarni et al., 2007) believe that a corporate culture that is supportive and or adaptive can enable the successful implementation of knowledge management technologies as well as practices.

2 Literature review

This section rigorously reviews the relevant literature to point to the importance and the substance of knowledge management and characteristics of corporate culture, as well as the relationships between them.

Standards Australia (2005) defines knowledge managements as the design, review and implementation of both social and technological processes to improve the application of knowledge, in the collective interest of stake holders. Nonaka (2007) prefers to call knowledge management knowledge-based management, connecting people to people and people to

information to create competitive advantage. Bergeron (2003, p. 54) defines knowledge management in this way: "Knowledge management is a deliberate, systematic business optimization strategy that selects, distils stores, organizes packages, and communicates information essentials to the business of a company in a manner that improves employee's performance and corporate competitiveness." According to Collison (2005) is knowledge management an integrated, systematic approach to identify, manage, and share all of the department's information assets, including databases, documents, policies and procedures, as well as previously unarticulated expertise and experience resident in individual officers.

Knowledge management implementation in corporation will aid in effectively and efficiently solving learning problems and apply strategic planning and dynamic decision making (Gupta, 2000). Lopez noted that knowledge and corporate capabilities are forms of strategic capitals that promote the corporation's long-term goals and have strategic application in dynamic contexts. One of the key goals of knowledge management is to transform implicit knowledge to explicit knowledge; this leads to a reduction in the loss of valuable knowledge due to performance declines, as well as a reduction in the loss of corporate memory (Liebowitz, 2015). A comprehensive definition of knowledge management, which includes many aspects of knowledge management and serves as a basic definition of the concept in this paper is presented by Davenport and Prusak, i.e., the "exploitation and development of knowledge assets in the corporation, in [such] a way that goals are achieved" (Davenport & Prusak, 1998, p. 47). Generally, we can say that knowledge management is a process that helps companies to detect, select, organize and distribute important skills and information that is not usually accessible or organized, and can be considered as corporate memory. Many scholars and practitioners: Lopez et al., 2004; Kulkarni et al., 2007 and others believe that a corporate culture that is supportive or adaptive can enable the successful implementation of knowledge management technologies as well as practices. Schein (2004, p. 34) defined corporate culture as: "A pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid and therefore to be taught to new members". This is the most widely used definition. Schein (2004) posited that culture is the most difficult attribute to successfully achieve by many corporate. Schein corporate model illuminates culture from the standpoint of three cognitive levels of corporate culture (basic assumptions, values and artefacts). Cooke and Lafferty (1987) came up with the concept of corporate culture inventory define culture as the behaviours that members believe are required to fit in and meet expectations within their corporation (Easterby-Smith, 2011).

According to Cooke and Lafferty, corporate culture inventory, measures twelve behaviors of norms that are grouped into three general types of culture:

- constructive cultures, in which members are encouraged to interact with people and approach tasks in way that help them meet their higher satisfaction needs.
- passive/defensive cultures, in which members believe they need to interact with others in ways that might not threaten their own security.
- aggressive/defensive culture, in which members are expected to approach tasks in forceful ways to protect their status and security (Easterby-Smith, 2011).

Hofstede (2005, p. 47) called culture the "software of the mind". Notwithstanding the numerous definitions that exist, there is no consensus regarding a single exact definition of corporate culture. From the above, corporate culture is reflected in the way people perform tasks, set objectives and administer the necessary resources to achieve set objectives. Culture affects, the way

individuals make decisions, feel and act in response to the opportunities and threats affecting the corporations. Thus, culture is a sort of glue that bonds the social structure of a corporation together.

3 Importance of corporate culture for implementation the knowledge management

The creation and transfer of knowledge in a corporate has become a critical factor in corporation's success and competitiveness. Many corporations are now concentrating their efforts on how knowledge particularly tacit knowledge that exists in the corporate can be transferred across the corporations. In studies done in various corporate, Dixon (2000) found that the two main knowledge activities that need to be balanced are the creation of knowledge (referred to as common knowledge) and the transferring of knowledge across time and space. Generally, when something is being transferred, someone will gain it and someone else will lose it.

However, knowledge, which is regarded as an intangible asset, is different from tangible assets. Tangible assets tend to depreciate in value when they are used, but knowledge grows when used and depreciates when not used (Nonaka, 2007). Knowledge transfer requires the willingness of a group or individual to work with others and share knowledge to their mutual benefit. Without sharing, it is almost impossible for knowledge to be transferred to other person. This shows that knowledge transfer will not occur in corporation unless its employees and work groups display a high level of co-operative behaviour. Knowledge is transferred not only from individual to individual, but also involves „individual to a team or group, team or group to individual, or team or group to team or group. According to Davenport and Prusak, knowledge transfer involves two actions which are „transmission (sending or presenting knowledge to a potential recipient) and absorption by that person or group. (Davenport and Prusak, 1998, p. 101). They further stress that „transmission and absorption have no value unless they lead to some change in behaviour, or the development of some idea that leads to new behaviour. (Davenport and Prusak, 1998, p. 101) So one of the most important questions for corporate interested in implementing knowledge management is what are the key enablers to help us be successful? Several studies have tried to identify these enablers for knowledge management. Figure 1 displays the results of one European-wide company survey asking about the main success factors for knowledge management initiatives. Nearly one company in two mentioned corporate culture as one of the main enablers for knowledge management. Almost every third company named structures and processes, information technology, skills and motivation and management support as key success factors.

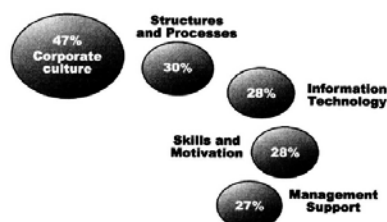


Figure 1 Main enablers of knowledge management initiatives. Source: Mertins (2003, p. 148)

Also other studies and practices pointed on culture as a key success factor for implementing knowledge management. For example Skyrme and Amidon (1997) highlighted seven key success factors. These include a strong link to a business imperative, a compelling vision and architecture, knowledge leadership, a *knowledge creating and sharing culture*, continuous learning, a well-developed technology infrastructure and systematic corporate knowledge processes. These factors play a key role in taking advantage of hidden benefits; however, achieving them can be complicated. These factors are called

critical success factors or bottlenecks. Lacking these factors is a major corporate barrier for achieving corporate goals.

Wong and Spinwall (2005) discussed managerial factors that affect knowledge management's successful implementation within 11 frameworks. These factors are: leadership and leadership support, *culture*, information technology, goals and strategies, evaluation, corporate infrastructure, corporate activities and process, incentives, resources and training and human resource management.

Collison (2005) claims those top managers' support, *corporate culture*, technological infrastructure, knowledge management strategy, performance appraisal, corporate infrastructure, activities and processes, rewards, resource limitations, education and training, human resource management and benchmarking. So, we can say, that corporate culture is an important driving force behind all the movements in the corporation. According to the results of many studies is corporate culture one of the major reasons behind the failures of knowledge management initiatives and it is crucial for successful knowledge management. Corporate culture impacts the knowledge exchange, the combinative interaction, and the perceived value of corporate members (Schein, 2004), thus it has a significant effect on knowledge creation capability.

According to studies, practices mentioned above and many others, we can divide these factors into four groups. Figure 2 shows critical success factors grouped into four pillars, that can help corporation to derive real and significant results in its most critical business processes and measures through its knowledge management initiative. Corporation need to have all four pillars in place. Half measures will not give the company any significant results.

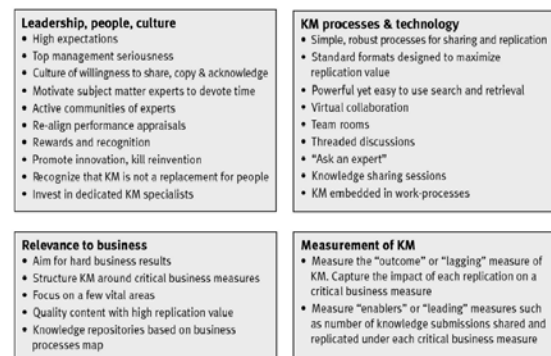


Figure 2 The four pillars of knowledge management Source: Easterby-Smith (2011)

3.1 Key elements of corporate culture supporting the knowledge management

Senge believes that in the future only two types of corporations will exist: ceased corporations that will disappear slowly and unexpectedly; and the learning corporations that will have the ability to learn and to react on fluid market much faster than their competitors (Collison, 2005). Resultantly, the success or failure of knowledge management within corporations depends on culture, an emerging pre-requisite for effective knowledge management. Researchers argued that culture is a complex system of norms and values that is shaped over time and affects the types and variance of corporate processes and behaviours (Nonaka, 2001).

According to Schein (2011) corporate culture can be understood on three different levels (see figure 3):

- Basic assumptions are unconsciously held learned responses which determine how group members perceive, think and feel.

- Values and beliefs are part of individuals' consciously held conceptual apparatus, which they use to justify their actions and evaluate outcomes.
- The third level of culture comprises visible artefacts, by which is meant everything from office layout, dress codes and books relating company history, to stories, myths and symbols.

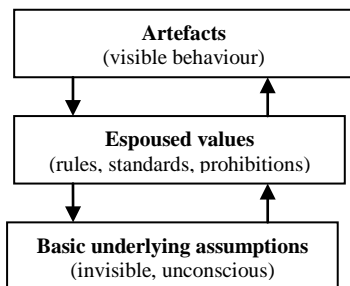


Figure 3 Three levels of culture
Source: Schein (2011, p. 78)

All three levels of corporate culture are extremely powerful determinants of corporate life, and are intuitively incorporated into the actions of skilled executives who use them to manage people, formulate strategy and induce corporate change.

Corporate culture is imperative factor for successful knowledge management (Davenport et al. 1998, Pan and Scarbrough, 1998, Martensson, 2000). It defines the core beliefs, values, norms and social customs that govern the way individuals act and behave in corporation. In general, a culture supportive of knowledge management is one that highly values knowledge and encourages its creation, sharing and application. The biggest challenge for most knowledge management efforts actually lies in developing such a culture. Since culture is a wide concept, it comprises many facets. According to some authors that have studied this kind of culture, learning culture can be described as a corporate culture that is oriented towards the promotion and facilitation of workers' learning, its share and dissemination, in order to contribute to corporate development and performance (Liebowitz, 2015). In the literature, this cultural orientation towards learning is called oriented learning culture or simply learning culture and, in short, it is the type of culture that a learning corporation should have. In other words, "in practice, corporate learning culture can be a vital aspect of corporate culture and the core of a learning corporation" (Wang et al., 2007, p. 156).

Among them, we could highlight learning as one of the corporation's core values, a focus on people, concern for all stakeholders, stimulation of experimentation, encouraging an attitude of responsible risk, readiness to recognize errors and learn from them, and promotion of open and intense communication, as well as promotion of cooperation, interdependence and share of knowledge.

Based on the compilation of several studies, the following values are identified as key corporation values or cultural drivers (Holbeche, 2005; Rooney, 2006; Avedisian & Bennet, 2010; Kippenberger, 2010, Nevis et al, 1995, Senge, 1999, Sveiby and Simons, 2002):

- innovativeness,
- customer-centricity/focus,
- flexibility,
- openness, communication and dialogue,
- teamwork, collaboration
- trust and respect for all individuals,
- risk assumption
- creativity and
- learning (Easterby-Smith, 2011).

Edward Hall identified three levels of the culture and explained them by referring to how they influence learning:

- the formal level – here the concepts are “taught by percept and admonition (...) the learner tries, makes a mistake and is corrected.”, in other words he learns using conceptual and behavioural patterns;
- the informal level – here learning is done through models and imitation;
- the technical level – here learning is done using explicit forms (Collison, 2005).

And how can be culture managed to be culture supporting knowledge management initiatives? If manager think of culture as both a source of resistance and energy, long-term „managed change“ is possible. If the sailor understands the prevailing wind systems, tides and currents, he can use them to his advantage. If managers attempt to force the culture by „managing it“ or insult the culture by ignoring it, they will experience its subversive and invisible power. If they aim to understand it and work with it in support of explicit change goals, the culture itself will shift over time in tune these goals.

According to Bevern (2002) corporate culture does not refer only to people, their relationships and beliefs, but it also refers to products, structures, as well as on selection and reward practices of the company. It is deeply embedded and has an intensive historical impact on present and future management.

Moreover, some of the world's most admired and successful business leaders (for example, Lou Gerstner or Jack Welch) believe that corporate culture, if correctly aligned with the external environment, is the key to long-term corporate success (Schein, 2004). However, too often these soft issues are forgotten and values are just declared by the management: no real understanding about corporate values exists.

These issues will be elaborated in turn in the research of this article. This study is based on quantitative research, administered on 246 employees of three big organizations, which are in study of Kokavcová (2011) identified as organizations having elements of knowledge management. As mentioned earlier, we have selected key elements that were identical among more authors (Holbeche, Rooney, Avedisian & Bennet, Kippenberger, Nevis, Senge, Sveiby and Simons): collaboration, trust, creativity, respect for all individuals. The questionnaire consists of 55 items, 12 for culture supporting knowledge sharing, 12 for collaboration, 11 for trust and 10 for creativity and 10 for respect of all individuals. The scale was rated on 5-point Likert-type scale, with 5 indicating “strongly agree” to 1 indicating “strongly disagree”.

As part of a deeper analysis of the data file was reviewed by the correlation structure (see Table 1). According to the results of this analysis, the culture supporting knowledge sharing in surveyed organizations is mostly influenced by trust and than by collaboration.

Table 1 Correlations between evaluated variables – Pearson Correlation

	Culture supporting knowledge sharing	Collaboration	Trust	Creativity	Respect of all individuals
Culture supporting knowledge sharing	1	0,742	0,829	0,678	0,688
Collaboration		1	0,731	0,620	0,670
Trust			1	0,731	0,626
Creativity				1	0,505
Respect of all individuals					1

Based on the research results it can be said that within the organizational culture there are various characteristics of culture that affect knowledge sharing, but mostly this study focuses on trust nad collaboration. Goh (2002) assented that a collaborative culture is an important condition for knowledge transfer to happen between individuals and groups. This is because knowledge transfer requires individuals to come together to

interact, exchange ideas and share knowledge with one another. Not only this, collaboration has been empirically shown to be a significant contributor to knowledge creation.

Trust is also another fundamental aspect of a knowledge friendly culture. Without a high degree of mutual trust, people will be sceptical about the intentions and behaviours of others and thus, they will likely withhold their knowledge. Building a relationship of trust between individuals and groups will help to facilitate a more proactive and open knowledge sharing process.

Besides this, there is a need to foster and innovative culture in which individuals are constantly encouraged to generate new ideas, knowledge and solutions. Likewise, Goh (2002) suggested a culture which emphasises problem seeking and solving. This requires also respect of all individuals. Individuals should also be permitted to query existing practice and to take actions through empowerment. By empowering individuals, they will have more freedom and opportunities to explore new possibilities and approaches. Equally important is the element of openness whereby mistakes are openly shared without the fear of punishment. In this respect, reasonable mistakes and failures are not only tolerated but allowed and forgiven. Making mistakes should be viewed as an investment process in individuals because it can be a key source of learning.

3 Conclusions

Corporations that are successful in knowledge management consider knowledge as corporate property and develop corporate rules and values to support its production and sharing. Critical success factors of knowledge management system implementation that were identified in this study are: corporate culture dimension. The key elements of corporate culture, which support knowledge sharing, were in our research identified as trust and collaboration. The corporate culture can be understood as a system of collective thinking which differentiates one group from another. It integrates everything that has a certain value: the style of leadership, the symbols, the norms that are shared by the members of that corporation and which are considered definitive, the goals that have to be attained and the way this should be done, in a few words, it integrates everything that defines the success of corporation. In this respect, it is necessary for managers to discuss themes related to business processes in their meetings and to disseminate among employees a vision of the company as a set of interconnected processes that must work in harmony with the strategic goals. In other words, the departmental objectives should be in line with those of the corporation as a whole. The findings of this article support the argument, that building knowledge management in organization is possible only by creating knowledge culture, which is based principally on the trust. As to knowledge culture, an attitude of organization members to knowledge, significance of its transfer to the organization is important. Behaviour of organization members, formed by knowledge culture, will determine whether knowledge is shared or not. There are many other questions, which are related with building a corporate culture supporting knowledge management such as: how human resource management affects the building of a corporate culture, how leadership style, how size of organization, scope of business and under. These questions can be an inspiration for further research.

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Primary Paper Section: A

Secondary Paper Section: AE

THE VOLATIVELY SUBJECTIVE NATURE AND VALUE OF STOCK – CZECH CASE STUDY

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Abstract: A joint-stock company is a legal fiction with a long history and with a successful present. Although the capital type joint stock aka Plc. is one of the most popular forms for business, its stock and share of its stock do not have a unanimously accepted objective nature and value. A holistic multi-disciplinary Meta-analysis reveals, thru the use of a Czech case study, that in contrast to the EU and Czech legislative and academic wording, a Plc can have personal features and that shares of stock can be a passive investment as well as instrument of control and even of the ownership.

Keywords: Shareholder company, nature of stock, value of stock.

1 Introduction

A joint-stock company is a legal fiction with a thousand years-long history. Typically, it is a legal entity oriented towards business in which different numbers of shares of the company's stock are owned by shareholders, but its centralized governance is separated from these shareholders (Duračinská, 2017). Thus, a joint-stock company has a different legal (juridical) personality from its shareholders, some shareholders can have more shares than others and can transfer their shares. Following the indicated legal fiction, a joint-stock company has its own separate legal personality, its own liability and perpetual existence even if all the shares are owned by one single shareholder who is a natural person (human being) or a legal entity (another company or corporation). Both legislation and academic literature points out that a company has members and not owners, and that nobody can own a company as, since the abolition of slavery, one person cannot own another.

In Western civilization, joint-stock companies started to emerge in the 13th century in continental law jurisdictions, namely in France, e.g. Société des Moulins du Bazacle (Sicard, 1953), and in Sweden, e.g. Stora (Groom, 2015). However, the true blooming of modern types of joint-stock companies began in common law jurisdictions in the 16th century, namely in the colony acquisitive England, e.g. the Company of Merchant Adventures to New Lands and East India Company (Irwin, 1991). The Amsterdam Stock Exchange soon became the place for trading shares, such as of the Dutch East India Company. In the following decades and centuries, the creation and existence of joint-stock companies separated from direct state participation and the role of the state became reduced to the registration and following recording process.

The post-Lisbon EU follows the Strategy Europe 2020 and, both at the EU level as well as the national level, fully recognizes the significance of joint-stock companies, while distinguishing between the typical capital style joint-stock company, called a public limited company, aka Plc, and its personal style parallel, called a private limited company, aka Ltd or LLC. Due to restricted space, further attention will be paid only to the capital style joint-stock company ("Plc") which often has the word "share" or "stock" in its legal description (shareholder company, Aktiengesellschaft, akciová společnost, etc.). Namely, the focus will be oriented towards a five year long period in re the stock, control and management evolution of a Czech Plc with over 511 shareholders and this real case study and its results will be confronted with the conventional perception of these phenomena as suggested by the legislation and the academic literature in the EU. The central leitmotif reflects the hypothesis that even the capital style joint-stock company, i.e. Plcs, can have personal features and, more specifically, the underlying hypothesis is that the legal fiction about its independence can be contrasted by the business reality even in the case of the involvement of more than one or a few shareholders. It is suggested that, despite a strong

legislative and theoretic academic wording and in contradiction to well-established law theories, after all shareholders might reach the status of true owners of a Plc and they are ready to pay (even some extra) for a stock in order to pass from a control level to the level of ownership. Indeed, the subjectively perceived nature and value of a stock can have a truly objective impact.

2 Sources and methods

A scientific, academic and practical exploration of the nature and value of stock and the ultimate meaning and objective consequences of the acquisition of a certain amount of shares in the light of a real Czech case study requires a deep and holistic understanding of the business as well as law setting. An open-minded and yet still sufficiently oriented approach needs to explore the general setting and move to a concrete situation in a given jurisdiction. A real Czech case study has to be explored, and both accounting and the actual paid value of the stock critically discussed in the context of the practical, as well as legislative and academic, understanding of the control and even ownership of a Plc. Such a combination of general theory on fundaments with a real life experience with stock valuation can be highly beneficial, bringing fresh ideas, provided that appropriate data and methods are used. The data in such types of presentations needs to mirror the cross-disciplinary and multi-jurisdictional nature (EU and Czech) of the topic and thus needs to be extracted from a multitude of resources. Primary resources, especially the inside data linked to the case study, have to be explored, along with secondary resources, such as legislation, standard settings and academic articles presented by authors from various EU member states.

The methods must reflect the nature of the topic and the underlying hypothesis that the nature and value of stock is highly subjective and that this has an objective impact. Namely, shares needed to pass a legislative milestone, set regarding the control and management of a Plc can be, for certain shareholders, extremely valuable, while basically worthless for other shareholders. In particular, when no dividends are paid and controlling power takes place, the accounting value of the shares is overshadowed by the subjective desire and drive for control, and ideally the ownership of the company. Therefore, methods have to work with the data generated by the indicated open-minded and multisource research. Indeed, the yield of data generated or indicated by research is to be processed by Meta-Analysis (Silverman, 2013), while using a holistic approach, a critical comparison of laws and confronting the concepts with the reality of the Czech case study. Due to the inevitable fact that economic, legal and technical aspects are involved, attention must be given to both qualitative and quantitative data and the deductive and inductive aspects of legal thinking (Matejka, 2013), as well as business and sociological aspects, must be respected. As a result, the quantitative research and data is complemented by qualitative research, along with a critical closing and commenting and refreshed by Socratic questioning (Areea, 1996). Ultimately, a vacuum becomes partially filled in with at least some suggestions about the extent and meaning of the subjective nature and value of stock and the objective impact of that.

3 General perception of the nature of stock and its Impact – legislative and academic overview

Separation of the legal personality of shareholders and separation of centralized corporate governance from shareholders is one of the fundamental features of a Plc (Duračinská, 2017), regardless of whether these Plcs are, or are not, listed on stock exchanges. The governance and management of a Plc is entrusted to directors, who are agents of shareholders, i.e. shareholders are principals (Kothari et al., 2010). These directors and their governance is supervised by the members of the supervisory board and ultimately by all shareholders during

annual meetings. This mechanism and its operation are regulated by several branches of law, and predominantly by the corporate law. The corporate law is conventionally classified as the Private law, but progressively it includes more and more mandatory provisions from the sphere of the Public law. These provisions are often enacted due to failures, abuses and even frauds committed while dishonestly taking advantage of the legal fiction of a Plc and of the above described features. Czech examples of the provisions trying to reduce these dark sides are liability (Cvik & MacGregor, 2016), bankruptcy, squeeze-out (Cvik & MacGregor, 2017) and other provisions. For the purposes of this paper it is critical to underline the fact that the directors of poorly performing or even unsound Plcs tend to either avoid any decisions or to make highly risky and controversial decisions (Duračinská, 2017).

These aspects and challenges project in perceptions of not only the nature but as well the value of the stock, namely shares of the Plc's stock. These perceptions are inherently subjective and each stakeholder approaches them from their own perspective and based on his or her expectations. Therefore, the drive to propose the accounting value, calculated based on historical costs, book value or combined assets value of the Plc, as the objective stock value, is controversial, by both listed and non listed Plcs. However, even the drive to propose the fair market value assessment is problematic, because in the same moment even the same bulk of shares can have a dramatically different value for different shareholders or outside investors. These differences are even bigger when we move in time or when we consider different sizes of blocks of shares. Financial theory and practice do not give generally accepted recommendations in this respect (Jackova, 2017) Indeed, this chronic unpredictability of value occasionally leads to empirical and other studies which bring concrete recommendations, such as e.g. that the share repurchases make prices more efficient and reduce idiosyncratic risk (Busch, 2016) and that IFRS firms have a lower rate of restatements compared to the GAAP (El-Gazzar & Finn, 2017). Both legislation and academia confronts the dichotomy of the GAAP, with the historical cost preference, and the IFRS with the fair market value preference. Regarding the listed Plcs, and perhaps even non listed Plcs, they are inclined to go for the IFRS, but this brings new questions about how to determine the fair (market value) and the straggle over the nature of stock and shares reappear. Indeed, the EU, its law and businesses face challenges which they often address rather intuitively. The following EU and Czech legislative and academic overview along with the Czech case study demonstrates this clearly. Discussion and semi-conclusions are dynamically across the paper and culminates in its conclusion.

3.1 The nature and value of stock and their impact according to the EU and Czech laws

Post-modern global society is marked not only by a very intense competition and digitalization (Pelikánová, 2012) and increasingly more complex and dynamic organizations (Piekarczyk, 2016), but as well by an exponential growth in the focus on accounting standards, such as the US GAAP and the IFRS. They both encompass conservative financial accounting, and this even regarding financial instruments, namely a special type of tradable financial asset called a security. A security can be either a debt security (such as bonds) or an equity security (such as common stock) or a derivative (such as options). The law and accounting standards have slowly to move to the recognition that the nature and value of equity securities are very particular and include both features of passive as well as active investment. Indeed, the transfer of a stock demonstrates the complexity of the overlap of business and law (Vivant, 2016) and brings to the surface many controversial topics, often related to the legal personality fiction and corporate veil doctrine in the context of Plcs. As a matter of fact, transferring the stock means transferring a virtual interest and perhaps even control on somebody else with the consideration taking usually a monetary form. In contrast to relatively commercial deals, in the case of a stock ownership and transfer many stakeholders are directly or indirectly involved. The law must address these features and

provide an appropriate legal framework facilitating the administration and disposition with stock, while simultaneously fitting in the general legal and strategic doctrines, such as the EU doctrine of the famous four freedoms of movement, including the movement of capital, in the single internal market (Cvik & Pelikánová, 2016) and the digitalization proclaimed by Europe 2020 (Pelikánová, 2014). The EU law, and in the harmonization wave as well as the Czech law, attempt to provide a legal framework effectively and covering Plcs, their stocks, shareholders and even stockholders and balance the involved, often contradictory interests. Plcs can be created both based on the EU law as well as national laws of the EU member states, and the legislative proposed accounting method aims rather towards the IFRS than US GAAP. Hence it is relevant to present a cursory overview of key EU and Czech legislative documents.

Table 1: Overview of selected EU and Czech legislative acts covering Plcs and their stock

EU law	Czech national law
Regulation 2137/85 on a statute for European Economic Interest Groupings (EEIGs) Regulation 2157/2001 on a statute for a European Company (Societas Europea or SE) Regulation 1435/2003 on a statute for a European Cooperative Society (SCE)	Act No. 89/2012 Coll., Civil Code Act No. 90/2012 Coll., Business Corporation Act (Act. 513/1991 Coll., Commercial Code)
Directive 2012/30/EU on the formation of Plcs and their capital (the minimum capital EUR 25 000) Directive 2009/102/EC (the 12 th Company Law Directive) on setting up a single-member company in a Ltd (but EU countries may decide to extend it to Plcs).	
Regulation (EC) 1606/2002 requiring IFRS for all listed companies Regulation (EC) 1126/2008 on adopting IFRS	Act No. 563/1991 Coll., on accounting
Directive 2009/101/EC on the coordination of safeguards Directive 2013/34/EU on the annual financial statements	

Source: Prepared by authors based on their own research via eurlax

Despite its importance and impact on the operation and control of a Plc and on the investment sphere of the shareholder, the nature of the stock of a Plc, i.e. shares of the given Plc, is not well defined and described in the EU legislative acts. Indeed, the post-Lisbon EU has both supranational and intergovernmental natures and has normative and other characteristics centered around the concept of the single internal market with significant institutional features and a competing interest group (Damro, 2012). However due to the internal and competence challenges of the EU, although a Plc. is critical for the single internal market, its nature and stock valuation are not directly, explicitly and mandatorily stated in the EU legislation. The current EU strategy, Europe 2020: A strategy for smart, sustainable and inclusive growth COM(2010) 2020 final ("Europe 2020") is strongly impacted by both formal and informal institutions (Pasimeni & Pasimeni, 2016) and attempts to develop the technological (Pelikánová & MacGregor, 2015) and other potentials of a European economy (Balcerzak, 2016) and systematically pushes for harmonization, if not unification and international standardization, see the EU embracement of the IFRS. However, it must be underlined that it has but little to do with increasing competitiveness (Erixon, 2010) and improving the understanding of principal business forms. The implementation of the Europe 2020 underlines persistent differences between EU member states (Çolak & Ege, 2013) due

to different social, political and economic traditions (Pelikánová, 2017), insufficient efforts of many European economies, especially the most important ones (Balcerzak, 2015), and the fact that smart, sustainable and inclusive activity, especially innovative activities, of businesses are far from being a spontaneous, market-based process (Pohulak-Žołądowska, 2016). The effectiveness and efficiency of the goals of the Europe 2020 and their implementation remains highly questionable (Staničková, 2017). The above table and the below quotation demonstrates that the EU law is perhaps closer to find an approach to the valuation (IFRS) than to the nature of stock.

Namely in the EU legal system, the Regulation 2157/2001 on SE states only in Art.1 “The capital of an SE shall be divided into shares. No shareholder shall be liable for more than the amount he has subscribed.” and in Art.33 “Shareholders who have contributed their securities to the formation of the SE shall receive shares in the holding SE.” No further information on the nature is provided and the EU legislative wording focuses in more depth only on the valuation, especially on the valuation of shares of stock of listed companies, see above in the Table. As a matter of fact, the EU requires since 2005 all exchange-listed firms, including Plcs., to adopt the IFRS in their consolidated financial statements (Beisland & Knivslå, 2015) and softly push for the same by other subjects, including not listed Plcs.

In the Czech legal system, more legislative information is provided about the nature of shares and stock. Since the Czech Commercial Code was abolished, the legal regime of Plcs, stock and shares is included in the Civil Code and in the Act on Business Corporations. The Czech Civil Code extends the definition of the item (re) via Art. 489 et foll. even to rights. Therefore, a Plc is an independent legal entity having its own legal (juridical) personality and its stock/shares are a subject matter of absolute property rights. The Act on Business Corporation deals specifically with Plcs and defines them in Art. 243 “A Plc. is a company with a registered capital divided in a certain number of shares.” It includes even the definition of share via Art. 256 “A share is a security (stock) or an intangible recorded (security) to which are linked rights of a shareholder as a participant member to participate on the management, on the profit and on the wind-up proceeds of a Plcs, as stated by this Act and the Bylaws of the concerned Plc.” The regulation of Czech Plcs is extensively developed and there are many provisions in the Act on Business Corporation specifying the nature, form and regime of Plcs, stocks and shares. Hence, it can be suggested that the Czech law passed the Rubicon, and recognizes both the legal independency of a Plc and its capacity to have a legal (juridical) personality and the ownership potential of stocks and shares. However, this leads to the dilemma about how to address one of the most fundamental legal principles applicable in the 21st century, namely that one law subject cannot own another law subject. Boldly, slavery was abolished and thus one person cannot own another person. This is the point of view of law. However, in the economic and business perspective, there is not any doubt that the single (or even majority) shareholder is a true master of his Plc. and can (and should be) labeled not only as the owner of shares but as well as the owner of the Plc. Is such a Plc really an independent person with its own will? Are not shares the building blocks to its ownership? The below points how the academia is tackling this *prima facie* non reconcilable dilemma and what happens in the real business life, see the part about the Czech case study.

3.2 The nature and value of stock and their impact according to the EU and Czech academic literature

Although academia and the academic press consistently state that the continental law jurisdiction is rather formalistic, while common law jurisdictions are more pragmatic (Pelikánová, 2012), there is no doubt about the fact that Plcs integrally belong in all modern Western civilization jurisdictions and they are a popular academic topic. Indeed, corporations and companies are indispensable for business conduct in the 21st century and both in the EU and in the Czech Republic, their most popular forms are Ltds and Plcs. The number of small and

medium sized enterprises (“SMEs”) in various EU member states often exceeds 90% and directly affects employment, welfare, etc. (Brozek, 2017). A significant part of these SMEs represent Plcs, often described as the paramount of capital independence. However, no Plc can be considered as an isolated entity, i.e. each Plc needs to take into account inside and outside specifics and develop a well balanced relationship with all relevant stakeholders (Gubova et al., 2017). Academia does not miss the chance to underline that, due to the legal fiction of the separate legal (juridical) personality, each and every Plc potentially faces the eternal principal-agent problem linked to the fiduciary duties, duty of loyalty and duty of due care and centered around the threshold criteria of the business judgment rule, see e.g. *Smith v. Van Gorkom*, 488 A.2d 858 (Del. 1985) and §102(b)(7). Indeed, the doctrine of the business judgement rule is linked with the evaluation of an admissible risk that is borne by the statutory body, directors, when adopting the right, proper and educated decision and the management of the Plc (Smalik & Lukacka, 2016). It is important for directors to make right decisions, to consider all risks and uncertainties while respecting the individual conditions of each Plc. (Jackova, 2017), and this even in the hot context of the setting of directors compensation (Kothari et al., 2016) and of the new preference of managers to rather focus on the avoidance of losses than on acquiring gains (Mandal et al., 2018). It cannot be overstated that the asymmetric information from an agency-based perspective creates moral hazards and conservatism in financial reporting (Thijssen & Iatridis, 2016). The fundamental aim of a Plc governance is to create a sustainable balance (Gubova et al., 2017) between shareholders and directors, as well members of the supervisory board, employees and other stakeholders of the Plc (Duračinská, 2017). To make it even more complex, one shareholder can be, at one and the same time, a director (or a member of a supervisory board), an employee and a creditor. In addition, directors and members of supervisory boards are predominantly selected by shareholders, thus a majority shareholder can become the only decision maker in this respect. Naturally this is the case, as long as the law governing the Plc does not provide otherwise, e.g. see Czech or German compulsory rules about the involvement of employees in the supervisory boards of certain Plcs. At the same time, academia underlines the particularity of each Plc. Undoubtedly, each Plc. is unique with distinctive features which vary based on asset structure, development phase, investment, market position, etc. (Jackova, 2017). Each Plc. follows its unique business model, which (hopefully) ensures its financial, and other, stability (Megova & Palka, 2016). Well, the questions are, who at the very end determines it, how much is one ready to pay for such a power and to what extent this power needs to consider other stakeholders and their interests emerge. One of the six cultural dimensions analyzed by Hofstede, namely individualism v. collectivism, comes into play and manifestly influences the approach to the nature of stock and its valuation (Todea & Buglea, 2017) as well as to the corporate social responsibility (Celeda & Bilkova, 2016).

Well, this chronic academic hesitation and incapacity to address the nature of the Plc, its stock and shares can be confronted with the academic readiness to go for a consent regarding the valuation. Indeed, similar to the legislative trend towards the IFRS, the prevailing academic trend is to expand the use of fair value and so make financial information useful for firm valuation (Kothari et al., 2010) and support stock market development (Othman & Kossentini, 2015). The below case study supports this view, but could hardly support another view pushed by academia, namely calling for more academics among the directors of Plcs (Huang et al., 2016).

4 Particular perception of the nature of stock and its impact – Czech Case Study

The presented Czech case study concerns one Czech non listed Plc. and the evolution of its shares prices and of its management during the period 2011-2016. This target Plc has a seat in the Czech Republic, is governed by the Czech national law and allowed authors of this paper to access its internal data and use

them in the academic press, provided the anonymity of the Plc. is maintained. The main business activity of the Plc. was and remains agricultural production, including the production of raw agriculture outcomes for their processing and further resale. The Plc. managed 1 500 hectares of arable land and is a beneficiary of a repetitive annual dotation (subsidy) in the amount of CZK 11 000 000 yearly. It had and still has seven directors and important legal documents must be signed by the chairman of the board of directors, or by the vice-chairman of the board of directors or by the CEO or an agent having a power of attorney from one of them. According to the Bylaws, shares are transferable only upon the consent provided by directors. In 2012, the registered capital was CZK 101 000 000 and consisted of shares in name in the value as described in Table 2.

Table 2: Capital (share) structure of the Plc. during the entire period 2012

Number of shares	Nominal value per share in CZK	2012 value of shares in CZK
2870	1 000	2 870 000
1493	10 000	14 930 000
1664	50 000	83 200 000
2012 value of all shares (2012 registered capital)		101 000 000

Source: Prepared by authors based on the accounting and other data provided by the target Plc.

In 2011, one of the target Plc.'s shareholders decided to purchase via shares purchase agreements ("SPA") from minority shareholders in order to pass the threshold and become the majority shareholder of the concerned Plc. This active shareholder was a business corporation with 7.6% shares successfully active in the same field as the Plc. (agricultural production) in the neighborhood, i.e. the active shareholder was a majority shareholder of prospering agricultural production Plc. a few kilometers away which regularly paid dividends in the amount of 11% of the nominal values of shares. Seven directors and three members of the supervisory board of the Plc. had 22% shares and the remaining 70.4% shares were held by 500 minority shareholders. Hence the total number of shareholders was 511 and all directors and members of the supervisory board were shareholders. Although the target Plc. had a history of non-payment of dividends and of non-investment, it took out several loans. The turnover and profit kept declining also. This deplorable situation and the success of its own similar (if not identical) business contributed to the decision of the active shareholder to pass the majority control threshold and to change the business model, management and even long term strategies. In other words, the active shareholder wanted to transpose the experience from the similar Plc in the neighborhood and be in each of them the majority shareholder, if not the only shareholder (and thus, de facto, the owner). This active shareholder took a coordinated individual approach and sent an offer to other minority shareholders of the target Plc. in 2011 and, based on it, managed to purchase 8% of the shares for 20% of their nominal value (!!!). Many minority shareholders made the prompt decision to accept the active shareholder's offer based on their knowledge of the poor performance of the Plc, the lack of investment and thus no prospects, while not getting any dividends. For three months, the directors did not perceive this as a threat and did not fight against it. After several months, it became a general knowledge of all shareholders, including the directors, that the active shareholder was not merely buying a few extra shares, but instead he wanted to "get" the target Plc. and the remaining shareholders started to speculatively demand a higher price while being ready to wait out a few months or years (this attitude kept reinforcing over time and led to the increase of the price paid to 50% of the nominal value in 2016). This process continued progressively on during the entire observed period and the prices went from 20% of the nominal value in 2011, then over 25% in 2012, to 50% in 2016. At the end of this period, the active shareholder managed to increase his participation from 7.6% to 65%. Further, there are no indices

about the termination of this process, i.e. the active shareholder kept purchasing shares even in 2017 for the growing prices, i.e. despite the passing of the 50% majority line. Manifestly, the drive for the control and perhaps even the total ownership (achievable by 90% or 95% participation by the squeeze-out procedure) is a crucial factor in determining the price of the shares. The accounting value, historical cost or current balance sheet have very little to do regarding the determination of the price to be paid for shares. Interestingly, this share purchase process was not interrupted or modified by the law changes. Until 31st December 2014, the share purchase and buy-outs were regulated provisions of the Act No. 513/1991 Coll., Commercial Code. However, the re-codification of the Czech Private law brought the Act No. 89/2012 Coll., (new) Civil Code which abolished the Commercial Code and moved the special Plc regulation into the Act No. 90/2012 Coll., Business Corporation Act, while the general regulation of natural and artificial persons is included in the (new) Civil Code. Even more interestingly, this trend was even not interrupted or modified after the active shareholder reached the 50% threshold in 2014. However, the management of the Plc. changed dramatically at this point. Namely, a noticeable modernization and revitalization of the agro-technical equipment and employment of modern technologies was launched. Further, in 2015, the Plc. under the management determined by the active shareholder purchased 17 hectares of arable land. Even in other aspects, the new progressive business strategy since 2014 is noticeable. Although at the end of 2016 the situation of the Plc. was not completely financially stable, the general perception and assessment of the Plc. is better than in 2011.

This is the background of the subjective perception of the nature and value of the stock of the Plc. and the objective impact was obvious. Namely, the contractual sales price of shares during the period 2011-2016 was determined by the interplay of the demand and supply and the general willingness of minority shareholders to sell their shares. Naturally, the accounting value is to be determined based on the Czech law, namely based on the registered capital. Table 3 provides a highly relevant information about the registered capital, accounting value and average contractual price for shares.

Table 3: Registered capital, accounting and contractual prices of Plc's shares in 2012 – 2016

Yr	Reg. Capital in CZK 1000	Acc. value of shares in the nomin. value CZK 1000 (2 870 pc.)	Aver. contr. price for a share in the nomin. value CZK 1000	Acc. value of shares in the nomin. value CZK 10 000 (1 493 pc.)	Aver. contr. price for a share in the nomin. value CZK 1000	Acc. value of shares in the nomin. value CZK 50 000 (1 664 pc.)	Aver. contr. price for a share in the nomin. value CZK 50 000
2012	104 122	1 030	250	10 309	2 500	51 545	12 500
2013	106 591	1 055	300	10 553	2 800	52 767	12 800
2014	114 533	1 134	420	11 341	3 100	56 709	14 000
2015	114 195	1 130	500	11 306	5 000	56 532	25 000
2016	115 397	1 142	500	11 425	5 000	57 127	25 000

Source: Prepared by authors based on the data provided by the target Plc.

Due to the maintenance of the same number and type of shares of the stock of the Plc., the slowly increasing registered capital and the determination of the active shareholder to increase his participation, control and perhaps even the ownership led to the fact that both accounting and contractual prices of all three types of shares grew during 2012-2016, but this growth has a dramatically different intensity. The accounting value grew slowly and in the same proportion of all nominal values, while the contractual price grew faster and contractual prices shares in the nominal value of CZK 1000 seem to react faster. This trend continues even after 1st January 2017 when the active shareholder has a rather comfortable majority of 65%.

5 Conclusion

A real Czech case study demonstrates that a rigid insisting on the legal fiction of a Plc. fully independent along with the perception of shares as a generic instrument of passive investment has very little in common with daily reality. Certainly, a Plc. has its own legal (juridical) personality, but the nature and value of stocks as vehicles of many forms of participation is deeply subjective and ephemeral. This has a strong objective impact and deeply influences both the management of the Plc. and valuation of shares. The agency issue along with asymmetric problem plus other representative management challenges lead to both managerial moral hazards (Thijssen & Iatridis, 2016) and a managerial inclination to rather avoid losses than acquiring gains (Mandal et al., 2018). The accounting value determined by the amount of registered capital is detached from the readiness to pay a contractual price and even if the IFRS with its recognition of fair value prevails in the EU, the subjective nature and value of stock remains not perfectly reflected by legislation and academia. After all, the personal and subjective aspect is omnipresent, even in the strongly capital Plc. Considering the priorities of Europe, it is high time to pass the Rubicon and lift the veil, see and say what the true nature and value of a stock of a modern Plc., able to succeed locally and globally, has.

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Primary Paper Section: A

Secondary Paper Section: AE, AG, AH

CASE STUDY: IMPACTS OF GLOBALIZATION ON SOCIO-ECONOMIC DOMAIN OF EMPLOYEES IN THE AREA OF CZECH AND SLOVAK REPUBLIC

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This work was supported by the Faculty of Management, Comenius University in Bratislava, Slovakia. This publication is the result of the project implementation BiDaC: Big Data Industrial Research and Development Center project, ITMS2014 + [project number 313011B814] supported by the Operational Programme Research and Innovation funded by the ERDF.

Abstract: "Globalization" widely used for increasing internationalization comes along with shifting power from national governments towards multinational corporations. The international division of labour is changing due to shifts of labour-intensive production to countries with lower labour cost with corporate governance, technology-intensive production and research kept in wealthy countries significantly increasing the development differences among countries including employment opportunities. This article focuses on sociological, economic and social aspects of globalization and emphasizes the development of human potential and changes in working conditions and employment character in Czech and Slovak Republics based on survey of the socio-economic trends of today's employees towards their future and level of satisfaction.

Keywords: globalization, internalization, employment, employee's satisfaction, employment opportunities, socio-economic domain, multicultural environment, employee benefits

1 Introduction

The ways of life has significantly changed over the past century (Dávidková et al., 2015) through the emergence of information and communication technology (ICT). The Internet that allowed the most accessible "transport" media for informational exchange enabled the globalization to evolve (Bauman, 2000). Globalization brings together people from various countries into one place building one team committed to a common goal and purpose creating an international and multicultural environment (Dávidková & Greguš, 2016). To further drivers of globalization besides ICT belongs the so called economic migration (Bartram, 2011) enabled by liberal trade where individual companies can allocate resources independently on place of origin on their own (Coslovsky, 2016) that has been exploited within Schengen Area and represents a never-ending ongoing process (Papastergiadis, 2013). Cultural diversity enriches interactions with new insights to work problems and tasks (Han & Beyerlein, 2016) despite its negative effect due to language barrier (Downes-Martin et al., 1992). Experiences of global virtual work lead to positive work's complexity and learning potential that in turn improves innovation, satisfaction and engagement (Nurmi & Hinds, 2016).

However, the higher the cultural diversity at workplace is, the more demanding is the leadership and management of such a multicultural group or team. The diversity of cultures denotes a significant factor that influences mutual collaboration, often leading to destructive conflicts due to clashes of mentalities with impacts team's coherency (Dávidková & Greguš, 2017). A collaboration in such an environment requires more intensive motivation of its team members and an extensive support by its team leader to maintain the same level of performance effectivity (Carter et al., 2015). This adds extra load to skills of the team leader. Insufficient and ad-hoc motivation of workers and insufficient support of their collaboration can cause stagnation similar to a strategy loss (Dávidková & Hvorecký, 2017).

Managing employee performance is currently becoming an important topic in human resource management recently and involves individual participation in setting performance goals, feedback on the way to achieve the goal, opportunities to improve based on performance assessment, training and human resource development, connections between results and rewards (Fenwick, 2005).

According to Urban (Urban, 2007), the basis for evaluating the performance of international staff denotes individual goals. Suggestions for personal goals of an employee working in an international environment implements milestones he/she wants to achieve in the future, often set by himself on the basis of his/her personal ambitions and performance indicators of the business or organizational unit he/she is a member of. To enhance employee motivation, their personal goals can be divided into two parts: basic and advanced goals (so-called ambitious goals, stretch targets, aggressive goals, etc.), which are the most challenging variant of goals. While meeting basic goals is expected from employees, meeting the more demanding goals requires a high employee commitment that will be appreciated by the business.

Due to international competition and current ease of travel, job mobility and employee benefits became one of significant factors impacting employment and job satisfaction (Fasang et al., 2012). External upward mobility is decisive to enhance satisfaction with objective working conditions and work-life balance, while internal mobility is pivotal for satisfaction with future career prospects (Fasang et al., 2012). Lower job qualities are highly associated with flexible employment contracts and several benefits (Dekker and van der Veen, 2017). Whereas better paid jobs are usually connected with longer commuting and less employee benefits. However, cultures differ in value hierarchies and thus the preferences in job selection may vary from culture to culture. Furthermore, people are individual beings and therefore, their satisfaction varies depending on their individual preferences.

However, a job dissatisfaction due to various reasons leads to fluctuation of employees that may lead to knowledge loss and thus has a long-term effect on the profit ability of given company. Therefore, this paper analyses the satisfaction of employees in global companies with focus on their preferences in selection of jobs to outline the directions of employee benefits that have the most significant impact on employee staying.

Benefits are specific to the remuneration of workers with a contradictory position. It is the incentive effect of benefits to employees in an effort to increase their satisfaction and keep them at work (Branham, 2009). Benefits are seen as corporate social responsibility that denote organizations' responsibility to provide dietary, continuing education, health care, and maintenance of the physical fitness of employees (Staňková, 2007).

Other experts state that employees are very different and, above all, are dissatisfied with the flat benefits allocation (Katcher & Snyder, 2009). A solution to this issue is represented by individual programs (Walker, 2003) that makes it possible to deduce the need to distinguish employees in an effort to achieve greater satisfaction. It is also necessary to distinguish the employees in relation to their position and "talent" to ensure "supposed justice" and future satisfaction (Nohria et al., 2003).

This paper is organized as follows: next section describes used methodology and sample. Section 3 describes achieved research findings followed by discussion. The conclusion summarizes the outcomes.

2 Methodology and Sample

Surveying was made via electronic questionnaire. The questionnaire was available on Facebook and sent by e-mail to target groups working in selected companies in Czech Republic and Slovakia with more than 3000 employees and self-employed professionals such as Dell or Czech Aeroholding. Questionnaires were filled out online within the duration of one month. The final processing and evaluation of the survey was focusing on having equal coverage of male and female individuals in the

sample (thus, 50% each). Respondents were selected from the administrative staff and IT departments.

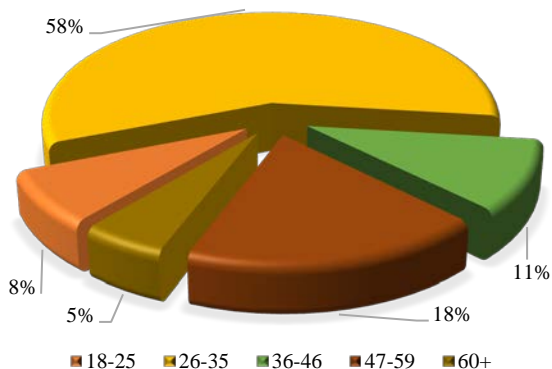


Figure 1: Age coverage of surveyed sample
Source: Survey

As more than a half of our respondents are in the active working age of 26-35 years. This can be influenced by high relevance of this topic to young people graduating from university, college of finishing secondary education. Further indicating factor is the utilization of information and communication technology that is more spread in younger generation as the invitation to this survey was in particular, by electronic form.

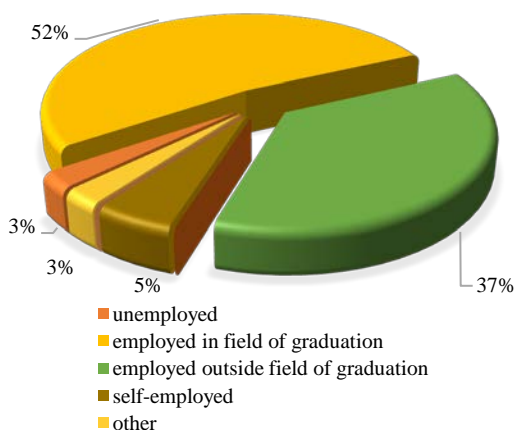


Figure 2: Sample by employment status
Source: Survey

The pleasantly surprising fact is that category of 47-59 years is represented by almost 20% of all respondents, from which it can be concluded that even the older generation is not afraid to communicate via the Internet about their attitude to jobs and their attitude towards more globalization-friendly companies and the possibilities offered by such companies.

An interesting result of 52.6% of employees that are working in their field of study leads us to the idea that a large number of people are working outside their field of study especially because companies are starting to specialize in specific sectors in given regions such as IT or automotive industry. In those regions, people have a problem of applying and finding employment in other fields. Additionally, IT is often a hobby at first and people learn it within their spare time. Thus, globalization now has socio-economic impact even on job choices by focusing on specific sectors in individual regions.

Almost 60% of our respondents live in the capital cities (Slovakia and Czech Republic). As we have already learned from other questions, one of the most important factors for job satisfaction is the availability of work in terms of commuting. It can therefore be assumed that most of the multinational companies are predominantly based in the capital cities. However, it should also be mentioned that our research included mainly mental workers, such as administration, IT, and similar.

Thus, no plants producing products of a physical nature. It is also possible to conclude that finding employees for mental work is easier in capital cities, as schools or travel options are concentrated here as well: airport, train station or other accessible transport network. As a matter of fact, the main cities become the victims of companies that target workers who work primarily conduct mental work. This makes this place more lucrative but also more costly to live.

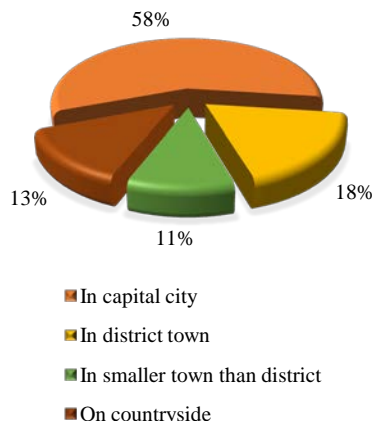


Figure 3: Sample split by place of living
Source: Survey

At the same time, these impacts are already a long-term trend because young people are moving away from regions with weaker employment possibilities to cities and to other parts of Europe, where they may benefit from employment within or outside their field of study and enjoy more advantageous socio-economic benefits. Such trend has a negative impact on the intelligence distribution of society in given country and its regions creating a larger discrepancy between wealthy and poor regions. At the same time, it has a positive influence on the opportunities that bring new jobs to open and adaptable countries in the form of moving their branches or factories.

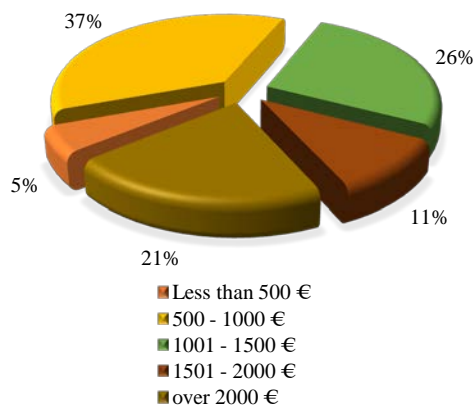


Figure 4: Sample coverage by income
Source: Survey

As for the budget for the month of the given household, we found out that for the 500-1000e per month category, one of the younger families, where only the person who filled out the questionnaire was in earnest. One could say, though, that the family has a lower budget employee who is happy with their work to decide to change it only for a short-term increase in the family budget. They prefer to temporarily quit and end the job they are happy with as if they were looking for a new job. The category above 2000e includes mainly entrepreneurs or employees who have income other than employment. Based on our respondents' replies, we could say that the companies employing them give them a standard income as their average

country inhabitant. However, it has to be remarked that often such employees are temporarily transferred to the motherland of their employer. As long as they gain strong knowledge of language, and the view of work issues reduces the risk of unemployment. Since they are often young people without a family, such a lucrative income, which is multiplied by the certainty of work and knowing its character and with a lot of past experiences, goes abroad.

Findings from other research endeavors point out that the higher the income of the household, the less women work and their expectations for the ideal amount of working hours are lower (Fedáková et al., 2008).

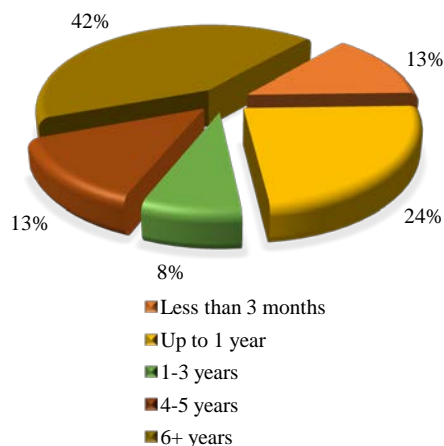


Figure 5: Sample by length of current employment
Source: Survey

Through our questionnaire, we tried to find dissatisfaction with employment and possible resistance to work that they spend overnight every day by going to work they do not enjoy. However, the results of research clearly show employment stability, as more than 55% of employees said they were more than 4 years old in the workplace, which could be a sufficient indicator of stability and thus also of satisfaction with the working environment. Of course, there are always exceptions, and there are always possibilities that we can improve. However, it seems that the current situation is not alarming.

The research findings are presented and discussed in subsequent section.

3 Research Findings and Discussion

As first aspect of satisfaction with current employment, we analyzed the financial question: the height of salary income. Almost 80% of respondents are satisfied with their income earned by work in a multinational company. Interestingly, more than half of the underprivileged people have this income as passive: retirement, university scholarship, dividends.

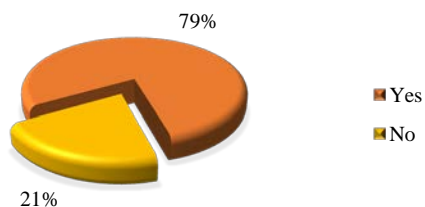


Figure 6: satisfaction with income
Source: Survey

When analyzing the length of employment as well as amount of previous employment experiences, we analyzed the age of respondents at their initial joining of job market. Interestingly,

more than two-thirds of the respondents started to work between 15 and 18 years of life. It could therefore be said that they are ambitious individuals. They understood their role in the society and the value of money earlier as it was understood by their peers. To work in a multinational society requires a degree of ambition. It is relatively easy to obtain a higher status there. However, in almost every hierarchy of such a company, it is possible to occupy only a certain level. For example, according to the results of surveyed companies participated on this research, senior managers are used to employ mainly people of the parent's nationality. This situation can cause frustration in very ambitious people, and if they have the ability to work on a given position, their frustration with failure from discrimination could lead to termination of employment. What internal staff also confirmed.

In addition to 3 respondents, everyone started working at the age of about 20 years of life, as up to 1/2 of the respondents have university education 1st, 2nd and 3rd level, it means that the full time employment was already during the attendance of the university. Therefore, they are not only very ambitious but also tenacious individuals. By their capabilities, they are able to enroll at university and full time job at the same time. Thus, it is possible to conclude that multinational companies place high demands on the quality of their employees, their education and their expertise. At the same time, it is possible to motivate such employees, for example, language or other courses; learning makes them happy and aware of how they improve their lives. This gives the companies a wider choice of possible employee benefits that their employees are interested in. At the same time, it improves not only the relationship with employees but also their educational level. This strategy is beneficial for both sides.

When directly investigating the employment satisfaction of respondents, we found out that the dissatisfaction with current employment exceeded 25% of all respondents for the cases of dissatisfaction with superiors and inadequate or null career progression possibilities. As the majority of survey respondents were employed by global companies, we might deduce that the dissatisfaction with superiors may often stem from significant divergences in the nature, mentality and culture of distinguish nationalities. This is often caused by pursuing overwhelmingly the nature, mentality and culture of the founders or the higher-ranking company. At the same time, it is necessary to take the human relationships into consideration that became significantly complicated for agitations and interactions in multicultural environments and lead often to complex situations in terms of leadership and management.

Next reason can be found in the nature of staffing of projects where outsourced companies frequently use leasing of workforce for only one purpose and for only a temporary period of time and thus, to achieve the project goals. On the other hand, employees, usually people coming from previous east block that conclude middle and eastern Europe where the workforce is awarded with significantly less amount of money, are commuting to work or even leaving their region for employment in countries with higher hourly rate. In such cases, it is important to emphasize that such places do not offer almost any career potential growth perspective that may cause burnout or a decrease in the interest in continuing working in given job. From this, it can be assumed that the globalization of companies and their behavior towards employees has both social and economic impacts on society. We think it would be better to explore the capabilities of multinational companies that would adapt corporate culture to their respective countries.

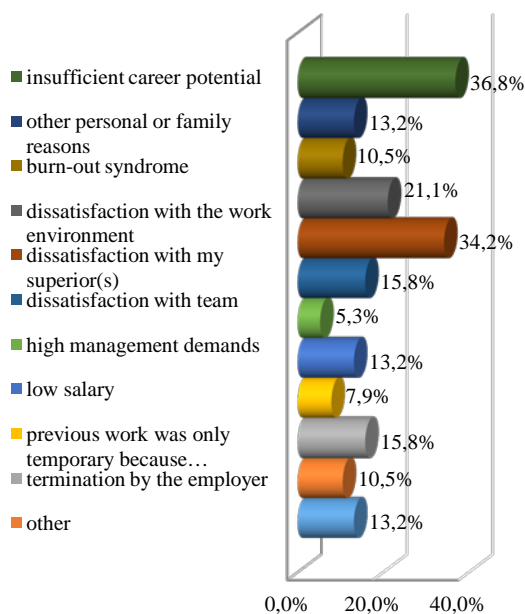


Figure 7: Reasons for leaving previous job(s)
Source: Survey

The surveying included also the vision of respondents of staying in current employment; we found out that more than 70% of respondents would stay longer than 3 years in the job, indicating that employees are satisfied with their job, position, or rank. It seems that multinationals are choosing hard choices, and the individuals they gain are worth their place. As we have found, they are also satisfied with their ratings and have the opportunity to receive various benefits.

Employees who feel that they are reasonably valued are not looking for side job opportunities and use their spare time to regenerate strengths and rest. They are then healthier (physically and mentally) and relaxed. They are not often sick and are more profitable for the company than those who have to divide their energy for multiple jobs (Brožová, 2001).

As for the reasons why people stay in current employment despite their dissatisfaction with given conditions, the lack in education, practice and sufficient vacancies were together 43% (fig. 4). However, the majority of the respondents gave other reasons: they reported fearing social concerns about the economic instability caused by a change of employment. This in first place caused by all the liabilities and responsibilities the respondents are bound to, whether economical aspects like mortgage loans without which today's young people have almost no chance of securing independent housing; or social concerns like the well-being of small children or good collectives. This all despite their incomplete satisfaction with current job, wage or other conditions. These fears are not to be attributed directly to globalization, but global banking trends in turbulently expanding credit products could be a frequent cause of the budgets of working families. In the past, it was more adventurous to save money on a given house or service. Nowadays, by speeding up the processes and the possibilities of most multinational banks, a new credit to cover existing credit can be borrowed. Reckless pursuit of profit can harm the environment and conflict with other social values (Soros, 2002).

Almost 60% of the respondents expressed their reluctance to commute to work longer than 60 minutes for one direction. Nowadays, people are already aware that they have little free time remaining besides their working time that may be even

disproportionately distant from their place of residence. The willingness to commute to work and to travel is only when: "it will have a significant contribution to my further development" (source: survey) or "depending on the conditions and the current situation" (source: survey). Today, when working from home (home office) and remote working via the omnipresent internet network, the willingness to commute to work and to travel is decreasing significantly.

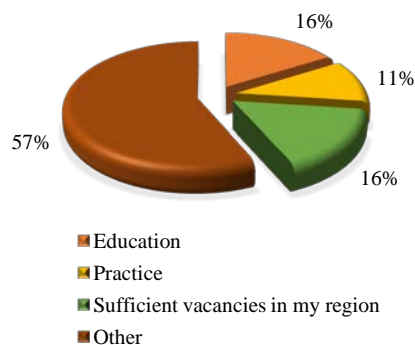


Figure 8: Perceived missing aspects in applying for another employment
Source: Survey

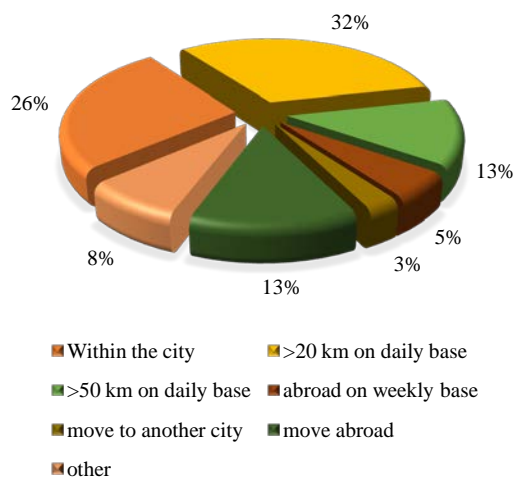


Figure 9: Willingness to commute to work
Source: Survey

A next survey outcome connected to this topic is also the assessment of benefits of employment that the respondents appreciate at their work the most. It was an open answer question where up to 70% of respondents expressed their feeling of being weakly financially awarded and would prefer 13th and 14th salaries. Besides that, the overwhelming majority of respondents (90%) would appreciate an increase of the number of annual holiday pool or at least to have the possibility of working remotely from home (so called home office). At the same time, almost all respondents expressed their desire to have flexible working hours in terms of work beginning and end according to their needs. Thus, employees are willing to commute to work and to travel for better economic conditions. However, in the case of lower economic remuneration, they require benefits of a short distance between home and workplace and better leisure time arrangements. Basically, the well-known statement "time is money" (Connors et al, 2016), (Wrenn and Irwin, 2015) is valid also for selection of employment possibilities. The time spent on

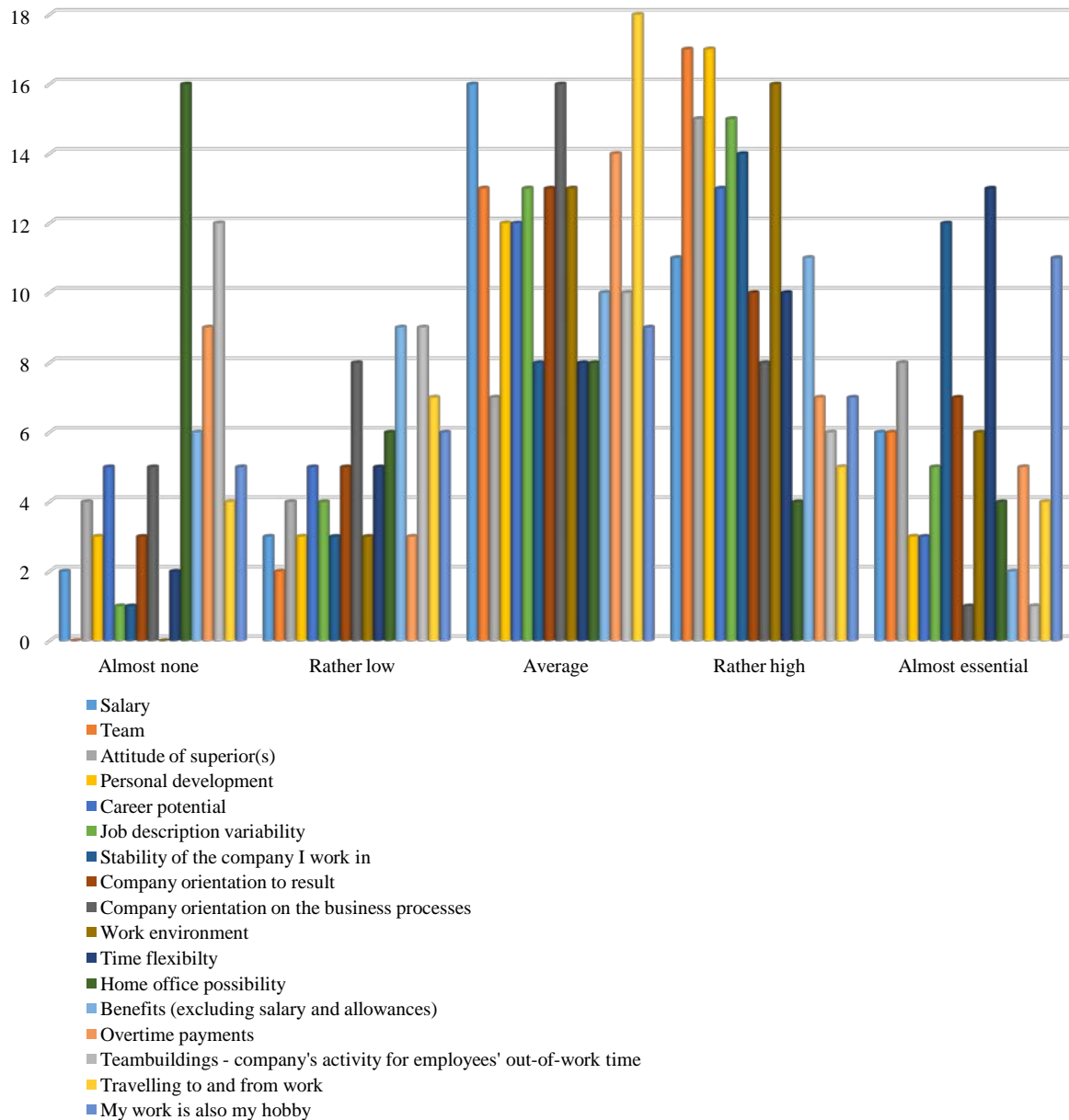


Figure 10: The influence of individual factors to remain in current employment

Source: Survey

traveling may be compensated by higher income, however, the time lost to commute to work with lower remuneration the employee rather devote to themselves.

Subsequently after overcoming the financial and economic crisis, globalization has a significant impact on the choice of the future employer. Up to 50% of respondents expressed their attitude to the factors influencing their job selection being impacted mostly by the stability of the company they would like to work for. This was followed by the possibility of time flexible working hours that 48% of all respondents stressed as one of the most important factors. Further, new factor of high importance to respondents (up to 47%) is also associated with the team in which they would like to work. Especially, as many as 38% of respondents were not interested in the Home office, despite the fact that they were preferring this option in the pre-eminence questions. Furthermore, 43% of participants expressed a strong emphasis on the working environment and the variability of work during job selection. Transnational globalization is governed by the principle of profit. It is recklessly contra-ecological, ignoring the needs, interests and cultural traditions (Bondy, 2005).

One of surprising outcomes of the survey was the disinterest of the majority of respondents (80%) in teambuilding and activities with colleagues outside working hours.

A well-designed incentive program is a tool for effective work-change behavior to increase employee performance and hence increase overall business efficiency (Hitka, 2004). Therefore, the benefits represent the program of incentives of the particular company to increase employees' performance.

Investigating directly which benefits would be valued by employees, the responses could be divided into 4 main categories:

1. Increased financial evaluation. This incentive would be very relative. Especially because during the aforementioned questions regarding their vision of the length for staying in given job, their expectation were approximately 3 years and more. This gives the impression of being satisfied with current job. However, when the respondents were asked whether they have any other income in addition to the salary of current employment, the findings showed that

respondents have only the job as source of income or only other passive income sources what means that they do not initiate an active effort to make any further income. We could conclude that the current salary could denote a satisfactory income. Even though, money can increase the short time employment satisfaction, however it does not denote a prerequisite for staying in the job for many years.

2. More free time, more holidays, sabbatical, home office, school dropouts, and job dropouts. Even though this sounds as future vision, not applicable in the present, this is not true as we can see in the Nordic countries, where the working time decreases in favor of the increase in work performance. In Slovakia and in the Czech Republic, we can still see, overloading of employees from time to time. However, the differences in culture and mentalities is necessary to be mentioned. Slovak and Czech nature is distinctly different from the Nordic, and often the sense of duty is at a lower level of importance than a morning talk with a colleague. That is why this condition is relative. Of course, the importance differentiates from individual to individual. It might be worthwhile to try to get the employer to get more quality work in less time and perhaps with higher efficiency in small experiments.
3. One time purchases or gifts to increase the qualification or relaxation of employees. Activities that people often drop out of the budget in the first place in a tight budget. This area is an opportunity to get a well-earned, educated, and more satisfied employee, without having to pay a fixed salary and thus significantly increase the cost. At the same time, it can help to establish better relationships at the workplace and put those items in the cost. It deals with the problems of the increase of qualification in their study focused on the personal development of employees and the design of their educational projects (Galajdová, 2004). Here also belong benefits such as holidays, retirement or sickness insurance, the possibility of personal development. The rapid development of knowledge resulting from new technologies leads to the need for lifelong learning that must be available to anyone, anytime, anywhere (Jakubíková & Kyselová, 2006).
4. Personal appraisal. Frequent problem in the work environment is represented by the relationship between the worker and his/her supervisor. Often their expectations and visions do not overlap. Especially from the point of view of performance vs. awards. Frequently the personal level is what the employee is missing from the employee relationship. It is often a lack of appreciation or better communication from superiors that is often the reason for burnout of the employee in the position. This area would be worth exploring in further research endeavor and experimenting.

Topics related to employee relations, staffing and management are considered to be the most important during relatively high employment. However, with the rise in unemployment, workplace-related motives go to the last places (Kuzmin & Svencicki, 1985).

However, the main goal outlines of global performance management include providing feedback to employees at all levels and alerting employees to unsatisfactory performance (Cascio, 2006). Among development goals belong also the willingness to help employees at all levels, to improve their work performance and to develop their professional skills and abilities, diagnose personal and organizational problems, develop action plans for education and career development, and motivate employees to improve work performance (Cascio, 2006).

In the last part of the survey, we focused on the way of searching new employment. The modern times that brought the internet reflected on the results: nearly 2/3 of them would choose to search for new jobs through job sites such as Profesia.sk or

Prace.cz or visiting specific employers' sites. It is therefore confirmed that ICT tools are an indispensable tool when looking for a job. The second preferred option denoted the possibility to get work through recommendations, which is the most advantageous way for the employee.

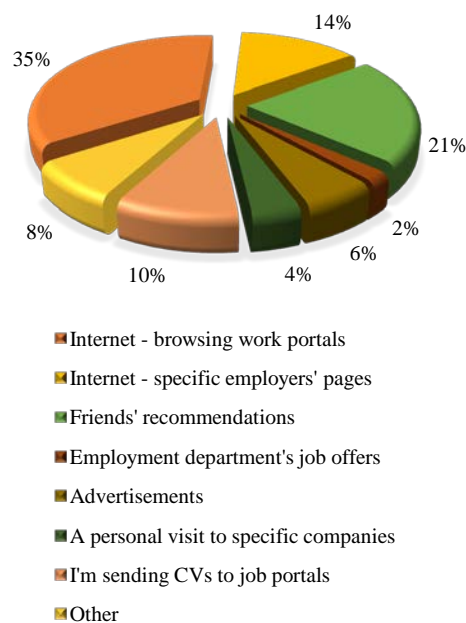


Figure 11: Channels to search for work

Source: Survey

Regarding the employment of specialists and experts in specific positions, the so-called referral program - a system of recommending new candidates, friends, or familiar internal staff - is essentially the largest and most effective source of quality reference people (Bondareva, 2009).

4 Conclusion

This paper analyzed the current satisfaction of people with their current employment and their attitude towards commuting to work by focusing on the impacts of globalization through preselection of respondents. The research was conducted through surveying employees of global companies.

As it can be concluded from the research findings, globalization as such has a social and economic impact on employment as well. We often see these effects only in the negative light, but each coin has two sides. As it negatively influences e.g. the brain drain and the movement of young people for work outside of Slovakia, it also brings jobs to less wealthy regions in the form of foreign investors.

The results of the research in the field of employee benefits in organizations and their acceptance by the employees shows on one hand little individualization of benefits according to the qualities of an individual employee and his/her preferences, on the other hand, that most benefits are provided according to the preferences of the majority. Providing benefits is therefore unjust - only uniformly. An individual minority of employees cannot choose benefits. Dissatisfaction with remuneration, including benefits, may lead to employee leaving the organization. Fluctuation of key talented employees is certainly not a desirable phenomenon. Individualization of rewards may solve the problem.

In this work, we also encountered an interesting phenomenon of corporate culture of multinational companies, which we might be able to address in future as part of another project. All of the theoretical currents conclude that globalization has not led to fundamental changes in international relations but has created a new framework for their further development (Eichler, 2009).

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Primary Paper Section: A**Secondary Paper Section: AH, AE**

USING E-BOOKS TO MOTIVATE CHILDREN'S LEARNING OF ENGLISH AS A SECOND LANGUAGE

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This article was created with financial support from the project of Grant fund of the Dean of the Faculty of Education, Palacký University Olomouc, 2017, in the framework of the project "Postoje žáků a učitelů k obsahu vzdělávání v předmětu informatika na ZŠ a SŠ.

Abstract: The increasingly important position of English language in the world makes children's learning of English a concern of teachers as well as parents. However, due to children's cognitive traits, they are reluctant to spend a long time reading paper books which, from their point of view, seem to be tedious and boring. Gradually, they will probably lose interest in reading and for a long time this issue has vexed many teachers and parents. With the development of computer technology, we have entered into a digital age in which ICT (Information and Communication Technology) tools has been implemented into our lives and has become more accessible to children than ever before. The children who grow up in a digital environment have become affinitive to digital technologies. Many ICT tools have been proven to have the ability to facilitate learning. It is possible to find a kind of technology to help children with reading. An e-book is an ICT tool among them. It combines educational content intended to teach and entertainment. It is a book publication made available in digital form stimulating senses and making learning enjoyable. The concept of using e-books in the process of teaching-learning is in conformity with the didactic principle of audiovisual education and constructivism. In this paper, we will explore the features as well as the benefits of children's e-books, and analyze the theoretical foundation of using e-books in education. We also share previous studies on the use of children's e-books. We come to the conclusion that an e-book is a useful means for supporting and encouraging children's learning of English as a second language. In the end, we will provide the implication on the use of children's e-books.

Keywords: e-books, children, English, language, learning, teaching.

1 Introduction

With the increasing importance of English language, children's learning of English has become a concern of many parents as well as teachers. It is not uncommon that in many areas and countries, teaching English to young children starts in primary school or even pre-school education. Many children are required by their parents to learn English in a learning center or at home before going to school in order to outperform, or at least not to lag behind their peers.

However, the traditional teaching method characteristic of reading from textbooks is not suited to young children as many children find it difficult to engage with a printed book for a long period of time. This is due, on the one hand, to children's psychological peculiarity, they prefer fun learning to serious learning; on the other hand, to their surroundings. Today the environment that children grow up in is very different than that of the past. They live in a society ubiquitous of digital technology such as computer games, internet, digital toys, videogames, digital music plays, video cams, etc. Different kinds of experiences lead to different brain structures, "says Dr. Bruce D. Perry of Baylor College of Medicine. Their thinking and processing information is far more different than their predecessors (Prensky, 2001). Therefore, the old way of teaching method and teaching materials is difficult to bring productive learning outcome to the digital generations and new methodology and new teaching materials should be adopted.

The advance of Information and Communication Technology (ICT) has brought out fundamental changes in the process of education. Studies have indicated that ICT is an effective teaching tool. Integrating ICT in the process of teaching-learning helps students experience things virtually. For example, if a teacher wants to lecture a topic about Disneyland they can display the scene of Disneyland through a video as not all the students have the opportunity to go there before the lecture. The simulated environment gives student an experience similar to the real experience. Also, the use of ICT can make learning more interesting and therefore attracting the students' attention. Numerous studies have indicated that ICT tools can enhance the outcomes of English as a foreign language education (Wang

&Dostál, 2016). Integration of computer technology into the process of education has become an irreversible trend in this modern world. In current digital world, computer technologies have grown exponentially such as educational DVDs, video, television, computer games, educational series, and other online network. This huge spread of ICT enables learners to gain a rich access to computer technologies, giving them the chance to have more frequent interactions with digital technologies, enabling them to be more affinitive with digital tools than their predecessors. Therefore, it is necessary to take advantage of an appropriate learning technology for supporting children's learning of English. Today's digital living environment and children's cognitive peculiarity brings us insight in the use of digital materials to assist children's learning.

The combination of technology with traditional industry brings out many new things, such as E-business and E-community, in the same vein, the combination of computer technology with book publications brings about e-books. Recent studies have indicated that an e-book can be an effective tool to support children's learning. An e-book, also called an electronic book, is a book publication made available in digital form, readable on the flat-panel display of computers or other electronic devices. The contents of an e-book consist of text, images, or both, and even multimedia resources such as sound, video and interactive games (see Ebook). Nowadays, more and more e-books have penetrated children's lives and have a far-reaching impact on children's learning. Therefore, it is necessary to have a comprehensive understanding of how an e-book can help children's learning and the important role an e-book plays in encouraging and supporting children's learning. In this paper, we will analyze the features as well as the benefits of children's e-books, and also share previous studies on the use of children's e-books. It is concluded that an e-book is a useful means to better children's learning of English. In the end, we will provide the implication on the use of children's e-books.

2 Theoretical Framework

Audiovisual education is one of the main methodological principles in pedagogy. It is a method of instruction that advocates the use of audiovisual materials as supplementary teaching aids to help learners' comprehension and retention of words and expressions taught. According to the Webster dictionary, audio-visual aids is defined as "training or educational materials directed at both the senses of hearing and the sense of sight, films, recordings, photographs, etc. used in classroom instructions, library collections or the likes". There are various types of audiovisual materials, such as pictures, flashcards, radios, filmstrips, projected opaque materials, microforms, recording, videos, slides, specimens, demonstrations and other audiovisual tools

Audiovisual education has developed rapidly since the 1920s. The concept of audiovisual education is advocated by John Amos Comenius, a Bohemian educator, who was one of the first to put up with a systematic method of audiovisual education. His *Orbis Sensualium Pictus* ("Picture of the Sensual World"), published in 1658, was profusely illustrated with visual pictures, each playing an important role in teaching the lesson at hand. Comenius was followed by other great educators, including Jean-Jacques Rousseau, John Locke, and J.H. Pestalozzi, who advocated the use of sensory materials to supplement teaching (see Educational entertainment). Studies have indicated that the use of audiovisual aids makes students remember the concept for longer period of time. Although the same meaning can be conveyed through audiovisual materials as well as by paper books, audiovisual aids express concepts vividly so that they benefits students to retain the concepts and knowledge they learned for longer duration than traditional verbal instruction. Research indicates that audiovisual aids, when skillfully used, can improve students' critical thinking, imagination ability and

creativity. It is well known that learning will become more effective when stimulating multi-sensory organs as opposed to single sensory organs. Studies also have shown that there is significant difference between the use and non-use of audiovisual material in teaching and learning (see Educational entertainment).

The effectiveness of audiovisual education can be maximized when it combines with constructivist teaching method. Constructivism views learning as an active process. The earliest proposer of constructivism can be traced back to Swiss psychologist J. Piaget who is an influential psychologist in the field of cognitive development. Piaget's theory is characteristic of materialist dialectics. He studied the cognitive development of children from internal and external causes. From his point of view, children gradually build up knowledge of outside world by interacting with their environment. "The child, at first directly assimilating the external environment to his own activity, later, in order to extend this assimilation, forms an increasing number of schemata which are both more mobile and better able to intercoordinate" (Piaget,1955). Through this process, their cognitive structure develops. Piaget(1983) said, children do not simply mimic everything that is part of the external environment, but rather that developing and learning is an ongoing process and interchange between individuals and their surroundings, a process through which individuals develop increasingly complex schemas. Constructivism holds the belief that knowledge is not given but gained through direct experience in the real world, that learning occurs when learners have an active participation in the process of learning. According to this perspective on teaching, "the learning process of knowledge is also the construction process of knowledge; students are the main body of learning activity and they construct knowledge on their own initiatives; teachers are the helpers and the drivers for students constructing knowledge" (Jia,2010).

According to Bloom's taxonomy (Bloom et al,1956), more than 75% of the knowledge a learner learned can be retained if the learner actively participate in the process of learning. Constructivist teaching technique has been adopted by many instructors in recent years. In current educational settings, the concept of constructivism has begun to penetrate teaching practice based on digital technology and multimedia.

2 Features of Children's E-books

In this paper, e-books refer to e-books for children. A children's e-book is an e-book designed specifically for children. In addition to the general characteristics of an e-book, a children's e-book also has its own peculiar characteristics as far as its content and form are concerned. Firstly, the content, the written text, animation and oral reading are designed according to the child's cognitive level. The story setting, events and the characters are affinitive to children's lives and experiences and the music and sound effects help create a joyful atmosphere. The pictures and the multimedia amuse children in the process of reading. In the operation of the device, clear instructions facilitate a natural and harmonious interaction between children and an e-book, so that children can operate it independently. In other words, a children's e-book includes three aspects. First of all, it is still a book in essence so it has a book's basic characteristics. It contains table contents, pages, structure, chapters. Secondly, it is different from the traditional printed book. It is an e-book -a product of modern technology- it needs to be read through an electronic screen which contains multimedia and interactive hotspots. Thirdly, it is an age-oriented product and is designed especially for young children so that it is different from the adult e-books.

Generally speaking, there are mainly two types of children's e-book according to the function an e-book contains. The main feature of children's e-books is the function of reading-aloud, which adult e-books do not possess. There are also buttons on each page of a children's e-book, which when pressed a recorded voice will be heard. The first type of e-book is basic one characterized by the function of read-aloud and a series of static

graphics. This kind of e-book is adapted according to a corresponding printed book as the content in each page of the e-book is in line with that in the paper publication.

The second type of e-books, which is our focus of discussion in this paper, is more advanced than the first type as it contains the above mentioned features as well as other interactional functions. The second type of children's e-books contains animations that bring the story to life. Users can activate the animation to enjoy a fun experience of reading. By clicking on the character or an object on the screen, children can hear a conversation, and they can complete the reading by role play, or communicate with the characters in e-books. This virtually simulative technology not only endows learning with edutainment, but also helps promote language skills and comprehension. A study by Verhallen, Bus, & de Jong, (2006) shows that children's narrative comprehension and language skills gained more improvement by using an e-book with animation than that with a static picture. The authors concluded that e-books with multimedia features (video, sounds, and music) have a potential to support language literacy. In the same vein, studies by Korat, et al (2014) show that reading an e-book with a dynamic dictionary is more effective in enhancing children's ability to explain new words compared to reading an e-book with a static dictionary.

An additional feature of the advanced children's e-books is its built-in educational game. This does not mean that students engage in the games only for fun, these games have educational value. Computer games can serve for knowledge development, sense development and thinking development (Dostál&Basler,2015). The games in children's e-books often take on in form of raising questions about texts. The questions will become more difficult when the level of learning increases. Children are expected to answer the questions before further reading. If they can provide a correct answer, they will get rewards. Students would like to learn when their motivation and curiosity about something is lightened. This teaching-learning technique encourages children's learning as most children strive to get more and more rewards. Many recent research articles postulate education and gaming can be joined to provide academic benefits (Paraskeva,2010). Ongoing researches that have included the last 20 years of educational findings have proven that digital games can be educational (Van Eck ,2006)

It is worth to mention that the hidden hotspots which are devices embedded on the screen intended to provide additional information about the text, character, words, themes, or provide entry into games and other activities, is another attractive function of children's e-books (Korat, et al 2014). Most of the interactional type of children's e-books includes the hidden hotspots. By clicking on a glowing word, the word will be explained by the image of a figure or animation emerging on the screen, which helps to sustain longer memory and promote the text's understanding. This function is something that written text does not possess.

With the development of children's e-books, the interactional function in it will be reinforced in the future, which makes reading more like watching a movie or playing a game. Some scholars worry about that a children's e-book is more like a tool of entertainment rather than a tool of learning. The fact is, we must bear in mind that the way young children learn is different from students of any other age; they are inspired by fun learning. Making learning closely connected to playing games is a wise way to encourage children's learning. Reading an e-book with interactional function makes children feel like they're watching a movie or playing a game, which fully endows children's e-book characteristics of "edutainment". The so called "edutainment" is media designed to educate through entertainment (see Educational entertainment). In other words, it means using audiovisual materials to make learning in the form of a story or playing games. Edutainment is a combination of education with entertainment, aiming to make learning more funny and enjoyable by integrating entertainment into the process of learning. It takes into account learning and teaching methods

suiting to children according to the child's cognitive characteristics. This methodology of instruction is student-centered, assuring students' active participation in the process of learning. It is a crystallization of constructivism.

4 Benefits of E-books for Children's Learning of English

Encouraging Reading Engagement

English Reading Literacy is the most basic and most critical learning ability. Many examples have indicated that children's emergent literacy has a significant impact on later literacy performance. The lack of early childhood reading experiences will lead to reading difficulties in later reading achievement (Blatchford et al, 1987). Therefore, attention should be paid to pre-school children's early reading literacy. As we discuss previously, the content of children's e-books is full of animation, motion pictures and hotspots, which makes reading more enjoyable, thus encouraging children to read. Some e-books with familiar and popular characters such as Ben10 and Angelina Ballerina about whom children are crazy motivate children to read. Scholastic's 2010 reading survey showed that six-to-eight year old children respondents were more likely to have read an e-book than their older counterparts (Guernsey, 2011).

Enhancing Phonological Awareness

As mentioned previously, most children's e-books, if not all, are featured with hidden hotspots. By clicking on the hotspots, children will see words divided into syllables and sub-syllables. For example, pigeon is divided into two syllables: pi-geon. This function helps improve children's phonological awareness. Korat and Shamir (2008) conducted a research on the effectiveness of an educational e-book for young children's emergent literacy. The result indicated that significant improvement from pre- to post- test was found in children's score on phonological awareness. That means children's phonological awareness improved significantly after using an educational e-book. This finding is correspondent to what Chera and Wood(2003) had found in their research which is concerned with whether an animated multimedia 'talking book' can promote phonological awareness in young children. They found out that young children who engaged in using e-books to read for four weeks showed significantly higher increases in phonological awareness than the control group who read in a normal way.

Developing Vocabulary

Early childhood is an important stage for children's learning of vocabulary as it will fundamentally affect their later literacy. Multimedia and interactional function in children's e-books help children better learn English vocabulary. When a child encounters a strange word in the text of an e-book, (s)he just needs to click on the word and instantly there is a multimedia interpretation of the word, including its meaning, pronunciation, animation and spelling. Meanwhile, children's e-books provide a meaningful context for learning vocabulary, which not only help understand the vocabulary but also enhance the effectiveness of learning and aids retention of new vocabulary. A study by Segers (2002) was undertaken so as to study the vocabulary acquisition of twenty five immigrant children. They were asked to use e-books to study vocabulary. The result indicated that there was a significant difference between the average scores at pre- versus post-test of children's knowledge of vocabulary. The scores of pre- and post-test when compared show an increase by 54% in the post-test scores. That means, in the study, e-books enhanced children's vocabulary attainment significantly. Israeli educator Ofra Korat (2010) investigated the effectiveness of e-books to foster young children's vocabulary development. The result showed that the improvement in word meaning was greater in the experimental group than in the control group.

Improving Oral English

A children's e-book is featured with a recorded voice. The text in an e-book is read by a narrator. When an icon is clicked, the words, sentences and phrases are "spoken". The e-book uses a cursor, when the cursor is placed over a particular word, the selected word will be "spoken". They can click on a certain word, phrase or sentence again and again to listen to the pronunciation or follow the reading pace. Repeated listening and reading help some new and strange words be impressed on the learners' brain. Digital stories can improve learner's listening comprehension in learning English as a foreign language (Verdugo&Belmonte,2007). Listening comprehension plays an important role in English learning. Listening ability is closely related to speaking ability. By repeating these words, phrases and sentences, children's speaking skills will be improved. E-books also include a forward button (a colored arrow that points to the right) and a backward button (a colored arrow that points to the left) for repeated reading, which also benefits the improvement of listening skills as well as speaking skills. Vocabularies are considered to be one of the important elements in improving oral English. As mentioned above, an e-book is a proven tool to enrich children's vocabulary. Rich vocabulary volume links to fluent oral English and poor vocabulary not only influences verbal fluency but also appropriateness.

5 Conclusion

In this paper, we discuss the characteristics of e-books and its ability to assist young children's learning of English. We believe the e-book is a proven technology to better children's learning of English. This assumption is based on the premise that an e-book reading activity enables young children enjoy an authentic experience, by providing vivid motion pictures and interactional function, thus helping to bring effectiveness in learning. However, not all current e-books are well designed for educational goals. Some e-books available on the market are not satisfactory as an educational tool because some figures and games in e-books are not so much an attraction as a distraction. Also, some e-books do not contain essential options explaining meanings of words and supporting children's understanding. In some children's e-books, the hotspots are not congruent with the storyline so that they have little educational value. Therefore, we should use a discerning eye to choose quality e-books for children. Moreover, there are different kinds of e-books for different levels of learning. Not one size fits all. An age-oriented and well-designed e-book can maximize the effectiveness and efficiency of learning. We should choose the kind of e-books that are suited to children's level of learning. On the other hand, improper use of e-books will have negative effect on the learning outcome. It is useful only if it is implemented effectively. It is suggested that children's use of e-books should be guided by teachers and parents whose intervention is of paramount significance. Adults can help to check and correct learning performance, which helps to maximize the effectiveness of e-books.

From the trend of its development, we assume that the application of e-books in basic education, even in preschool education is an irreversible trend. It goes without saying that an e-book is an effective tool for teaching-learning process. It makes abstract ideas more concrete to the learners so that knowledge can be remembered for a longer period of time. However, this does not mean that e-books will completely replace real interactive activities and printed books. An e-book is just a supplementary means to foster children's learning and it should be combined with other teaching materials and techniques to promote healthy development of children. There is still a long way to go to study the educational application of children's e-books and shared efforts from educators are needed.

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Primary Paper Section: A**Secondary Paper Section: AM, AJ**

ON THE ISSUE OF IMPORTANCE OF LUCK IN THE WORK OF BERNARD WILLIAMS

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Abstract: In ancient moral philosophy, happiness was regarded as the ultimate goal of human life, the motivating force that determines the human effort to become a „better“ person. In contemporary ethics, it has returned to the very idea of luck, it has come about a revitalization of the philosophical reflections on the phenomenon of luck. The problem of moral luck – i.e. the problem that arises from the clash between our intuitions about the conditions of responsibility and common practice of moral assessment – is brought to the forefront of contemporary philosophical debates. Most people believe that one can be held responsible only for what is under one's control. However, common practice shows that factors beyond the agent's control make a difference in moral assessment. In the present study we analyse the above mentioned problem on the basis of Williams's philosophical reflections.

Keywords: morality, luck, retrospective justification, agent-regret.

1 Introduction

The problem of moral luck consists in conviction that the conditions for attribution of moral responsibility are – in cases involving the element of luck – in contradiction with the common practice of moral assessment. However, the notion that the moral status of individuals is subject to luck seems to be incomprehensible. The very term "moral luck" appears alike incomprehensible. It is rather contrasting combination of two quite different concepts. In addition, the very idea of moral luck involves the tension between morality, which implies control and luck which implies lack of control. There is no doubt that this is one of the reasons why the idea of moral luck has become – not only for the members of the narrow community of philosophers – so attractive. As Margaret Urban Walker puts it: „*The very idea of "moral luck" cannot fail to engage our interest, if only because some of us may be astonished at the very idea*“ (Walker, 1985, p. 319).

2 The concept of luck in Williams's theory of morals

The fact that one's motives, intentions and personality are influenced by luck (constitutive luck) is taken by Williams to be a bitter truth (Statman, 1993, p. 5). However, Williams does not elaborate on this kind of luck. The author pays attention the idea of the rationally justify, i.e. individual's ability to rationally justify its own decision and actions. In this context, it is necessary to emphasize that the fundamental distinction between Williams's and Nagel's debate on moral luck consists of the subject position in respect of the object of moral assessment. Thomas Nagel in contrast to Williams, is focused on an examination of moral responsibility assessment issue from an objective point of view, i.e. from the position of participant assessing the conduct of other persons.

Bernard Williams (1929 – 2003) was one of the most influential Anglo-American philosophers of the 20th century. From the beginning of his professional career as a thinker he paid attention to a wide range of topics. His contribution to philosophy was very wide-ranging from metaphysics and epistemology to moral, social, and political philosophy (Thomas, 2007, p. 1). Despite the fact that he was not a systematic philosopher, he noticed the consistency and mutual support among the distinct theories of contemporary ethics. As he noted: „*It is a reasonable demand that what one believes in one area of philosophy would make sense in terms of what one believes elsewhere*“ (Altham-Harrison, 1995, p. 186).

Williams wants to show that rational justification of his own action is often a matter of luck to some extent. He presents his claim based on the Gauguin's story. Paul Gauguin was young creative painter who had decided to leave his family in order to live life, which would allow him to increase his chances of becoming a great painter. He went to live in Tahiti, believing that by averting from the obligations towards his family or

requirements that had been imposed at that time of life he can carry out his project. However, at the time of the decision he could not know whether it will be successful. The only thing that will justify his choice will be success itself (Williams, 1981, p. 23). In fact, Gauguin does not have control over success. The will, no matter what is strong, is not sufficient to carry out his desire. In order to allow Gauguin to become a great painter, there should be much more: talent, motivation and many other factors beyond his control. In this context, the justification for Gauguin's decision is affected by factors which are resulted from luck. Central to Williams's argument is his contention that Gauguin's justification, if there is to be one, is not available to him at the time of the choice, i.e. in advance of knowing whether it would come out right. That is, his justification is essentially retrospective. The reason for this necessarily retrospective perspective is not only the trivial fact that Gauguin's choice, as with many other choices, is made under the conditions of uncertainty that result from limited human knowledge. It has a much deeper reason. Gauguin is, to some extent, a different person, a person who is the product of his earlier choices. That is, Gauguin's standpoint after his success differs from his standpoint at the time of the choice, i.e. he is now a different man (Statman, 1993, p. 7).

Not all kinds of luck are equally relevant to the justification of the decision (Statman, 1993, p. 5). In this context, Williams distinguishes between intrinsic luck and extrinsic luck. The intrinsic luck in Gauguin's case concentrates itself on virtually the one question of whether he is a genuinely gifted painter who can succeed in doing genuinely valuable work and thus carry out his project. Gauguin's project of realising his gifts as a painter affects talent as well as a sequence of accidental circumstances, which „... are subject to laws outside ourselves...“ (Nussbaum, 2003, p. 68) and thus lead us to the subject of extrinsic luck. For instance, if Gauguin suffers and injury on the way to Tahiti which causes his project is never really carried out it will be a matter of extrinsic luck. Despite the fact that both kinds of lucks are necessary for success, and hence for actual justification – only intrinsic luck relates to unjustification (Williams, 1981, p. 26).

In this context it should be pointed out that for Williams this marks no small point, for „*The discussion is not in the first place directed to what we or others might say or think of these agents, but on what they can coherently think about themselves*“ (Williams, 1981, p. 27). Describing the states of their mind, the author uses the concept of regret, i.e. desire to go back and change a past experience. Everyone can express regret. But there is a specific kind of regret (agent-regret) which a person can feel only towards his own past actions or actions in which he regards himself as a participant. (Williams, 1981, p. 27). „*It can extend far beyond what one intentionally did to almost anything for which one was causally responsible in virtue of something one intentionally did*“ (Williams, 1981, p. 28). As an example, he considers the regret of a lorry driver who – without being reckless or negligent - runs over and kills a child. Despite the fact that he could not to avoid the crash, he experienced painful feelings that are strange to somebody else with the exception of individuals who believed that they had been able to prevent that accident. Some people will try to console him by telling him this. They will try to free him from the state he fell into. This feeling of coexistence presupposes that its relation to the event is something specific, something that cannot be eliminated by thought that it was not his fault.

The fact that the agent regrets his own actions (agent-regret) is something that everybody should experience. To do otherwise it would be unwise. Williams is very strict on this point, arguing that: „... it would be a kind of insanity never to experience sentiments of this kind towards anyone, and it would be an insane concept of rationality which insisted that a rational person never would“ (Williams, 1981, p. 29). This madness is related to the false assumption that „... we might, if we conducted

ourselves clear-headedly enough, entirely detach ourselves from the unintentional aspects of our actions...and yet still retain our identity and character as agents ..." (Williams, 1981, p. 29).

However, unintended consequences of actions are also involved in shaping the one's identity. Taking into account this fact, detaching oneself from them one fails to retain one's identity and character as an agent. In this context *..... the idea of the voluntary is essentially superficial*" (Williams, 1995, p. 243).

An interesting and quite common case of involuntary action is the case of moral dilemmas. This is a specific situation when one must choose between two evils and, in this sense, one is not acting voluntarily. Nevertheless an agent faced with these choices should feel regret (agent-regret), and a desire to make up in some way for the wrong action he committed. This brings us back to the case of Gauguin. Gauguin's success as a painter lies beyond his control, hence, whether or not he was justified is a matter of luck. If he had bad intrinsic luck and he failed he would be unjustified and sense feelings of agent-regret about his wrong decision. If he had bad extrinsic luck, then though he would regret the failure of the project, the regret would not take the particular form of agent-regret and would not be much different from the regret experienced by a spectator (Statman, 1993, p. 7).

3 Conclusion

Although the picture of moral immunity to luck is attractive – such an understanding of morality as immune to luck is ultimately implausible. Two questions arise in this context: *„If the possibility of acting morally is available to everyone at any time in their lives, why doesn't everyone do so? If the possibility of "being moral" is open to everyone then why so many people become and remain evil is unclear*" (Haybron, 2002, p. 130)? The embarrassment we encounter in reply to the above questions agrees with the initial claim. In addition, a picture of the moral life as entirely immune from luck does not correspond to the way things are. The fact how we attribute praise and blame is closely connected with the idea that some people should not be held responsible for what they have done, that some circumstances furnish appropriate excuses and some influences are acceptable mitigating factors. The above-mentioned idea that morality is totally immune from the randomness of the outside world places a burden on a person, as it holds person responsible for all his acts and character traits irrespective of the nature of facts which directly affected them.

An understanding of morality as exclusively immune to luck is also implausible. If morality is subject to luck, then it attacks the idea that human lives have meaning. In that respect, all our efforts, our striving, our choices, are essentially meaningless. In view of that, this raises the question: If anything we do could turn out either way, regardless of our efforts and because of factors outside our control, then why should we try to do anything? In this context, D. M. Haybron also notes: *„With lack of control comes lack of meaning in what we choose and what we do, and ultimately lack of importance or significance in what we do and who we are...“* (Haybron, 2002, p. 129).

On the basis of the above facts, it is evident that neither of the two options outlined above, the luck view and moral immunity form luck, is satisfactory. Both are extreme and mutually exclusive views how to understand morality. Even though the lives of human beings are neither exclusively subject to the influence of this phenomenon, i.e. to luck, nor exclusively immune to it. In the words of Daniel M. Haybron: *„We are neither inert objects at the mercy of elements entirely outside our control, nor perfected gods entirely above the influences of luck“* (Haybron, 2002, p. 131).

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Primary Paper Section: A

Secondary Paper Section: AA

COPING WITH EMOTIONS AND ASSESSMENT OF INTERPERSONAL RELATIONSHIPS BY EMPLOYEES IN HELPING PROFESSIONS

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The contribution was created as part of the grant projects: VEGA 1/0909/16 (Research of determinants of decision-making in the business management and sales management, taking into account the personal and psychological aspects of trading, and analysis of the possible implications in neuromarketing) and KEGA 003PU-4/2017 (Coping with demanding situations – subject innovation and university textbook preparation).

Abstract: One of the significant attributes in the helping professions is coping with emotions in the context of interpersonal relationships. The contribution presents the results of the research attended by 150 respondents employed in helping professions, which was conducted by means of a shortened version of the Functional Idiographic Assessment Template-Questionnaire (FIAT-Q). The FIAT-Q questionnaire enables to identify five attributes within which coping with and expressing emotions; random and close interpersonal relationships were used in the research project. The results pointed to the fact that women indicate that they are aware of their feelings and emotions at a moment when they are just happening to them, they can identify the differences between individual emotions, and are able to name the individual emotions. For women, close relationships are more important than for men. They talk about their experience more often with other persons and they also indicate that they listen to other people and offer them support.

Keywords: helping professions, coping with emotions, interpersonal relationships, gender

1 Theoretical background

Employees of helping professions are daily exposed to stress due to the challenging contact with a large number of other people who are often in a difficult life situation. In the rich mosaic of prerequisites for an effective behavior of employees in helping professions, the issues of coping with emotions and interpersonal relationships have, therefore, also a significant place.

1.1 Managing emotions

Rutherford (2009) describes Skinner's (1953) view of emotions which defines emotions as the predisposition of a person to behave in a certain way at a certain time. Carlson and Hatfield (1992) characterize emotions as part of the inherited and partially acquired predisposition to react remotely, physiologically and behaviorally to changes of certain internal and external variables. Levenson (1994) argues that emotions effectively coordinate different response systems, such as physiological, experiential and expressive responses, helping us to respond to important challenges or opportunities in the environment.

Emotion control can be characterized as a group of external and internal processes that are responsible for monitoring, evaluating and modifying emotional responses, especially their intensity and time characteristics, to achieve goals of an individual (Thompson 1994; Thompson and Mayer, 2007). Individuals master and control emotions usually in three ways, i.e. habituation, overlap and avoidance (Millenson, 1979; Leslie, 1996). Coping with and regulation of emotions can be defined as the process of innovation, maintenance, adaptation or changes in the occurrence, intensity and duration of the internal emotional states and emotional physiological processes often serving to achieve the objectives of individuals (Eisenberg, 2000). Slaměnik (2011) states that the sources of human emotions are very diverse, and considers interpersonal relationships to be also one of the sources.

1.2 Interpersonal relationships

A person as a social being is highly dependent on interpersonal relationships. The basic element of an emotional and social

development of an individual is the relationship, the bond between people, which has its own specific qualities. Interaction can be understood as a time-bound social event. Interactions are essential to maintain relationships (Skorunka and Mareš, 2007). The basic prerequisite and characteristic of interpersonal relationships is that individuals find themselves in an interaction that leaves a certain "trace" in the form of impression, willingness to reunite, understand, or misunderstand the other (Slaměnik, 2011).

A number of authors (e.g. Hendrick and Hendrick, 2000; Fletcher and Clark, 2003; Mashek and Aron, 2004) introduce Kelly's (1986) concept of interdependence as one of the essential features of interpersonal relationships. It is characterized by the degree of consistency in preferring the common needs and their satisfaction, and the associated positive assessment of relationships that are intertwined with positive emotions. Individuals become interdependent when they become aware of shared responsibility for mutual well-being (Rusbult, Arriaga and Agnew, 2003; Rusbult et al., 2004; Výrost, 2008).

Interpersonal relationships at the workplace are discussed by Bedrnová and Nový (2007). Provažník (2002) considers interpersonal relationships at the workplace to be a significant and effective motivation factor. These relationships can have a significant impact on the quality of performance and work of the workers (Suhányi and Svetozarovová, 2016). Interpersonal relationships may be considered as a space in which human emotions manifest themselves in the most intense and varied forms but, at the same time, it is not easy to clarify all their functions (Slaměnik, 2011).

1.3 Helping professions

Helping professions may be characterized by the need and willingness to help others with respect to the individual needs of each individual (Pilař, 2004). On the part of the company, high demands are placed on their work (Frankovský and Birknerová, 2015). Their work is often underestimated and the performance of helping workers is difficult to evaluate (Čekan, 2010). Determining success criteria is very difficult (Hrbáčková, 2011). Workers encounter tasks that are often psychologically and emotionally challenging (Vávrová, 2009). Helping professions are little appreciated by the society.

According to Kopriva (1997), the human relationship between the helping professional and the client plays a very important role in these professions, the main instrument of the helper being his personality. In this context, interpersonal relationships in the workplace also play a very important role. The helping worker needs admission, participation, or understanding, and also good interpersonal relationships as a signal to satisfy their emotional need and good self-esteem. Křivohlavý (1998) includes among the people who carry out helping professions for example doctors, nurses, health professionals, psychologists, psychiatrists, social workers, teachers, pedagogues working with mentally handicapped children, entrepreneurs and managers. Based on this it is clear that the mosaic of helping professions is very varied.

An ideal worker in helping professions is a prosocially oriented mature person, aware of his or her life direction, with a positive and realistic sense, personality without neurotic or psychopathic features, with a prerequisite for self-reflection of own decision-making, negotiation and emotions, open to stimuli, willing to proceed with further education (Kraus et al., 2001). Balvín (2012) puts the „prosocial behavior“ label on such behavior that is aimed at helping or benefiting another person without a right to reward. In order for a worker to come to a given insight into the world, he or she needs education, value self-orientation, awareness of life sense, and well-developed coordination of social interactions.

2 Research project

The aim of the research project was to find out whether there are statistically significant gender differences in coping with and expression of emotions as well as in the assessment of interpersonal relationships by the respondents working in helping professions.

2.1 Methodology and research methods

A short version of the Functional Idiographic Assessment Template-Questionnaire (FIAT-Q; Callaghan, 2006) was used in our research. The original version contains 117 items. The FIAT-Q questionnaire is created as part of the FIAT system and is divided into five FIAT classes: Assertion of needs, Bidirectional communication, Conflict in social interactions; Disclosure and interpersonal closeness, and Emotional experience and expression.

For the purposes of our research, we focused on two areas: Emotional Experience and Expression, and interpersonal relationships. The two areas examined describe 24 statements that identify the respondents' attitudes to the phenomena under investigation. The degree of agreement or disagreement could be expressed by the respondents on the 6-point scale: 1 = Strongly Disagree, 2 = Moderately Disagree, 3 = Mildly Disagree, 4 = Mildly Agree, 5 = Moderately Agree, 6 = Strongly Agree.

<i>Examples of items of Emotional experience and expression:</i>						
I have problems with my emotions.	1	2	3	4	5	6
I am able to put a name to what I am feeling.	1	2	3	4	5	6
I express my emotions in an overly intense manner.	1	2	3	4	5	6

<i>Examples of items of Disclosure and interpersonal closeness:</i>						
Close relationships are important to me.	1	2	3	4	5	6
I do not want to share things about myself with others.	1	2	3	4	5	6
I have difficulty making conversation with people.	1	2	3	4	5	6

In order to detect the gender differences between the two variables, an independent double-choice t-test was used. For the statistical processing of research data we have used the statistical program SPSS 20 (Statistical Package for Social Sciences 20).

2.2 Description of the research sample

The research included participation of 150 respondents employed in the helping professions. Of these, 73 were men (48.7%) and 77 were women (51.3%), aged 19 to 60 (M = 37.57 years, SD = 12.61 years). In the research sample, 82 respondents received higher education (54.7%), the remaining 68 respondents (45.3%) reported secondary education with a school-leaving examination certificate. The most represented working area was education (64 respondents, 42.7%), 50 respondents were from the area of social care (33.3%) and 36 were from the healthcare sector (24%).

2.3 Interpretation of research results

The aim of the research was to find out whether there are statistically significant gender differences in assessing the attributes of coping with and expression of the selected emotions in helping professions. Table 1 shows the detected statistically significant differences.

Table 1: Gender differences in assessing the attributes of coping with and expression of the selected emotions in helping professions

	Gender	M	SD	t	p
I am aware of my feelings and emotional experiences as they are happening.	male	3.64	1.378	3.783	.000
	female	4.47	1.283		
I can tell the difference between one emotion and another.	male	3.76	1.208	3.189	.002
	female	4.36	1.075		
My emotional responses make sense to me when I consider the circumstances.	male	3.67	1.191	2.220	.028
	female	4.13	1.331		
I am able to put a name to what I am feeling.	male	3.71	1.124	2.258	.025
	female	4.14	1.211		
I clearly communicate my emotions to people so that they know exactly how I feel.	male	3.45	1.081	2.112	.036
	female	3.84	1.193		
People don't like it when I talk about my emotions.	male	3.27	1.017	2.837	.005
	female	2.75	1.216		

We have recorded statistically significant gender differences in assessing the attributes of coping with and expression of the selected emotions in helping professions (Table 1). Women have shown a higher degree of acceptance of the statements that they are aware of their feelings and emotions when they are currently in the process of identifying the differences between emotions. They are also more inclined to think that their emotional responses make sense when they think about the circumstances. Women are more capable of naming emotions than men, and their emotions are clear, so people around them know exactly how they feel. Men, on the other hand, scored higher only in one statement. They say people around them do not like when they talk about their emotions. It should be noted that, except for the latter case, these differences can only be interpreted as a difference in the degree of agreement with the items analyzed.

Table 2: Gender differences in assessment of interpersonal relationships among the helping professions workers

	Gender	M	SD	t	p
I have had one or more close relationships.	male	3.76	1.359	4.736	.000
	female	4.67	1.224		
I am not able to identify when it would benefit me to share my experiences with another person.	male	3.03	1.190	3.117	.002
	female	2.39	1.309		
I am aware when it is appropriate to ask people about their experiences.	male	3.82	1.110	3.043	.003
	female	4.38	1.172		
I will share personal	male	2.96	1.358	2.386	.018

information with a stranger or casual acquaintance.	female	2.40	1.489		
When friends ask me about how I am doing, I choose not to tell them.	male	2.78	1.158	3.242	.001
	female	2.12	1.347		
I talk about myself and my experiences with other people.	male	3.43	1.225	2.029	.044
	female	3.87	1.380		
Close relationships are important to me.	male	4.08	1.412	3.212	.002
	female	4.81	1.393		
I ask other people to tell me about their feelings and their experiences.	male	3.69	1.266	2.923	.004
	female	4.31	1.300		
When I talk about my experiences, people clearly understand what I am telling them.	male	3.68	1.200	3.357	.001
	female	4.32	1.079		
I exaggerate my good points and brag about my skills and abilities.	male	3.01	1.034	3.469	.001
	female	2.38	1.203		
People say that I talk about myself in a way that downplays my good qualities.	male	2.97	1.147	2.021	.045
	female	3.33	1.001		
I listen to others and offer them support.	male	3.76	1.339	2.856	.005
	female	4.38	1.329		

Subsequently, the focus of the research project was on the analysis of gender differences in the assessment of interpersonal relationships by employees of the selected helping professions. The differences found are shown in Table 2.

Statistically significant gender differences were recorded between the random and the close interpersonal relationships in several statements of the FIAT-Q methodology. Based on the data presented in Table 2, we can conclude that women more than men tend to think that they have often had one or more close relationships at the workplace in the past. They also state that these close working relationships are important to them. Compared to men, they more often ask other people about their feelings and experiences, listen to others and offer them support.

They are aware of when it is advisable to ask people about their experience. When they talk about their experiences, others clearly understand what women say to them.

Women also scored higher in statements regarding the assessment of the downplaying of their good qualities, as well as about talking about themselves and their experiences with others. However, it should be noted that these statements were assessed by the two groups of respondents on a scale of disagreement.

Unlike women, men are more often unable to determine when it would be beneficial to share their experiences with another person and share their data with strangers and random acquaintances. More often they exaggerate their good qualities and brag about their knowledge and abilities. Men, also more

often than women, tend not to answer the question of their friends about how they feel. It is also important to point out that men's responses are on a scale of disagreement, with women disagreeing more with the given statements than men.

3 Discussion and conclusion

Diener et al. (1999) report that people experience relatively more frequently positive emotions. With an increasing unease in the work process, individuals are more likely to express negative emotions as well (Reis, Collins and Berscheid, 2000; Fischer and Manstead, 2008). The emotional impact on participants in the work process is had almost by all the events that take place in it (Weiss, 2002). Stuchlíková (2007) describes the key components of emotional intelligence which she considers to be necessary in expressing emotions in relation to the environment. She emphasizes the understanding of the causes of emotions, the regulation of emotions, the communication of emotional content and empathy. Gross (2011) states that emotion regulation is a process by which people influence what emotions they will have, how they will use and express them.

Slaměník (2011) claims that the sources of human emotions are very diverse, and considers interpersonal relationships as one of the sources. Expression of negative emotions can significantly affect interpersonal relationships. Negative emotions in the work process can also be caused by work constraints, lack of recognition, and lack of social relationships (Oginska-Bulik, 2005).

Rosenzweig (1990, according to Chenery et al., 2008) states that interpersonal relationships can be manifested in interpersonal communication, which involves mutual intercourse and communication, as well as in cooperation, or mutual collaboration. In order to develop positive interpersonal relationships, the author states, as a basic prerequisite for understanding the other person, the tolerance of other opinions and attitudes. Barsade and Gibson (1998) report that emotions greatly affect the roles we work on, the efforts we put into the work, and the way we influence the team.

The degree of effective emotional management in the work process affects various factors, including gender or work area. The aim of the research project presented in the paper was to find out whether there are statistically significant differences in the level of effective coping with emotions and the assessment of interpersonal relations in the work process among the employees of the selected helping professions from the gender perspective. Sociologists Ross and Mirowsky (2008) report in their study that women, compared to men, experience more negative and passive emotions. This may be due to work environments, workloads, deployment, and a variety of other factors. The addressed women report that they are aware of their feelings and emotions when they are just going through them, they can identify the differences between emotions, and they are able to name the individual emotions. These findings coincide with Goleman's (1997) statement which says that women are more capable of perceiving their own emotions, able to deal with these emotions, use them for the benefit of something, feel the feelings of other people, and deal with relationships properly.

Detecting the differences in the assessment of interpersonal relationships in the work process from the point of view of the group of respondents was another objective of this research. Litz and Folker (2002) report that women are more people-oriented, they create richer social networks, rely more on their contacts and teamwork. The recorded statistically significant differences between men and women are consistent with the claim. For women, close relationships are more important than for men. More often they talk about their experiences with other people, and they also say that they listen to other people and offer them support. On the contrary, men report that they are unable to determine when it would be beneficial to share their experiences with another person. Similar findings were acquired by Vasil'ová (2004), who states that men behave colder and harder than women in interpersonal situations.

The presented results also show that what employees feel, how they express it, and how they behave in interpersonal relationships relates to the gender issues. We can conclude that our research sample of the helping professions workers supports this fact. In the future, we plan to extend the research sample to other professions and study this issue in other contexts as well.

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Primary Paper Section: A

Secondary Paper Section: AE, AN

CONCEPT OF HOME FROM THE SOCIAL WORK PERSPECTIVE

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Abstract: In sociological literature, the term "home" is usually replaced by the synonym "community" (Keller, 2013). The concept of home may be challenging also for social workers, for whom this concept remains mysterious. Their profession is primarily focused on client's problem solving (Musil, 2004). If they see client's home as a problem, they can reduce it to "housing". This article aims to outline the meaning of the term home more precisely referring not only to the texts of various authors, but also relying on partial empirical outputs of her dissertation thesis. In terms of its content, the article builds on the conference paper "Secret of home in perspective of sociology and social work" presented by the author at the PhD e-conference (QUAERE 2017) in June 2017.

Keywords: home, sociology, homeless, secret, conference

1 Introduction

In sociology, the term home is usually replaced by the synonym "community" (Keller 2013). Some authors (Edgar, Meetr 2005) assess the importance of home through the operational definition of the phenomenon of homelessness and exclusion from housing. In this context, they attach great importance to the depth of the individual's social relationships creating his or her home. Nevertheless, home remains to a certain extent a mysterious concept shrouded in secrecy also for members of one of the applied branches of sociology - social work.

In the first part of the article, the author looks at the sociological concepts of home. She presents several aspects of the life of homeless people who, in the eyes of sociologists (Keller 2013, 2014), belong to the individuals who may be variously excluded from society.

The second part of the article defines home from the social work perspective. The author using help of the further cited authors (Kostrzyńska 2012, Gojová 2016, etc.) considers possibilities of effective social work intervention in the field of housing. Together with one of the authors (Kostrzyńska, 2012), she poses the following question. *"How can a social worker effectively intervene in the life of a homeless person?"* In this context, the author discusses how homeless clients can look at their social status and evaluate their contact with social workers.¹

The final part of this text focuses on the concept of social entrepreneurship as a possible tool for intervening of the social worker in the life of homeless people.

2 What is home?

The sociology-oriented literature (Sýkorová 2014, Mackie 2011) connects the concept of home with the solution of housing issues of different social group members (e.g. people with disabilities, elderly, etc.) who may be at different levels exposed to the risk of social exclusion and one of its most serious consequences - homelessness. Along the loss of shelter (rooflessness), Edgar and Meert (2005) describe conditions in which people cannot build stable social relationships that create their home. They have unsatisfactory and potentially dangerous housing where they face a wide range of risks (social, health, etc.). The authors also point out that a person living in this situation is in persistent existential uncertainty that may result from the lack of space for the development of interpersonal relationships. These relationships are strengthened in interaction with other people both inside and outside of their home (e.g. with family, friends, neighbours, colleagues, etc.).

The above suggests that home can mean more than only a place where a person physically lives on his/her own or with his/her family. It significantly depends on the level of interpersonal relationships and on emotional bonds between the household members, which can enhance the feeling of home for each individual. Hogenová (2008) believes that creation of home environment is a continuous activity being a meaning of life for many people. Kostrzyńska (2012) holds a similar perspective believing that potential loss of housing (and thus of home) may significantly disrupt the individual's identity. From the psychological point of view, a homeless person can further feel lonely and besides rooflessness, he/she can face a so-called "emotional" homelessness. It means that he/she usually does not identify with people in similar situation, and his/her adaptability to the loss of home depends on the level of his/her contacts with people not having housing problems, i.e. not being socially excluded citizens (e.g. with social workers) (Kostrzyńska 2012).

3 Homeless people as the social work clients

The important feature of the social work profession is that they are predominantly problem solving oriented (Musil 2004). If a social worker views client's home as a problem, he/she can reduce this part of the client's life to housing only (Rozhoň 2015). This is in contradiction with the deeper concept of home outlined above. The risks that accompany the person living on the street may, on one hand, be related to his reduced ability to cope with the demands of everyday life. He/she may have problems with hygiene and dietary habits, availability of health care, lack of finance needed to find a suitable housing, increasing criminal activity, etc. (Kostrzyńska 2012). His/her emotional ties with people in his or her near social environment can be (ir)recoverably disturbed, which corresponds to the aforementioned emotional homelessness.

In this regard, Keller (2013: 86-87) pays attention to the process of progressive loss of home which he believes takes several stages. In the first stage, the *home is at risk*, with a rising work issues. Both young and older people still have self-confidence, hope and determination to overcome the problem. The middle-age generation are reluctant to accept help from social workers. On the contrary, younger people tend to be more accommodating to accept help.

Unless anything changes, the following stage is called *"fight for home"*. It is usually accompanied by deepening difficulties to find a job. There is deterioration in health, disruption of family bond. This all together or separately leads to the need for institutional help. It can be the key stage in which it is decided whether home will be found again, or people at risk will definitely lose it. People who enter this stage can respond in two ways. Some have not given up on their fight yet; they look hard for a job and actively try to deal with all problems. This group includes the above cited CPI. The others have no longer any motivation to work.

The subsequent loss of home is a stage in which all the hope for home recovery ends. The disadvantages cumulate: people find themselves outside the market, their families are broken, they lost their housing and their health problems grow. They neither have income from work as in the first stage nor more or less regular income from social benefits as in the second stage. Without any permanent income, they cannot keep their housing. They combine various one-time sources (charity, undeclared work, begging, petty thefts). Clients have again two ways of response. They can retain the rest of their will for social and professional integration; get back from the edge of society (they dream of a new life). Or they can reconcile the misery of poverty and resign to the last attempt to re-establish their home (Keller, 2013: 86-87).

I suppose that especially for the first way the response to the loss of home and associated securities, people can more or less

¹ In the article, the author refers to the partial outputs from the research she conducts as part of her dissertation thesis on "Housing of persons with physical disabilities living in the territory of the statutory city of Ostrava".

succeed in the world of homelessness that initially seemed strange to them. According to Kostrzyńska (2012), they can create organized communities over time the members of which do not consider themselves to be socially excluded. On the contrary, the results of several scientific researches show that members of majority are metaphorically transferred to the role of the excluded, as they cannot fully understand the world (i.e. the experience) of homeless people (Kostrzyńska, 2012). One of those who are to some extent outside the world of the clients living on streets is usually a social worker.

According to Kostrzyńska (2012), social workers face the following question. "How does this context shape their role in the contact with a homeless client?" *As indicated above, social worker can oscillate between two worlds in his/her work with this target group - in the world of homeless clients and in the world of people with their own housing secured.*² The aforementioned author recommends that it is appropriate for a social worker to approach work with these people on several levels. Whereas at the individual level, he/she should be in direct contact with the life situation of current and potential clients, at the structural level, he/she should affect not only individuals but also society as a whole. Social workers should also support the development of job opportunities to increase the chances of homeless people not only to get a job but also to obtain an adequate housing that will become their home. However, home still remains a mystery for social worker (Rozhoň 2015), which is likely to be revealed at the interactive level (Kostrzyńska 2012).

The interactive social worker enters the client's natural environment. During the collaboration, both sides mutually share their experience. An important factor influencing their contact is the "right moment" of the social worker's arrival into the client's life. Kostrzyńska (2012) emphasizes that this moment should be determined by the client (with regard to his/her needs), not only based on the social worker's decision. From the social worker's point of view, the client becomes a true expert in solving his/her life situation. This fact is approached by foreign researchers on housing (Mackie 2011, Dean 2003, Kostrzyńska 2012), some of which deal with the approach of young people with disabilities to their housing problem solving.

The above mentioned researchers seek answers to the following questions: *"When do young people with disabilities make decisions regarding their housing? What do young people think about their home? How do they look at their housing situation? How do they feel in their home? What possible changes should be made to their homes? What support do they receive from other entities (in the housing market, in the labour market, from social service providers, social workers)?"*³ (Dean 2003).

In the light of the above, it seems that homeless people can be a highly organized community the members of which do not consider themselves to be socially excluded. This means, among other things, that the physical absence of one's own housing may not represent a major problem for the "potential client" to be solved in cooperation with the social worker (Kostrzyńska 2014).

Partial outcomes of my research show that both social worker and other people in the neighbourhood can support homeless person in fulfilling other basic living needs (i.e. eating, clean clothing, providing a place to sleep, etc.).

CP said: "...the people who surrounded me when I was on the street... they noticed that something was wrong with me. ...Somehow they started helping me. Whether it was food or advice or clean clothes..." (CPI)⁴

The support, comfort, and safety provided by the surroundings can ultimately lead homeless person to thinking about a possible change in their way of life.

"... well, and so they actually helped me find... the flophouse where I had peace ... And I actually started thinking about... if I want to live like that any longer. I had a lot of help from social workers at that hostel. And they saw that I wanted to change something. So we were looking for some ways..." (CPI)

3 Homeless people as social entrepreneurs

With regard to the above, social workers face one more question. *"Which ways of intervention can I use to understand the meanings that their clients (such as homeless people) attribute to their home?"* The traditional approach of the social work profession mainly focuses on working with an individual, which can limit the workers' view of the client's situation in a broader social context (e.g. with regard to changes taking place in the labour market) (Musil, 2004).

Gojová (2016) recommends paying attention to new practices introduced into the social work practice. These practices are designed to respond to the ongoing changes in today's late-modern society, such as the declining functioning of welfare state (Keller 2009) or the growing influence of the economy, which also covertly influence the nature of social exclusion and homelessness (and other social problems). Gojová (2016) believes that such a social atmosphere favours the application of "social entrepreneurship". It can be defined as an economic activity that gives socially disadvantaged members of society (i.e. elderly, people with disabilities, etc.) an opportunity to find their place in the labour market (Gojová 2016). In this context, I find it worthwhile to mention that social entrepreneurship may not only involve purely economic activities. Kostrzyńska (2014) states that some homeless people also consider themselves to be "social entrepreneurs". From their point of view, they can manage their own lives and determine conditions for their eventual return among the members of majority. It leads me to a belief that social entrepreneurship can also be understood as expression of one's ability to cope with the above-mentioned risks that accompany the threat or loss of home. As a "social entrepreneur", a homeless person can also make the decision whether or not to cooperate with the social worker. The interviews carried out by the author of this article imply that some people living on the street may initially feel distrust towards social workers who contact them. This may inter alia relate to the age difference of the two sides.

CP also said: "I did not get it at first... But I looked at it from my perspective and the social worker had a completely different way..." (CPI)

However, if the client-social worker cooperation is successful, it can make a significant change for the life of a homeless person. Not only can he/she acquire new skills that are important for acquiring and maintaining a permanent housing, but he/she can also try to restore relationships with his/her loved ones which have previously been disrupted. He/she can further (e.g. as a volunteer) support other homeless people living in a similar situation. The above-mentioned interviews also indicate that to a certain extent, positive relationship between the client and the social worker can help replace the missing family. The social worker's approach directly influences the creation of the client's home. However, I believe that it is fundamental to properly carry the professional power and control associated with the human effort of the social worker to support and help the homeless client. The social worker then faces one of the dilemmas. It is to maintain clearly defined boundaries in the social worker-client relationship, which corresponds to the required professional approach of the worker. The phenomenon of power and control applied in the social work field is addressed more closely by Kraus 2014, Janebová 2015, Musil 2014 and others. According to Keller (2013), social worker should perceive his/her work as a tool to help the client to maintain his/her autonomy.

² In this context, Kostrzyńska (2012) distinguishes two worlds - "world of theirs" (i.e. world of homeless people) and "world of strangers" (i.e. people with secured housing).

³ The above mentioned questions were translated by the author of the article.

⁴ CPI = Communication Partner. A participant in the research conducted within the author's dissertation thesis.

4 Conclusions

The author aimed to bring the reader close to the possible meaning of the concept of "home", which presents a certain mystery to social workers. Based on information not only from the cited authors, but also from the interviews conducted within her dissertation thesis, she came to the following conclusion. Home as such cannot be defined universally. It represents a background which every person experiences subjectively. It is not rare that the meaning of home is covered to the researcher under the term of housing, which in fact represents a physically occupied place. For a social worker's deeper understanding of the meaning of his/her client's home, he/she should approach it in terms of all three levels defined by Kostrzyńska (2012).

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Primary Paper Section: A

Secondary Paper Section: AO, AN

PART-TIME EMPLOYMENT OF SENIORS IN THE COUNTRIES OF THE VISEGRÁD GROUP

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This paper is part of the output of the project VEGA 1/0233/16 "Dimensions and factors related to social and economic development of V4 regions".

Abstract: The aim of this paper is to compare the state and trends of part-time employment of people aged 65 and over in the V4 countries. The methods used in the article were regression analysis, beta convergence and correlation diagram. In the Czech Republic, Hungary and Slovakia, the share of seniors employed part-time out of the total number of seniors increased. In Poland, the share of seniors employed part-time out of the total number of seniors decreased. The Czech Republic had above-average values of the share of seniors employed part-time out of the total number of seniors as well as an above-average growth factor. By using beta convergence, neither the convergence nor the divergence of EU countries in terms of the indicator of the share of seniors employed part-time out of the total number of seniors was confirmed.

Keywords: population ageing, labour market, part-time employment

1 Introduction

The current common demographic feature of European developed countries is population ageing. As stated by Klapková, Šídlo and Šprocha (2016), population ageing is the result of improving the health status of the population and the associated mortality ratios in the context of general improvement of the quality of human life as well as the long-term reduction of fertility. Deepening population ageing and changes in the family patterns have significant consequences for the economic growth, investment and consumption, the labour market, pensions as well as transfers between generations (Bleha, Vaňo).

From the point of view of population ageing, it is important for developed societies to take measures ensuring that the demographic change does not result in an increase in the share of seniors living below the poverty line. As stated by Šimková and Langhamrová (2017), besides ensuring the financing of retirement, health and social services, it is important to ensure that after the seniors become retired their living standard does not deteriorate dramatically.

The characteristics, implications and strategies in the field of population ageing have been elaborated in some European documents (WHO, 2012; Council of Europe, 2017) and formulated into national strategies aimed at supporting active ageing. Active ageing and successful ageing have become ubiquitous concepts in the current societies (São José et al., 2017). Documents focusing on active ageing do not define population ageing as a future threat but as a chance for individual companies to achieve a higher level of development, cohesion and intergenerational sustainability (Ministry of Labour, Social Affairs and Family of the Slovak Republic, 2013). Thus, developed European countries see population ageing as a challenge that, from the perspective of active aging, can lead to positive development of individual companies.

According to Vidovičová and Kafková Petrová (2016), in WHO documents active ageing is seen as a situation where elderly and ageing people have a continuous opportunity to participate in the labour market as well as to engage in other unpaid productive activities. Thus, the active ageing strategy includes finding ways to involve older workers into social action and work processes. Engaging elderly people in social actions can be supported by the flexibility of the labour market and the employment of elderly workers and seniors (Ministry of Labour and Social Affairs of the Czech Republic, 2014).

The issue of employing elderly people is very up to date and is addressed in many scientific areas. It is based on the current demographic development and reflects the all-society needs of all economically advanced countries. Krajňáková and Vojtovič (2017) state that favouring a policy that subordinates the

concept of positive ageing of the population to the economic growth and labour market is a dominant approach of the absolute majority of both academic and executive branches. This approach represents the second important theoretical and empirical methodology of analysing the issue of population ageing; a methodology that accentuates the importance of the needs of the labour market and employability of older workers. The link between demographic conditions and the labour market has been analysed by Serban (2012). He refers to the fact that there is a gradual change of the demand and consumption structure. One of the problems addressed is the impact of education on the labour market. Lisenkova, Mérette and Wright (2013) deal with a model assessing the impact of population ageing on the labour market in Scotland. The model is used to evaluate the effects of labour force decline and labour force ageing on the key macroeconomic variables.

At regional levels, population ageing may have a different impact on the labour market (Gregory, Patuelli, 2015). According to Weller (2007), employment is the result of an interaction of labour supply, labour demand and the regulatory environment. Changes in employment across countries can therefore be triggered by the development of the labour market supply and demand and changes in the regulatory environment at national level. It is important to analyse these changes and specify measures that will have a positive impact on the social and economic development.

Stephenson and Scobie (2002) draw attention to the fact that the shrinking of the working age population raises the prospect of an economy-wide reduction in total labour supply by the middle of this century. However, the actual size of any reduction will depend crucially on future labour force participation rates.

In the field of labour market and employment at national levels, the adoption of national active ageing strategies and policies aimed at addressing active ageing and supporting the labour market is already taking place today. According to Börsch-Supan (2002), in most OECD member countries labour force attachment has increased in recent years not only in the age group 60–64 years but also among people aged 65 and over. However, this process is at the very initial stage of development and it is important to deal with it continuously and over the long term.

V4 countries have some specifics. According to Nováková and Šoltés (2016), the Czech Republic is the country with the best material living conditions among the V4 countries. This is mainly due to having the best values of the indicators except for the indicator representing housing conditions. Slovakia maintained its second position during the whole period analysed and recorded improvement in the areas of income, material deprivation of citizens and GDP. Hungary recorded worsening material living conditions almost in all indicators. Poland improved its position mainly by significant growth of income and decrease of the indicators representing material deprivation and poverty. Our intention will be to determine whether part-time employment of seniors is a different feature of the Visegrád Group (hereinafter referred to as the V4) countries.

2 Aim, Data and Research Methodology

2.1 Aim and Data

The aim of this paper is to compare the state and trends of part-time employment of people aged 65 and over (hereinafter referred to as "seniors") in the V4 countries. Based on these findings, we will focus on assessing the differences in the part-time employment of seniors in the V4.

In the next step, we will look at whether EU countries show convergence or divergence in the employment rate of seniors

employed part-time and whether individual V4 countries have a tendency to shift away from other EU countries in terms of seniors' part-time employment or a tendency to approach them. During the analysis, we will use the methods of regression analysis, beta convergence and we will construct a correlation diagram. Data were obtained from the Eurostat (2017, (1), (2)) database. The period analysed was 2009-2016.

2.2 Research Methodology

Regarding the set objective, we will use regression analysis to outline linear trends in the seniors' part-time employment in the V4 countries. We will use the method of least squares to estimate parameters. The method minimizes the sum of the squared errors in the data series Y.

A simple linear trend of the data series Y is

$$y_t = \alpha + \beta t + \varepsilon_t, \quad t = 1, 2, 3, \dots, n$$

α is the constant term in model,

β is the regression coefficient,

ε_t is the t^{th} noise term, random error

n is the number of periods.

From the estimated parameters of the linear trends we will derive an average annual increase, better said a decline in the share of seniors employed part-time out of the total number of seniors in the V4 countries.

Beta convergence is one of the methods for convergence analysis, better said region divergence analysis. It is based on the assumption that regions converge over the period analysed if regions that had low levels at the beginning of the period show a faster growth than regions with higher values at the beginning of the period. On the contrary, regions diverge if regions that had low levels at the beginning of the period show a slower growth than regions with higher values at the beginning of the period. In order to find out which regions out of the analysed ones tend to shift away from the others or to delay we used a chart called correlation diagram. Beta-convergence procedure and the correlation diagram are performed as follows:

In the period analysed, the initial values of the indicator and the values of the indicator at the end of the period for all regions are determined. The average growth factor is calculated from the data using the geometric mean.

From the time series of growth coefficient k_t for $t=2, 3, \dots, T$, which were determined from the values of the time series y_t for $t=1, 2, \dots, T$, the average growth coefficient will be calculated as (1)

$$\bar{k} = \sqrt[T-1]{k_2 k_3 \dots k_T} = \sqrt[T-1]{\frac{y_2 y_3 \dots y_T}{y_1 y_2 \dots y_{T-1}}} = \sqrt[T-1]{\frac{y_T}{y_1}} \quad (1)$$

Using the least squares method, linear regression parameters are determined, where the dependent variable is the logarithm of the average growth coefficients and the independent variable is the logarithm of the initial values. If the estimated linear regression function is declining, we are talking about predominant tendency towards convergence. If the linear regression function is increasing, we are talking about predominant tendency to divergence.

The coefficient of determination is determined in the linear models. It explains how many percent of total variability are explained by the model. If the values of the coefficient of determination are high, we are talking about highly demonstrated convergence or divergence.

The correlation diagram is a point chart where the dependent variable is the logarithm of the average growth coefficients and the independent variable is the logarithm of the initial values. The points in the figure are separated by lines. One goes through the arithmetic average of the logarithm of the initial values. The second goes through the arithmetic average of the logarithm of the average-growth factor. Thus, all the points are divided into

four groups with a below-average or above-average value of the logarithm of the initial values and with a below-average or above-average value of the logarithm of the average-growth coefficient.

In the first group, there are regions with above-average initial values and an above-average growth factor. They reduce convergence. They tend to shift away from the others. In the second group, there are regions with below-average initial values and an above-average growth factor. They tend to move into the first group, i.e., into a group in which there are regions that tend to shift away from the others. In the third group there are regions with below-average initial values as well as a below-average growth factor. They tend to delay the others. In the fourth group, there are regions with above-average initial values and a below-average growth factor. They tend to move into the third group, i.e., into the group in which there are regions that tend to delay the others (Minařík, Borůvková, Vystrčil, 2013).

3 Research Results and Discussion

Before the analysis of seniors employed part-time we analysed the share of seniors out of the total population and the ageing index in all V4 countries. The share of seniors out of the total number of people tended to increase in all developed EU countries. At the beginning of the period analysed, the highest share of seniors was in Hungary. The lowest share was in the Slovak Republic. At the end of the period analysed, the highest share of seniors was in the Czech Republic and Hungary. The lowest share was in the Slovak Republic. The average annual growth factor of the share of seniors was the highest in the Czech Republic (102.98%). The lowest average annual growth factor of seniors was in Hungary (101.58%). The share of seniors out of the total number of people in % is in Table 1.

Table 1 Proportion of population aged 65 and over out of the total population (%)

	2009	2010	2011	2012	2013	2014	2015	2016
Czech Republic	14.9	15.3	15.6	16.2	16.8	17.4	17.8	18.3
Hungary	16.4	16.6	16.7	16.9	17.2	17.5	17.9	18.3
Poland	13.5	13.6	13.6	14.0	14.4	14.9	15.4	16.0
Slovakia	12.2	12.4	12.6	12.8	13.1	13.5	14.0	14.4

Eurostat, database

The aging index, expressed as the share of seniors per 100 people aged 0-14 was the highest in Hungary in the period analysed. The lowest values were achieved by the Slovak Republic. The highest average annual growth factor of the ageing index in the period analysed had Poland, the lowest annual average growth factor had the Czech Republic. The ageing index in % is in Table 2. In the next step, we expressed the share of seniors employed part-time out the total number of seniors (Table 3).

Table 2 Ageing index (%)

	2009	2010	2011	2012	2013	2014	2015	2016
Czech Republic	104.93	106.99	107.59	110.20	113.51	116.00	117.11	118.83
Hungary	110.07	112.93	114.38	116.55	119.44	121.53	123.45	126.21
Poland	88.24	88.89	88.89	92.72	95.36	99.33	102.67	106.67
Slovakia	78.21	80.00	81.82	83.12	85.06	88.24	91.50	94.12

Processed according to Eurostat database

Table 3 The share of seniors employed part-time out of the total number of seniors

	2009	2010	2011	2012	2013	2014	2015	2016
Czech Republic	2.63	2.59	2.47	2.60	2.63	2.55	2.99	3.19
Hungary	0.90	0.90	1.07	1.04	0.93	0.96	1.00	1.18
Poland	2.67	2.59	2.55	2.47	2.29	2.36	2.09	2.10
Slovakia	0.59	0.69	0.77	0.64	0.76	0.65	0.96	0.92
EU 28	2.53	2.57	2.71	2.90	2.96	3.09	3.12	3.18

Processed according to the Eurostat database

In the first three years of the period analysed, the highest share of seniors employed part-time out the total number of seniors had Poland (in 2010 together with the Czech Republic). However, in the following five years, the Czech Republic had

the highest share of seniors employed part-time out of the total number of seniors. In 2009, 2010 and 2016, the maximum values exceeded the arithmetic average in the EU. In the Czech Republic, Hungary and Slovakia, the values increased over the period analysed. In Poland, the values decreased.

In the next step, we expressed the parameters of the linear trend of the share of seniors employed part-time out of the total number of seniors in all four countries of the V4 and we expressed the coefficient of determination.

Parameter values are in Table 4. Graphical depictions of the linear trend of the share of seniors employed part-time out of the total number of seniors from all countries of the Visegrád Group and in the EU are in Charts 1-5.

Table 4 Estimation of the linear trend parameters of the share of seniors employed part-time out of the total number of seniors $y=a+bt, t=1, 2, \dots, 8$

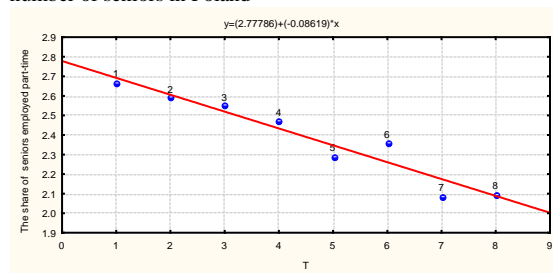
	a	b	R ² (%)
Czech Republic	2.37464	0.07369	52.89%
Hungary	0.889286	0.024048	37.17%
Poland	2.77786	-0.08619	93.03%
Slovakia	0.564286	0.040714	55.81%
EU 28	2.42714	0.10119	96.44%

Own processing in Statistica

By examining the quality of linear models, we found that in all linear models the arithmetic average of the residues was zero. Based on the Shapiro-Wilk test, we did not reject the zero hypothesis of normal residues distribution. Based on the Durbin-Watson statistics, it can be concluded that there was a significant negative autocorrelation of residues in the model for Poland. In the linear models for Hungary, Slovakia and the EU, the autocorrelation of residues was insignificant. In the model for the Czech Republic it was not possible to decide on autocorrelation. Heteroscedasticity of the residues was not confirmed in the models.

From the estimation of the linear trend parameters in all four V4 countries we can say that Poland was the only country in which the share of seniors employed part-time out of the total number of seniors decreased. The proportion of seniors employed part-time out of the total number of seniors decreased by about 0.0862% annually. The graphical representation of the linear trend of the share of seniors employed part-time out of the total number of seniors in Poland is in Chart 1.

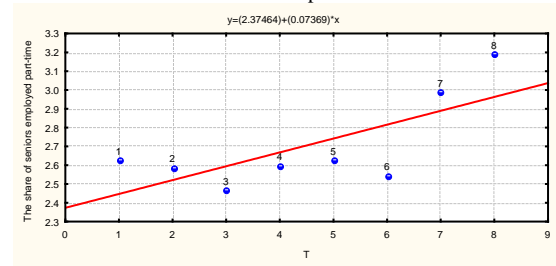
Chart 1 The share of seniors employed part-time out of the total number of seniors in Poland



Own processing in Statistica

The highest regression coefficient of the share of seniors employed part-time out of the total number of seniors was in the Czech Republic. The proportion of seniors employed part-time out of the total number of seniors increased by about 0.0737% annually. The graphical representation of the linear trend of the share of seniors employed part-time out of the total number of seniors in the Czech Republic is in Chart 2.

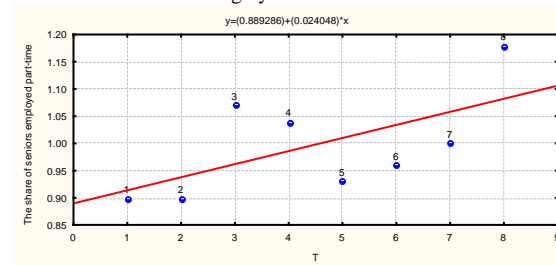
Chart 2 The share of seniors employed part-time out of the total number of seniors in the Czech Republic



Own processing in Statistica

In Hungary, the linear trend was growing. However, the model had a coefficient of determination with a relatively low value. Only 37.17% of the total variability was explained by the model. The graphical representation of the linear trend of the share of part-time seniors out of the total number of seniors in Hungary is in Chart 3.

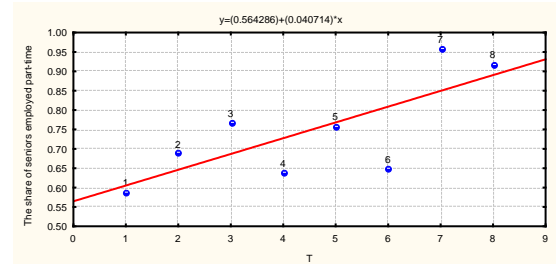
Chart 3 The share of seniors employed part-time out of the total number of seniors in Hungary



Own processing in Statistica

In the Slovak Republic, the regression coefficient of the share of seniors employed part-time out of the total number of seniors was about 0.0407%. The graphical representation of the share of seniors employed part-time out of the total number of seniors in Slovakia is in Chart 4.

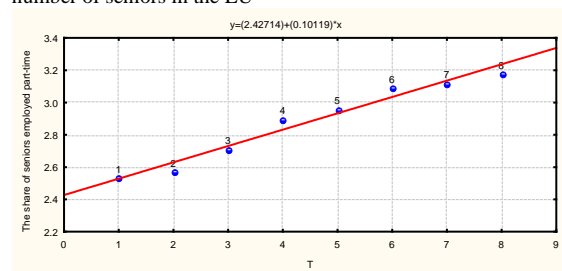
Chart 4 The share of seniors employed part-time out of the total number of seniors in Slovakia



Own processing in Statistica

The proportion of seniors employed part-time out of the total number of seniors in the EU increased by about 0.1012% annually. Thus, if this trend was to be maintained, the share of seniors employed part-time out of the total number of seniors in the EU would increase by about 1% over the next 10 years. The graphical representation of the linear trend of the share of seniors employed part-time out of the total number of seniors in the EU is in Chart 5.

Chart 5 The share of seniors employed part-time out of the total number of seniors in the EU



Own processing in Statistica

Based on the linear models, Table 5 provides a point estimate and a 95% confidence interval of the share of seniors employed part-time out of the total number of seniors in 2020.

Table 5 Estimation of the share of seniors employed part-time out of the total number of seniors in 2020

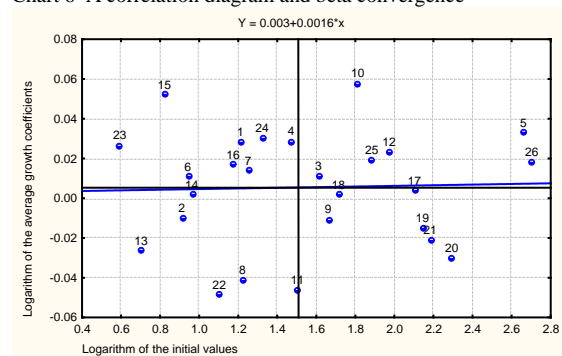
	Point estimate	95% confidence interval	
Czech Republic	3.2589	2.7141	3.8037
Hungary	1.1779	0.9329	1.4228
Poland	1.7435	1.5587	1.9285
Slovakia	1.0529	0.7690	1.3367
EU 28	3.6414	3.4891	3.7938

Own processing in Statistica

If share of seniors employed part-time out of the total number of seniors develops with the linear trend, in 2020 the Czech Republic will have the highest value. However, the value of the indicator would be lower than the EU average.

In the next step, we focused on finding out whether EU countries show convergence in the share of seniors employed part-time out of the total number of seniors. However, we had to omit Luxembourg and Malta from the analysis of 28 EU countries due to unpublished data. Countries with a relatively high share of seniors employed part-time out of the total number of seniors include e.g., the United Kingdom, Portugal, Sweden, Netherlands, Denmark and others.

Chart 6 A correlation diagram and beta convergence



Own processing in Statistica

Note: 1. Belgium, 2. Bulgaria, 3. Czech Republic, 4. Denmark, 5. Germany, 6. Estonia, 7. Ireland, 8. Greece, 9. Spain, 10. France, 11. Croatia, 12. Italy, 13. Cyprus, 14. Latvia, 15. Lithuania, 16. Hungary, 17. Netherlands, 18. Austria, 19. Poland, 20. Portugal, 21. Romania, 22. Slovenia, 23. Slovakia, 24. Finland, 25. Sweden, 26. United Kingdom

Linear regression function with a dependent variable, logarithm of the average growth factor of the share of the number of seniors employed part-time out of the total number of seniors (y) and with the independent variable, with the logarithm of the initial values of the share of the number of seniors employed part-time out of the total number of seniors (x) has the following expression:

$$y = 0.003 + 0.0016x$$

The regression coefficient is almost 0, so there is neither convergence nor divergence. The coefficient of determination is only 0.109%. Thus, only 0.109% of the total variation is explained by the model. Graphical representation of the regression function is in Chart 6.

Chart 6 also contains a correlation diagram in which the countries are divided into four groups. The Czech Republic is in the first group, i.e., in the group in which there are countries that have above-average initial values and an above-average growth factor. Countries in this group tend to shift away from the others. The Slovak Republic and Hungary are in the second group. They have below-average initial values and an above-average growth factor. They tend to move into the first group, i.e., into the group in which there are regions that tend to shift away from the others. Poland is in the fourth group. This group includes regions with above-average initial values and a below-average growth factor. They tend to move into the third group, i.e., into the group in which there are regions that tend to delay the others.

4 Conclusions

Based on the analyses carried out, we can state that regional specifics in terms of part-time employment of seniors in the V4 countries were determined. In 2009-2011, Poland had the highest share of seniors employed part-time out of the total number of seniors. However, in 2012-2016, the Czech Republic had the highest share of seniors employed part-time out of the total number of seniors. In the Czech Republic, Hungary and Slovakia the share of seniors employed part-time out of the total number of seniors increased in the period analysed. In Poland, the proportion of seniors employed part-time out of the total number of seniors decreased.

By using beta convergence, neither convergence nor divergence of EU countries in terms of the indicator of the share of seniors employed part-time out of the total number of seniors was confirmed. From the correlation diagram we concluded that the Czech Republic had above-average initial values and an above-average growth factor. It belongs to the countries that tend to shift away from the others. The Slovak Republic and Hungary are in the group in which countries tend to move into the group that tends to shift away from the other countries. Poland is in the group in which there are countries that tend to move into the group in which there are countries that tend to delay the others.

Our research has got some limitations. During the analysis, we did not take into account various regulatory measures and did not monitor the supply and demand in the national labour markets. Their detailed specification would make it possible to characterize the causes of the development of seniors' employment in individual V4 countries in a wider context. In further research, it would be necessary to focus on analysing the development of seniors' part-time employment in terms of the changing supply and demand in the labour market and regulatory measures.

Acknowledgement

This paper is part of the output of the project VEGA 1/0233/16 "Dimensions and factors related to social and economic development of V4 regions".

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Primary Paper Section: A

Secondary Paper Section: AO

HOMELESSNESS AND ITS PERCEPTION BY SOCIETY

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Abstract: As a sociopathological phenomenon, homelessness has far deeper significance than it might seem at first glance, where the loss of one's own home becomes not only the loss of material values, but also non-material ones. In conditions within Slovakia, an ongoing insufficient examination of the homelessness issue can be witnessed whose results are reflected in practice not only in frequent distortion by the housed majority of information about homelessness, but also in the inability to find a comprehensive and lasting solution to it. This paper consists of both a theoretical and empirical part. While the theoretical part consists of basic theoretical reflections concerning homelessness, as an extreme form of social exclusion, the empirical part focuses on exploring the perception of homelessness and its various aspects from the point of view of the majority who have housing.

Keywords: Homelessness, Home, Social exclusion, Perception of Homelessness, Society.

1 Introduction

Nowadays, homelessness represents an extremely active and serious sociopathological phenomenon characterized by its far-reaching consequences not only for the lives of individuals who suffer from the loss of housing, but also for all of society (Tvrdoň, Kasanová, 2004).

In conditions observed in Slovakia and other countries in the former *Eastern Bloc*, the homelessness issue was brought to attention especially after 1989, when a transformation of society occurred in these countries. Considering that homelessness has still not been sufficiently mapped out and supported by research findings, it may be nevertheless considered a modern social phenomenon in Slovakia.

The consequences of this situation may be reflected in frequent misunderstandings about homelessness by the majority that have housing, or the inability to take a decisive position on this issue due to minimum, and very often only distorted information about homeless people.

2 Homelessness and the attempt to terminologically define it

In considering homelessness as an extreme expression of social exclusion, it is necessary first to define the concept of social exclusion itself. It includes, in a wider context, several dimensions of exclusion (Berafe, 2017) which can therefore affect the economic, social, political, community, individual, group or spatial dimension (Gerbery, Džambazovič, 2005).

Concerning the rise of homelessness, no one can specify a singular, universal and generally true cause of homelessness since this phenomenon is affected by several factors of both an objective and subjective nature. In practice, however, these may often enough be interconnected (Turnbull, Muclke, Masters, 2007).

Chronic homelessness can also be described as a syndrome of comprehensive social failure, combined simultaneously with the person's inability to cope with conventional social requirements. In this respect, homelessness is not exclusively associated with the space intended for everyday dwelling, but is mostly intangible in nature (sense of safety, security,...) (Vágnerová, Csémy, Marek, 2013).

Within such a context, it is very difficult to map the actual number of homeless people because they include not only people who have clearly and openly declared their social status, but also a group of hidden or potentially homeless people living either in substandard or poor housing conditions. Two different thoughts have emerged in society about what is causing the rise in homelessness. While the first opinion suggests structural weaknesses within society, which no one individual can

influence, the second view argues that homelessness is strictly a failure by individuals observed in various aspects of his or her life (level of education, employment, health, etc.) (Lux, Mikeszová, 2013).

When it comes to public space, the life of a homeless person is fraught with many risks and threats which non-homeless people do not normally encounter. Concurrently, homelessness is closely associated with increased health problems affecting not just physical health, but also mental health, too (Schranzer, Dominiguez, ShROUT, Caton, 2007).

Homeless people often "*escape*" their mental illnesses through various addictive substances. In this connection, it could even be said that the homeless include those who are injecting drugs into their bodies. However, the administration of drugs by injection is fraught with extremely serious risks, accompanied by the risk of HIV and Hepatitis C transmission which threatens not only the individual's own health, but also public health (Linton, Celentano, Kirk, Mehta, 2013).

Since the fall of Communism, homelessness has become a new social phenomenon in Central and Eastern Europe (Hradecký, 2008).

Yet the transformation of social conditions in these countries has not just caused the onset of homelessness, but also other sociopathological phenomena directly or indirectly related thereto (poverty, government housing policies, unemployment, etc.) (Haburajová-Ilavská et al., 2015).

Nowadays, there are two possible solutions to the issue of homelessness. One method consists of a gradual, "staircase" model of existing social services, starting with those of a low-threshold nature, and culminating with the homeless person becoming independent with his or her own housing. However, this model has been shown in a number of European Union member states as hardly effective (Marek, Strnad, Hotovcová, 2012).

The other solution model whose approach has received attention is Housing First, which has become part of the adopted strategy to tackle the situation of homeless people in several countries, providing social and affordable housing to minimize long-term homelessness in society (Pleace et al., 2015).

Housing First motivates people who would normally not be able to obtain their own housing by maintaining affordable housing, while also providing them with other material and non-material benefits (Habánik, 2016).

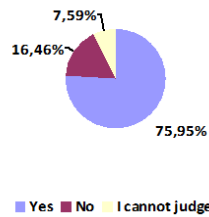
3 Objective and methodology

Based on the theoretical part and as part of this paper, we decided to continue quantitative research with a questionnaire covering the period from March 1 to June 15, 2017 in Trenčín, Slovakia, a city which has a low-threshold day center providing social services for homeless people. The overall response rate reached 79%.

The sample consisted of 158 respondents living in the wider environment around the low-threshold day center who anonymously replied to a set of questions. This paper aims to identify the perceptions and attitudes of the respondents toward the homeless utilizing a range of social services in the closer social environment of those participating in the survey.

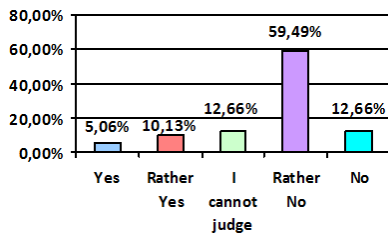
4 Results

Figure 1 : Do you consider homelessness to be a significant and current social problem?



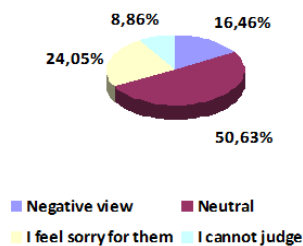
Regarding their perception of homelessness, 120 respondents considered it to be an extremely current and visible social problem. On the other hand, 26 respondents did not perceive homelessness as a major social phenomenon, while 12 respondents were either unable to comment on the issue or did not have an opinion.

Figure 2: Do you believe that society is paying sufficient attention to the issue of homelessness?



It can be concluded from an analysis of the responses that an overwhelming number of respondents (114) feel that society does not pay sufficient attention to homelessness. On the other hand, only 24 respondents were of the opinion that today's society is giving the issue proper and sufficient attention, while 20 respondents were unable to express any opinion about the issue or take a position.

Figure 3: What is your personal opinion of homeless people?



We encountered very interesting opinions when examining subjective views by respondents about the homeless. The most common response seen was a neutral attitude regarding these people (80 respondents), followed by feelings of pity (38 respondents). Negative opinions towards the homeless and homelessness were expressed by a total of 26 respondents, while 14 respondents had nothing to say about the issue.

Figure 4: Do you believe that the homeless are themselves responsible for homelessness?

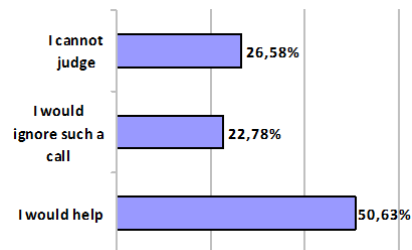


In examining responsibility for homelessness, 52 respondents were convinced that individual responsibility could be found for the rise of homelessness, while only 20 respondents believed that other factors were in the forefront. Something quite interesting was the option of "other answer", which 86 respondents entered and is consistent with the inability seen to generalize all homeless people and the cause for the rise in homelessness, while it demonstrates, on the other hand, the necessity of taking an individual approach toward each person when investigating homelessness.

Table 1: What do you think is the most common cause of the rise in homelessness?

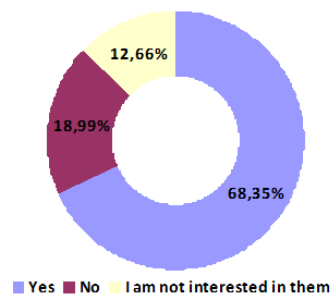
No willingness or interest in working	13.58%
Breakdown in family or partner relationships	19.20%
Loss of shelter	18.74%
Departure of minors from children's homes	6.09%
Incapacity to integrate into society after being released from custodial sentences	10.30%
Mental issues	21.08%
Voluntary decision	6.09%
Cannot judge	3.04%
Other answer	1.87%

Figure 5: How would you respond if a homeless person asked you for help?



In this respect, a heterogeneity in opinion can be seen. While more than half of the respondents (80 persons) declared their concern and willingness to provide assistance when asked by a homeless person, 36 respondents would ignore and refuse to respond to such a call for help. A very interesting finding was the large number of respondents (42) failing to state an opinion; whether it was a positive or a negative attitude on their part toward the issue.

Figure 6: Have you ever in some way helped someone who was homeless?



Following up on the previous question, we were still concerned about whether respondents sometimes provided assistance in some way to homeless people. To this question, the highest number, 108 respondents, said that they had provided some kind of assistance, while the exact opposite answer was given by 30

respondents and the remaining 20 respondents expressed the opinion that they had no interest in this target group.

5 Discussion

The quantitative research demonstrated by us shows that most respondents perceive homelessness as a current and significant social issue to which society has not given enough attention. The dominant view expressed argues that homeless people do not themselves contribute exclusively to the loss of housing, with the presence of other reasons leading to the rise of homelessness. We also consider a major conviction among respondents not to morally condemn the homeless, with most respondents taking a neutral position or pitying people without homes. This view was confirmed by the fact that most of the respondents have helped the homeless in some way, or would not refuse such a call from someone living on the street.

6 Conclusion

Homelessness can be characterized as a multi-faceted sociopathological phenomenon that is influenced by several factors and causes. In this context, no universal and unified scheme of homelessness can be stated, and as a result it is essential to prefer individual treatment for people who are homeless. The results from a quantitative survey show the public not to perceive homelessness negatively, although in order to obtain a better understanding of homelessness, it is necessary for further research to be carried out to find and address it in society also in future.

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Primary Paper Section: A

Secondary Paper Section: AO

EDUCATIONAL NEEDS OF SENIORS LIVING IN THE FACILITIES OF SOCIAL SERVICES

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Abstract: In his work, the author deals with the concept of an educational need with the emphasis on the adult age. He dedicates to the classification of educational needs and factors influencing them and also to the analysis of the educational needs of seniors. In the second chapter, there the author presents the chosen results of his research which was carried out almost in all regions of Slovakia in the facilities for seniors with a sample of 259 respondents. The aim was to find out whether there exists a relationship between the achieved education of institutionalized seniors and their need to further educate themselves and also a relationship between the satisfaction of institutionalized seniors with their own life and their need to further educate themselves. It was proved in the research that the level of achieved education of institutionalized seniors is statistically related to their need to further educate themselves in a significant way. The satisfaction of institutionalized seniors with their own life is statistically not related with their need to further educate themselves.

Keywords: educational needs; motives; seniors; education; satisfaction with life; quality of life; level of education; facilities of social services.

Introduction

People think about the old age and seniors mostly in two basic levels. On one side, there are prevalent such opinions that the ageing of population is a burden for the economic- social system of the state because older people often require a certain care they have not needed until then and, at the same time, they do not have such a working performance that would be reflected in the economics. We do not talk about a big amount of prejudices and myths which depict the old age and seniors in a bad way (more in: Hrozenská et al., 2008, etc.). On the other side, there is a very vivid discussion also about the need of active living of the old age and active ageing which has a legislative support in several strategic documents, e.g. also in *The national programme of active ageing for the years 2014 - 2020*. However, it is necessary to mention that active living of the old age is not only "a matter" of self-sufficient seniors who live in their natural environment but it is also related to the care-requiring seniors living in the facilities of social services. From among a wide range of possibilities that help to achieve the active ageing and the active old age, we have centred our attention exclusively on the education as a professional tool of andragogues.

1 Theoretical bases - educational needs (of seniors), their classification and analysis

The educational needs of adults represent a very often mentioned concept of the andragogical theory and practice. J. Průcha (2014, p. 35) says that „in the attitudes of adults to the education there overlap three psychological characteristic features which can be differentiated with difficulties: motivation - interest - need“. Z. Palán (1997, p. 128) writes about the educational needs that they „arise as a hypothetical state (conscious or unaware) when the individual feels the lack of knowledge or skills that are significant for his/her further existence, for keeping of his/her psychic (and also physical) or social functions“. The educational needs are influenced by values that a man appreciates and, at the same time, they become a motivational factor of his/her activity whereas they are being changed during the course of his/her life (Průcha, 2014, p. 37). Referring to other authors, G. Simon and C. Gerdenitsch (2012, p. 16) mention that the developmental tasks, motivation to education, educational interests, experience, the need of social contact and living conditions of seniors are significantly different from the other age categories. S. Haring and H. Bacher (2014, p. 3) come to the conclusion that the educational needs of older people are heterogeneous, the attitudes to education are manifold and the contents of interests change. Therefore the authors recommend to the educator to find out what educational needs (needs to learn) the senior participants have and subsequently, he/she should connect the process of education / teaching-learning to their biographical

context, personal interests and preferred methodics (how, where and when) (Haring, Bacher, 2014, p. 13).

It is undeniable that with finishing of the working life, the state of dependence and the subsequent institutionalization of the senior, his/her general hierarchy of needs are being changed fundamentally. What was significant for the senior in the past (in the state of his/her physical and psychic functioning and independence), suddenly it becomes insignificant, and vice versa.

Generally it is possible to distinguish at least three kinds of educational needs and these are the *educational needs of individuals* (i.e. the needs of real or potential participants of education which are changeable, they depend on age, gender, educational level etc.), the *educational needs of groups of subjects* (we differentiate the age, professional, socio-economic, ethnic and other groups) and the *educational needs of companies, sectors, national economy, all the society* (these are mainly the requirements of employers transformed into the needs and the national priorities/aims of education on the overall social level) (Průcha, 2014, p. 36-37).

V. Prusáková (2010a, p. 25) writes that by the analysis of the educational needs it is important to know the possible motivation and distinguish *the need to solve a specific situation* from the educational need. While the need to solve a specific situation is based on the fact that a man does not have enough knowledge and he/she cannot solve that situation (the lack of knowledge and skills), in the educational need the main leitmotiv is his/her own need of education in order to cope with with the changing conditions of life. In the practice it means that the education is understood as *a process of saturation of the needs of the man or as a need in itself*.

The reasons of further education mentioned by V. Prusáková (2010a) can be fully applied also to the age category of seniors. It is true that many seniors participate in further education only in order to satisfy their other needs, mostly the social ones but there are also such seniors whose incessant education makes them intrinsically satisfied. Also A. Kobylarek (2010, p. 310) names several factors which motivate seniors to participate in education (in the conditions of the Third-Age Universities). These are the need of personal development, need of social contact, need of feeling important and significant, need to decide and the need of something important in their life. It is evident from the research carried out by S. Haring et al. (2012, p. 35-38) that women-seniors participate in further education due to the following reasons: *they want to stay active, they perceive education as a life necessity, they are interested in the presented topics, social recognition, commitment to fulfil certain tasks (to go out from the house), the educational group and the social solidarity in it, social contacts, personal enrichment, etc.* From the mentioned research it was clear that women-seniors are interested in topics such as the general knowledge and special skills, the old age, gerontology, work with seniors, astronomy, movement, biography, theory of chaos, film, photographing, garden, training of memory, history, health and illness, globalization, handicrafts, childhood and young age, eating, culture, art, psychology, literature, painting and drawing, management, music, nature, new media, pedagogy, anthropology and education of adults, PC, philosophy, politics, presentation technique, directing, travelling, religion and spirituality, rhetoric, singing, languages, dancing, theatre, environment, etc. (Haring et al., 2012, p. 38-46).

When thinking about the importance of education in the life of an institutionalized senior, it is important to take into consideration the whole complex of other needs of an older person. M. Vágnerová (2000, p. 467-470) includes among them different psychic needs such as *the need of stimulation, need of orientation and learning, need of activity, need of emotional security and safety, need of self-realization and the need of open*

future and also the whole complex of needs of the social facility where the seniors live. Therefore the identification of the current (educational) needs, motivation and interests of an older person represent the gateway to the success. It is not possible to educate without knowing who to educate and also without knowing whether the institutionalized senior is really interested in education.

In the end, we would like to add that, when analysing the educational needs of institutionalized seniors, it is important to avoid different mistakes described by V. Prusáková (2010a, p. 20-21) who refers to J. Krajcarová (2004). For example, these mistakes are non-differentiating between the wish and the need, the tendency to evaluate more the past needs than the future needs, the inability to promote the system approach to the education, the assumption that everything is possible with the education or, vice versa, the assumption that it is necessary to educate only when there have been found out some shortcomings.

2 Research of the educational needs of seniors in the facilities of social services

2.1 The project of the research

Regarding the fact that we offer only the selected results of our research in the submitted work, we mention just the following related research questions which we asked at the beginning of our research: 1) Does any statistically important relationship exist between the achieved education of institutionalized seniors and their need to further educate themselves? 2) Does any statistically important relationship exist between the satisfaction of institutionalized seniors with their own life and their need to further educate themselves? From the mentioned research problems there arose the following aims: 1) To find out whether there exists any statistically important relationship exist between the achieved education of institutionalized seniors and their need to further educate themselves. 2) To find out whether there exists any statistically important relationship exist between the satisfaction of institutionalized seniors with their own life and their need to further educate themselves.

The selection of respondents for our research was intentional because we centred exclusively on the clients of a facility for seniors (§ 35 Law No. 448/2008 about Social Services with subsequent amendments), and it was consequently accessible. The total number of respondents was 259, there were 81 men and 178 women from all the regions of Slovakia except Trnava region. 58,68% of respondents were in the life phase of the *old age* (75-89 years), they were followed by the respondents (28,58%) in the phase of the so-called *older age* (60-74 years) and subsequently there were respondents (7,72%) who we already consider to be *long-living* (90+ years) and the smallest group was formed by the respondents aged 45-59 years (5,01%). The mentioned age structure is based on the periodization of the parts of the adult age and all the senior age according to WHO (Čornaničová, 1998, Balogová, 2005).

In order to acquire new empirical data we used a non-standardized questionnaire. The administration of the questionnaire in the facilities was carried out personally by the author/researcher (3 facilities), by the Slovak Post Company (1 facility), colleagues of the author/researcher (2 facilities) and by a family member of the author/researcher (1 facility) in the time period of July - September 2013. The acquired data were evaluated by the methods of the mathematical statistics and logical operations. More detailed findings resulting from this research are presented in his monographic work (Határ, 2014).

2.2 The analysis of the research results

Quite a big attention has currently been paid to the research of senior education in Slovakia and abroad as well. In spite of this fact, the education of seniors in the facilities of social services still remains a marginal and almost unknown area which is being studied mainly in our works. We offer partial results of our

research of senior education in the facilities for seniors (i.e. the former retirement homes for elderly people) in the submitted study.

One of the indicators which we put in the relationship with the need of seniors to educate themselves was their highest achieved education. We divided the respondents into two groups in the following way: 1) seniors with academic education (6,18%) and secondary education with the school-leaving exam (28,19%) and 2) seniors with secondary education without the school-leaving exam (26,64%), basic education (36,29%) and without education (2,70%). These groups were mutually compared by us. The eighth question was aimed on the need of senior clients to further educate themselves. We found out that only 30,89% respondents felt this need. There exist several reasons why the institutionalized seniors were not interested in further education. On one side, the reason lies in health problems and other limitations derived from them which play a decisive if not primary role or there are certain prejudices which are based on the incorrect perception of education only as an obligatory task of young people. The proper setting of the system of residential care often leads the staff, clients and their family members to the conviction that only the health and nursing care connected with satisfying of the physiological needs are the most important things which a senior needs in this phase of life and in these conditions. 65,25% of respondents did not feel the need to further educate themselves and 3,86% of seniors did not answer this question. It was also evident from the research that the health condition (i.e. the health problems) and the age of clients (i.e. the old age) are the key factors which influence their need to further educate themselves.

Z. Palán (1997, p. 128) mentions that there exists a narrow correlation between the achieved level of education and preparation for the profession and the need to further education. Therefore, in the first hypothesis we made the assumption that *the level of achieved education of the institutionalized seniors is statistically significantly related to their need to further educate themselves.*

Table 1: Relationship between the achieved education and the need of seniors to further educate themselves

chi-squared testing statistics	p-value of the test's importance	test's importance
17,7692	0,0001	++

Source: Author's own research

It was proved with the statistical testing that the level of achieved education (between two compared groups) of institutionalized seniors is statistically significantly related to their need to further educate themselves (more than surface of importance 0,01) and on this basis we accept the formulated hypothesis.

We suppose that seniors with a higher level of education where, in the past, belonged the secondary education with a school-leaving exam as well, perceive the further education more as a need in itself than a tool for solving individual problems or a process of satisfying other needs of a senior as also V. Prusáková (2010a, p. 25) mentions in her work. We assume that not all seniors, who achieved only lower or no education, did not have a real potential or aspiration to educate themselves in the past. However, from the practice we know that the possibility of education in the past was not such a usual matter as it is now. Therefore the current need of further education of the institutionalized seniors with a lower level of education can be influenced also by their (un)experience with education in their young age. Functions of education of adults (from the point of view of the relationship to the school education) can be applied to both compared groups of respondents. These functions are described by G. Porubská and E. Ďurdiak (2005, p. 100), and they are *one's own continuing functions* (they are related to the satisfying of the intellectual needs of the senior, exceeding the programme of the school, they are usually connected with the participation in the public activities, with the solving of personal and other problems etc.) and *the substitutional function* (it is

related to the acquisition of a certain level of education and saturation of educational needs in the adulthood/senior age).

Regarding the relationship to the seniors, there is a frequent discussion about the quality of their life (e.g. Balogová, 2005; Heřmanová, 2012; Escuder-Mollón, Cabedo, (eds.), 2014; Határ, 2014 etc.). Satisfaction and well-being in different areas of life are generally understood as common denominators of the majority of definitions of the quality of life and, at the same time, they represent the key elements of the indicators of the individual quality of life (Tokárová, 2002, p. 26). We found out in the research that 76,45% of respondents were satisfied with their own life, 19,69% of seniors were not satisfied with their own life and 3,86% of respondents did not answer the question. J. Džuka (2004, p. 42) describes more precisely the relationship between the quality of life and the subjective well-being. In general, he differentiates three constructs and these are *the objective quality of life* (i.e. the objective conditions of life of the individual), *the subjective quality of life* (i.e. individually assessed conditions of life of the individual) and *the subjective well-being* (conditions of life evaluated with the emotional system). M. Zimermanová (2013, p. 23-27) experimentally verified the influence of the cooperative programme of the educational character, which was created by her, on the quality of life of the institutionalized seniors, on the frequency of positive emotions and non-emotional states and the frequency of negative emotions and non-emotional states of seniors. She found out that the programme she had suggested, did not improve the quality of life of the institutionalized seniors nor the frequency of positive emotions and non-emotional states SEHP, but it decreased the frequency of their negative emotions and non-emotional states SEHP. According to the author, the results of her research could be influenced by the external non-tested variables.

Z. Bútorová et al. (2013, p. 305) mention that the level of satisfaction of people aged 45 - 64 years with their own life situation „cannot be perceived as a true reflection of the objective state of social and economic conditions of life, but it expresses mainly the personal definition of the life situation of the individual“. The authors also say that „education is a quite important factor. Generally it is valid that more educated people are more satisfied with their life. This influence is reflected the most significantly in their evaluation of the working life as well as in the general feeling from their life, the satisfaction with their social life and their participation in the public life“ (Bútorová et al., 2013, p. 305).

Based on these mentioned facts we assumed that *the satisfaction of the institutionalized seniors with their own life will be statistically significantly related to their need to further educate themselves.*

Table. 2: Relationship between the satisfaction with their life and the need of seniors to further educate themselves

chi-squared testing statistics	p-value of the test's importance	test's importance
2,8534	0,2401	-

Source: Author's own research

It was proved with the statistical testing that the satisfaction (as an indicator of the quality of life) that was felt by the institutionalized seniors regarding their own life is not statistically related to their need to further educate themselves (since the level of importance is higher than 0,05) and based on this fact we reject this hypothesis.

We also asked the respondents why they are not satisfied with their own life. From their answers, which we processed, it is evident that *unfavourable health condition, limited mobility and immobility, loneliness, bad relationships with their roommates and family-related reasons* caused their dissatisfaction with their own life. We perceive the mentioned reasons as objective ones because, in the longer term it was also proved by the checking of the need of seniors to further educate themselves that the health condition (health problems) and age (the old age) play a very

important role in this matter. However, there appeared unusual reasons as well, such as, for example, *not enough cigarettes, the death of a son or the impossibility to go wherever the client wants to go*. In spite of the fact that there was not verified any connection between the satisfaction of seniors with their own life and their need to further educate themselves, it does not mean that the educational could not influence the life of the institutionalized seniors in a positive way, just on the contrary. It was also proved with the research findings of M. Lenhardtová et al. (2015, p. 174) who tested the influence of the co-educational cooperative programme on institutionalized children and seniors. They found out that the general satisfaction of the senior clients was increased after the application of this programme.

Instead of the conclusion

„However, the education of seniors is not and cannot be primarily oriented on the professional preparation, but it fulfils a whole range of not less important functions“ (Haškovcová, 2010, p. 129). R. Čornaničová (1998, p. 68-70) mentions the preventive, anticipative, rehabilitation, adaptation, reinforcing, communicative, compensation, activating, relaxing, cultural-cultivating, social-psychological and intergenerationally understanding functions. It has also been proved by the research that the educational activities have a very significant meaning for the institutionalized seniors. By means of these activities, the seniors frequently *avoid inaction and boredom* (46,72%), *they take a rest and relax* (28,57%), *they communicate and share their experience* (27,41%). Thanks to the education, more than 23% of seniors *keep their body and mind fit*, almost 23% of respondents *broaden their horizons of knowledge* by means of education and almost 21% of respondents *participate in overall social activities and they do not think about their own problems* thank to the educational activities (Határ, 2014, p. 50). Regarding this fact, we highly recommend so that the education becomes an obligatory service which will be provided in the facilities of social services to their senior clients by means of qualified andragogues.

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Primary Paper Section: A

Secondary Paper Section: AM

MASS AND POPULAR CULTURE, THEIR FEATURES AND SPECIFICS

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Abstract: The paper deals with the issues of culture with a specific emphasis put on the matter of mass and popular cultures. In the paper the author reflects fundamental theoretical outcomes of culture and submitted subcultures, their definitions and characteristics according to different authors and from different perspectives of investigation. A part of the paper also involves individual difference attributes and specifics of mass and popular cultures, as well as briefly depicted and defined individual philosophical streams (schools) related to a concrete type of culture. The paper is of theoretical character and by means of theoretical reflection it introduces to and simultaneously compares two independent units of culture.

Keywords: culture, mass culture, popular culture, mass media, audience.

1 Introduction

Generally speaking, culture as such is a part of any society. Individual societies are characterised by different spiritual and tangible values, which they have acquired during its origin, development and existence. In a complex way, it is possible to call a set of such values with the term culture. However, sole exact defining of this term is very difficult. The etymological origin of the term culture lies in the Latin language, where this notion was connected with the term *colere* – to cultivate, to farm. Later, a Roman statesman, rhetor and philosopher Cicero called philosophy the so-called culture of spirit (*cultura animi*), which meant that the term culture started to be understood in intellectual meaning, as well.

E. Delgadová (2010, pp. 142) states that the first modern global and scientific definition of ethnological and anthropological understanding of culture, which is one of the most respected benefits in anthropology, was presented in the second half of 1890th by the English anthropologist Edward Burnett Tylor. He understands culture as a unit, which includes knowledge, belief, art, moral, law, customs and all other abilities and habits that a human being has acquired as a member of the society. Tylor understood culture from the positions of consistent evolutionism i.e. theoretical approach, which seeks to objectively describe and explain long-term processes of cultural changes as a configuration of learnt behaviour and its results shared by members of certain society. This new theory of culture is definitely diverted from until then accepted definitions and conceptions of culture. According to Tylor's definition, culture is thus manifestation of the whole social life of a human being, it is characterized by collective dimension, it is not transferred biologically – by inheriting, but it is acquired unconsciously in the process of socialization of a human being.

V. Gažová (2003, pp. 105) explains how we can come across – most often in theoretical reflection, but also in everyday usage – the definition of culture based on its understanding as an adaptive system; culture is here perceived as a set of typically human means of a human being's adjusting to their environment. Therefore, we can talk about culture in at least two levels, as follows:

- Culture as a universal human phenomenon, a specifically human activity, which is not natural to other biological forms of life. From universal standpoint it is thus the most important sign with which a human being differs from other animals. This universal all human culture is manifested in huge amount of local cultures.
- Culture is reflected and investigated as a specific way of life of different groups of people. In this sense individual local cultures represent unique and unrepeatable configurations of artefacts, socio-cultural rules, ideas, symbolical systems and cultural institutions, typical for a certain society or a social group.

From psychological perspective, a definition is offered by psychoanalyst S. Freud (1990, pp. 276), who perceives culture as everything with which human life elevated over its animal conditions and with which it differs from the life of animals. We consider B. Kafka (1992, pp. 7) to be the author of one of the most pertinent specification of culture; for him culture is what comes into existence through work and leads to genuine human good. He says: „*Human world is culture*“. Since a human being is born into a culture and not with it, they have to pass through processes of learning and acquiring cultural values. Therefore it is clear that the process of enculturation is practically identical with socialisation of an individual into society, at which it comes to the development of their cultural identities and civilisation as such.

However, the word culture can also have a broader meaning, when it includes whole area or set of meanings, by means of which people of certain society understand each other and the world, in which they live. Here, we may involve language and scholarship, experience and techniques, religion, art or the field of science.

Sociologists say that culture is an inseparable part, feature and attribute of a society. It originates together with the society and thus the society develops due to it, whereas with the decline of the society there comes to disappearance of the culture. The culture is thus something that is shared by all members of the given group and that is transferred from older generations to the younger ones. It is the basis of interpersonal relationships; it influences behaviour of people and communication among them. The culture is a manifestation of us; it has its own features – values, opinions, attitudes or norms, which provide it with a unique character that distinguishes it from other cultures.

Therefore, from sociological perspective we may say following:

1. In culture there are fundamental activities of people, or better to say values and rules, norms that regulate these activities; exerted procedures, or other circumstances and conditions of activities;
2. Culture is not inborn, inherited or instinctive, but it is social, learnt, educated;
3. Culture as a unit is a collective product that is created in social interactions of people;
4. Cultural norms and values are passed on from generation to generation, culture as a unit keeps certain continuity over the time, even though individual parts of culture can arise and fade out from time to time;
5. Culture is adaptable, thus it is able to adjust to internal and external changes on the basis of activities of a human being (Búzik-Sopóci, 1995, pp. 29-33).

Communication is closely related to culture. Cultural parts or values are spread mainly by means of communication; simultaneously at the sole process of communication there comes to the exchange of cultural contents. Here, we identify with the media theorist D. McQuail (1999, pp.119), who considers exactly communication to be the most elementary feature of culture. Ways, with which cultural contents were spread in the framework of communication, have gradually developed together with the sole form of communication – from verbal manifestation, through written one up to current media that brought along culture of homogeneous type – aimed at a large amount of people. It is one of subsystems of culture – the so-called *mass culture*. Apart from mass culture, other subsystems include *popular or media culture*. It is right the more detailed issue of mass and popular cultures, signs, their characteristics and definition that makes the core of this paper and we will deal with it in the following chapters.

2 Mass culture

If we mentioned difficulties of exact definition of the term culture in the above part, similarly, even in a more diffuse way it is operated with the terms mass or popular culture in specialized literature or in practice. Sometimes it can even happen that these terms are mutually confused, or their mutual delimitation is not sufficiently defined and restricted. Why does it come to confusion of these terms? Terminological problems in unambiguous delimitation of the terms mass and popular culture are probably caused by the fact that in the description of both terms there is emphasized primarily extensive characteristics of their users – in Anthological dictionary under the entry popular culture there is denoted following „*culture shared by wide layers of population*“, in the Dictionary of Media Communication mass culture is characterized as „*culture created for mass audiences*“. In several cases it comes to a complete interconnection of these terms, which naturally is not correct (Rusnák, 2011, pp. 53).

Individual differences between mass and popular cultures may be seen especially in the analysis of way of their usage by the audience. A. Kloskowska in her work *Mass Culture* (critic and defence) states that mass culture was born as a secondary product of industrial revolutions together with industrialisation and urbanisation and she reminds of two important criteria that delimit it – criterion of quantification and criterion of standardisation. In the meaning that is accepted most generally, according to her the term mass culture relates to current communication of identical or similar contents, stemming from a small amount of sources to large masses of recipients, as well as monolithic forms of a game or entertainment of large masses of people. The author also states that production of mass culture enabled origin of secondary mass audience that consumes contents by means of mass media (Kloskowska, 1967, pp. 68 – 70). We agree with I. Reifová, who adds that mass culture keeps its characteristic features – it is homogenised, commercialised and those for whom it is designed do not participate in its production (Reifová et al., 2004, pp. 113). In general we can say that mass culture is specific mainly from the perspective of its aesthetic parameters, target group of consumers and way of usual production and distribution. In the course of the 20th century mass culture reached two highlights: in 1920th (development of radio and film) and in 1950th (spread of television). To several of typical products of mass culture can be included folk novels, popular music, comics, TV series, commercial films, cheap reproductions of creative art works or decorative utility subjects and the like.

G. Lipovetsky (1999, pp. 62) in his publication *Soumrak povinnosti* (*Dusk of Duty*) in the context of cycle of mass production and consumption says that a decisive and important role is played mainly by advertising – by means of it there is sold and also consumed. Besides consumption and satisfaction of needs, with advertising there are created new needs, there arises new life feeling, new mentality, and new culture – culture of consumption. In this culture civilisation does not suppress the needs, but it escalates them and absolves from guilt. At the beginning of the 19th century there were first attempts to classify different cultural levels and to describe the phenomenon of pseudo art. American journalist and critic Will Irwin used for the first time the terms „lowbrow“ (an uneducated) and „highbrow“ (an intellectual) in a series of articles published in the newspaper *New York Sun*. Reflections on cultural levels and kitsch were deepened by a well-known American journalist and critic D. MacDonald, who says that mass culture is goods meant for mass consumption, which appeared by misshaping and simplifying of works from highbrow culture and folk art. Simplicity, naturalness and local availability of folk culture were replaced by trivialness, global spread and prefabrication of mass culture that only misuses needs of the masses and serves for accumulation of profit. MacDonald also spreads concepts highbrow and lowbrow with a category midcult (middle culture – culture of middle classes) (MacDonald, 1953, pp. 13-15). In this context sometimes it is said about a rule of three low – middle – high culture, whereas mass culture is low. Mass culture comes with the growth of free time and relatively good standard

of living. While these assumptions of mass culture were not provided, cultural life of people was at a very low level. Thus mass culture did not fill the place of a higher culture, but it replaced the absence of culture. It was determined for people who do not have either emotional or intellectual capabilities to be receiving high culture. However, we cannot say that mass culture evades works of high culture. It brings them along in condensed and averaged form, in neutralising contexts. Although valuable works belonging into high culture get by means of mass media to the audience only in limited extent, it is the only way how higher values can get to these recipients. If mass media did not exist, higher culture would not get to these recipients at all. Nevertheless, it is necessary to remind of the fact that in our times of a developed system of mass communication there exist mass media and programmes that purposefully and systematically focus on quality culture that can satisfy demanding and educated audience (Rankov, 2002, pp. 41-42).

A. Kloskowska points out that mass culture involves also components of high cultural level and in this culture they mix up, join and dissolve with components from other levels. She defines this process as homogenisation of mass culture, in which there comes to fading out of distances and differences among different products of various levels of culture (Kloskowska, 1967, pp. 223). We agree with H. Arendt, who pertinently emphasises the difference among subjects of individual cultures. Therefore, division of culture into mass (low) and elite (high) one is an excellent tool to distinguish quality of individual works. The subject of culture is characterised by permanence of values and relative stability, whereas the main signs of the mass culture works are modernity and novelty, therefore the culture cannot be consumed, however mass culture can. In mass culture it is valid that one goods is replaced by another one, which is in other cultures practically impossible (Arendt, 1994, pp. 127).

It is obvious that the dissemination of mass culture is closely related to the development and use of mass communication means, together with the development of reproduction techniques and technologies. From sociological viewpoint, the research of mass culture started at the turn of the 19th and 20th centuries, while it was being examined as a function of certain type of society and its needs. It may be reminded that in sociology the term mass culture is used neutrally in terms of value. However, sometimes this term is value-biased, when mass culture is characterised in antithesis to so-called high – elite - culture. It is namely justified to state that development of mass culture to some extent limits or deforms individual cultural needs and manifestations and it supports development of less demanding genres and contents.

Generally speaking, in theoretical reflection it is possible to delimit three fundamental approaches to the conditions of mass culture origin, as follows:

1. Mass culture is a typical product of mass society, which appeared as a secondary consequence of the impact of industrial revolution, industrialisation, urbanisation and mass media (Antonina Kloskowska and Hannah Arendt).
2. Mass culture filled the space after folk culture, which it gradually pushes to the margin (Dwight McDonald).
3. Another approach attributes a key role solely to the impact of mass media and non-critical adjusting of authors of media products to average or low taste of the audience (Umberto Eco).

The above mentioned approaches have a common denominator, which includes critical outcomes related to the consequences of the impact of mass culture. In the process of production and reception of mass culture contents there comes to physical separation of authors from their recipients, whereas mass produced culture grades values, withdraws or even destroys individuality and creativity, supports averageness of an individual and degrades taste. It often happens that under the influence of mass culture and utility way to its reception, people become lethargic, unprincipled to their neighbourhood; willing - in the name of their utility and hedonic ideal - to tolerate

negative phenomena in the society (e.g. violence on the helpless, injustice, military aggressions, promiscuity, alcoholism, drug addiction, etc.). Mass culture grades values of the so-called high culture, while it permanently comes to a fusion between high and low arts, whereas there shade away uniqueness and autonomy or originality of genuine works of art. Unique production was replaced by mass culture, reacting to mentality and needs of the audience. Cultural industry producing mass culture supports the process of homogenisation of objects of art. Unique production was replaced by mass production, reacting to mentality and grading by generalising cultural production and shifting it to the level of market relations, which are set by price of individual cultural commodities. Cultural contents in the society, in which there dominates mass culture, have become goods.

The „Frankfurt School“ is a term with which we denote a group of intellectuals from the Institute for Social Research, which was established in 1923 in Frankfurt on the Main. Founders of the Frankfurter School were philosophers and sociologists Max Horkheimer (1895-1973) and Theodor W. Adorno (1903-1969), who elaborated first critical theory on functions and functioning of mass culture. On the basis of their own analysis of mass culture they consider mass media as one of the key parts of maintaining social economic and political relationships in the modern capitalistic society. In it, mass media are a component part of a commercial market circle of offer and demand and they bring along cultural values as goods and culture supported by advertising. They say that mass culture is a product of industrial production. This critical reflection of mass culture is denoted by the term cultural industry. At present, there is much more used the term entertainment industry (show business), which however does not change anything in the basis of the criticised phenomenon (Rankov, 2002, p. 40). A key tool of cultural industry is commodity. Thus commodities are cultural products that entered into market mechanisms and have become goods. Representatives of the Frankfurter School say that by means of cultural industry the society has overmastered an individual using advertising and mass communication, therefore the term cultural industry is not compatible with the term mass culture. These critics perceived mass culture in a positive way, as a culture of masses „from the bottom“ (form of folk culture). While this culture reflects traditional values, is a manifestation of individual creativity and stands in opposition to the industry, cultural industry is a „controlled culture from the above“ and its aim is ideological impact and social control (Plencner, 2005, pp. 191). Basic features of mass culture are as follows:

- It is not traditional (not connected with a territory, not designed for closed communities);
- It is not elite;
- It is produced in a mass way (mass production and distribution of cultural contents);
- It is commercialized (focused on profit);
- It is standardised (it uses time-proved methods of production, simple aesthetic schemes and attractive effects, repeating plots and stereotyped characters);
- It is homogenised;
- It incites to mass behaviour.

3 Popular culture

The times after the World War II bring a new insight on mass media and mass popular culture, which originated in the USA and gradually penetrated into other countries and societies. Due to popularity and relatively easy availability, it started to be perceived as a culture designed for elite audience and not only as a culture mass produced for masses of people. The endeavour for fun and phenomenon of free time has become the main part of popular culture – pop culture. Etymological meaning of the word comes from the Latin word *populus*, which means people. In broad sense of word we may thus talk about certain community, which is united into certain group. Although the term „people“ is an abstract category, in this context we may claim about the community that its members behave as one organism in specific situations, they have certain common needs,

desires, ideas and values. In this original Latin understanding is thus popular something what is favourite for people, generally known or aimed at people.

According to A. Giddens (2000, pp. 360) popular culture is defined as a „form of entertainment, which is watched, read or attended by hundreds of thousands or *even millions of people*“. It is also denoted as a culture that makes a statement on real life of ordinary people, or folk culture of a modern society. We also identify with the theory of DeFleur-Dennis (1998, pp. 283), who understand popular culture as „*mass communicated messages with limited intellectual and aesthetic demands and content that is proposed for entertainment and distraction of media audience*“. It often comes to the shortening of the term popular culture into the form pop-culture; both terms are identical as far as the meaning is concerned. The object of popularity (favour) thus can be people, opinions, subjects or activities. However, popular culture or popularity cannot be automatically connected with mass audience, as it was by mass culture. Consumers of pop culture can be divided into two groups according to who is involved, as follows:

1. Huge amount of people, wide population, masses - mainstream
2. Smaller amount of people, minority audience – sub-stream

In this context Z. Slušná mentions an important media theorist J. Fiske, who in his work Understanding Popular Culture states that popular culture – sphere whose basis and determinant is popularity, lives due to activity of subjects. This connection of reflection of pop-culture with the reception of an activity both intellectual and sensual at the same time has brought along second wind into the research of popular phenomena. It may be unambiguously stated that cultural production meant for public reception usually takes into account taste, interests and attitudes of receivers by means of the attribute of „pretty-pannedness“. Pop-culture is a specific cultural sphere that on the basis of its inner flexibility and dynamics enables self-expression and self-presentation to groups and communities, which exist in different positions inside the official culture, but through their picture of the world, are not in absolute contrast with it. (Slušná, 2012, pp. 3)

A. Plencner says that if a group is united by popularity of common objects, such a group creates „subculture“ (Plencner, 2005, pp. 196). Theorist of communication technologies and media D. McQuail (1999, p. 127-128) denotes popular culture as „*the most widely spread symbolical culture of our times*“. Here, we can remind of the fact that pop culture has more sources. The basic ones include institutions specialized in production and dissemination of cultural material (music industry, radio, television and film companies, publishers of books etc.). A specific source includes specialized communities that spread different facts and information and seek to clearly interpret them (news providing media, scholars etc.). In these cases popularisation has a function of making specialized information available to laics. V. Gažová (2003, pp. 29-31) adds club activity to the sources of popular culture. Within it, it may be said that „club culture“ deals with a specific group interest and focuses on common programme. Here, we include mainly various free time activities and hobbies.

In the context of popular culture we may also mention the term *idol* – an important component of popular culture. It is a person who has become popular among the audience. Role models are most often preferred by children or teenagers; here we mean famous actors, music bands or sportspeople. The audience admire their idols, they perceive them as role models and very often they identify with them. We may also mention idol as gainful employment – different understudies of film stars or imitators of famous musicians and singers. L. Gogová says that pop culture is a product of industrial revolution and it is also a part of market cycle of offer and demand. Mass produced commodities have become an entity, which was used by the audience in order to distract or entertain, whereas entertainment has transformed to one of the priority goods determined for consumption of a consumer (2013, pp.41).

In the 1970s there came to a theoretical turn in the field of research of culture and mass media. The fundamental development of critical cultural theory was brought along by the Centre for Contemporary Cultural Studies, which was founded in 1964 in Birmingham. Social and cultural approach that was asserted by the director of the Centre - theorist of culture and sociologist Stuart Hall (1932) – became known as „Birmingham School“. It was right Stuart Hall, who helped to distinctly distinguish mass and popular cultures. According to him popular culture developed from folk culture, which however cannot be said about mass culture. He considered the latter to be „corrupted“ popular culture (Jiráč-Köpplová, 2003, pp. 107). In this connection D. McQuail again reminds of the most important American defender of popular culture – John Fiske. According to him popular culture is culture of people. He says that popularity is a measure of into what extent a given form of culture can satisfy desires of its consumers. In addition, he says that if a cultural commodity is to be successful, it must suit at the same time the interests of people, among which it is popular, but also the interests of its producers (McQuail, 1999, pp. 128).

We may talk about the origin of popular culture in the second half of the 19th century. It was determined by urbanisation and technological progress. It is not rare that mass and popular cultures are perceived as counterparts. By popular culture we may emphasize succession to older folk culture, closer contact among its authors and users. Popular culture is a result of mutual discussion among mass media and cultural producers on the one side and consumers on the other side on what they will produce. Popular culture unlike mass culture cannot be made beforehand; popular culture must become popular among the audience on its own. It happens in a way that people start to like, adapt or reshape (make popular) certain cultural products (made by cultural industry) or activities. One of the most striking differences is that mass culture is made for the audience, but without cooperation of the audience. In popular culture, on the contrary, it is counted on the audience as a co-creator. Therefore popular culture is understood as „favourite culture“.

J. Malíček (2012, pp. 17-18) in his publication *Popkultúra: návod na použitie (Pop culture: guidebook for use)* mentions individual differences between mass and popular cultures. Mass culture is culture of the mass and it communicates quantity, unlike pop culture, which due to the word pop expresses something quality. It unambiguously results that the terms mass and popular are not synonyms. Mass culture is the object of passive reception (accepting) and pop culture is perceived by active subjects. Mass culture denotes a wide spectrum of events and phenomena, about which we can however say only that they are mass. On the contrary, pop culture devotes only to such phenomena that are to some extent popular. If we want to express the relationship of these two cultures in mutual interaction, we may state that mass culture can be to some extent also pop culture. However, pop culture is never automatically mass culture. It is only that part of the mass culture, which the receiver picks up on the basis of focused interest. Besides J. Malíček the most famous Slovak authors and researchers of this issue involve also Viera Gažová, Erich Mistrík, Vincent Šabík or Pavol Rankov, who develop issues of popular culture in the frameworks of culturology, aesthetics and mass media studies.

Here, we may also mention the fact that component parts of popular culture are forms that are not products of mass media, for example new dance steps, hair-cuts, games, fashionable clothes and accessories or other subjects of ordinary consumption. Popularity is a dynamic phenomenon that disturbs static model of high and low cultures; therefore it can reach work of any cultural level (highbrow, lowbrow, middlebrow) regardless its inner qualities. Another option is that certain work is made popular at another level than it originally appeared (Eco, 1995, pp. 60-63).

We agree with H. Pravdová (2011, pp. 22), according to whom popular culture bounds upon individual approaches and assumes the ability of receivers to form their own meanings, which reflect

their needs and are different from the dominant mainstream meaning and values. She understands popularity as an indicator of potential of a cultural product and proves that given media content suits needs of its receivers. If any cultural product is to become popular, it must satisfy needs and various interest of addressees, for whom it is determined. However, H. Pravdová (2009, pp. 28) in her publication *Determinanty kreovania mediálnej kultúry (Determinants of creating media culture)* points out the fact that mass and popular cultures are necessary to be distinguished in the production of mass media. Nevertheless, at the same time this differentiation cannot be strict, since both cultures are mutually determined and have an identical tendency to standardisation and commercialisation. Both cultures are substantially related to the production of media contents and messages, as well as to the way of their reception and interpretation, while they in a fundamental way determine manifestations of media production of culture and social cultural reality.

Fundamental signs of popular culture are as follows:

- it is created also by its users;
- it serves to interests of manifold subjects;
- it is polysemous;
- it is inter-textual;
- it brings along pleasure;
- it is the source of socially relevant meanings.

Conclusion

The paper is focused on theoretical reflection of mass and popular cultures. In the introduction the author presented the term culture and its scope in general. The core of the paper consists of chapters on mass and popular cultures, where the author presented basic definition frameworks to the terms, their signs, ways of production and other specifics. One of the most differential attributes of submitted subcultures is that products and contents of mass culture are produced by mass media and by media or creative authors. Although it is meant for masses, however in production only the preferences of the audience are important. On the contrary, popular culture is made by the sole audience and users of cultural products. Popular culture cannot be created in advance; it must become popular on its own. The paper provides receivers with a more detailed overview on these subcultures, their origins, authors and tendencies, which cooperated in their production and development from the culturological, mediological and sociological perspectives.

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Primary Paper Section: A

Secondary Paper Section: AJ, AO

SELF-CARE - SELF-REGULATION

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The study was supported by the grant APVV-14-0921 Self-care as a factor of coping with the negative consequences of the practicing the helping professions

Abstract: The main aim of this study was to focus specifically on the area of self-care and identify dimensions of self-regulation within this context. In this study, self-care is conceptualized as a much broader phenomenon. Self-care contains a self-regulatory activating and inhibiting component. For this reason, we constructed and verified a new questionnaire for measuring self-regulation in the context of self-care named the Self-Care Self-Regulation Questionnaire (SCSRQ). Based on the factor analysis four factors were extracted: Personal growth, Healthy life style, Control over negative mood, Control over health risks. The results support a dual concept of self-regulation. The factor analysis also distinguished between self-care of health (factors Healthy life style and Control over health risks) and self-care of psychological well-being (factors Personal growth and Control over negative mood).

Keywords: self-regulation, self-care, health, well-being

1 Self-care

The topic of self-care has been established as a subject of research mainly in the context of nursing in relation to health (Jarsma et al., 2003). This is reflected in many definitions in which self-care is basically defined as taking care of one's own health (Godfrey et al., 2011). Most of the research of self-care focuses on people suffering from health problems (Riegel, Jarsma, Stromberg, 2012). However, it can be argued that self-care is not necessarily limited to the context of health and illness. Self-care as such is relevant for the whole population and related to a whole spectrum of other issues.

For example, Orem (2001) in her theory argues that application of a broad definition of self-care is needed. She defines self-care "as the practice of activities that mature person initiates and performs, within time frame, to promote and maintain personal well-being, healthy functioning and continuing development throughout life" (Orem, 2001, p. 52). Others have also pointed out there is a relationship between self-care and well-being (Moore et al., 2011). Jaarsma et al. (2003) suggested that self-care could be a universal phenomenon which is triggered by the presence of health problems or by developmental issues. However, at the same time it has been emphasized that any activity related to self-care is based on an initiative of an individual (Godfrey et al., 2011). The fact that self-care should be understood as a part of a wider context is supported by the existence of terms such as psychological and spiritual self-care (Moore et al., 2011). In particular, psychological self-care has been given a substantial attention with respect to its relation to work stress, burnout syndrome and further problems often faced by psychologists, social workers and therapists (Maltzman, 2011; Lovašová, 2015; Raczova, Lovašová, 2016; Halachová, Lichner, 2017; Mesárošová, 2017).

Defining self-care as a set of initiatives of an individual raises the question of their psychological background. Some definitions of self-care present self-care as an ability but this does not provide any explanation regarding the underlying process. For a better understanding of the processes involved in the psychological background of self-care as well as factors that influence it, it is important to put self-care in the existing theoretical context. The importance of recognizing this background was pointed out by Leventhal, Leventhal and Robitaille (1998). They presented their view of self-care and put it in the context of self-regulatory processes. The concept of self-regulation is defined as a consciously regulated activity (or a set of activities) by an individual (by his/her self) and therefore represents a natural framework for explaining the psychological background of self-care. As a result, the concept of self-regulation can provide a background for the self-care domain

within which self-care activities are based on self-regulatory processes.

2 Self-regulation

Self-regulation is frequently studied in relation to the processes of selection, goal pursuit and behavioral change. For example, Hoyle (2010) defined self-regulation as a set of intra-individual processes through which an individual maintains the pursuit of his/her goals. According to Baumeister, as well as a number of other researchers, self-regulation can be defined as a complex ability of human beings to exercise control over their internal states, processes and behavior. Self-regulation manifests itself as an ability of an individual to change his/her behavior, modify it and adjust it to certain requirements (Baumeister, Vohs, Tice, 2007).

Defining self-regulation as a set of complex processes highlights the importance of the identification of these processes and their conceptualization. For example, Carver and Scheier (1982) proposed a cybernetic model of self-regulation consisting of four components: reference, input, comparator and output. Next, Kanfer (1970) proposed a model consisting of three processes of self-regulation (self-monitoring, self-evaluation and self-reinforcement). Then, Miller and Brown increased the number of processes involved in self-regulation to seven. In order to identify these processes they have constructed the Self-Regulation Questionnaire (SRQ) (Brown, Miller, Lawendowski, 1999), which consists of seven dimensions (informational input, self-evaluation, instigation to change triggered by perceptions of discrepancy, searching for ways to reduce discrepancy, planning for change, implementation of behavior change, and evaluation of progress toward a goal). Carey, Neal and Collins (2004) explored the factor structure of this questionnaire and failed to confirm its original factor solution. Instead, they found support for the existence of a single factor with 31 items. Based on this finding a short version of the SRQ named the SSRQ (Short Self-Regulation Questionnaire) was created. Following this, Neal and Carey (2005) continued with the psychometric testing of the SSRQ and identified two factors: impulse control and goal setting.

The overview of the research findings shows that when describing the processes of self-regulation it is important to include the processes which inhibit activation in certain directions. This corresponds with the distinction between the two basic motivational systems: activating and inhibiting (Carver, White, 1984). It also corresponds with the concept of self-regulation defined as a complex ability of an individual to exercise control over his/her internal states (Baumeister, Vohs, Tice, 2007). This basically means that having control over oneself, or exercising self-control, is a part of self-regulation. Self-control is characterized as an ability of an individual to keep under control and suppress or inhibit inappropriate pressures which can be either elicited by stimulation from the outer environment or spontaneously emerge from individual's inner states. Self-control stands, within the current research, as an independent construct distinct from self-regulation (Tangney, Baumesiter, Boone, 2004) and this allows for testing the assumption that there is a positive relationship between self-regulation of self-care and self-control, which is implied by their definitions.

3 Research

The presented background shows that when operationalizing self-regulation in the context of self-care, it is possible to distinguish individual components based on their specific content as well as with regard to the systems involved, represented by the activating and inhibiting systems. The content is given by focusing on health and physical well-being or on psychological well-being and personal development. Both types of focus contain a proactive or activating component which is

represented by goal orientation and self-control used to avoid risky situations.

The main aim of this study was to focus specifically on the area of self-care and identify dimensions of self-regulation within this context. While the current understanding of self-care is predominantly seen in relation health, in this study it is conceptualized as a much broader phenomenon. The theoretical analysis has resulted in a construction of a new questionnaire for measuring self-regulation in the context of self-care. This was followed by a project of rigorous verification of this instrument.

3.1 Sample

In this study, the analysis was based on several archived datasets. Within these individual data collections respondents completed the Self-Care Self-Regulation Questionnaire (SCSRQ), which was administered as a part of a larger questionnaire set. In total, data from 777 respondents (328 males and 449 females) were included in the analysis. The age of the respondents ranged from 18 to 60 (mean 30.57, standard deviation 14.57). The respondents were adult volunteers residing in Košice, Spiš and Bratislava regions. In addition, 172 of the respondents completed the Self-Control Scale and these data were used for the purposes of correlation analyses.

3.2 Measures

Based on the presented theoretical background, the aim of this study was to construct a new questionnaire for measuring self-regulation in the context of self-care. The questionnaire was named the Self-Care Self-Regulation Questionnaire (SCSRQ) and the draft version of this questionnaire consisted of forty items, which represented a range of self-care possibilities regarding physical and psychological well-being. Each item was rated on 5-point scale, ranging from 1 (not typical form me) to 5 (very much typical for me). The items measuring psychological well-being and personal growth were inspired by the definitions used for categories in Riff's Scale of Psychological Well-Being (Ryff, Keyes, 1995), as well as other sources. These items covered domains such as: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, personal growth and emotion regulation. Three items for every category were formulated to address both the activating as well as the inhibiting component of self-care (e.g. "I try to develop my potential"; "I try to suppress depressive thoughts"). Self-care regarding health and physical well-being was measured by sixteen items of the Self-care questionnaire (Lovaš, 2010) (e.g. "I try to live healthily"; "I try to take care of my figure"; "I avoid risky situations").

The Self-Control Scale (SCS) (Tangney, Baumeister & Boone, 2004) was used for the purpose of correlation analysis with the finalized SCSRQ factors. The SCS measures dispositional self-control behaviors and consists of 36 items rated on a 5-point scale, ranging from 1 (Not at all like me) to 5 (Very much like me). The SCS has been adapted into the Slovak language and the Slovak version of SCS (with one item excluded) was published by Lovaš (2008). The Cronbach's alpha was of this questionnaire was 0.86.

3.3 Statistical analyses

Exploratory factor analysis as well as all presented statistical procedures were carried out using the SPSS 21.0 software.

4. Results

The raw questionnaire score was used in the analyses. The mean score of the SCSRQ in the total sample was 138.94 (range 46-179) with a standard deviation of 18.09. Internal consistency of the scale proved to be adequate (Cranach's alpha = 0.92).

4.1 Factor analysis

Guided by the scree-test and orthogonal varimax rotation four robust factors were extracted explaining 50.6% of variance in total. The individual factors explained variance as follows: factor 1: 17.4%, factor 2: 14.2%, factor 3: 10.5% and factor 4: 8.5%. The item loadings of individual factors and the eigenvalues are described in detail in Table 1. Eight items form the initial versions of the questionnaire were withdrawn due to a low factor loading (under 0.3).

Table 1 Factor structure of The Self-Care Self-Regulation Questionnaire

Items	F1	F2	F3	F4
13. I try to achieve my goals	0.69			
14. I try to use my abilities	0.65			
17. I try to be in charge of my life.	0.64			
6. I try to develop my potential	0.63			
20. I try to improve my abilities/ I work on my personal growth	0.62			
12. I try to use all the opportunities that I get in my life	0.62			
16. I try to be satisfied with myself	0.59			
5. I try to live a meaningful life.	0.57			
19. I try to see my work in the context of my future perspective	0.54			
3. In the first place, I try to rely on myself.	0.52			
4. I try to control my environment	0.52			
18. I try not to be controlled by the pressures from the environment	0.51			
11. I try to do what is in line with my principles	0.49			
10. I try to look for positive things even in my failures	0.45			
32. I try to take care of my figure		0.80		
25. I try to have optimal weigh		0.74		
30. I try to do regular physical activity		0.74		
22. I try to take care of my condition		0.72		
23. I regularly monitor my weigh		0.71		
29. I try to have a healthy diet		0.67		
24. I try to eat healthily		0.67		
26. I try to live healthily		0.64		
27. I try to look good		0.53		
31. I try to suppress pessimism			0.74	
7. I try to be in a positive mood			0.73	
15. I try to have good mood			0.72	
21. I try to suppress depressive thoughts			0.64	
2. I am careful not to get injured				0.75
8. I am careful not to get ill				0.71
28. I avoid risky situation				0.68
9. I make sure that I get a good night sleep				0.50
1. I try to take core of my health				0.49

As shown in Table 1, the first factor (F1) SCSRQ contains fourteen items. Detailed analysis of their content showed that individual items reflect self-regulation in terms of goal directed behaviour and personal growth. These items addressed self-care

and well-being and based on this the first factor was named Personal growth.

The second extracted factor (F2) consisted of nine items which measured the activation of physical self-care. These items addressed how an individual tries to live healthily by monitoring his/her weight, diet and physical shape. This second extracted factor was named Healthy life style.

The third extracted factor (F3) consisted of four items which mainly addressed individual's effort to maintain control over psychological well-being and inhibit negative mood. This factor was named Control over negative mood.

Finally, the fourth factor (F4) consisted of five items which addressed the effort to control physical health and avoid risk behavior. The factor was named the Control over health risks.

The following analysis of the extracted factors and individual items showed that the SCSRQ reflected the dual character of self-regulation in self-care. Specifically, the factors Personal Growth and Healthy life style measured goal setting in the context of health, whereas the factors Control over negative mood and Control over health risks reflected the effort to suppress or avoid undesired behaviors. This questionnaire was also based on a wider view of self-care when the physical (F2 Healthy life style; F4 Control over health risks) and the psychological (F1 Personal growth; F3 Control over negative mood) can be distinguished within the domain of self-care.

Inner consistency of the final version of the Self-Care Self-Regulation Questionnaire was 0.89 and inner consistency of individual factors ranged from 0.72 to 0.87 (F1 = 0.80, F2 = 0.87, F3 = 0.76 a F4 = 0.72).

4.2 Correlation with self-control

In the final step in the analysis, the relationship between the newly constructed questionnaire and the Self-control scale was analyzed. As can be seen in Table 2 the Pearson correlation coefficients between the SCSRQ, as well as its factors, and the SCS were found to be significant and positive.

Table 2 Pearson correlation between the factors of the Self-Care Self-Regulation Questionnaire and Self-control scale

Factors SCSRQ	F1	F2	F3	F4	HS
SCS	0.31**	0.28**	0.17*	0.43**	0.42**

F1 = Personal growth, F2 = Healthy life style, F3 = Control over negative mood, F4 = Control over health risks, HS = total score. *p < 0.05, **p < 0.01

5 Discussion

The most important contribution of this study is the identification of the four factor structure of self-care self-regulation based on the factor analysis of the items of the SCSRQ. The identified factors were named: Personal growth, Healthy life style, Control over negative mood, Control over health risks. The questionnaire as a whole, as well as its individual subscales showed good psychometric properties. All alpha coefficients reached values well above the desired criterion of 0.70 which is required as a minimum for newly constructed instruments. The relationship between self-control and self-care self-regulation was found to be statistically significant and this was also found with regard to all SCSRQ factors. The Self-care Self-Regulation Questionnaire was also found to be positively and significantly associated with self-control.

From the perspective of theoretical consistency, it is a positive finding that the identified factors corresponded with important aspects of current approach to studying self-regulation and self-care. In case of self-regulation, the results of the factor analysis can be interpreted as supporting the dual concept of self-regulation which distinguishes two basic components: goal setting and impulse control (Carver, Scheier, 1984; Strack, Deutsch, 2004). The factors of Personal growth and Healthy life style represent goal orientation and the factors Control over

health risks and Control over negative mood represent the tendency to inhibit impulsive behavior in these domains.

However, it is still a matter for further discussion whether factors, and the particular items, sufficiently address goal-oriented behavior. In other words, whether the responses of the respondents sufficiently reliably measure goals regarding to health, physical well-being, psychological well-being and personal growth. Future research should address whether the factors Control over negative mood and Control over health risks sufficiently measure the ability to inhibit impulses which disrupt the physical and emotional well-being.

The findings of this study are significant for self-care research, especially because the identified factors correspond with the theoretical assumptions regarding self-care in the context of health. At the same time they emphasize the fact that a broad and complex approach for studying this construct is needed. Another finding which supports this conceptualization is the fact that the constructed questionnaire (consisting of items regarding self-care, psychological well-being and personal growth) was internally consistent. High correlations were observed between individual items and the total score SCSRQ. In addition to this, the factor analysis distinguished between self-care of health and self-care of psychological well-being and personal growth. In particular, the factor Personal growth and the factor Control over negative mood represent the self-care regarding psychological well-being and the factors Healthy life-style and Control over health risks represent the striving to maintain physical health and have a long life.

Further research in this area using the SCSRQ can built on the positive correlations between self-control and the total score as well as subscores of the SCSRQ. These correlations demonstrate that there is an inherent association between self-regulation, self-care and self-control which was also observed in our previous research (Lovaš, 2010). Although, a stronger association between the SCS score and the individual factors representing content specific self-control within the SCSRQ (subscales Control over negative mood and Control over health risks) had been expected. While statistically significant correlations were found they were relatively small. Surprisingly, the smallest observed correlation was found between the SCS and the factor Control over negative mood in self-care. This could be partially explained by the wording of the items in the SCS and should be addressed in further research.

This study focused on the self-care in terms of self-regulation. For this purpose the Self-Care Self-Regulation Questionnaire with final 32 items was created and psychometrically tested. The self-regulation offers a possibility to clarify the background of self-care. It enables to adapt a broader view of self-care, which does not limit it only to health care. This new questionnaire can be used in the field psychology, health or social work.

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Primary Paper Section: A

Secondary Paper Section: AM, AN

INTEGRATION OF ESG 2015 AND ISO 9001:2015 STANDARDS IN THE HIGHER EDUCATION ORGANIZATION (CASE STUDY)

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This paper is published under project number 001RnUAD-2-3/2016, TnUAD quality assurance system certification pursuant to ESG 2015 and ISO 9001: 2015 standards.

Abstract: The article describes our approach to creating quality management system in higher education, integration of ESG 2015 and ISO 9001:2015 requirements and experience with positive synergies of these standards. In 2015, both standards underwent revision that contributed to their mutual compatibility and more efficient improvement in study programme quality. The system is open to further integration of standards in the field of education. Objective of this article is to share experience with systemic development of quality of higher education and contribute to discussion about utilization of ISO 9001 in education and potential approaches to creation of quality systems in compliance with requirements related to quality of education in the European Higher Education Area.

Keywords: Internal Quality Assurance System of Higher Education, ESG:5015, ISO 9001:2015, Quality of Education, Integration of Quality Standards in Higher Education.

1 Introduction

The year 2015 brought significant changes to the basic standards of quality management, specifically in the form of ISO 9001 standard. The standard was released on 15 September 2015 and published on 23 September 2015. According to the IAF (International Accreditation Forum), the transition period of 3 years ends on 15 September 2018. The standard is a part of managerial ISO standards built on a shared parent structure.

Two thousand and fifteen was also an important year for Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG). Increased demands for skills and competences in Europe require that higher education institutions respond to the situation in new ways. Original text from 2005 was updated to reflect progress in quality assurance, as well as other Bologna action lines, such as qualifications frameworks, recognition of qualification and promotion of the use of learning outcomes with a shift towards student-centered learning and teaching (Ostrovský, 2013). The ESG were adopted by the Ministers responsible for higher education in the European Higher Education Area in May 2015 in Yerevan, who at the same time committed themselves to their implementation into the national education system (Hrnčiar, 2012).

1.1 ISO 9001:2015 and ESG 2015 compatibility

Revisions of ISO 9001:2015 and ESG 2015, part Internal Quality Assurance, brought these standards closer and made them more compatible. Moreover, ISO 9001 provides the ESG standards with adequate support system of effective quality improvement. On the other hand, the ESG provide terminology and requirements that better define the subject of the education system, goals and strategic framework in the area of higher education. (Table 1). At the same time, it is expected that in compliance with Article 87a of the Act on Higher Education, the content and requirements of ESG 2009 become part of accreditation criteria as is the case with the current system of accreditation.

The third and fourth part of ESG 2015 include standards and guidelines for external quality assurance and quality assurance agencies. ISO requirements for external quality assurance process and operations of certification bodies (certification and accreditation) are part of ISO 17021 Conformity assessment -- Requirements for bodies providing audit and certification of

management systems and ISO 17011 Conformity assessment -- Requirements for accreditation bodies accrediting conformity assessment bodies, that accredit conformity assessment bodies (International Accreditation Forum, 2015). Under current regulation, the scope and frequency of external assessment under ISO 9001 scheme is more rigorous and frequent for both school (certified organization) and assessment bodies (Table 1).

Table 1: ESG 2015 and ISO 9001:2015 comparison

INTERNAL QUALITY ASSURANCE	
ESG 2015	ISO 9001
Policy for quality assurance	Policy. Scope and processes of the quality management system. Leadership. Organizational roles, responsibilities and authorities.
Learning resources and student support	Planning, risks and opportunities actions. Quality objectives and planning to achieve them. Planning of changes.
Teaching staff	Support. People. Infrastructure. Environment for the operation of processes. Monitoring and measuring resources. Organizational knowledge.
Design and approval of programmes	Competence. Awareness. Communication. Documented information.
Student-centred learning, teaching and assessment	Operational planning and control. Requirements for Education. Design and development study programs. Control of externally provided processes.
Student admission, progression, recognition and certification	Education provision.
Information management Public information	Release of Education. Control of nonconforming outputs.
On-going monitoring and periodic review of programmes	Monitoring, measurement, analysis and evaluation. Internal audit.
	Management review. Improvement. Nonconformity and corrective action. Continual improvement.
EXTERNAL QUALITY ASSURANCE	
Accreditation of institution / study program once every 5-6 years	Certification and surveillance audit Once a year
↑	↑
Evaluation of the Agency Once every 5 years	Accreditation and surveillance audits Once a year
	↑
	EA Evaluation European Accreditation

Among the main benefits of using ISO 9001 is the ability of organizations to steadily provide products and services that meet customer requirements, applicable requirements of regulations and regulatory requirements, increase customer satisfaction, risk management and opportunities to achieve goals (Richnák and

Gubová, 2016). The standard is applicable to each industry and its requirements are always supplementary to requirements for the service or product itself (Jambor, 2013). Its combination with the ESG standards will allow the system to focus more on the sector of higher education in compliance with the requirements of the European Association for Quality Assurance in Higher Education (ENQA), European Students' Union (ESU), European Association of Institutions in Higher Education (EURASHE) and the European University Association (EUA). The main goal of the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) is to contribute to the common understanding of quality assurance for learning and teaching across geographical borders among all stakeholders.

The focus of the ESG standards is on quality assurance related to learning and teaching in higher education, including the learning environment and relevant links to research and innovation. Institutions of higher education should implement principles and practices in order to ensure and improve the quality of education (study programmes) and other activities. The term "programme" refers to the provision of higher education in its broadest sense, including education that is not part of a programme leading to a formal degree, i.e. all activities aimed at achieving goals in education that are supported by the institution. The ESG work (similarly to ISO 9001) with stakeholders' requirements, whereby stakeholders represent all players within an institution, including students and staff, as well as external stakeholders such as employers, and external partners of an institution. According to the ESG, quality of education is primarily the result of an interaction between teachers, students and institutional learning environment. Quality assurance should lead to the creation of a learning environment in which the content of study programmes, learning opportunities and learning facilities fit their purpose. Essential to all quality assurance activities are two objectives: accountability, and quality improvement. The term "quality assurance" is used to describe all activities within the continuous improvement cycle (i.e. quality assurance activities and development activities).

From a long-term perspective, the application of ISO 9001 in institutions of education is increasing worldwide. The year 2016 introduced a revision and witnessed a 16% growth in education certificates. Attenuation related to ISO 9001 in 2015 was recorded across all sectors. It was linked to the announced revision published in September 2015.

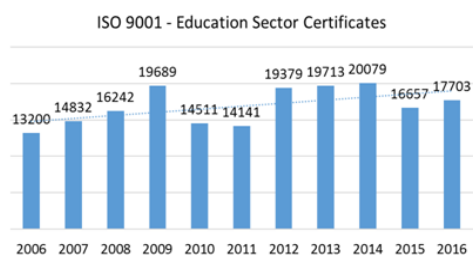


Figure 1. ISO 9001 Certificates in education organizations

2. TnUAD Quality Assurance Approach

One year after implementing the integrated system within the Trenčín University environment and successful recertification, a further shift in performance reflected in evaluation results of study programmes can be observed.

At the integration of both standards we relied on our experience with ISO 9001:2008 and ESG 2009 systems (which were part of the accreditation criteria of Internal Quality Assurance System in compliance with Article 87a of the Act 131/2002 Coll. On Higher Education and Accreditation criteria). The reason for choosing this particular concept lied in the experience with maintaining the quality system and improving the quality of higher education in the Slovak Republic. Particular emphasis was placed on the need for regular external system assessment and external feedback. Framework of the system consists of the ISO 9001 structure and high-quality external certification (Myna, Yarka, Peleschshyn, Bilushchak, 2016). The

system is complex, with rigorous management of the main processes and improvement cycles and is conditioned by regular internal as well as external assessment. It also requires regular feedback from all stakeholders and a demonstrable improvement (Jambor, 2013). All new or revised requirements of ISO 9001:2015 and the majority of ESG 2015 requirements were implemented in 2016. Currently, the focus is on activities related to the redesign of study programmes in compliance with the national qualification framework in force, as well as on research and classification of student-centered learning and teaching processes in compliance with the timetable of project no. 001TnUAD-2-3/2016 (Attard, Iorio, Geven, Santa, 2010).

2.1 Review of higher education internal and external aspects

When determining core strategic, objectives of the University, and its individual faculties, we designed regular monitoring and reviewing processes for internal and external aspects that are relevant to the institution's strategic direction and that influence its ability to provide education and related services. Each department reviewed internal and external aspects and the way they influence the unit's future direction. The results were incorporated into regular reviews of internal quality assurance system and served both as the basis for revision of the University's vision and objectives and as an input to the management of internal and external risks of the main processes.

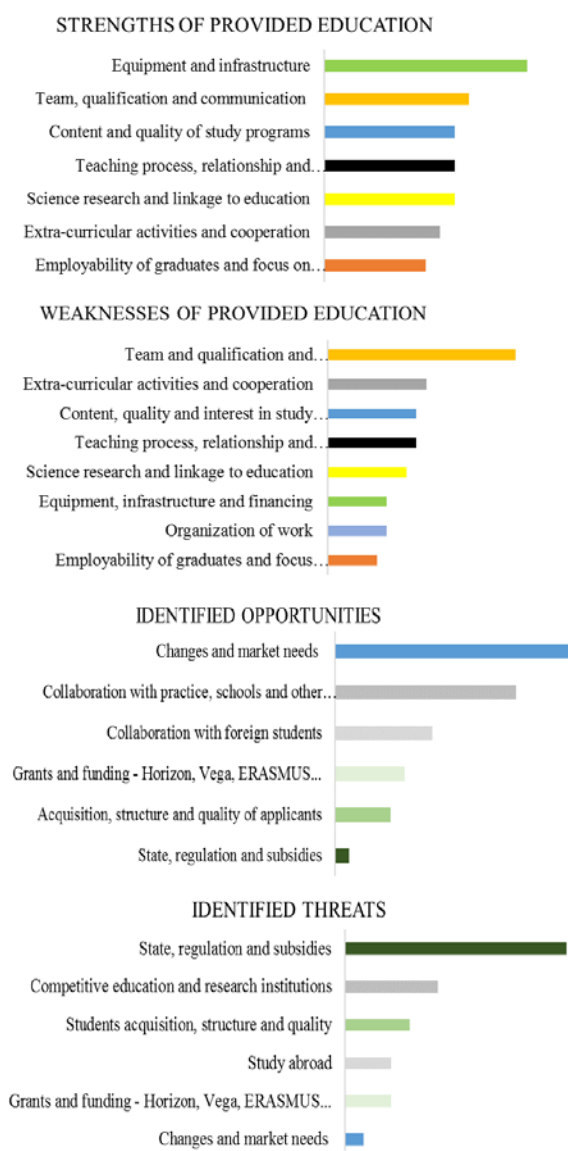


Figure 2. TnUAD SWOT results

The departments identified their strengths and weaknesses. Judging by their multitude, the second best rated aspects, after several infrastructural projects, were related to department equipment and education infrastructure. Additionally, the majority of departments highly rated the team, qualification and employee communication. At the same time, this category also received a multitude of low ratings, predominantly in the context of language skills of teachers and quality of publication output. We started an employee quality development program and accredited doctoral programs at departments interested in offering programs in foreign languages.

The departments identified opportunities and threats related to provided education and scientific-research activities. Given the announced amendments, legislation and accreditation in Slovakia were the most frequently identified threats related to the Government's influence. At the same time, only few departments considered the forthcoming amendments (due to the lack of clarity) an opportunity to further improve the quality of education. Cooperation with businesses and other institutions was identified as the most challenging area, both as a threat and an opportunity. A request to map the existing cooperation and review requirements of partners and potential partners emerged (it was implemented during the detailed review of department's stakeholders). Important partners of the University were offered positions on the University's Board of Quality.

2.1 Stakeholders

We have thoroughly examined the needs and expectations of stakeholders that may influence or are influenced by the decisions and actions of the University, with a particular focus on stakeholders influencing the University's ability to provide and develop quality study programs and scientific-research activities. Each department reviews the needs of the following stakeholders:

- Students in accordance with profile of the accredited study programme,
- Employers that employ, provide internship placement or other forms of job training for graduates of the department's study programme.
- Users of scientific-research and publication activity outputs of the faculty - members of cooperating academic and scientific community in the given field of science, businesses and organizations using applied research know-how,
- Partner organizations, schools and unions - specific organizations with close relations with and significant impact on the TnUAD department,
- Local and regional organizations and communities - based on the faculty's area of operation, location and local specifications,
- Employees - specific requirements of teachers, researchers, administrative and technical staff of the department.

The process of analysis identified 104 key partners and their requirements/influence (employers, partners in education process, scientific-research partners and local and regional institutions). The task of rectorate departments is to review key partners of the University:

- Requirements related to study programme accreditation, inaugural proceedings, rules for establishment of public higher education institution and provision of higher education
- grant and scientific-research agencies and programmes - conditions for grant applications and rules of preparation, evaluation and financing of approved projects,
- Requirements of suppliers of products, services and processes in compliance with the provisions of Act on Public Procurement.

Identification of stakeholders' requirements is part of a regular review of internal management system and their fulfillment will be monitored.

2.2. Measures of risk and opportunity management

Risk management process for each department involves five steps and is part of regular system review.

Leadership of each department identified and analysed risks related to main processes, i.e. Education (risks in study programmes) and scientific-research processes. They analysed positive and negative impact and likelihood of risk development on a scale of 1 to 9. Each department implemented a register of risks and risk management measures. Assessing the efficiency of these measures is part of regular review of department and university systems.

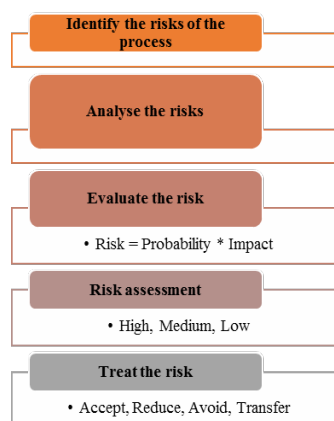


Figure 3. Risk assessment process

The departments identified 84 acceptable risks with negative impact on the outcome of provided education and activities and 8 unacceptable risks, for which they implemented management measures. Mostly, they were related to acquisition of new students and increasing attractiveness of selected study programmes, long-term compliance with accreditation criteria, adequate staffing of study programmes or minimising the risk of losing key scientific-research partners. The Board of Quality integrated measures with systemic impact into processes of University's management system.

2.2 Planning of internal system changes

Planning of changes is one of the new requirements of ISO 9001. Basic competences and change implementation procedures were established as not to disturb the stability of education system:

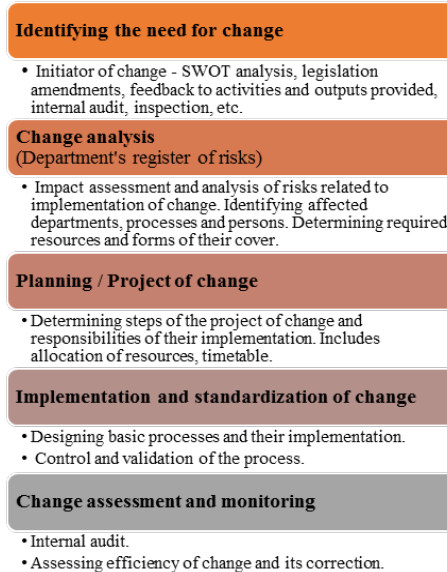


Figure 4. Change management process

2.3 Competence and awareness

In accordance with Article 1.5 of ESG 2015, institutions should assure themselves of the competence of their teachers. They should apply fair and transparent processes for the recruitment and development of the staff. Equally, Article 7.2 of ISO 9001:2015 sets out the requirements of competence management. Therefore, management of the University laid down clear rules of "quality" improvement of staff in 4 sub-processes.

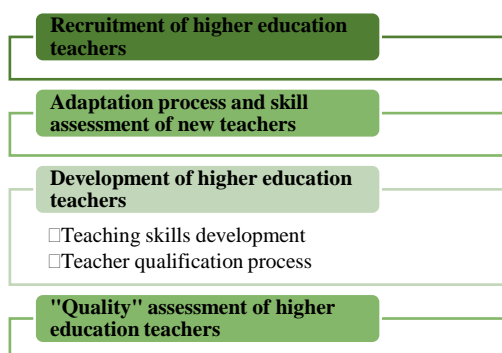


Figure 5. Quality of faculty processes

Quality assessment of higher education teacher consists of assessment of:

Teaching activities

- scope of direct and indirect teaching activities,
- student feedback,
- staff feedback (results of class visit).

Assessment of scientific-research and publication activities.

Development of teaching skills.

The faculties define target criteria for quality assessment of teachers based on individual areas of research and results of previous assessments.

2.4 Monitoring, measuring, analysis and assessment of internal quality system

System of information collection, analysis and assessment of provided study programmes and related services with the objective of continuous improvement consists of a set of integrated monitoring and measuring tools of the institution's internal system (Jill, 2016):

- I. Measuring and analysing quality of the study programmes and feedback from students
- II. Measuring and analysing scientific-research activities
- III. Measuring and analysing quality and development of the teaching staff
- IV. Internal audit of the system and processes
- V. Quality assessment of suppliers (in compliance with KP 10 TnUAD Asset Management)
- VI. Assessment of non-conformance and complaints
- VII. Assessment of corrective actions related to quality
- VIII. Assessment of quality objectives and policy

Assessment of a study programme is carried out by guarantor of the respective study programme based on results of assessment of subjects A, assessment by employers B, assessment by graduates C, assessments related to scientific- research activities D (Figure 6). The guarantor evaluates individual areas of quality, identifies strengths, risks and limitations and suggests measures of study programme improvement. Objectives of the study programme are defined and monitored via study programme quality indicators:

- | | | |
|----------------------------|---|--|
| Quality of study programme | → | Appeal of study programme - number of applicants, students, graduates. |
| | → | Placeability of graduates. |
| | → | Assessment of employer feedback. |

- | | | |
|------------------------|---|---|
| | → | Number of filed theses / number of thesis supervisors. |
| Assessment of subjects | → | Results of the study. |
| | → | Assessment of student feedback |
| | → | Assessment via inspection of classes - syllabus, organization of education, forms of education, staffing, literature, spatial, material, technical and information resources of the study programme |

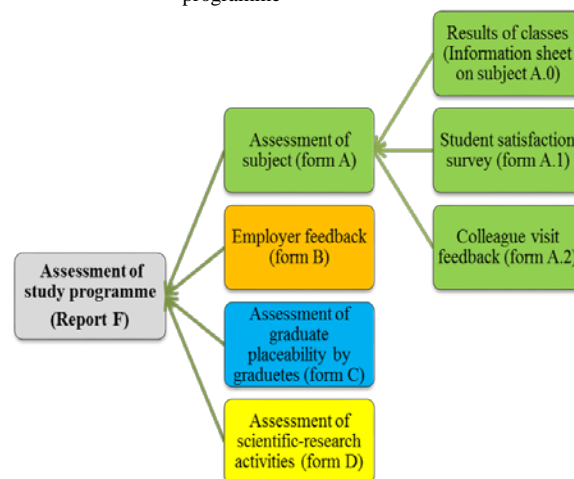


Figure 6. Study programme assessment structure.

Performance indicators for individual areas of science and research were defined on the basis of the following attributes: environment (indicator A, D, E), output (indicator B), acknowledgement (indicator C, G) in the respective field of research via the following indicators:

- Number of academic staff in the given field of research: *Annual IKA index.*
- Assessment of outputs based on categories and academic degrees of full-time staff: *Weighted sum of outputs / number of academic staff.*
- Responses in WOS/SCOPUS/ERIH: *Number of responses / number of teachers.*
- Scope of academic mobility of doctoral students and academic staff: *Average length of stay per teacher.*
- Assessment of grant success rate:
 - *Number of submitted projects / number of academic staff.*
 - *Number of in-progress projects / number of academic staff.*
 - *Amount of financial resources / academic employee.*
- Research infrastructure quality assessment: *Amount of financial resources invested into VV infrastructure / number of academic staff*
- Acknowledgements: *Frequency of categories A, B, C, D*

2.5 Non-conformance, corrective action and improvement

Preventive role of the system is one of the key changes that were crucial to understanding and implementation. The standard no longer has a separate chapter or sub-chapter dealing with preventive measures.

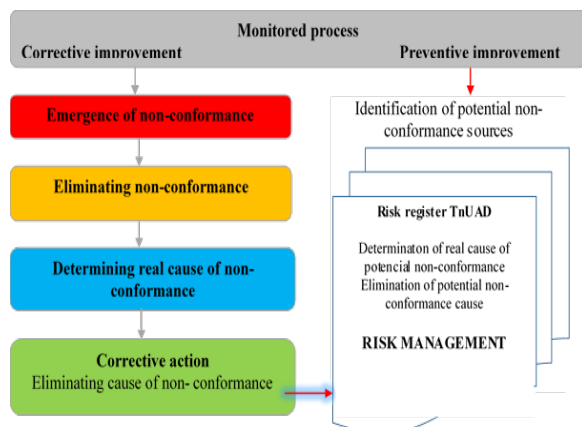


Figure 7. Corrective and preventive improvement

3 Conclusion

In the assessment period of 2016/2017 the University implemented all requirements of ISO 9001:2015 and the majority of requirements of ESG 2015 as conveyed by the regulation authority. As for the new requirements of ESG 2015 (e.g. requirement of student-oriented teaching and learning, or compliance of education objectives and outputs with national qualification framework), their successful implementation to fit the conditions of our country is not currently known. The analysis of best practices started in the second half of 2017, and is still ongoing. Methodology and plan of implementation will be prepared based on intentions of the regulatory authority (see project SIHE). In the middle of 2017, the University successfully completed the recertification audit and gained a valuable feedback. As a result, we have identified 11 strengths of the system and 5 areas of further improvement.

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Primary Paper Section: A

Secondary Paper Section: AM

INTERGENERATIONAL LEARNING AS PREVENTION AGAINST AGGRESSIVE BEHAVIOUR

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Abstract: The aim of the author's contribution is to clarify and explain the essence of the intergenerational learning in the familiar environment. Subsequently, she emphasizes the importance of developing intergenerational activities in the present type of a family between grandparents and grandchildren as a significant means and tool of prevention in relation to the chosen social - pathological phenomenon, namely to the aggressive behaviour of children and teenagers which is a serious social problem with an incessantly increasing tendency. The research was carried out as the part of VEGA project no. 1/0244/15 Detection and resolving cyberbullying.

Keywords: social position, sociometric status, cyber-aggressor, cyber-victim

1 Introduction

If we consider the process of human learning to be never ending, we can say without any doubts that the family environment represents such a place where we have learnt a lot, we are still learning and where we will continue learning as well. Therefore the educational process in a family has a privileged position from among the other forms and ways of learning. At the same time, it is also the basis for learning in other opportunities and other situations.

2 Intergenerational learning in the family environment

The intergenerational learning in the family is considered to be lifelong informal education and particular members of the family community can act as educators as well as educants. This kind of learning includes in itself all phenomena and processes which help to the two-way transmission of knowledge, experience and attitudes in the family. Thus this learning takes place in specific situations of the family life, in the interactions and joint activities of all participating generations (children, parents, grandparents). It takes different forms which are centred mainly on the common activities in the family providing an opportunity to learn for all its members. By means of these everyday activities, such as walks, family trips, common preparation of meals and eating together, work in the garden, visits of cultural and sport events, discussions and conversation about different topics, the children, or more precisely grandchildren acquire competences for the everyday life and, at the same time, their scientific and technological skills are supported as well (Rabušicová, 2011). The learning in the family context, taking place between different age generations, is not based on the specific teaching plans or ideas. However, it often happens at random, unintentionally, unawarely and it remains non-thematized. In many cases it relies on the forms of imitation and knowledge and also experience of members of older generation who pass them to the children, young and middle generation. There are applied different forms of learning (sensual-motoric, verbal-cognitive, social) within the activities of the intergenerational education. However, by the intergenerational learning in the context of family environment there clearly dominates the social learning (therefore it is possible to perceive this learning as a preventive tool in relation to the social-pathological phenomena).

There do not exist any complex researches (quantitative or qualitative) related to the topic of the intergenerational learning between grandparents and grandchildren and they are totally absent in our country. Nowadays, grandparents represent an important pillar and factor in the process of education of grandchildren and more and more frequently they become its active participants. Their presence in the family circle is indispensable and irreplaceable in the area of education and instruction of the youngest members (Sanz Ponce, Mula Benavent, & Moril Valle, R., 2011). Observing changes in the family structure and in the model of the family life prevalent at

this time, it is necessary to remind and emphasize the importance of the task and function of grandparents which they have in the learning and primary socialization of the child in the family. When we also perceive the gradual change of the conception and current real situation of seniors, we have to take into account these facts and try to renew the role of the grandparent as a very useful and beneficial tool contributing to develop the child's personality and to educate him/her in the context of intergenerational relationships (Atanes, 2002).

2.1 Intergenerational education as a preventive tool of aggressive behaviour

Nowadays, aggressiveness and aggressive behaviour belong to the most frequent negative social deviations, they represent a complex and multi-causal phenomenon and they become a problem in the global measure. We meet with a wide range of problematic behaviour by children of primary school and, as many specialists point out, this type of behaviour becomes a particularly serious problem. Children act aggressively to each other mutually but, unfortunately, parents, teachers and educators become its recipients more and more often. We based this statement on the research which dealt with the social-pathological issues of children and teenagers in the Slovak Republic and was carried out at primary and secondary schools within all Slovakia. The most frequent social-pathological phenomena, the teachers see by their students, are the following ones: smoking, truancy, consumption of alcoholic drinks, *bullying*, *respectively aggressive behaviour* and taking of illegal drugs (Pétiová, 2015; Emmerová, 2011; Böhmová, 2011). At primary schools there the most frequent deviation is truancy which is followed by aggressiveness and violence. Therefore the biggest attention in the area of preventive measures is paid by the specialists to the prevention of aggressiveness and violence (64%) (Böhmová, 2011).

In his publication, Višňovský (2011, in: Kraus, 2014) presented an opinion that the best prevention of the social-deviant behaviour is a well-functioning family with clearly set norms and rules of mutual co-existence. A family where the parents have time to be with their children, representing a model of acting for them, and where love, understanding, tolerance, respect and protection are the attributes determining the everyday family practice and life. The family is thus a significant preventive and protecting factor against the occurrence of social-pathological phenomena by children and teenagers but, at the same time, it is also a dominant risk agent of problematic behaviour. (Hroncová et al., 2015). There is inevitable an assumption that the society itself will acknowledge the family as a basic socializing and educating element and it will create conditions indispensable for its optimal functioning. However, there arises a question: Does the current family represent such a family which would comply with the mentioned criteria?

Due to these above mentioned reasons, we perceive more and more intensively the importance of the intergenerational education in the family environment between grandparents and grandchildren as an effective preventive tool in relation to the occurrence of aggressive behaviour by children. In the following part, there we mention some positive aspects of the intergenerational exchange. Based on the intergenerational programmes carried out in different countries, it is evident that one of the positive contributions is undoubtedly the decreasing of participation of children and teenagers in manifold social-pathological phenomena:

- seniors become a support for younger family members in the moments of difficulties and problems, subsequently there is evident their lower participation in *aggressive, asocial and antisocial acts* (Sánchez Martínez, 2010),
- younger generation *changes its attitudes* to older people, their mutual relationships improve gradually,
- increasing of the feeling of the social responsibility,

participating in different free-time activities in cooperation with the seniors what is, at the same time, a *prevention against the drug addiction and antisocial behaviour* (Sánchez Martínez et al., 2010).

- both generations develop their ability to learn; their social integration is supported and their social segregation is reduced (García Mínguez & Bedmar Moreno, 2002),
- increasing of the feeling of the personal value and self-confidence (Sánchez Martínez et al., 2010),
- better school attendance, better school results, *lower probability of the social-pathological behaviour* (Rabušicová et al., 2011),
- escape from the loneliness and isolation, reintegration into families and society, creating of new friendships; increasing of the self-esteem and motivational factors and in particular the development of the social skills. (Sánchez Martínez et al., 2010).

We know that the aggressiveness is a complex and multi-causally influenced phenomenon with its positive and negative sides and the expressions of aggressiveness can reflect the psychosocial development of the person, his/her current life situation he/she experiences at the moment or they can reflect constellations of the personal dispositions and cognitive strategies. Thus the reasons can have a biological character (inherited) or a social character (obtained). The obtained dispositions are related mainly to the level of social learning (Fischer & Škoda, 2014; Emmerová, 2014) which primarily takes place in the family. Therefore, when dealing with the matter of prevention, it is very important to take into account mainly the social environment where the child lives. The social environment substantially influences his/her attitudes, opinions and it instils certain values into the child which are subsequently reflected in his/her acting and behaving to other people. Undoubtedly, the first position is here occupied by the family where the child learns to create relationships to himself/herself, to other people and the society. The child develops his/her skills, he/she acquires the norms and learns to be empathic, tolerant, to respect and understand people in his/her surroundings. It is precisely the family community where the child acquires the basic life scale of values and the bases of his/her future behaviour outside this institution (Kofa, J., 2015).

We can find numerous definitions of aggressiveness and aggressive behaviour in specialized publications and there also exist manifold classifications of this social-pathological phenomenon. Based on our methodological orientation, we mention the following classification from the point of view of pursuing the intention of being aggressive (Fromm, 2007, in: Vašutová & Kitliňská, 2010):

- a) *benign* – it is considered to be a defensive aggression if keeping of life is put at risk. It represents a tool of biological adaptability and it is used in order to survive.
- b) *malignant* – the main expression is angry, attacking, destructive and fiery behaviour which can lead to social delicts such as a murder. The motivation of the aggressor is not the achieving of a certain aim but it is his/her pleasure of the performed act. By means of aggressiveness the man satisfies his/her own cruelty.

Repková (2000, in: Határ, 2015) adds two other types to this classification:

- a) *pseudo-aggressiveness* – the intention of the man who behaves aggressively is not to hurt another person. Therefore we call it unintentional or coincidental aggressiveness.
- b) *aggressiveness without any motivation* – an aggressive emotions of anger, rage, hatred or jealousy.

3 Methodological orientation of the research

The aim of our research was to find out and explain what role plays the learning in the family environment between grandparents and grandchildren in the context of prevention

against the aggressive behaviour of different symptomatology by grandchildren. We used a questionnaire of our own construction as an investigative tool. The core of the questionnaire was formed by eight questions. The first two questions we centred on finding out the presence or absence of different kinds of aggressive behaviour by the respondents (verbal, physical, auto-aggressiveness and bullying) whereas the starting point for its classification was the division we mentioned in the theoretical part of our article. In case of a positive answer we tried to determine the etiology of the inappropriate acting and behaving in the following item. In the next questions we found out the frequency of meetings of grandchildren with their grandparents, what type of an educator the grandparents represent for the younger generation, the course, direction and contents (a type of common activities) of the intergenerational learning between both generations, as well as the roles the grandparents play in the life of their grandchildren. We chose all pupils of the eight grade of primary schools as a basic observed group and we created our representative sample by means of an accessible selection. It was formed by 172 respondents coming from four regions of Slovakia: Košice region (63), Bratislava region (41), Žilina region (40) and Nitra region (28). There were five town schools and two schools were located in a village. In order to process and evaluate the obtained data from the questionnaire and to verify the formulated hypothesis, we used *the methods of mathematical statistics* (calculation of frequency, percentual evaluation, a chi-squared test) and *the methods of logical operations* (analysis, synthesis, induction, deduction and comparing). Subsequently, we recorded the results of the empirical investigation in particular tables and we complemented them with the qualitative analysis. We mention only some empirical results in our article.

3.1 Partial results of the research

In the following tables we mention research findings related to the frequency of occurrence of aggressive behaviour by respondents, its etiology, the contents of intergenerational learning between grandparents and grandchildren in the family environment and, at the same time, those findings which support the confirmation or rejection of the scientific hypothesis we formulated at the beginning of the research process:

Hypothesis: We assume a statistically related relationship between the intergenerational learning in the family and the occurrence of aggressive behaviour by grandchildren.

The following table documents the frequency of the occurrence of particular types of the aggressive behaviour in the observed research sample. The first item of our research tool consisted of four degrees of the scale (always, often, sometimes, never). The respondents could choose one option. The reason of formulating this type of a question, or respectively, its answers, was the final statistical evaluation of the results which requires the scaling of answers. At the same time, it provides us a more detailed and precise view at the intensity of expressions of aggressive ways of behaviour by the observed pupils of primary schools.

Table 1: The occurrence of aggressive behaviour

Frequency	Always		Often		Sometimes		Never		TOGETHER (always, often, sometimes)	
	n	%	n	%	n	%	n	%	n	%
Verbal	5	3	25	15	107	62	35	20	137	80
Physical	1	0,6	3	1,7	34	19,8	134	78	38	22,1
Auto-aggressive	2	1,1	3	1,7	24	14	143	83	29	16,7
Bullying	3	1,7	1	0,6	9	5,2	159	92,4	13	7,6

Based on the research findings recorded in the table, we can state that among the pupils of the eighth grade, who participated in the scientific research, there evidently dominated the verbal aggressiveness in the total number of 137, representing 80% of all respondents. We are pleased that the highest frequency (107, 62%) was recorded by the degree of the scale expressing the lowest intensity: *sometimes*. The option of the answer *there occur physical expressions of aggressive behaviour by me* was chosen by 38 respondents, representing 22,1% of the total number of the participants. Quite a high number of boys and girls also marked the answer *I hurt myself*, specifically 29 pupils (16,7%). (Cyber-) bullying as a form of aggressive behaviour was chosen by the lowest number of respondents (13 pupils, 7,6%). In our research we were also interested in finding out how many pupils do not have any type of those four types of aggressive behaviour, or respectively, how many pupils chose the scale degree *NEVER* by every item of the first question. From among all respondents of the research sample, 29 participants of the empirical research, representing 16,9% of all respondents marked this answer. Up to 143 observed pupils of the eighth grade marked at least one of four forms of aggressiveness which they practise in a higher or lower measure..

Regarding the investigation of the occurrence of the aggressive behaviour by pupils, we also wanted to know the reasons due to which they decided not to act in accordance with the social norms and requirements. The following table shows the frequency and percentage evaluation of the answers to the question addressed to the respondents of our questionnaire: *Why do you behave in this way?* By the formulation of particular options we chose the differentiation of aggressive behaviour by Repková as our starting point (2000, in: Határ, 2015).

Table 2: The etiology of aggressive behaviour

Reasons of aggressive behaviour	Number	Percents
Benign form of aggressiveness (defence)	99	69,2
Malignant form of aggressiveness (it causes pleasure)	16	11,2
Pseudo-aggressiveness (unintentional, coincidental)	117	81,8
Aggressiveness without motivation (reasonless)	94	65,7

The respondents of the questionnaire were allowed to mark more options in the given question and thanks to this we obtained a more detailed overview of the reasons of their aggressive acts. In spite of the fact that up to 143 pupils of the eighth grade identified themselves at least with one type of aggressive behaviour which is manifested by them, there is a pleasant finding that majority of the pupils, i.e. almost 82% of all participants, behaves in this way unintentionally, or respectively, coincidentally, their intention is not to hurt anybody. These can be some kind of spontaneous reactions when the individual does not sufficiently think about the consequences of his/her

inadequate behaviour and he/she does not have the feeling of responsibility yet what can be caused exactly by the age or immaturity of our research sample. Similarly, a significantly high number of respondents, specifically 99 pupils (69,2%) identified their expressions of behaviour as a benign form of aggressiveness, respectively as a defence against somebody or something. Once again it is not intentional, planned hurting of other people. Their motive is mainly fear and defence of oneself what is, in its essence, biological-adaptation acting serving for surviving. We assume that this inadequate behaviour can be again connected with the insufficient ability of children to solve conflicts and problems without aggressive acting. To remove the given deficit there are many preventive programmes aimed on the prevention against aggressive behaviour by means of developing the particular social skills. In 94 cases (65,7%) we recorded aggressiveness without any motivation, i.e. cases when the individual hurts without any reason, as well as without feeling fury, anger or hatred. We can state that it is quite a high number which should be a challenge to lead the current generation to bigger responsibility for their acts, respectively to bigger awareness of the consequences of their decisions and behaviour which hurts people in their surroundings. The occurrence of this kind of aggressiveness can be an evidence of bad spending of free time by children and teenagers who fill their empty moments with hurting other people even though they do not have any reason to do so. Unfortunately, by our research sample there also appeared a malignant form of aggressive behaviour (16; 11,2%) when the child is really pleased with his/her performed act. The main motivation is the pleasure of hurting other people what we can mark as a real cruelty and violence.

The fourth item of our questionnaire was aimed to find out whether in families there takes place learning between children (respondents) and their grandparents. 146 respondents answered to this question positively what represents almost 85% and only 26 pupils (15%) said that they were not used to doing any common activity with their grandparents. Subsequently, we put the results of this question into the statistical relationship to the first question in order to verify the hypothesis formulated at the beginning of the research process. The aim of the statistical analysis was to verify whether the intergenerational learning in the family has some influence on the aggressive behaviour of the children (i.e. whether this learning can positively influence the aggressiveness and it can alleviate, eliminate or prevent this inappropriate behaviour). We observed aggressive expressions by children in four areas and therefore we also evaluated separately the relationship between the intergenerational education and the particular types of aggressiveness.

At first we tested the dependence of two qualitative features *A, B*, where *A* denominates the intergenerational learning in the family between grandparents and grandchildren and *B* represents particular types of aggressive expressions of grandchildren (verbal, physical, bullying and auto-aggressiveness).

The statistical method which we used to verify the dependence of two qualitative features *A, B*, is χ^2 - the test of independence for the contingent table of the type $k \times m$. There is an assumption that the feature *A* takes on *k* of the

levels A_1, A_2, \dots, A_k and the feature B takes on m of the levels B_1, B_2, \dots, B_m , whereas $k > 2$ or $m > 2$. At first we tested the zero hypothesis H_0 : the features A, B are independent opposite the alternative hypothesis H_1 : the features A, B are dependent. As a testing criterium we applied the statistics χ^2 , which is defined with the relationship $\chi^2 = \sum_{i=1}^k \sum_{j=1}^m \frac{(f_{ij} - o_{ij})^2}{o_{ij}}$, where f_{ij} are empirical numerical data and o_{ij} are the expected numerical data. The testing

statistics χ^2 has, by being valid the tested hypothesis H_0 - a division with the number of degrees of discretion $r = (k - 1)(m - 1)$. We reject the tested hypothesis H_0 at the level of importance α if the value of the testing criterium χ^2 overpasses the critical value $\chi^2_\alpha(r)$. We will find the critical value $\chi^2_\alpha(r)$ in the table of critical values χ^2 - divisions. χ^2 - with the test of independence for the contingent table $k \times m$ we will test the zero hypothesis H_0 opposite

Table 3: The relationship between the intergenerational learning and the verbal aggressiveness

	VERBAL EXPRESSIONS OF AGGRESSIVE BEHAVIOUR									
	Always		Often		Sometimes		Never		TOGETHER	
Learning	n	%	n	%	n	%	n	%	n	%
NO	4	2,3	2	1,1	15	8,7	5	2,9	26	15,1
YES	1	0,6	23	13,4	92	53,5	30	17,4	146	84,9
TOGETHER	5	3	25	14,5	107	62,2	35	20,3	172	100

the alternative hypothesis H_1 , which expresses in our case that there exists a statistically important relationship between the intergenerational learning in the family (between the grandparents and the grandchildren) and the occurrence of the aggressive behaviour by the grandchildren.

The test was carried out by means of the programme STATISTICA. After entering the input data in the output set of the computer, we obtained the always - contingent table, the

value of the testing criterium χ^2 - test and the value p . We can assess the test also by using the value p , what represents the probability of the mistake we will make if we reject the tested hypothesis. If the value of the probability p is sufficiently small ($p < 0,05$, respectively, $p < 0,01$), we reject the tested hypothesis H_0 about the independence of the observed features A, B (at the level of importance 0,05, respectively, 0,01). It means that the difference between the frequency found in the sample and the expected frequency is too big to be the consequence only of the coincidental selection and therefore it is statistically important. If the value p is equal or higher than the chosen level of importance, it is not possible to reject the zero hypothesis. It means that the difference between the observed (empirical) and expected frequencies can be the consequence of the coincidental selection and therefore it is not statistically important. In this way we proceeded in all four cases (more in detail: Tírpáková & Malá, 2007).

In the following table no. 3 there is shown the result of the chi-squared test we used in order to verify the hypothesis whereas we were interested in the relationship between the intergenerational learning and the verbal expressions of aggressive behaviour.

Since the value of the probability p is smaller than 0,05 ($p = 0,000555$), we reject the hypothesis H_0 at the level of importance $\alpha = 0,05$ and we accept the alternative

hypothesis H_1 . Based on the mentioned results of the given test, we can confirm that the intergenerational learning in the family statistically correlates with the verbal expressions of aggressiveness by grandchildren. The more frequently the education between the grandparents and grandchildren takes place in the family, the smaller is the occurrence of the verbal aggressiveness by the observed sample of children. It is evident from the table that by 17,4% of pupils there do not appear verbal attacks against other people when they have the possibility of the common activity with their grandfather or grandmother. Analogically we proceeded by verifying the hypothesis where we assumed that the intergenerational learning in the family is related to the physical expressions of aggressiveness by children. Also in this case we used the χ^2 test of independence for the contingent table χ^2 - and we carried it out in the programme STATISTICA.

Table 4: The relationship between the intergenerational learning and physical aggressiveness

	PHYSICAL EXPRESSIONS OF AGGRESSIVE BEHAVIOUR									
	Always		Often		Sometimes		Never		TOGETHER	
Learning	n	%	n	%	n	%	n	%	n	%
NO	1	0,6	1	0,6	9	5,2	15	8,7	26	15,1
YES	0	0	2	1,2	25	14,5	119	69,2	146	84,9
TOGETHER	1	0,6	3	1,7	34	19,8	134	77,9	172	100

Chi-square: 11,4140, df=3, $p=0,009688$

Since the value of the probability p is smaller ($p = 0,009688$) than the chosen level of importance $\alpha = 0,05$, we reject the hypothesis H_0 at the level of importance $\alpha = 0,05$ and we accept the alternative hypothesis H_1 . It is evident that the intergenerational learning in the family has a statistically important influence on the physical expressions of aggressiveness by the children. The results of the test proved that the tendencies towards the physical expressions of

aggressiveness by children are statistically significantly dependent on the intergenerational learning in the family.

Based on the table no.4 where we recorded the given situation, we can state that up to 70% of respondents never experienced any physical expressions of aggressiveness what was influenced exactly by the participation in the intergenerational exchange with their grandparents.

In the following table there we recorded the frequency, the percentage composition, the result of the chi-squared test, the value p . Based on them we can subsequently confirm or reject the formulated hypothesis.

Table 5: The relationship between the intergenerational learning and the auto-aggressiveness

	AUTO-AGGRESSIVENESS									
	Always		Often		Sometimes		Never		TOGETHER	
Learning	n	%	n	%	n	%	n	%	n	%
NO	1	0,6	0	0	4	2,3	21	12,2	26	15,1
YES	1	0,6	3	1,7	20	11,6	122	70,9	146	84,9
TOGETHER	2	1,2	3	1,7	24	14	143	83,1	172	100

Chi-square: 2,49664, df=3, $p=0,475902$

Since the value of the probability p is bigger ($p = 0,475902$) than the chosen level of importance $\alpha = 0,05$, we can say that the intergenerational learning in the family does not have a statistically significant influence on the auto-aggressiveness of children. It was proved with the test that the intergenerational learning in the family between the grandparents and

grandchildren, respectively any common activity they do together, is statistically not related in a significant way to the fact whether there appear tendencies towards the auto-aggressiveness by the children.

Table 6: The relationship between the intergenerational learning and bullying

	BULLYING									
	Always		Often		Sometimes		Never		TOGETHER	
Learning	n	%	n	%	n	%	n	%	n	%
NO	3	1,7	0	0	1	0,6	22	12,8	26	15,1
YES	0	0	1	0,6	8	4,7	137	79,7	146	84,9
TOGETHER	3	1,7	1	0,6	9	5,2	159	92,4	172	100

Chi-square: 17,3397, df=3, $p=0,000602$

On the basis of the results we can see that the value of the probability p is smaller ($p = 0,000602$) than the chosen level of importance $\alpha = 0,05$ and therefore we reject the hypothesis H_0 at the level of importance $\alpha = 0,05$ and we accept the alternative hypothesis H_1 . We subsequently conclude that the intergenerational learning in the family has a statistically significant influence on the occurrence of bullying by the children. It was proved with the test that the intergenerational learning in the family is statistically related to the expressions of bullying by the children in a significant way. Almost 80% of pupils who have the possibility to participate in the intergenerational education, never experienced bullying as a form of their aggressive behaviour.

The hypothesis, which was the basis of our assumption that there exists a statistically significant relationship between the

intergenerational learning in the family and the occurrence of aggressive behaviour in the observed sample, was confirmed in the relationship to the expressions of verbal aggressiveness, physical aggressiveness and in the relationship to the bullying by the respondents.

It is exactly the only one type of the aggressive behaviour where the formulated hypothesis was not confirmed. We can find the reason in the fact that it is a different type of aggressiveness when compared to the other three types because the aim of

hurting is the proper aggressor himself/herself. The actor of aggressive acts is identical with the victim. Finally we verified

with the χ^2 - test of independence for the contingent table whether the intergenerational learning in the family has an influence on the expressions of bullying by the children.

However, there was not confirmed the existence of the relationship between the auto-aggressiveness and the intergenerational learning in the family environment. In other words, we can state that the learning between the chosen target groups alleviates or eliminates the chosen inappropriate expressions of behaviour. The more there takes place the interaction between the grandparents and grandchildren, the less there appears the aggressiveness by the grandchildren. In spite of this fact, the mentioned finding was not confirmed in the area of auto-aggressiveness which is, to some extent, different from the other types of aggressive behaviour because it is oriented towards the interior of the man and not towards his/her surroundings. However, due to the fact that the auto-aggressiveness often arises from the failure to accept oneself, low self-esteem and self-evaluation, as well as from the inability

to solve problems in the family or school environment, we assume that, despite the mentioned results, the intergenerational learning has a preventive potential also in the relationship to the given type of aggressiveness because there is proved its positive contribution for the participating generations in increasing of the self-esteem, positive self-perception as well as in the improving of social skills where is also included the ability to solve conflicts effectively.

If the respondents answered positively to the question related to the carrying out of the common activities with their grandparents, they could subsequently select and mark specific activities they are used to doing with their grandmother or grandfather.

Table 7: The contents of learning in the direction from the grandparents to the grandchildren

Contents of learning grandparents - grandchildren	Number	Percents
Preparation for the lessons, writing of homework	16	9,3
Housework (cooking, making cakes, cleaning,...)	77	44,8
Work in the garden, around the house/flat	72	41,9
Talking about different topics or problems	99	57,6
Table games (or other types of games)	69	40,1
Trips in the nature, theatre, cinema, museum, church	57	33,1
Artistic activities and hobbies (painting, singing, knitting, wood carving, modelling from different materials)	30	17,4

On the basis of the answers we can say that there clearly dominates *talking about different topics or problems* from among activities the pupils of the eighth grade do with their grandparents. We recorded the identical tendency also by the analysing of the essays where the growing age of the grandchildren influenced the type of common activities. The older were the grandchildren, the more they preferred and appreciated the possibility to talk with their grandmother or grandfather and they had nice memories of the playing, walking, housework or manifold artistic activities the grandparents taught them to do. Up to 99 pupils, representing 57,6% of all pupils, said that they are used to talking with their grandparents about different topics or problems. Surprisingly, the lowest numerousness we observed by the item *preparation for the*

lessons, writing of homework. Only 16 boys and girls (9,3%) of our research sample confirmed that their grandfather or grandmother help them to fulfil their school tasks. Why is talking the most favourite activity? Basically, there was confirmed the opinion of the specialists Álvarez (2003) and Galiano (2003) which they mention in their work that the intergenerational education is a process „of learning by means of communication“. We also think that the given fact influences the situation of current families when the parents, due to manifold reasons (work, career, hobbies), do not have enough time to listen to their children patiently, to express their empathy and understanding as well as their willingness to participate in solving of their problems and difficulties.

Table 8: The contents of learning in the direction from the grandchildren to the grandparents

Contents of learning grandchildren - grandparents	Number	Percents
Foreign languages	52	30,2
Using of modern technologies (PC, tablet, mobile, etc.)	130	75,6
How the current generation thinks	78	45,3
To know the fashion trends, what is "in" at the present time	51	29,7
I do not teach them anything	15	8,7
Other	11	6,4

In the table no.7 we present the findings which provide us a more detailed picture about the contents of the intergenerational education, more precisely the education in the direction from the grandparents to their grandchildren. Once again the pupils could choose one or more options when filling this part of the questionnaire.

Therefore also here is important the person of the grandparent who is able to listen to his/her grandchildren carefully as well as to talk with them about all the topics they are interested in. As we can see it in the data from the table, the grandchildren appreciate this effort adequately. Why does there appear the role of the grandfather or grandmother as a facilitator of the preparation for the lessons in the smallest measure? It is possible that it is a result of the influence of the modern times when the grandparents - seniors perceive a big ability and knowledge in the area of intelligence - communication technologies and they probably think that they are not able to help their grandchildren with homework and subjects which are completely at a different level from the level they knew during the times of their own school attendance.

We know that the intergenerational learning can take place in two directions, from the older generation to the younger one and vice versa. The previous table documented the curriculum of the education where the grandparents represent the educators and the grandchildren are the educants. The following table no.8 recorded the contents of learning where the target group and the receivers are the representants of the senior population - the grandparents.

The mentioned indicators point out the fact that children and teenagers of the present time, often living in the virtual world, mediate modern information and communication technologies to their grandparents. At the same time, they represent experts in this area for the grandparents and they explain them all the secrets of handling and using of the current technical developments. Up to 130 grandchildren marked this item what represents $\frac{3}{4}$ (75%) of all respondents. Almost half of the pupils (45,3%) also helps to reduce the generation gap by means of explaining and clarifying to the older generation the ways of thinking of the current young generation. In the item *Other* which was marked by 11 grandchildren (6,4%) they mentioned other areas of education as well (we provide them freely

adapted): *things I am interested in; whose birthday it is; things about sport; to write; to buy; to use slang; what I study at school; I teach them what they need.*

Fifteen students (8,7%) answered negatively regarding the education of the grandparents, respectively, they identified themselves with the answer *I do not teach them anything*. Some pupils (8) mentioned the following reasons: *when I tried it, they said they were old; I do not have time for it now; they know almost everything; we have never talked about it; I do not have a good relationship with the grandparents; I do not have to teach them anything; what they should know, they know it already (2x); they are like Google - they know everything*. We did not record any reasons by seven pupils.

3.2 Conclusion

In the current world we can perceive the incessant increasing of number and frequency of manifold social-pathological phenomena, criminality and delinquency of every type and degree. Nowadays there are more and more frequent and intensive expressions and consequences of aggressiveness and aggressive behaviour by children and teenagers. One of the reasons is also the neglected or incorrect education, inability of the young generation to communicate, to conduct a dialogue, to listen actively, to solve conflict in a constructive way, to create long-term, stable and healthy relationships and on their basis to mature as a human being in the biological, psychic, social and spiritual area. Therefore, the intergenerational learning, based on the development and strengthening of the intergenerational relationships between young people and seniors, is perceived as a very effective way and tool of prevention against undesirable social phenomena, respectively the aggressive behaviour in our case, and as the most suitable social capital.

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Primary Paper Section: A

Secondary Paper Section: AM

EU DIGITAL SINGLE MARKET – ARE WE THERE YET?

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Abstract: Establishing a Digital Single Market is an ambitious goal of the European Union, which will definitely change the European Union as we know it now. The article maps the current *status quo* of the development of the Digital Single Market. The author uses different sources to identify the movement of the European Union towards the Digital Single Market. Data protection reform as one of the very important steps forward the Digital Single Market is also subject of the article.

Keywords: Digital Single Market, Digital Agenda, Data protection reform, Strategy Europe 2020.

1 Introduction

The creation of a Digital Single Market is a priority of the Union and aims liberties associated with the EU internal market to expand to the digital world, thereby promoting growth and employment in the EU. Following the Lisbon Strategy¹, the Strategy Europe 2020² has introduced the Digital Agenda for Europe as one of the seven major initiatives, while accepting the key role of the use of information and communication technologies, that the EU will succeed in its effort in 2020. The Digital Agenda for Europe has seven policy areas.

European Union finds important to extend the current EU single market, which consist of free movement of goods, services, labor and capital. The single market makes the EU territory without any barriers. Currently four freedoms included in the internal market needs to reflect the development of the society and the digital era. After creating the Digital Single Market, the European Union can enjoy its full potential.

“A Digital Single Market is one in which the free movement of goods, persons, services and capital is ensured and where individuals and businesses can seamlessly access and exercise online activities under conditions of fair competition, and a high level of consumer and personal data protection, irrespective of their nationality or place of residence. Achieving a Digital Single Market will ensure that Europe maintains its position as a world leader in the digital economy, helping European companies to grow globally.”³

The idea of the Digital Single Market generally covers the European Union without any digital barriers, which includes the option of the consumers to compare goods from all over the Europe, access the digital entertainment around the Europe, simple access to sources of information, no barriers when accessing digital banking and other financial products, possibility for small and medium businesses present themselves online and enjoy the opportunities given by the electronic world.

2 Development of the Digital Single Market

The idea of the Digital Single Market came up already in mid - 1990's. “Michal Barner, the European Commissioner for the Internal Market, labelled the Digital Single Market a new frontier in 2013 speech.”⁴

As already mentioned the Strategy Europe 2020 approved by the EU Commission in 2010 is marked as an official beginning of the new era in European Union. It established the seven priorities such as Innovation Union, Youth on the move, A digital agenda

for Europe, Resource efficient Europe, An industrial policy for the globalization era, An agenda for new skills and jobs, European platform against poverty.

In May 2010, the Commission published a communication dealing with the digital agenda for Europe⁵. Commission highlighted that it is time for a new single market to deliver the benefits of the digital era. At the same time, another communication was published: Towards a Single Market Act; For a highly competitive social market economy, 50 proposals for improving our work, business and exchanges with one another⁶. The preparation for the digital era started, the Commission provided an accurate action plan about the legislative development for next years. The aim is to adopt the new legislative which is a Single Market Act. “Its implementation will make it possible to exploit the considerable opportunities for growth presented by the digital economy, the services sector and developments associated with the environment and climate change. The adoption of the Single Market Act will be a dynamic way of commemorating the 20th anniversary of the single market at the end of 2012.”⁷

In January 2012, the Commission issued another communication⁸ about building the Digital Single Market for e-commerce and online services. The Commission states that Europe is still not unified in the internet world and has different legal rules, standards and practices. The aim of the Commission is to set the plan to meet the Digital Single Market by 2015. Five obstacles to reach the goal were identified: a) the supply of legal, cross-border online services are still inadequate; b) there is not enough information for online service operators or protection for internet users; c) payment and delivery systems are still inadequate; d) there are too many cases of abuse and disputes that are difficult to settle; e) insufficient use is made of high-speed communication networks and hi-tech solutions. Those obstacles led to five priorities.

A second communication about the Single Market Act was published in October 2012⁹ where the Commission stated about the Digital Single Market that despite progress made, the European Union is still far from reaching the Digital Single Market. “To reach our vision of the Digital Single Market, the EU must address swiftly a number of further issues, including the best use of spectrum in the Single Market and pursuing a reflection on the need to further adapt the EU telecommunications law and copyright law.” The Commission's vision was a digital economy that delivers sustainable economic and social benefits based on modern online services and fast internet connections. All citizens and businesses must have the opportunity to be part of the digital economy, while at the same time being protected from illicit trade.

Another step forward reaching the digital single market was the Commission's communication from May 2015¹⁰ stating the Digital Single Market Strategy. “Europe has the capabilities to lead in the global digital economy but we are currently not making the most of them. Fragmentation and barriers that do not exist in the physical Single Market are holding the EU back.”

⁵ Communication from the Commission to the European parliament, the Council, the European economic and social committee and the Committee of the regions: A Digital Agenda for Europe (COM(2010) 245)

⁶ (COM(2010) 0608)

⁷ Communication from the Commission to the European parliament, the Council, the European economic and social committee and the Committee of the regions: Towards a single market act; For a highly competitive social market economy; 50 proposals for improving our work, business and exchanges with one another (COM(2010) 0608);

⁸ Communication from the Commission to the European parliament, the Council, the European economic and social committee and the Committee of the regions: A coherent framework for building trust in the Digital Single Market for e-commerce and online services, (COM(2011) 0942);

⁹ Communication from the Commission to the European parliament, the Council, the European economic and social committee and the Committee of the regions: Single Market Act II; Together for new growth (COM(2012) 573);

¹⁰ Communication from the Commission to the European parliament, the Council, the European economic and social committee and the Committee of the regions: A Digital Single Market Strategy for Europe, (COM(2015) 192)

¹ The aim of the Lisbon Strategy was to make the EU “the most competitive and dynamic knowledge-based economy in the world, capable of continuous economic growth with more and better jobs and greater social cohesion.”

² Europe 2020 - A strategy for securing of a smart, sustainable and inclusive growth (COM (2010) 2020)

³ (COM(2015) 192), p. 3

⁴ Savin, A.: *E-Commerce in the Single Market context – the invisible framework*, In.: Research Handbook on EU Internet Law, Cheltenham: Edward Elgar, p. 285

The three pillars of creation of the Digital Single Market are: 1. Better access for consumers and businesses to online goods and services across Europe; 2. Creating the right conditions for digital networks and services to flourish; 3. Maximizing the growth potential of our European Digital Economy. Communication states the term “*geo-blocking*” which refers to online practices of the seller and e-shops when the access to several websites is denied or when the buyer cannot purchase a product from the webpage based in different Member State due to the commercial reasons. Geo-blocking question is recently discussed at the EU level by adopting the regulation on addressing geo-blocking and other forms of discrimination based on customer’s nationality, place of residence within the internal market¹¹. The proposal was currently (December 2017) rejected by the Parliament. Also, the issue with different VAT is a question. Commission identifies the key aim of the Digital Single Market Strategy which is to establish a supportive investment climate for digital networks, research and innovative business.

Recent mid – term review on the implementation of the Digital Single Market Strategy¹² reviews the current stage of the establishment of the Digital Single Market. The Digital Single Market Strategy outlined the path for the EU to build the right digital environment: one in which a high level of privacy, protection of personal data and consumer rights are ensured, businesses can innovate and compete, and cybersecurity strengthens the fabric that weaves our societies together. Digital era and its power and role on the future development of the Europe is also described in the White Paper on “The Future of Europe”¹³.

On Digital Single Market summit in Tallinn in September 2017 was agreed that the Digital Single Market will be completed and the European Union will follow the strategy.

3 Data Protection as Part of the Digital Single Market

The protection of personal data is a fundamental step to reach the Digital Single Market which was already taken. The reform of the data protection rules was adopted. The reform includes General Data Protection Regulation¹⁴ which was adopted in April 2016 and will apply from 25. May 2018 and the Directive¹⁵ which has to be transposed by Member States into their national law by 6 May 2018.

Reform and its aims are well expressed by Commission¹⁶ that citizens need guarantees that their personal data will not be used without their consent, and operators must be able to develop innovative economic models. The development of new online services such as behavioral advertising generates fears about the use and standard of protection of personal data. People affected by any processing of their personal data must be given clear, comprehensible information. Reform provided a good balance to be achieved between encouraging innovation and setting a high level of user protection.

This uniform legislation at level of European Union replaces the current divergent national legislation of the Member States of the Union. In EU the new data protection rules, establishing a modern and harmonized data protection framework across the EU were enacted.

European Union calls the reform as the most important change in data privacy in 20 years. There are more reasons for such a characteristic. Personal data is specified much broader as any information relating to an identified or unidentified natural person.

Firstly, the data protection regulation gives more rights and intensifies already existing right of people to protect their data (such as: right to be forgotten¹⁷, right to personal data portability, right to restriction of processing, right to access to personal data, right to rectification, right to know about the personal data breach). Principle of transparency is the main principle of the rights and mostly refers to clear, easy communication and information of the data subjects. On the other hand, the rights are creating the new obligations for the data controllers.

Data portability right is completely new right and includes the right to receive the personal data in a structured, commonly used and machine-readable format and have the right to transmit those data to another controller without hindrance from the controller to which the personal data have been provided. The right includes the right to direct transfer of the data from one controller to another. This means that data controllers that outsource data processing or process data jointly with other controllers must have clear contractual arrangements to allocate responsibilities of each party in answering data portability requests and implement specific procedures in this respect.¹⁸ The right consist of a) the right to obtain and reuse personal data for further personal use (ex. contact list, etc.) b) the right to transmit personal data from one data controller to another one on request of the data subject. This right creates indirectly duty for data controllers not to establish any barriers to the transmission. c) right to controllership, which means that data controllers answering a data portability request have no specific obligation to check and verify the quality of the data before transmitting it. On the other hand, receiving data controller is responsible for ensuring that the portable data provided are relevant and not excessive with regard to the new data processing. Regulation also provided that data portability based on the regulation shall be provided without any payment required unless an exception applies.

A discussion about the right to explanation of decisions made by automated and artificially intelligent algorithmic systems is included in the General Data Protection Regulation. The right to explanation is viewed as a promising mechanism in the broader pursuit by government and industry for accountability and transparency in algorithms, artificial intelligence, robotics, and other automated systems.¹⁹ Currently there are two opinions about the existence of the mentioned right.²⁰

Secondly, the applicability of the regulation extends its applicability also outside of EU under specific conditions²¹. The regulation also covers the data controllers and processors having seat outside of the EU while offering goods or services (no matter if payed or not) and while monitoring of behavior people inside EU.

Thirdly, the penalties for breaching the rules of the regulation are serious and the maximum is twenty million Euro. Generally speaking the penalty model is based on revenue – annual worldwide turnover of the undertaking as it is already known in anti-trust law.

¹¹ (COM(2016) 289

¹² Communication from the Commission to the European parliament, the Council, the European economic and social committee and the Committee of the regions: on the Mid-Term Review on the implementation of the Digital Single Market Strategy; A Connected Digital Single Market for All, (COM(2017) 228)

¹³ COM (2017) 2025

¹⁴ Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data

¹⁵ Directive (EU) 2016/680 on the protection of natural persons with regard to the processing of personal data by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data and repealing Council Framework Decision 2008/977/JHA

¹⁶ (COM(2011) 0942)

¹⁷ See for example Post, R.: *Data Privacy and Dignitary Privacy: Google Spain, the Right to Be Forgotten, and the Construction of the Public Sphere* (April 15, 2017). Duke Law Journal, Forthcoming; Yale Law School, Public Law Research Paper No. 598.

¹⁸ Guidelines on the right to data portability adopted by article 29 Working Party WP 242 rev.01

¹⁹ Wachter, S., Mittelstand, B., Florini, L.: *Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation*. In: *International Data Privacy Law*, Volume 7, Issue 2, 1 May 2017, Pages 76–99.

²⁰ See also Goodman, B., Flaxman, S.: *EU Regulations on Algorithmic Decision-Making and a “right to Explanation*, [2016] available <<http://arxiv.org/abs/1606.08813>> accessed 30.12.2017.

²¹ This Regulation applies to the processing of personal data in the context of the activities of an establishment of a controller or a processor in the Union, regardless of whether the processing takes place in the Union or not. – art.3 of the regulation

Fourthly, the consent and its conditions were changed to simplify and make the consent and its withdrawal as easy, clear as possible. Processing of a sensitive personal data is prohibited unless the exception applies (ex. The person makes such a data public voluntarily (on social media or other way or a separate consent was given). Separate consent with profiling is also needed. Profiling as itself has separate rules which needs to be followed. The discussion about the consent and whether is given free is ended in the regulation stating that the consent should not be a condition to the entering into contract in case data are not necessary for performing the contract.

Fifthly, one stop shop mechanism was established to simplify the contact with public authorities. Supervisory Authority is the only authority the data controllers and operator has to deal with. In case they are multinational companies they deal with the authority based on its establishment and with the Lead Supervisory Authority also.

The topic of the data protection reform is very broad and this part of article can only outline the general idea of the data protection reform.

On the other hand, some critics of the reform stated that the reform is not perfect.

Right of data portability has more practical challenges and challenges in the enforcement procedure. Right of data portability applies only to the data provided by the subject based on the wording of the art. 20 of the regulation. This might limit the current development of the cyberspace as far the data added by others might be also important part of the subject data which he might be interested in. On the other hand, the data added by the subject might include also data about third party. Then the question remains whether based on the wording of the article 20 regulation those data should be transmitted also or not?²² Until now the practical realization of the right of data portability is in question. The costs and the technical support needed for realization of such a right are not known yet. Based on the wording of the article 20 there is only a word "technically feasible". The explanation of the working party is more about not providing any obligation on data controllers only asking them not to make any barriers in the transfer. In practice, this might lead to blocking the real usage of the right with stating of the data controller that the transfer is not technically feasible. The Union should provide more practical guidance on the technical support of the real exercise of the right, otherwise it can happen that the right will not be exercised in practice due to the technical issues.

More critic as the IT experts are worried about the practical exercise of some provision of the regulation. Discussion about the cloud and their usage and their security level and compliance with the regulation started.²³

General data protection regulation affects all kind of life and different sectors. Artificial intelligent is a specific topic which arise also from the General Data Protection Regulation and its regulation is currently in question and subject of a discussion. Genetic research is another specific sector which will be affected by the General Data Protection Regulation as far they also fall into the scope of the personal data and are specified as sensitive data.²⁴

The regulation applies only on personal data as they are defined in the regulation.²⁵ For establishing the digital single market we

also need rules for non-personal data. The unrestricted movement of non-personal data across borders and technology systems in the EU is also considered a key building block of the EU's Digital Single Market strategy. In September 2017 Commission proposed a draft regulation²⁶ on free flow of non-personal data which is based on the communication with the topic Building a European Data Economy²⁷. The proposal of the regulation is much shorter than the General Data Protection Regulation and has 10 articles and shall apply to storage or other processing of electronic data which are other than personal data as defined in General Data Protection Regulation and stipulates the free movement of such a data. A more power is proposed to be given to authorities by data availability for competent authorities means that relevant national law or Union authorities might provide assistance with obtaining the relevant data stored in different Member State.

4 Conclusion

There is no doubt that establishing a Digital Single Market is a difficult goal which on the other hand after reaching it will enable the European Union to use its potential in the digital world where the Union is nowadays behind. The impact of the establishment of the Digital Single Market will be on grow will be on all areas of life, law, technology, medicine, research, education, etc. To reach this goal the European Union has lots of work ahead of it. The first base stone was already laid down and that is the personal data protection reform. Personal data protection reform enables people "to move" in the digital world safely having specified clear rules, rights and a clear mechanism of supervision was set. The personal data protection reform does not apply yet, but already there are some gaps, overlaps and questions which shall be solved.

On the other hand, to establish the Digital Single Market this is not enough. Several goals have been already achieved such as:

a) canceling the retail roaming charges²⁸, b) cross-border portability of online services²⁹, c) end of the unjustified geo-blocking³⁰. Directive on measures to reduce the cost of deploying high-speed electronic communications networks³¹, was enacted in order to facilitate the deployment and/or roll-out of high-speed electronic communications networks (mobile as well as fixed broadband networks) by reducing the cost of deployment.

Establishing a safe cyberspace which can be digital single market needs common cybersecurity law which has the plan – cybersecurity package adopted by Commission in September 2017. The first NIS directive was already adopted³² in July 2016. This put in place the necessary structures for strategic and operational cooperation between Member States and for making networks and information systems within the EU more resilient. A proposal for Cybersecurity Act³³ is already prepared by Commission where a new Agency on the Union level will be created (ENISA).

factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person – art. 4 para 1

²⁶ Proposal for a Regulation of the European Parliament and of the Council on a framework for the free flow of non-personal data in the European Union COM(2017)495

²⁷ COM(2017) 9, "Building A European Data Economy", 10 January 2017

²⁸ COM(2016) 399, Regulation (EU) No 531/2012 of the European Parliament and of the Council of 13 June 2012 on roaming on public mobile communications networks within the Union, OJ L 172, 30.06.2012, p. 10; Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 laying down measures concerning open internet access and amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services and Regulation (EU) No 531/2012 on roaming on public mobile communications networks within the Union, OJ L 301/1, 26.11.2015

²⁹ COM(2015) 627

³⁰ COM(2016) 289

³¹ Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks, OJ L 155/1

³² Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 concerning measures for a high common level of security of network and information systems across the Union, OJ L. 194/1, 19.7.2016

³³ Proposal for a Regulation Of The European Parliament And Of The Council on ENISA, the "EU Cybersecurity Agency", and repealing Regulation (EU) 526/2013, and on Information and Communication Technology cybersecurity certification ("Cybersecurity Act"), COM(2017)477

²² For more critics about the right of portability see: Diker Vanberg, A. & , Ünver, MB.: *The right to data portability in the GDPR and EU competition law: odd couple or dynamic duo?*, In: European Journal of Law and Technology, Vol 8, No 1, 2017 and also <https://medium.com/mydata/gdpr-data-portability-is-a-false-promise-af460d35a629> (30.12.2017)

²³ An Example of discussion <https://www.cbronline.com/cloud/public/5-tech-reactions-to-the-eu-data-protection-regulation-4756923/> (30.12.2017)

²⁴ For more see: Shabani, M., Borry, P.: *Rules for processing genetic data for research purposes in view of the new EU General Data Protection Regulation*, In: European Journal of Human Genetics (2017)

²⁵ 'personal data' means any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more

Another step into the digital single market is the revision of the Audiovisual Media Services Directive³⁴ - a legal framework for using media in digital world such as television in mobile devices as far current directive brings minimum harmonization and mostly national law applies. Commission already adopted a new proposal of such a revision³⁵

Modern copyright rules for full functioning of the digital single market will be also needed. As already mentioned Europe has a lot of work ahead, some based stones are already laid down. The important message for Europe is that the Commission is providing new legislative proposals and the European Union is willing to finish the establishment of the Digital Single Market knowing that this will pick up the European Union to different level in all kind of areas of life. We still need to establish rules for digital labor market, public administration, public service (eGovernment), health and care digitalization, free flow of non-personal data and data cooperation framework within EU, energy sector and transport – mobility measures, financial and digital technologies. Artificial intelligent is a specific topic which comes hand by hand with the digital single market and should be solved too.

Establishing a digital single market is a huge challenge for European Union and we might not wonder that the timing is not as expected. The European Union will not be the same after the successful creation of Digital Single Market.

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Primary Paper Section: A

Secondary Paper Section: AG

³⁴ Directive 2010/13/EU of the European Parliament and of the Council of 10 March 2010 on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the provision of audiovisual media services (Audiovisual Media Services Directive), OJ L 95, 15.04.2010

³⁵ COM(2016) 287

IDENTIFICATION OF THE CONDITIONS (POTENTIAL) FOR THE DEVELOPMENT OF POTENTIAL CLUSTERS IN THE CONDITIONS OF REGIONS OF THE SLOVAK REPUBLIC

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The paper was written under the VEGA project No. 1/0953/16 "Clusters' impact assessment of regional development"

Abstract: The core of forming clusters resides in the creation of supplier and vendor network, information flow, technologies and innovations, which form comparative advantages in a given sector for the region with the aim to achieve the highest profit with the lowest costs. In this connection, it is necessary to pay attention to conditions, which form suitable environment for the clusters forming. The objective of this paper is to examine placement of the sector employment in the regions of the Slovak Republic with regard to identification of the possibilities of the cluster forming cooperation by means of the coefficient of localization and coefficient of variation. We realized analysis based upon data, which were available in the database of the Statistical Office of the Slovak Republic for observed period 1995-2014 and database DATA cube.

Keywords: cluster, region, regional development, Slovak Republic, sector structure

1 Introduction

In the present, forming and development of clusters represents huge potential not only for the region, but also for the whole country performance increase. Clusters represent tool for restructuring of the regional economy, the increase of the economic performance of the region and improvement of its competitiveness. Potomová and Letková (2011) state that it is due to created network of suppliers and vendors, information flow, technologies and innovations, which form comparative advantages for the region in a given sector, respectively the group of sectors in comparison with other regions. In many countries including EU countries, clusters become primary tools of the regional economic development policies. (Kirankabeş and Arik, 2013) By means of clusters and other involved parties in the region, the socioeconomic differences can be narrowed in the regions. (Ivanová and Kordoš, 2017) In this connection, well-known work of Porter (1990) generated a great deal of interest. In his work, he states that the concentration of industry corporations and their support industry sectors brings competitive advantages. In the present, the most of the cluster studies use Porter's work as a starting point for cluster analysis (Bergman and Feser, 1999). In fact, according to a study examining cluster initiatives across Europe, the majority of cluster programmes were not preceded by an in-depth regional analysis comparable with Porter's cluster mapping process. In most regions, the cluster approach is declared as one of the basic conditions for effective public policies, and clusters play the role of tools for increasing the competitiveness of regional economies, ensuring the formation of centres of attraction of investment and innovative activity. (Kovaleva and Baleevskih, 2014) Due to the lack of red tape in a cluster this form of organization is more flexible and agile than other forms of business (Evseenko, 2010). We can consider flexibility and mobility as the key advantages in terms of the modern economy. Despite the fact that current science and professional literature about clusters is unusually extensive and also simultaneously unusually heterogeneous, there is no so much discussion about the term itself and practical consequences of its inclusion into industry and regions development strategies in the Slovak Republic according to Székely (2008). The objective of this paper is to examine the placement of the sector employment in the Slovak Republic regions with regard to identification of the cluster forming cooperation possibilities by means of the coefficient of localization and the coefficient of variation.

2 Methodology

The paper begins with a brief review of the scientific literature on the subject with references to domestic as well as foreign sources.

We used the method of time series analysis, comparison and synthesis in this article. The method of comparison was used for comparing the employment localization in the particular sectors in the regions of the Slovak Republic. The method of synthesis was used to draw conclusions resulting from the analysis. Applied method of comparison and analysis is realized through localization coefficient and coefficient of variation.

The coefficient of localization (LQ) represents the ratio of the share of employment in the sector in the region to the share of employment in the sector in the total employment in the country. We use it to evaluate differences in the localization of sectors in the Slovak Republic regions.

$$LQ = \frac{Eb_R}{E_R} \cdot \frac{E}{Eb}$$

where:

LQ = localization coefficient,

EbR = employment in the selected sector in the region,

ER = employment in the region,

Eb = employment in the selected sector in the SR,

E = employment in the SR.

A localization quotient more than one, indicates the regional specialization. It means that the region is specialized in given industry. A localization quotient less than one means that the given region is not specialized in the given industry.

A localization quotient more than one, indicates the regional specialization. It means that the region is specialized in given industry. A localization quotient less than one means that the given region is not specialized in the given industry.

Coefficient of variation (CV) we used to measure the degree of regional inequality. It is the proportion of standard deviation to mean of value of the set that we express as a percentage based upon following formula:

$$V_x = \frac{\sigma}{\bar{x}}$$

To calculate the coefficients, we took data in the time series between 1995 and 2014. The statistical data from the Statistical Office of the Slovak Republic, database DATAcube was used.

3 Clusters and their importance for regional development

In the 19th Century, proposals for cooperation of industry sectors, which were concentrated in one place with the effort to achieve savings and increase revenues, although, they were not named clusters yet, they were emerging in the works of important economists (for example Marshall). At the end the 20th Century, an important American economist Michael Porter elaborated the issue of cluster cooperation in detail, and many other authors gradually started to deal with the area of clusters research. There are many definitions of clusters, which are connected with the purpose, area or a context of origination of this term.

Porter (1998) defined cluster as a geographical proximate group of interconnected corporations and associated institutions in a particular field, linked by commonalities and externalities. As stated Havierníková (2013), in general clusters can be defined as a group of firms, related economic actors, and institutions that are located near each other. Clusters are defined by relationships and geography with the aspect of concentration of one or more sectors, within a given region as well as the emphasis on networking and cooperation between corporations and institutions. Skokan (2007) understands cluster as a group of

dependent corporations and other affiliated institutions in the particular sector (for example: information technology, machinery, biotechnologies, financial services) that are interconnected with common technologies, research, traditions and workforce. He also emphasizes the importance of clusters in order to achieve competitiveness national or regional economies.

Potomková and Letková (2011) state that clusters represent tool to restructure regional economy, increase the region economic performance and improve its competitiveness. It is due to created network of suppliers and vendors, information flow, technologies and innovations forming comparative advantages for the region in a given sector, respectively the group of sectors in comparison with other regions. Clusters play an important role when it comes to small and medium enterprises access to innovation and research, or joint development at international markets. (Kordoš, Krajiňáková and Korbach, 2016)

The chaining and clustering bring many positive externalities, for example: (a) attracting and development of related industrial branches which provide the special outputs and services; (b) making the supply of specialized labour forces with all knowledge, skills and know-how what are needed for selected industrial branch; (c) ideas, knowledge and technological development spreading between firms and entrepreneurs in selected industrial branch; (d) the industrial atmosphere making with amount of formal and informal labour methods, habits, traditions, social values and specialized institutions which allow the effective existence of selected industrial branch. (Stejskal, 2009) Grouping corporations into clusters can have a positive influence on the development of the region where the corporations are situated and on the growth of competitiveness of the region.

For the reason that not only individual regions, but also the goals and ideas of individual clusters are different, the process of cluster forming, as well as their effective management, is subjective. (Sošová, 2014)

According to Jemala (2009), the key success factors in cluster forming are adequate capital structure; well-prepared long-term business plan, financial plan and budget observing to reality; qualitative infrastructure, nearness of markets and adequate demand in the area; support of the government, the region and the local population; adequate and stable legislation; intensive entrepreneurial and innovation basis and the existence of a knowledge supporting basis on a high-level (including universities and vocational schools); a high-class partnerships and their relationships, and finally a good management and controlling of a cluster.

3.1 Identification of potential clusters

In the professional literature, it is possible to identify two basic approaches to determine cluster mapping either (‘top-down’) or (‘bottom-up’).

As stated Potomová and Letková (2011), the first approach helps to identify key sectors, respectively branches that have real possibly potential competitive advantage usually based upon quantitative data particularly at the national and regional level. There is a huge amount of quantitative methods, however their usage to a certain extent, depends on the database availability. The most often applied quantitative methods are such as: the coefficient of localization, shift-share analysis, Gini’s coefficient of localization, input-output analysis, factor analysis, cluster analysis and others.

Top-down approach is based on the usage of qualitative methods independently of available public data and it is realized entirely at the local, respectively regional level. In contrast with quantitative methods, qualitative methods are dealing with the existence of inside processes and relations between particular corporations of the cluster in a given region. Apart from relations between inputs and outputs, they also explain other factors such as sectors cooperation and above-mentioned information flow

(Doeringer and Terkla, 1995). Qualitative methods are such as: interview with experts, representatives of the particular corporations, expert statement, case studies, surveys and other. As stated Zaušková (2010), the coefficient of localization is the most used quantitative method for cluster identification. It is simple method, which is suitable for statistical searching of the local and regional clusters. It is very often used because data needed for calculation are easily available. Its disadvantage is the fact that it does not provide deeper view of the mutual dependence between particular corporations within the sector. In order to do that, it is necessary to apply other methods for example: shift-share method. The value of the coefficient of employment localization expresses how many times the sector share of employment in the region is higher than the country average. The value of the localization coefficient of the particular sector higher than 1.5 proves regional specialization (Andersen, Bjerre and Hansson, 2006). Other authors state value 1.2, respectively 1.25 (Bergman and Feser, 1999).

Apart from mentioned authors, the coefficient of localization and the shift-share analysis potential clusters identification are also used by Havierníková and Strunz (2014), Stejskal (2011), Litvintseva and Shits (2015), Kovaleva and Baleevskih (2014) and others.

3.2 Application of the coefficient of localization for potential cluster identification in the regions of the SR

In order to assess possibilities to establish cluster cooperation in the regions of the Slovak Republic, we examine the localization of employment in the particular sectors in the following part by means of the coefficient of localization.

Statistical Office of the Slovak Republic divides sectors in terms of SK Nace Rev. 2 classification into sections A-U, as stated in Table 1.

Table 1: Sector classification in the SR

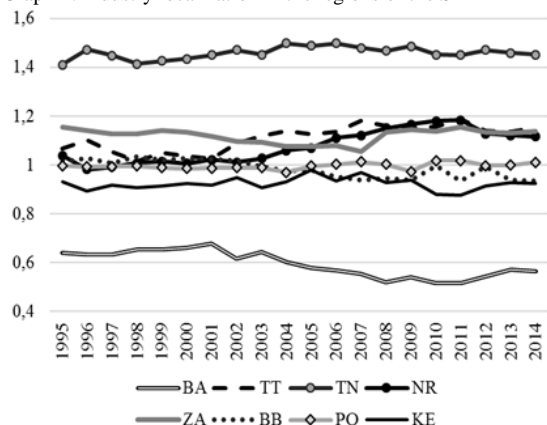
Section	Title
A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O	Public administration and defence; compulsory social security
P	Education
Q	Human health and social work activities
R	Arts, entertainment and recreation
S	Other service activities
T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
U	Activities of extraterritorial organisations and bodies

Source: Statistical Office of the Slovak Republic

Industry sector (B-E) takes the biggest share in GNP creation in the SR. It follows from the results of our analysis that industry sector is the most represented in the Trenčín Region (TN) as the coefficient of localization ranges from 1.41 (1995) to 1.5 (2006). Other regions follow by a relatively large margin. The Bratislava Region (BA) is the last one where the coefficient of localization reaches only 0.52 at the end of 2010. The development of the

industry coefficient of localization in the regions of the Slovak Republic is depicted on Graph 1.

Graph 1: Industry localization in the regions of the SR



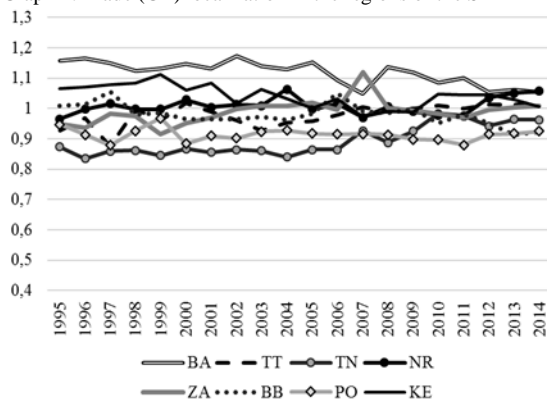
Resource: own calculations based on Statistical Office of the Slovak Republic

Agriculture, forestry and fishing (A) sector in the SR gradually decreases its share of employment and GDP creation. With regard to its localization coefficient in the Slovak Republic regions, above-average share of employment is showed in Nitra Region (NR), Banská Bystrica Region (BB), and Prešov Region (PO). The significant decrease of the localization coefficient was recorded in the Trnava Region (TT) in connection with the development of automobile industry. The lowest value of the localization coefficient is in the Bratislava Region (BA) only 0.24 in 2001 and it increased slightly to 0.35 until 2014.

With regard to construction (F), in year 1995, this sector was above-average localized especially in the Bratislava Region (LQ: 1.30). Since year 1996, the Žilina Region was at the first place (LQ: 1.36 in 2005). Since year 2010, the Prešov Region (LQ: 1.49 in 2014) was at the first place. In the observed period, the differences in the localization in the construction sector in the Slovak Republic regions were increasing.

Other important sectors of the Slovak Republic economy are such as: wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage and accommodation and food service activities (G-I) that represent the biggest employers in the SR. In these areas, the differences between regions in employment are small (LQ is between 0.8-1.2) and during the observed period are decreasing (graph 2). In the most years, the Bratislava Region takes the first place. The lowest LQ was in the Trenčín Region (TN) and since 2007 in the Prešov Region (PO).

Graph 2: Trade (G-I) localization in the regions of the SR



Resource: own calculations based on Statistical Office of the Slovak Republic

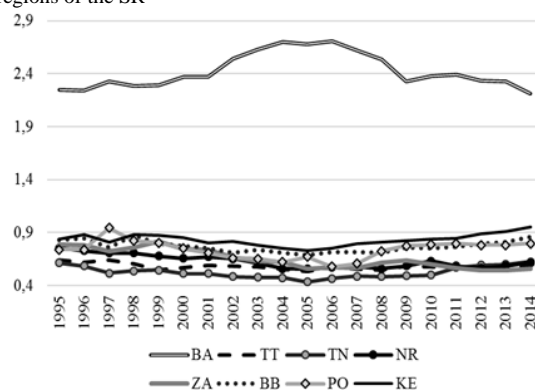
Public administration and defense; compulsory social security, education, human health and social work activities (O-Q) sectors

show small relative differences in employment, however these are slightly increasing. Until 2005, the highest LQ was in the Prešov Region (PO), later in the Košice Region (KE) and the Banská Bystrica Region (BB). The lowest localization coefficient was in the Trenčín Region (TN) amounted to 0.74 in 1997.

Information and communication sector (J) is very perspective sector where we can observe significant difference between the Bratislava Region and other regions when in 2011 LQ reached value of 1.65. The Košice Region is at the second place (LQ up to 1.23). In other regions, LQ values are almost at the same level. Although since 2010, the differences had been increased. The Prešov (LQ: 0.64 in 2010) and the Trenčín Region are at the last place.

Financial and insurance activities (K) sector is above-average localized in the Bratislava Region (graph 3), which as the only region is placed over the average of the Slovak Republic and in 2004 and 2006 reached LQ value up to 2.7. The Trenčín Region (LQ: 0.43 in 2005) was at the last place until 2010, since then it was the Žilina Region.

Graph 3: Financial and insurance activities localization in the regions of the SR



Resource: own calculations based on Statistical Office of the Slovak Republic

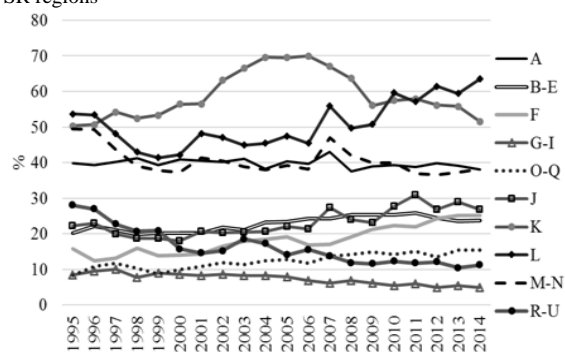
We can observe significant margin of the Bratislava Region over other regions in the SR (LQ: 2.51 in 2014) also in real estate activities (L). The Košice Region, that is the second one, reached the level over the SR average only in some years. Other regions do not reach the average level at all. The Prešov Region was the last one (LQ: 0.39 in 2011) and the Žilina Region is the last one within the last two years.

Sectors Professional, scientific and technical activities and administrative and support service activities (M-N) is characterized by a significant employment localization in the Bratislava Region, although its significant margin over other regions is slightly decreasing (LQ: 2.22 in 1995, in 2014: 1.91). The lowest localization coefficient value of 0.57 in this sector was in the Prešov Region in 1996.

In sectors such as arts, entertainment and recreation, other service activities (R-U), the Bratislava Region margin over other regions was at the beginning quite significant, however, in the following years, the differences were reduced. The Banská Bystrica Region, the Trenčín Region, the Nitra Region and the Žilina Region alternate at last places.

We evaluated differences in the localization of the particular sectors in the SR by means of variation coefficient. The result values of the variation coefficient are depicted in Graph 4.

Graph 4: Variability of the sector employment localization in the SR regions

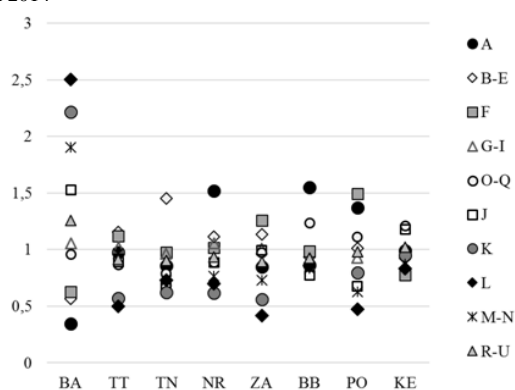


Source: Own processing, own calculations

At it follows from Graph 4, the biggest differences in the employment localization in the SR regions are in financial and insurance activities sector (in 1997-2009 and 2011). In other years, the biggest differences are in real estate activities sector. Both sectors are concentrated in the Bratislava Region. The employment in wholesale and retail trade and public administration sectors is distributed equally and as well as since 2007 in arts, entertainment and recreation sector.

At the end, we evaluate the localization coefficients of the particular regions in the SR in 2014 to find out which sector has over-average representation in the region. This would create prerequisites for cluster cooperation. The results are depicted in Graph 5.

Graph 5: The localization coefficient in sectors in the SR regions in 2014



Source: Own processing, own calculations

As it follows from Graph 5, the biggest differences in the sector employment localization are in the Bratislava Region, on the contrary, the lowest differences are in the Košice Region. In the Trenčín Region there are suitable conditions to form cluster in the industry area as industry is over-average represented in this region. In the Nitra and Banská Bystrica Region, agriculture, forestry and fishing dominate. In the Prešov and Žilina Region, construction is over-average localized.

4 Conclusion

Clusters represent network groups of corporations concentrated in one area, which operate in the particular industry sector. Clusters, which operate correctly by means of competitive benefits, are asset not only to the particular corporations, which are part of the cluster, but also to the region growth. In the article, we examined distribution of the sector employment in the regions of the SR with regard to identification of the cluster forming possibilities.

It followed from the research that the biggest differences in the sector employment localization are in the Bratislava Region (BA), on the contrary, the lowest differences are in the Košice

Region (KE). In the Trenčín Region, there are suitable conditions for cluster forming in industry sector as industry is over-average represented in this region. In the Nitra Region (NR) and in the Banská Bystrica Region, agriculture, forestry and fishing dominate. In the Prešov Region (PO) and in the Žilina Region (ZA), construction is over-average localized.

However, as Szekely (2008) stated, over-average sector employment provides hypothetically assumption about the existence and the possibilities of further cluster development in the region. Whether there is a cluster in a given region or not it can be revealed only by a detail analysis of the corporation's structure and their mutual business and non-business relations, because the existence of high regional employment itself in one sector does not mean cluster existence in that region.

Therefore, based upon our research as well as further researches from which we gained information sources, we can state that the cluster approach in the SR is very ambiguous and their correct identification belongs to the basic questions of the cluster research issue. Therefore, it is necessary to establish central database in the SR, which will monitor forming, activity and effectiveness of clusters, so that the relevant information about clusters activity would be more available for researches. This creates assumption for more accurate identification of the preconditions for forming of the new clusters that will contribute to particular regions development.

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Primary Paper Section: A

Secondary Paper Section: AH

INCREASING USER COMFORT OF HOUSING FACILITIES BLOCKS OF FLATS IN THE CZECH REPUBLIC

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The paper has been supported from the funds of the Student Grant Competition of VŠB – Technical University of Ostrava. The project registration number is SP2017/115.

Abstract: An essential requirement of these days in the Czech Republic is to increase sustainability of new and existing buildings and increase the benefits of their future use. This applies especially to the houses and flats, where the demand for user comfort and spatial efficiency is rising. User comfort and efficiency have so far been dealt with first of all with focus on the flat alone, whereas the other areas of blocks of flats were neglected. The concept of a building should always be a natural response to the needs of the users, who however change their needs during the course of time. Therefore this article focuses on the facilities in blocks of flats and their influence on the overall user comfort.

Keywords: block of flats, housing, flat, facilities, spatial, user comfort.

1 Introduction

Dwelling is a fundamental human need; it is a complex social phenomenon, reflecting any change in transformation of society and economics significantly. Dwelling issue does not only include designing and construction of a dwelling place but also the housing policy, responding to problems and requirements of the society. The main objective of housing policies of all countries, regardless of political, cultural, social or economic differences among them, is to provide their citizens with adequately good-quality and available housing. Housing, family, family or multi-family houses, residential environment, are topical and often discussed problems of the contemporary society. From the social and cultural view, user comfort plays a key role. When evaluating the complex quality of buildings from a wide array of sustainability criteria, the traditional assessment focuses on the economic issues, however according to contemporary trends this is no longer enough. Therefore we need to assess a building also from the social and cultural view, possibly during the whole life cycle of the building. Therefore this article focuses on the facilities in blocks of flats and their influence on the overall user comfort in blocks of flats..

2 Housing stock in the Czech Republic

In 2011, the housing stock in the Czech Republic included 4,756,572 flats in sum, which compared with 1991, represented an increase by almost 680 thousand (16.7 %). (czso.cz)

Houses, flats, type of house	Population Census Year		
	1991	2001	2011
Houses total	1 868 541	1 969 018	2 158 119
Family houses	1 605 227	1 732 077	1 901 126
Residential buildings	228 566	196 874	214 760
Other buildings	34 748	40 067	42 233
Flats total	4 077 193	4 366 293	4 756 572
In family houses	1 795 462	2 005 122	2 256 072
In residential buildings	2 244 947	2 310 641	2 434 619
In other buildings	36 784	50 530	65 881

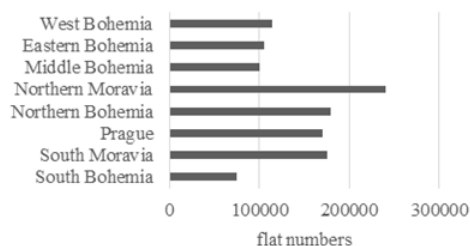
Tab. 1: Development of housing stock between population censuses in 1991 and 2011, Population Census Year (source: czso.cz)

Houses, flats, type of house	Growth index (in %)		
	2001 1991	2011 2001	2011 1991
Houses total	105.4	109.6	115.5
Family houses	107.9	109.8	118.4
Residential buildings	86.1	109.1	94.0
Other buildings	115.3	105.4	121.5
Flats total	107.1	108.9	116.7
In family houses	111.7	112.5	125.7
In residential buildings	102.9	105.4	108.4
In other buildings	137.4	130.4	179.1

Tab. 2: Development of housing stock between population censuses in 1991 and 2011, Growth index (in %) (source: czso.cz)

Living in multifamily houses in the Czech Republic refers to a significant portion of the total number of inhabitants. The contemporary society endeavours after general availability of dwelling, enhancing its quality which was mostly left at the level of "panel building" housing estates in the years of 1950 – 1990.

Panel building took place predominantly in the years of 1950-1990 and at present, the panel building in the Czech Republic represents a third of all permanently inhabited multifamily houses; it is necessary to tackle the problems in more detail than so far and deal with effective solutions. The number of buildings built of pre-fabricated concrete blocks in the Czech Republic reaches almost 200 thousand. The quantity of flats in the buildings is 1.2 million, which is roughly 55 % of all flats in residential buildings and approx. 30 % of flats out of the total housing stock in the Czech Republic. (Census - czso.cz)



Graph 1: Number of flats in panel buildings in individual parts of the Czech Rep. (source: processed by EkoWATT)

Panel buildings were built in construction systems, varying mainly in dimensions of wall elements, in types of service cores, in eventual heat cladding and according to the year of building. Furthermore, the systems modified into variants according to their original locality. The most used panel building systems in the CR: BANKS, B 70, G 57, HKS 70, Larsen & Nielsen, OP 1.11, OP 1.21, PS 69, PS 69/2, T 06 B, T 08 B, VVÚ ETA.

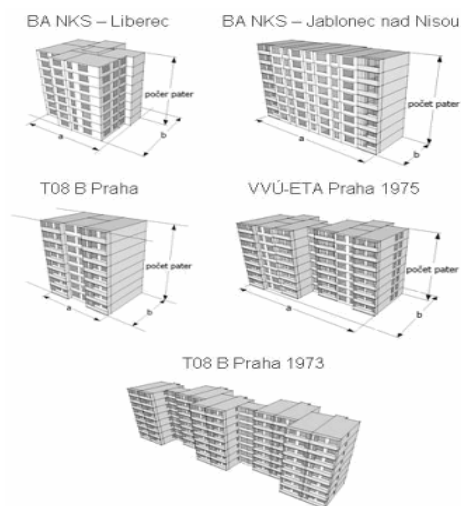


Figure 1: Types and variants of construction systems. (source: EkoWATT)

The contemporary condition of reconstructed panel buildings is satisfactory in terms of energy saving but it is due to application of standard economy measures and often due to one-sided view of the matter, the total reconstruction of residential buildings in light of internal lay-outs has not yet been considered for years.

While in the 1960s and 1970s, the construction of residential houses of pre-fabricated concrete blocks prevailed, primarily the construction of panel houses with a large number of flats, this proportion has been changed slowly since the beginning of 1980s. Since mid 1990s, the construction of family houses has prevailed. Growing interest in family living in one's own house supported new building round large cities, but it was also reflected in reconstruction and resettling of family houses that were only used for recreational purposes in previous decades. The trend was changed in inhabitation. While the number of inhabited family houses was gradually declining in the period of 1961 – 1991, the tendency has been opposite since 2001. (Census - czso.cz)

While at the time of construction of blocks of flats it used to be common to design and frequently use these house facilities, they rarely play their originally intended role now. Before designing the house and flat layout we need to clarify the requirements for the operation relationships, functional and special requirements. Therefore we need to think about the usability and spatial efficiency of the select areas of house facilities, especially the rooms for baby prams, bicycles and invalid chairs, storage rooms (unless a storage room is part of the flat), which are defined by the norm ČSN 73 4301 about housing in the Czech Republic as mandatory for ensuring the economic and technical operation of a residential building.

3 Interior facilities in Residential buildings

The quality of dwelling is created by personal dwelling space, the nature of surroundings, public areas and by creation of conditions and background for activities and actions related to dwelling. Other additional functions and services necessary for good quality living such as parking lots for cars or facilities are solved. It is necessary to design the facilities for provision of economic and technical operation of residential building. According to ČSN 73 4301, residential buildings are defined as mandatory area of the facilities such as the area for storage of prams, bicycles and wheel chairs, rooms for storage things that are not part of the flat, the space and equipment for heating in buildings with central heating, the space for fuel in buildings with local heating, the space for storage of unobjectionable garbage in terms of hygiene and fire prevention, lay-byes and parking areas, garage parking for passenger cars. Residential buildings may have other premises and facilities namely a housekeeping and storage room, a cleaning room with sink and

hot water outlet, linen drying room perhaps even laundry and ironing room, the facility for beating carpets, an assembling room for inhabitants with multi-purpose utilization, customization of flat roofs for recreational purposes or for linen drying. These premises, primarily the space of basement compartments, common rooms for storage of bicycles and prams should be a frequently discussed topic in designing of new residential buildings and during the reconstruction of buildings.

While in the period of development in housing estates it was common that a basement compartment, among others, was designed in each new residential building; these premises serve now for other purposes in the better case. The initial intended function of these premises was to store food, preserves or various clubs could have established clubrooms, workshops or fitness centres in larger premises. Times have changed during the last several decades. Due to the fact that food is more easily available in a supermarket and shopping frequency has changed, it is not necessary to store less durable food at the expense of its shopping frequency. Also thanks to social integration of inhabitants, within hobby groups and clubs into multi-purpose buildings, it is not necessary to build them in the residential building premises.

According to the Rule of the house, it is clearly defined how the residential building appurtenances should be utilized. The residential building facilities are only used for purposes corresponding to their operation and intention so that the rights of other tenants in the house cannot be limited. Placing or storage of any objects is not permitted in collective rooms except for those for which the spaces are designed (e.g. prams in pram room, bicycles in bicycle room, etc.). For this reason, one of the residential building premises that retained its function are the rooms for storage of bicycles and prams.

In a number of residential buildings, the premises are not utilized at all. This can be utilized for the establishment of the above mentioned functions and services for cheap rent. But the settlement on utilization of empty premises with owners is crucial. However, with the current increasing trend towards the utilization of bicycles in traffic and creation of new cycle paths, it is surely more suitable to find solutions for utilization of these premises that would be aimed at supporting the initial plan for utilization of these premises for storage of bicycles.

Generally speaking it can be said the facilities are an important part of the residential building – it can largely influence the convenience of living in the building. The implementation of premises for placement of the facilities increases simultaneously the costs for construction and these are negatively reflected in the dwelling unit price.

4 Influence of Household Equipment for evaluation user comfort apartment buildings according to the methodology SBToolCZ

The purpose of user convenience evaluation according to SBToolCZ Methodology for evaluation of residential buildings is the evaluation of a number of aspects in the field of healthy and good-quality dwelling. It includes also the evaluation of bicycle and pram rooms as well as basement compartments being evaluated pursuant to storage area safety and standings according to which the areas are given the so-called credits based on which the user convenience is then determined.

Item	Description	Credits
Safety of storage rooms	Individual threat of damage, theft secured location	10
	Acceptable threat of damage, theft - individual only	5
	Unsecured location without control and possibility of control	0
Position of storage rooms	In building – individual basement compartments (condition is sufficient)	10

In building – individual garage	10
In building in reserved common area	9
Outdoor - covered reserved area	5
Outdoor – uncovered reserved area	3
No reserved area	0

Table 3: Table for evaluation of bicycle and pram rooms and basement compartments (source: SBToolCZ Methodology)

The floor area is another of the evaluation criteria. The pram room or the bicycle room must have a minimum floor area according to Table 4.

Number of flats in building	Minimum area (m ³)
Family house	3
< 10	10
10 to 30	20
31 to 50	30
> 50	40

Table 4: Minimum floor area for pram rooms and bicycle rooms (source: Methodology SBToolCZ)

The size of individual basement compartment is considered sufficient if the basement compartment has minimum floor area dimensions of 1.9 x 1.1 m at least whereas the requirements for both dimensions must be met). If the minimum floor area is not met, then the points given for the position of storage rooms are reduced by a multiple of 0.5.

If there are more types of storage rooms in the building, then credits are determined for safety of storage rooms and their positions for each type of such room separately. But if each flat has a basement compartment, then credits are reduced adequately to the representation of quantity. The final evaluation is obtained as the sum of weighed averages of the points given for the safety of storage rooms and their positions in individual types of storage rooms, but 10 points at the most.

Other facility rooms located in the residential building, such as linen drying room, laundry room and others, are evaluated according to floor areas of the closed spaces that are accessible from common area and for all inhabitants. The common circulating area and the one located in the exterior of the building are not included. The floor area of the premises is calculated according to equation (1):

$$HP = PSP/(PB \times 0.5) \quad (1)$$

,where PSP is the sum of floor areas and PB is the quantity of flats in the residential building under evaluation.

Awarding points is implemented by linear interpolation according to limit values. If $HP \geq 2$, it is then given 10 points. If $HP \leq 0.2$, it is then given 0 points. (Vonka, 2012)

Except for evaluation of the residential building facilities, another three criteria are evaluated to determine the quality of user convenience. The existence of balcony or loggia, heating system, hot water preparation and ventilation ranks among them. The final credit evaluation of all categories, having an influence on residential building user convenience, is then their arithmetical average.

5 Research and Utilization space efficiency of Residential Buildings Household equipment for Determining User Comfort

The subject of research in the project to research the usability and space efficiency of residential buildings house equipment, from which this post is supported, is solved in the context

dissertation topic „Research on new forms of housing in the context of optimizing the space of residential buildings“. The current unstable global economic situation is not very favorable to new construction investments. Conversely, an essential requirement today is for enhancing the sustainability of new projects and existing buildings and increase their future benefit. This state is especially true for a group of housing stock; increasing demands for user comfort and space efficiency of residential buildings. Both of these criteria as a result of the important influence speak to the operating costs of residential buildings. In the methodology of the national instrument for quality certification of buildings according to sustainability principles SBToolCZ the criterion of user comfort weight of 3.2% and spatial efficiency criterion of 2.5%. (Vonka, 2012)

For the present project has been and will continue to be used a combination of theoretical and empirical methods. As a general input method project was implemented analysis of past and current requirements for the existence of house equipment. The analysis was performed through relational analysis focused on the analysis of legal and normative materials, as evidenced by the analysis portion of the sample is processed in this paper, see above. This method was chosen for its best explanatory power to reach certain results based on a detailed understanding of the details.

To determine the real state of usability house equipment will be used method of direct survey questionnaire form. Questionnaires will be sent to owners of residential buildings or their administrators and the general public to obtain the greatest possible range of respondents. Choosing this method to determine the real usability of house equipment is destined absence of any statistical information. Subsequently, descriptive statistics will be used to sort the measured values, their assembly into tables and graphs.

The research objective is to prove or disprove the hypothesis that domestic equipment is not really sufficiently exploited and on the basis of this result to suggest modifications subsequent forms of legal and technical standards governing the issue in question (eg. A partial moving surfaces to surfaces accessory apartment - bath, cellar rooms etc.). Achieving goals also relies on the ability to design implementation evaluation areas house equipment into the overall calculation of the quality certification of buildings according to sustainability principles SBToolCZ, which was mentioned in the previous chapter. Usage adjustments is expected to further solution.

6 Conclusion

The difference in flatness flats and apartment buildings house equipment is considerable. This also has an impact on its utility and space efficiency and consequently the overall user experience of residential houses. This concludes the need to develop spaces in residential buildings diverse, scalable and flexible, with an emphasis on the changing needs of the population.

Current city type person whom the population of today's Czech Republic without doubt is that increasingly tends not only to live in a family house outside of town, but also for living in an apartment in an apartment building, but which in this case must offer apartments with different number of rooms and flatness as well as comfortable space associated equipment, such as household equipment.

Minimized surface require thorough rethinking every detail. Link works civil engineering and architecture, sophisticated layout, based on the craftsmanship of today's real requirements, consistent work and participation of specialists from other professions can provide a perfect finish to the last detail. Finally, it should also be said that it is appropriate to focus on the organization consistently in the layout of the rooms and their proportional relationship. Consistently apply the material and aesthetic quality in production. Ensure efficiency, utility,

material and aesthetic quality of the user experience brings desirable.

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Primary Paper Section: A**Secondary Paper Section: AO, JN**

GROUP IDENTITY AND ITS IMPORTANCE IN CREATING MIXED MARRIAGES

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Abstract: The aim of the presented study is to determine the importance of group identity in creating mixed marriages. We will examine what is the attitude to belonging to a group when choosing a spouse, which categories people consider important when grouping partners and themselves into particular groups and which groups they consider recommended or unacceptable in their marital preferences and why. We will try to answer these questions on the basis of a questionnaire survey realized among the inhabitants of Slovak town Prievidza. The research results demonstrated the importance of group identity when choosing a partner, showing the preference of a partner from the same or a similar group, also suggesting the existence of specific groups which the respondents strongly oppose to in partner preferences.

Keywords: binary oppositions, identity, group, social category, mixed marriage, choice of a partner.

1 Introduction

In the Anglo-Saxon, Francophone, and also in the domestic Slovak scholarly literature, several terms are used to denote a mixed marriage: "international", "intercultural", "bi-cultural", "transcultural" marriage, or "marriage with a foreigner". A mixed marriage is a marriage where partners come from different ethnic, religious, racial, linguistic, social, cultural, geographic or political/economic settings. A common identifying feature of all of these cases is crossing of boundaries between different groups. Mixed marriage is therefore to be seen not only as a term of a commonly used language or legal terminology, but above all as a social category reflecting normative and moral aspects of individual's life within the group as well as mutual relations between two or more groups.

The aim of the study is to identify the importance of group identity (sense of belonging to a particular group or groups, conformity with its values) when creating mixed marriages or when thinking about them. In the empirical part, we will try to find out what is the attitude to belonging to groups when choosing a spouse, which categories (e.g. ethnicity, religiosity, nationality) people consider important when grouping partners and themselves into particular groups and which groups they consider appropriate and recommended and, on the contrary, unacceptable in their marital preferences and why. We will try to answer these questions on the basis of qualitative and quantitative questionnaire survey among the inhabitants of Prievidza – a town situated in the west part of Slovakia.

2 Theoretical background

2.1 Research of mixed marriages

Mixed marriages are most often studied as a consequence of a contact and spatial proximity to another group and its members. They occur in cases of immediate proximity to different groups, with the greatest intensity of their occurrence being usually recorded in mixed environments or at the borders of groups – in, so called, contact areas (e.g. near the state border). Migration processes are another factors enhancing contacts and crossing borders between groups of different types. On the American continent, the concept of mixed marriages has traditionally been based on the racial difference of partners. "The Interracial Marriage: Expectations and Realities" published by I. R. Stuart and L. E. Abta (1973) or "Black/white interracial marriage trends, 1820-2000" by A. Gullickson (2006) are examples of this type of works. Interest in this phenomenon in the USA was also focused on its connection to European immigration, i.e. marriages between Americans and foreigners. On the European continent, the cultural aspect is considered to be the main barrier to mixed marriages. Interest in this issue was therefore

significant in countries with an ethnically and religiously heterogeneous native population and states with a rich immigration history, such as the United Kingdom, France, Germany and the Netherlands. Mixed marriages were perceived in this context as an assimilation index, an identifier of migrant integration and social distance between groups. These topics are discussed in the works of M. Song (2009) and co-authors D. Furtado and T. Song (2015). The context of immigration and mixed marriages in the post war period is addressed by L. Lucassen and CH. Laarman (2009). The analysis of mixed marriages with foreigners in European countries in the perspective of current statistical data is found in the work of G. Lanzieri (2012: 1-4). The question of mixed marriages of the domestic population and migrant partners on the European continent is examined in the publication "Sociology of Mixedness. From amorous mixedness to social and cultural mixedness" by G. Varro (2003). The study by N. Milewski and H. Kulu (2014) and the authors T. Niedomysl, J. Osth and M. Van Ham (2010) or S. Carol (2016) deal with this phenomenon in the countries of Western Europe, particularly in France, Germany or Sweden.

In Slovakia, which can be perceived as a traditionally emigrant country with a low number of immigrants in its territory, the interest in mixed marriages has traditionally been related to local endogamy but also to ethnically and confessionally mixed marriages in culturally diverse regions. It was mainly about examining the relationship of majority to traditional national and religious minorities, but also between minorities. Among these works we can mention, for example, studies by L. Fónadová and T. Katrňák (2016), J. Majo (2011), E. Kráľová (1995), Z. Beňušková (1997), A. Mann (1990), Letavajová (2015) and P. Šoltés (2009).

2.2 Endogamous preferences when selecting a partner

It is obvious that marriage is more than a relationship between two people, it is a relationship between two or more groups and it is related to their mutual status and position. When choosing a spouse the desired pattern of behaviour is introduced through group identification. Relationship between groups is influenced by natural fixation on its own group, its highlighting and preference, and vice versa, the distance and rejection of a different group. Each group ensures that its members create only such relationships that do not harm it, in particular its internal coherence and homogeneity. It is therefore logical that the traditional and dominant model in marital preferences is to select a partner from the same group, referred to as endogamy (or homogamy). The term endogamy and its opposite exogamy (preference for a partner outside his group) were introduced into social sciences by Scottish ethnologist J. F. McLennan. In his work "The Primitive marriage" (1865) he used these terms in relation to kinship groups. Later on, this perception was extended to belonging to other types of groups. An in-depth study of mate selection was carried out by A. Girard (1964), M. Bozon and F. Héran (2006), who pointed out that most people do not choose their partner accidentally, but according to principles based on similarity. By choosing a partner with the same patterns of behaviour, worldview, values, habits or knowledge, individuals develop not only the cultural capital of the group, but they also maintain and improve their economic resources (Gabura 2012, Kalmijn 1998).

Crossing of the boundaries of the group by creating a mixed marriage was rare in the past. The most common reason why mixed marriages were not preferred in most communities was not only cultural differences but also different statuses between groups. D. Bensimon and F. Lautman (1974: 17-40) perceive mixed marriages in this context as an expression of group hostility to the environment and as betrayal of individuals towards their own group. Choosing a suitable partner that is in line with group preferences is realized by the community

through various forms of influence or pressure on the individual. This is accomplished in two ways:

1. prohibiting, discriminating against inappropriate and unacceptable partners,
2. preference, prescribing of suitable partners.

The pressure on the individual most often appears as a positive example, advice, pattern and recommendation. However, if an individual is not in line with a group identity and diverts from the expected patterns when choosing a partner, the sanctions will apply. Their form and intensity vary from defamation, intimidation, discrimination, economic sanctions (fine, extortion) to exclusion from the group (excommunication from the church) or death.

Influencing a desired marital behaviour occurs at different stages of an individual's life cycle - before choosing a partner (recommendations, patterns), during his / her choice (prohibitions, recommending of a suitable partner, granting or not granting parental consent) and after creating the marriage (disadvantage of the people of such a marriage including offsprings who have been born in the relationship). The control of compliance with social standards is primarily realized by the family and the wider kindred. The state and the church are the key institutions with the power to decide on the rules of marriage forming. They control the marriage institution through legislation, religious codes, the influence of priests, or local communities. Other members of the groups from which the partners come from - local authorities, neighbours, young men and girls groups, peers and others - also carry out an informal control.

2.3 "A mixed marriage – an unmixed marriage" as a binary opposition

The theoretical and empirical study of mixed marriages is in most cases aimed at perceiving the spatial and cultural-social distance between the groups, from which the partners come from, confronting them with matrimonial forms that are not mixed. The importance of mixed marriages in both traditional and modern communities, the reasons for their rejection or acceptance, can therefore be explained by interpreting the binary opposition itself, "mixed-unmixed". The problem of binary contrasts was elaborated by the French structuralist C. Lévi-Strauss (2007), who believed that people's thinking and behaviours are universal in all societies, as the world is perceived through binary oppositions. The most basic binary oppositions are the opposites "nature - culture", "me and the other person", "sense - rationality", "my society - other societies", "sacrum - profanum" and others. The logic of binary opposites, based on this contradiction, reveals the functioning of a particular group and its relationships with other groups. With this perspective, "unmixed" and "mixed" marriages can be perceived as the following counterparts:

marriage with a partner from the same group "unmixed marriage"	marriage with a partner from a different group "mixed marriage"
accepted/permitted	not accepted/forbidden
normal/ordinary	abnormal/special
customary/traditional/old	unusual/unconventional/new
common/frequent/typical	extraordinary/rare/unusual
conventional/conforming	non-conventional/non-conforming
dominant/connected with majority	connected with minority
unconflicting/without problems	conflicting/problematic
advantageous	disadvantageous
our/we	foreign/different/they
favoured/preferred/supported	unrecognised/stigmatized/despised
at home/inside	elsewhere/abroad/in a foreign country/outside

equal/the same/similar	different/unequal
closed	open
tradition	modernity/innovation

The outlined binary oppositions highlight in particular the disadvantaged position of the mixed marriage, they underline the existence of barriers between groups and the defence against their crossing and overcoming. Such model assumes or even expects a possible conflict within the couple (between partners) or between the couple and the groups from which the partners come from, it generally evokes negative connotations in relation to such marriages. The term "mixphobia" is an expression of a negative view of "mixing" in partner relationships (Varro 2012: 28).

Mixed marriage can be perceived in this sense as a deviation from the "normal state". Such partnerships are outside the group or groups from which the partners come from. They are not mixed because they are bi-cultural, but because their choice differs from the standards of marriage partner selection and group relations prevailing in the society. Mixed partnerships are a question of diversity and a question of conformity in relation to social standards. D. Bensimon and F. Lautman call a mixed marriage one that provokes a reaction in its social environment. In this sense, mixed marriages are an expression of a particular deviation in partner selection. They emerge as a specific type of a marriage, they describe the nature of the deviation, separating mixed marriages from unmixed ones. Individual communities, however, are very variable in the assessment, acceptance and rejection of these "mixed marriages". (Bensimon - Lautman 1974: 30, Collet 2012: 70-71)

The opposite view is represented by the perception of a mixed partnership as something new, modern, open, and connecting, and it is ultimately a positive phenomenon. The presence of mixed marriages and their perception in individual groups or cultures can be understood in this respect as a state of balance. It reflects the group's ability to maintain its own values and standards, to ensure stability and at the same time to tolerate, innovate and accept something different. This measure is a sign of a certain balance between openness and closure in relation to one's own group and other groups and thus a sign of the group's viability. In accordance with the concept of binary contrasts, the following oppositions can then be ascribed to a traditional and closed marriage with a partner from their own group:

marriage with a partner from the same group "unmixed marriage"	marriage with a partner from a different group "mixed marriage"
traditional/closed/unable to communicate	modern/open/innovative/capable to communicate
group separation/highlighting differences	bonding/integration/inclusion

Discourse on the principles of binary oppositions in mixed marriages is also being developed by the following authors. The perception of mixed marriages as "white - black" is considered archetypal. In this context C. Philippe uses the term "a domino couple". He explains his view by the effort to grasp and define cultural differences between the partners as a visible colour difference (Philippe 1983). The works of N. Karkabi (2011: 79-97) or M. Oppermann (1999: 251-266), which examine the cultural conditionality of this phenomenon as a consequence of tourism development, are also inspiring when studying the patterns of the creation and functioning of mixed marriages. The question of relationships or marriages created between partners (tourists) coming from West European countries and the so-called Eastern cultures (e.g. Egypt) can then be perceived as the opposition "West" – "East".

The existence of mixed marriages can therefore be seen as a sign of shifts in the intensity of adherence to the social boundaries and, at the same time, as a measure of socio-cultural distance

between groups, mutual acceptance and openness of groups, or vice versa, rejection and closure. Marital preferences simply tell us which groups they communicate with and with whom they do not communicate.

3 Methods of empirical research

The research of the marital preferences was carried out among the inhabitants of Prievidza – the town in the west part of Slovakia. We chose this city for our research for several reasons. In terms of the number of foreigners Prievidza ranks among typical Slovak towns and it is a town with a wide range of foreigners in terms of the reason of their arrival as well as their country of origin. The share of foreigners in the total composition of the population (1.73%) is comparable to the average of Slovak population. Almost 97% of the total population (47 thousand) are accounted for by Slovak nationality, 62% of the population has Roman Catholic confession (another 29% of the population is without confession, 2% are Lutherans). In 2014 the research of local integration of foreigners was carried out in the town (Hlinčíková - Chudžíková et al., 2014).

We carried out a questionnaire survey during 2016 and in the first half of 2017. To obtain the data we used a questionnaire (with more than 50 questions), which was filled out by respondents themselves or we filled it out after an interview with them. Through the questionnaire, we tried to find out how respondents define and evaluate a mixed marriage in general, within which groups (defined for example on the basis of ethnicity, religiosity, race, nationality, cultural specifics, spatial distance) and specific subgroups they are willing or unwilling to tolerate the crossing of inter-group boundaries by mixed marriage and why. The importance of ethnic, religious, linguistic, racial, national, state or continental identity in marriage preferences of respondents has already been indicated by a survey conducted on a sample of 5 respondents that we realized prior to the start of the research itself. The necessary information was found in relation to the respondents themselves, as well as the respondents' recommendations when choosing their children's partners. We therefore considered the use of open questions as important. This method gives respondents the opportunity to think freely, to create their own categories and to justify their views. The obtained material was then subjected to a qualitative and quantitative analysis, following the contents of the testimonies themselves, their structure and the frequency of occurrence of individual statements.

Several opinion polls in Slovakia (e.g. Vašečka 2009, Letavajová 2001) confirm that the perception and acceptance of something different is dependent on the social characteristics of the respondents. For this reason, we also observed the influence of gender, age, and respondents' education, which we perceive in this research as variables. When selecting respondents, we applied the so called quota principle, thus we have reached approximately the same percentage of respondents in the following categories: gender (male - female), age (up to 30 years, 30 to 50, and over 50) and highest level of education (primary, secondary without a graduation, secondary with a graduation and university education). We received information from a total of 221 respondents, out of which 109 were men and 112 women. Respondents are of Slovak nationality (with the exception of 7 respondents), 71% of respondents are Christians, 22% of respondents declared they are without confession. The direct answers of respondents are given in the text in italics.

4 Results

In the beginning, we found out what connotations associated with the subject of our research - the term "mixed marriage"- respondents have. Respondents expressed their opinions after being asked open-ended questions and in most cases gave a number of explanations. This term was explained by most of them as a combination of racially different people (37% of respondents). Another most frequent connotation was ethnic (national) (35%) and religious difference (27%), the difference

of partners in terms of citizenship (partnership with a foreigner) and finally, the difference defined by respondents as cultural. Statistically insignificant, but interesting from the perspective of content were ideas associated with homosexual couples, or vice versa with the relationship between individuals of different sexes, or a difference from the point of view of socio-economic characteristics of individuals. 4 of the respondents defined a mixed marriage directly as a "problem" or as "everything that goes beyond the traditional Slovak marriage". Relation of the statements to age, gender or education was not confirmed in this case.

4.1 Preference of a partner from a similar group

Realizing an affiliation to a certain group and at the same time a sense of difference from the other groups is evident from several respondents' formulations. It mainly refers to testimonies containing plural: "we are Christians", "we are different" or possessive pronoun "our": "our race", "only our religion", "close to our culture". More than a half (56%) of respondents believe that people should find a partner similar to them and the group to which they belong. This opinion was expressed in approximately equal ratio by both men and women, respondents over 50 years old inclined to this more often and also people with secondary education with graduation. 34% of the respondents opposed to this claim. The local endogamy, namely the preference of a partner from close surrounding, was examined in the following question. Here we noticed the opposite trend. Agreement with the claim, that people should find a partner mainly in their immediate vicinity, was expressed by 30% of respondents and the disagreement was given by 56% of respondents. Female respondents and university-educated people were more inclined to disagree. It is obvious that the choice of a partner within their own group is still essential for the respondents, but it is not exclusively related to spatial proximity.

By using general questions we examined whether the respondents perceive some of the particular types of a mixed marriage as specific and whether they have a special attitude towards one of them. In these responses we observed considerable variability and a wide range of opinions. Many respondents stated that none of the mixed marriages were perceived by them as specific, they generally perceive them as a negative aspect and especially marriages with Muslims or Arabs are perceived as unacceptable. As an example, we can mention the following answers: "*A partnership with a person outside "a civilized world" with a partner from a civilized world, since in most cases it is a formality for the purpose of gaining citizenship in a civilized country.*", "*Rather negative, I think that various races should not mix.*", "*I have a positive attitude towards mixed marriages - as long as it does not concern my family.*", "*Based on several published cases I would be a little afraid of a marriage with a Muslim.*", "*With the Negroes because their wooing looks like they would hit a woman on her head and pull her into a cave.*", "*Rather an insane mind. A person, who does not find a partner in his or her own background, has a personality disorder.*", "*Christian and Muslim, no, because it is mostly the Christian who has to convert.*", "*When two people understand each other there is nothing to deal with.*", "*If it's not my marriage, let everyone do what they find as appropriate. I do not really approve of it.*", "*They are all people and I do not condemn anybody because of their religion, race or nationality.*"

4.2 Preferences of partner according to citizenship

Another block of questions was to find out how the respondents rate the marriages with a partner from a group, whose difference we defined by one of the specific categories: nationality, religion, language, race, citizenship and continent. In this part of the research we examined from which particular groups the respondents are willing/unwilling to accept their partners and why. Only 66% of the respondents, who answered this question, would accept the partner explicitly from European countries or the EU countries. The partner from African continent was

identified as the most unacceptable (by 73% of the respondents). From the point of view of citizenship, the respondents consider the citizens from the Slovak and Czech Republic as most acceptable. In their statements these two categories are represented almost equally, among both men and women of all ages and educational categories. The partners, whose origin was in their answers collectively referred to as "European" or from "nearby countries", as well as citizens of particular countries, notably Germany, Poland, England and Austria are considered suitable. Their reasons are based mainly on their spatial and cultural proximity: "Because it's close enough to be in touch with my family.", "Mentality similar to ours.", "Czechs, because they are the closest to us from all the foreigners." Particularly the citizens of "Islamic and Arab states" are considered unacceptable (by 43% of respondents). Mostly women consider partners from Iraq, Iran, Syria, Tunisia, India and Africa to be unacceptable. Men in this question mention especially the female partners from Africa and Hungary. They explain the rejection of these partners by cultural difference and their inability to leave their own traditions and culture. Negative connotations to Muslim or Arabic countries are mostly connected with different religion, as well as bad relationship of Islam to women.

4.3 Preferences of a partner according to ethnicity and religiosity

Almost every third respondent, men and women equally, prefers a partner of Slovak nationality. The second most acceptable nationality are Czechs and partners who were labeled by respondents as "Europeans", "Europe", "the EU" or "Slavs". In this context, respondents also mentioned the English, Americans or Germans quite frequently. On the contrary, the highest rate of social distance is recorded in contact with the Roma ethnic group (more than 30% of the respondents of all categories). Other most frequently rejected people are partners, known as "Muslims", "Arabs", and "Africans". Respondents from all the groups expressed their negative opinion on these categories, with secondary school students having the most expressive opinions. The rejection of Roma partners is expressed by the respondents in statements like these: "Everything except for Roma.", "a Roma man – sponging, maladjustment, nomadic life.", "Definitely not, I hate them.", "A Roma woman - physically they do not attract me because they are who they are: a problematic social group, different thinking, unreliability, lying."

As far as the religious difference of the partner is concerned, more than one third of the respondents would accept exclusively a partner of Christian faith. Half of them referred to some or more Christian denominations, especially to Catholics, Evangelicals and Orthodox, or they used a general term a Christian. 22% of the respondents of all age and educational categories would be willing to accept exclusively members of the Catholic church, the respondents from the mentioned group claim to be Christians with the exception of 2 people. The spouse of any religion would be accepted by 12 people. Nearly 60% of Christian faith respondents would prefer a partner of "the same faith". Majority of respondents (70%) without religious confession would also prefer a Christian partner. The relationship between higher age, the Christian religion of the respondents and their preference for the Christian partner, which we postulated, was not confirmed. Christian partner would be preferred by approximately half of the respondents in all of the three age groups, with a slightly higher proportion in a group of secondary school students. A positive attitude toward a partner of the same religion was expressed by the respondents as follows: "I would marry a Christian, because I am a Christian", "I would prefer a Catholic", "I think the religion should be the same", "Christian, because we would have the same values, which is important for a functional marriage.", "I am a Catholic, and I would not convert to another faith." About two thirds of the respondents would not accept a partner from another religious group, different from "ours", "the same" or "Christian". Half of the respondents rejected namely Muslims.

4.4 Preferences of a partner by race

72% of the respondents have a clear preference for the Caucasian race. A slightly higher percentage is recorded in the group of respondents older than 50 years. We find relatively more expressive responses to the question formulated in the reverse order. 91% of the respondents were unwilling to accept a partner of the Black and Asian race or at least one of these groups. We noticed a more pronounced bias towards the members of the Black race, which would not be accepted by almost 40% of the respondents. This attitude was expressed mainly by men in the age category up to 30 years. Tolerance and impartiality to race in marital preferences were expressed by respondents as follows: "Acceptance of a person does not depend on colour.", "It does not matter - he must be a Christian." The rejection of racially mixed marriage is pronounced in statements like these: "Because the race is a very visible sign, people look different.", "Multiracial children are not accepted by either side; The White race must be preserved so that we do not die out.", "It is not good to mix blood."

4.5 Partner preference according to language difference

A relatively high degree of tolerance is expressed by respondents to the language difference of their potential partner. The most acceptable were partners speaking Czech (30%), German or English (15%) and Russian (8%). A partner from any language group would be accepted by 10% of the respondents. 16% of the respondents would accept exclusively a Slovak-speaking partner. This view can be observed especially among those with elementary or secondary education, it was very rare among the respondents with a university degree. They responded in a negative way to a partner of the Arabic and Hungarian languages. Arabic language would not be tolerated particularly by an older generation with elementary or secondary education. Other negative statements were directed to partners with the Roma and Chinese languages, less often the Turkish language or the languages of the "Islamic states". It can be observed that the respondents associate the issue of linguistic difference with the ethnic or religious background of the partner. Approximately 10% of the respondents would reject all partners whose language "they would not understand", about 5% of the respondents would be tolerant of all language groups.

The findings point to the fact that respondents under the age of 30 are more willing to accept a partner no matter what language group they belong to, and they would also accept an English-speaking partner. Respondents over 50 years of age are inclined to choose Slovak or Czech partners. Respondents with university education have not particular preference for Slovak and Czech language and are open to the linguistic difference of the partner. In general, respondents prefer a partner whose language they can speak or which is similar to the Slovak language or a language they would like to learn. Many respondents refer in this case to the possibility of linguistic enrichment or improvement of their language ability. "English and German - it is good for me, for example, for children who can learn two languages", "Czech language - it is similar to Slovak, I can speak the language and there is minimal difference.", "In any foreign language that you do not speak perfectly, conflicts arise from different naming of the problems, or inability to clearly express feelings and opinions."

4.6 Personal experience with a mixed partnership

We assumed that accepting or rejecting a mixed marriage is to a certain extent dependent on one's own personal experience with such a relationship. However, only 23 people, including 14 women and 9 men, confirmed their direct personal experience with a partnership or marriage in a mixed relationship. According to their testimonies, these were relations with partners of different categories, some of them still existing, some of them having ended. However, the answers of the respondents with their personal experience with a mixed relationship do not differ in any way from the respondents who did not report their personal experience.

4.7 Advantages and disadvantages of a mixed marriage

A relatively large variability of responses is recorded in relation to the declared advantages and disadvantages of a mixed marriage. In terms of content and frequency, these statements can be categorized into several categories. The most frequently cited positives are:

1. enriching of partners - culture, habits, traditions, knowledge (it was declared by 43 respondents out of 177 who answered the question),
2. the opportunity of partners to learn or improve in a foreign language, bilingualism in the education of children (23 respondents),
3. improvement or testing of psychological qualities - openness, tolerance, range of knowledge, respondents also refer to them as *"open mind"* (19 respondents).

The claim that mixed marriage has no advantages, was found in 22 answers. Moreover, travelling and the fact that the partners are not bored were frequently declared advantages. The same or similar categories are found in the statements describing the disadvantages of a mixed marriage. 162 respondents who answered the question most often agree with the following points when describing the negatives:

1. differences in culture in general (31 responses)
2. differences in religion (15 responses)
3. language barrier (11 responses)
4. misunderstandings, conflicts (10 responses)
5. the need to conform to a different culture (10 responses)

Respondents also expressed the problem of distance and separation of partners, racial disparities, different mentality, negative attitude of the neighbourhood and disfavour of the partner's family, differences in children's education and office complications (marriage ceremony, divorce) as well as kidnappings.

4.8 Recommendations in relation to the marriage preferences of the descendants

The last studied topic was the attitude towards a partner from a different or the same group, but this time we focused on the attitude towards the partner of the respondents' children. In most cases, respondents' evaluation and recommendations were the same as the ideas about their own partner. From the point of view of the studied topic, it is interesting to observe the formulation of these statements, in which we can study naming of acceptable and unacceptable partners for children, and also the occasional signs of activity / passivity or concrete action in such situation. The most frequent responses in this sense were responses which:

1. simply named the groups that would be acceptable or unacceptable for their children.
2. declared that the selection and evaluation of a child's partner is not their decision, they leave the decision to the children themselves, and accept it even if they disagree with it. *"My acceptance would not be important."*, *"I accept all son's decisions."*
3. strongly expressed disapproval of certain groups or they clearly (even imperatively) defined the group which the partner of a child would have to come from. *"I would not accept Roma."*, *"I would not be in favour of anybody Asian or Muslim."*, *"He must be a Christian."*, *"I would never agree with that."*, *"He must be white – that I will accept, nothing else."*

Rare answers were:

1. They indicated the procedures which would direct the child when choosing a partner. *"She tried to convince her to consider it."*, *"I would dissuade him from it."*
2. They indicated sanction procedures against a child whose decision would not be in line with parents' opinions. *"I*

would not accept it, I would throw her out of the house, and disinherit her."

5 Conclusions and discussion

Perception of the difference between a marriage within a group and a marriage with a partner from a different group is directly related to group identity and cohesion and it is a measure of the permeability of the group's boundaries and the ability of the group to communicate or to be closed towards other groups. Endo-exogamous rules act as group norms by which the community expresses its relation to particular groups and their application is ensured through social pressure on the individual.

The existence of such attitudes or patterns of behaviour in relation to marital preferences were confirmed in our empirical research. It is clear that respondents prefer partners from the same or similar groups. In their responses, they express their group identity as *"Slovaks"*, *"Christians"*, *"Slovak nationality"*, *"Causacians"*, *"speaking Slovak"*, *"Europeans"* and *"Slavs"*. Their own groups, as well as their values, are referred to by respondents in some of their statements as *"better"* or *"normal"*. *"We are the best."*, *"I think we have the best religion and it should be the only one in the world."*, *"It contrasts with the traditional Slovak marriage."* The choice of partners within these circles is then perceived as optimal and recommended. Partners from nearby or similar groups are considered to be acceptable. "Proximity" is in their statements perceived as a spatial category - neighbouring and nearby states (Czech Republic, European countries) or cultural similarity (Czech, Christian European culture, Slavic).

On the other hand, respondents are unwilling to cross the boundaries by a mixed marriage with a partner from "distant" groups. In this context, they name partners who come from different religious, ethnic and racial groups. They are rather strictly opposed to Muslims, Roma, Arabs, Blacks, and Africans. The language difference between the partners is perceived as the least problematic. Respondents perceive the linguistic difference of a partner as certain enrichment for them and their descendants.

Respondents' testimonies show a strong stereotyping and categorization of others into groups. We note the tendency to ethnize the issue of mixed marriages, i.e. to focus on the ethnic origin of the potential partner, as well as his religious confession. Content analysis of the testimonies points to the fact that the categories of difference specified by us (ethnicity, religiosity, citizenship or linguistic identity, race) are intertwined in the minds of respondents and that respondents create their own subcategories of wanted and unwanted marriage partners. An example of this is the category *"Muslim"* and further subcategories derived from it: *"Muslim states"*, *"Muslim languages"* and *"Muslim religion"* that resonate in all types of responses. Relatively significant binary oppositions that are perceived in the sense "we-they" when choosing a partner are represented by these opposites:

„we“	„they“
Christians/Europe/Caucasian	Muslims/Africa/Black/Roma

Unequivocal conditionality of responses with the social characteristics of the respondents (gender, age, education) was not confirmed. Certain specifics have been demonstrated in partial findings. Respondents with university education are more open to accept a partner of another language and a partner from a distant country; the oldest generation is mainly oriented to a partner speaking Slovak and Czech languages and ethnically and religiously similar partner; the youngest age group is open to the linguistic difference of the partner, more oriented to the Christian partner; a partner of Christian religion is preferred by Christians as well as people without religious confession. It can be deduced from the testimonies that respondents in their mixed marriage assessments rely on their own experience to a minimum extent, but are mostly influenced by mediated images

of the mixed marriage phenomenon presented in the media. The role of parental authority in choosing a partner is weakening at present. In relation to children, respondents formulate and clearly identify acceptable or unacceptable partners. Most often, their attitudes were the same as in the case of their own partner. This is realized by a recommendation, less often an active instruction or a command.

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Primary Paper Section: A

Secondary Paper Section: AC

ANALYSIS OF PERSONALITY TRAITS AMONG PSYCHOLOGICAL TYPES

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Abstract: The main aim of the study was to verify relationship of personality traits and psychological types, based on C.G. Jung's theory and on the five-factor personality theory. NEO five factor personality inventory and Golden profile of personality were completed by 291 university students of psychology, mathematics and informatics. Results of EFA confirmed five factors of personality traits and type preferences. Comparison of eight psychological types showed expected differences in personality traits. Results indicated a development potential for TF and SN function preferences and also showed the importance of introverted/extraverted attitude when speaking about Jungian psychological types.

Keywords: psychological type; personality trait; extraversion; NEO; GPOP.

1 Introduction

When speaking about psychological types, C. G. Jung (1921/1990) differentiates them according to attitudes (extraverted or introverted) and functions (rational and irrational). There are two kinds of rational (thinking and feeling) and two kinds of irrational (intuition and sensation) functions in his theory. Altogether eight psychological types: four extraverted and four introverted. Besides the theory (Jung 1921/1990) type's characteristics are described mainly by empirical resources (Čakrt, 2010; Dunning, 2001; Dunning, 2010; Quenk, 2002). In general the theory focuses on a description of extraverted and introverted types or on a description of normal and neurotic expression of psychological functions. Thanks to the most known tool for type's assessment, Myers-Briggs Type Indicator @MBTI, it is applied in various areas of practice: teaching (Lawrence, 1982), stress manifestation of healthy population (Quenk, 2002), carrier counselling (Čakrt, 2010; Dunning, 2001; Dunning, 2010), managerial development (Čakrt, 2009), team development (Benton, 2017) or self-development (Newman, 2016). Jungian psychological types are not validated by cluster analysis; consequently we cannot understand them in terms of psychological types identified by cluster analysis. Even though that theory of psychological types (Jung, 1921/1990) is not empirically verified by cluster analysis, MBTI questionnaire is widely spread in personnel area (Hoffman, 2002; Furnham, 2008) especially for purposes of individual and team development (Bailey, 2017) and it is considered as the most popular personality assessment in the world. It is used mainly for development purposes, because types are considered not to be stable personality characteristics. On the other side, personality traits of the five factor theory are considered as characteristics consistent over time and conditioned by temperament, „dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings, and actions“ (McCrae & Costa, 2006, s. 25). They are measured by self- or objective assessment.

Relationship between five-factor personality traits and Jungian psychological type's preferences was verified by number of correlation studies (Furnham, 1996; Furnham, Crump, Batey, & Chamorro-Premuzic, 2009; Furnham, Dissou, Sloan, & Chamorro-Premuzic, 2007; Furnham, Moutafi, & Crump, 2003; Tobacyk, Livingston, & Robbins, 2008). Regarding the mentioned studies, R. McCrae and P. Costa (2006) also found out relationship between dimensions of NEO-PI and MBTI preferences: extraversion & extraversion, openness & intuition, agreeableness & feeling, and conscientiousness & judging. The MBTI as the most spread diagnostic tool of Jungian psychological types (Hoffman, 2002), does not contain alternative preference to neuroticism dimension. Recently some other tools do have it. Golden profile of personality GPOP (Golden, 2005) identifies tense/calm preference in addition. Besides eight Jungian psychological types, this tool can measure also stress level of assessed person. J. Golden (2005) compared GPOP type's preferences to the five-factor personality traits

(stated in Table 1) and confirmed their overlapping, same did some other researchers (Kösegiová, 2009; Lisá, Letovancová, Pavlíková, 2011).

Table 1. *Conceptual Overlap of GPOP and NEO scales (Golden, 2005, p. 20)*

GPOP scale	Overlapping NEO Scale
Extraverting & Introverting (EI)	Extraversion
Sensing & Intuiting (SN)	Openness to experience
Thinking & Feeling (TF)	Agreeableness
Judging & Perceiving (JP)	Conscientiousness
Tense & Calm (TeC)	Emotional stability

The main aim of this study is to verify relationship of personality traits and psychological types, based on C.G. Jung's theory and on the five-factor personality theory. We expect the relationship between type's preferences and personality traits. Regarding the theory and empirical resources we expect differences among types in the personality traits.

2 Methods

The sample consisted of 291 participants, 33% men and 67 % women; age range from 18 up to 36 years ($AM=22.58$; $SD=3.83$). University students of psychology, mathematics and informatics were primary clients of university carrier counselling project and their research participation was voluntary based. Ten students could not be described by any psychological type because of their low difference between extraversion and introversion preference; hence, they were excluded from the analysis. Frequencies of the students' types are described in the table 2.

Table 2. *Frequencies of types in the research sample*

Psychological types	N	%
Extraverted feeling types (EF)	16	5,5
Extraverted intuition types (EN)	15	5,2
Extraverted sensation types (ES)	67	23
Extraverted thinking types (ET)	8	2,7
Introverted feeling types (IF)	70	24
Introverted intuition types (IN)	38	13,1
Introverted sensation types (IS)	17	5,8
Introverted thinking types (IT)	50	17,2
Total	281	96,6
Missing	10	3,4
Total	291	100,0

The Golden profile of personality GPOP questionnaire is based on Jungian theory (Golden, 2005; Lisá, Letovancová, & Pavlíková, 2011). It comprises of 116 questions with bipolar scales from 1 to 7 that measure five couples of preferences: extraverting & introverting (EI), sensing & intuiting (SN), thinking & feeling (TF), judging & perceiving (JP), tense & calm (TeC). Four couples of preferences make the global type (EI, SN, TF, JP). Tense & calm is not included in 4-letters type shortening, and it is important for feedback. Internal consistency of preferences in the research group attained average value $\alpha=0.77$, within the range from $\alpha=0.71$ up to $\alpha=0.84$. GPOP types' preferences are measured by continuous variable that helps to measure more precisely varying levels of Jungian attitude and function preferences (see Arnau, Green, Rosen, Gleaves, & Melancon, 2003).

NEO the five factor personality inventory NEO-FFI represents a shortened version of the five factor personality theory

questionnaire (Ruisel & Halama, 2007) that measures five main personality traits: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. The dimensions represent the sum of answers for 12 questions using ratings from 1 to 5. Internal consistency of the dimensions in the research group attained average value $\alpha=0.78$, ranging from $\alpha=0.67$ to $\alpha=0.85$.

Data were analyzed by SPSS Statistics 19. Statistical characteristics and procedures: mean, median, standard deviation, skewness, kurtosis, Pearson's correlation analysis, exploratory factor analysis (extraction maximum likelihood, rotation Promax), Kruskal-Wallis test including pairwise multiple comparisons, statistical and practical significance.

3 Results

Descriptive of dimensions included into analysis are included in a table 3. Expected significant correlations were confirmed (table 4): strong effect size between extraversion and EI, neuroticism and TeC; medium effect size between agreeableness and TF, conscientiousness and JP and small effect size between openness to experience and SN. Kaiser-Meyer-Olkin measure of sampling adequacy reached value of $KMO = 0.623$. Exploratory factor analysis (EFA) and Maximum Likelihood with Promax rotation showed five factor solution. Five factors together explained of 69% variance (table 5) and were saturated by following dimensions: factor 1 – extraversion and EI, factor 2 – neuroticism and TeC, factor 3 – agreeableness and TF, factor 4 – conscientiousness and JP, and factor 5 – openness to experience and SN. As the correlation analysis already suggested, factor 1 and 2 correlate.

Table 3. *Descriptive characteristics of GPOP preferences and NEO-FFI traits*

	M	Me	SD	Skewness	Kurtosis
EI	-	-	-	-	-
SN	13,01	-17	45,83	0,29	-0,69
TF	-	-	-	-	-
JP	10,91	-15	47,29	0,28	-0,74
TEC	-	-	-	-	-
Neuroticism	22,83	-25	42,68	0,37	-0,57
Extraversion	-7,99	-8	13,36	0,29	0,72
Openness to Experience	21,52	21	8,86	0,06	-0,55
Agreeableness	30,30	31	7,81	-0,53	0,25
Conscientiousness	10,91	-15	47,29	0,28	-0,74
	22,83	-25	42,68	0,37	-0,57
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	10,91	-15	47,29	0,28	-0,74
	22,83	-25	42,68	0,37	-0,57
	-7,99	-8	13,36	0,29	0,72
	21,52	21	8,86	0,06	-0,55
	30,30	31	7,81	-0,53	0,25
	10,91	-15	47,29	0,28	-0,74

Conscientiousness	195	188	125	141	111	185	109	200
	,19	,78	,53	,16	,68	,33	,51	,35

Table 7. *Kruskal Wallis Test (Grouping Variable: eight psychological types, dependent variable: the NEO-FFI dimensions)*

	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
Chi-Square	40,50	93,75	16,18	21,68	47,11
df	7	7	7	7	7
Asymp. Sig.	0,000	0,000	0,024	0,003	0,000
r	0,374	0,574	0,245	0,283	0,412

Pairwise multiple comparisons, nonparametric tests algorithms (table 8) enabled a detailed view on differences between psychological types in the NEO traits. We identified the most statistically significant differences in extraversion, but none in openness to experience.

Table 8. *Pairwise comparisons of types*

	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.
Neuroticism					
ES-IF	-74,063	13,879	-5,336	0,000	0,000
ES-IN	-78,800	16,491	-4,778	0,000	0,000
Extraversion					
IN-ES	107,435	16,487	6,516	0,000	0,000
IN-EF	108,982	24,195	4,504	0,000	0,000
IN-EN	113,263	24,756	4,575	0,000	0,000
IF-ES	104,062	15,172	6,859	0,000	0,000
IF-EF	105,609	23,318	4,529	0,000	0,000
IF-EN	109,890	23,900	4,598	0,000	0,000
IS-ES	89,836	13,875	6,474	0,000	0,000
IS-EF	91,383	22,496	4,062	0,000	0,001
IS-EN	95,664	23,099	4,142	0,000	0,001
Agreeableness					
IT-IF	-63,880	15,029	-4,251	0,000	0,001
Conscientiousness					
IF-IN	75,815	16,359	4,634	0,000	0,000
IF-EF	79,267	22,497	3,523	0,000	0,012
IF-IS	-90,839	21,952	-4,138	0,000	0,001
IT-IN	-73,649	17,473	-4,215	0,000	0,001
IT-EF	77,101	23,319	3,306	0,001	0,026
IT-IS	-88,673	22,794	-3,890	0,000	0,003

IN, IT and IF reached the lowest score of extraversion. The highest extraversion score was attained by EN, EF, and ES. Introverted perceiving types IF and IT reached the lower conscientiousness level than introverted judging types IN and IS. However, conscientiousness of extraverted perceiving types EN, ES was not statistically significantly different from extraverted judging types (ET, EF). When concerning neuroticism scale, ES reached the lowest level, and IN and IF the highest level of neuroticism. ES reached significantly lower score of neuroticism, compared to the IN and IF. Statistically significant difference of agreeableness between IT and IF appeared. IT reached the lower score of agreeableness compared to the IF.

4 Discussion

The research results confirmed study hypotheses. Structure coefficients of EFA confirmed overlapping of NEO traits and GPOP preferences the way that J. Golden (2005) stated. Personality traits correlated with GPOP preferences which confirmed former research results (Furnham, 1996; Furnham et al., 2009; Furnham, et al., 2007; Furnham et al., 2003; Tobacyk et al., 2008; Kösegióvá, 2009). As stated by K. Myers, N. Quenk, and L. Kirby (1995), overlapping of preferences of Jungian psychological types and dimensions of NEO shows similarities between characteristics of questionnaires based on two different theories. However, it does not mean that these characteristics are the same in the meaning of the dimensions, interpretation of the results and the application of the constructs.

Identified relationships between extraversion, EI, neuroticism and TeC are similar as results of other researchers (Furnham, 1996; Furnham et al., 2007; Furnham, et al., 2003; Kösegióvá, 2009). This provokes some practical questions: Do have introverted reflexivity and need for individual consideration of outer signals same behavioral manifestations as an emotional lability? Does mean manifestation of extraversion (such as making new contacts, perceived self-conscious and courage) emotional stability? Understanding the difference between introversion and neuroticism seems to be important.

Analysis of differences between types revealed several findings. Comparison of neuroticism dimension among eight psychological types showed that IN and IF reached the higher level of neuroticism than ES. Typically ES type is the most anchored in reality, while IN and IF are taken to be the most distant from reality (Čakrt, 2009; Jung, 1921/1990). Emotional stability in case of ES confirms following „They excel in areas in which they are faced with immediate problems or have to deal with changing situations. They enjoy solving problems and dealing with crises...” (Dunning, 2001, p. 36). More detailed view could bring NEO-PI-R sub-scales where we suppose difference. Self-consciousness showed the strongest correlation with EI preference (Furnham, 1996; Furnham et al., 2003). „Individuals high in self-consciousness are more prone to the emotion of shame or embarrassment. They are particularly sensitive to ridicule and teasing, because they often feel inferior to others” (McCrae & Costa, 2006, p. 48).

Extraverted types attained higher score of extraversion than did introverted types. The lowest score of extraversion was reached by IN, about whom we can read that „...the intensification of intuition often results in an extraordinary aloofness of the individual from tangible reality; he may even become a complete enigma to his immediate circle.” (Jung, 1921/1990, p. 401). Significantly low extraversion score of IF can explain Jung with saying „Still waters run deep” (Jung, 1921/1990, p. 388).

Comparison of openness to experience between types did not show substantive significant differences. Several authors (Čakrt, 2010; Dunning, 2001; Dunning 2010) stated that types the most open to changes are EN, because they need changes for their lives. C. G. Jung (1921/1990, p. 367) says about EN that „It is constantly seeking fresh outlets and new possibilities in external life”. Research findings did not confirmed practical significance of differences. Possible explanation could be that openness to experience expresses also other characteristics than only tendencies to change. In order to confirm a hypothesis that EN are oriented to change, in future research we would recommend to select sub-scales of NEO-PI-R, for instance sub-scales fantasy and idea. These sub-scales correlated with SN in the past (Furnham, 1996; Furnham et al., 2003). „Openness in Fantasy refers to a vivid imagination and a tendency to develop elaborate daydreams” (McCrae & Costa, 2006, p. 49). „Open people are curious and value knowledge for its own sake. Perhaps because they are willing to think of different possibilities...” (McCrae & Costa, 2006, p. 49).

Although we confirmed overlapping of TF with agreeableness as in some other studies (Furnham, 1996; Furnham, et al., 2007; Furnham, et al., 2003; Kösegióvá, 2009), comparison of types did not clearly show agreeableness differences among feeling and thinking types. Agreeableness dimensions showed significant differences only between IT and IF types. Jung (1921/1990, p. 385, 386) described IT as follows „To outsiders he seems prickly, unapproachable, and arrogant, and sometimes soured as a result of his antisocial prejudices”. About IF Jung (1921/1990, p. 389) wrote that „Although there is a constant readiness for peaceful and harmonious co-existence, strangers are shown no touch of amiability, no gleam of responsive warmth, but are met with apparent indifference or a repelling coldness.” In former MBTI and NEO-PI-R studies (Furnham, 1996; Furnham, et al., 2003) TF preference correlated the most with sub-scale of tender-mindedness. „Agreeable people exhibit Tender-mindedness and sentimentality, and may be an easy touch for charities and good causes” (McCrae & Costa, 2006, p.

50). Because of that we suppose that tender-mindedness could be the overlapping component of agreeableness and TF. EFA confirmed overlapping of conscientiousness and JP in accordance with the assumption (Golden, 2005). Comparison among types showed the lowest level of conscientiousness in Introverted Perceiving types (IP), namely IT and IF. They showed significantly lower degree of conscientiousness than Judging types (IN, EF, IS). Extraverted perceiving types (EP) did not significantly differed from Judging (J) types in conscientiousness level. However, EP belong to adaptive and flexible types, and in a case of ESP "long-term planning" belongs to "the greatest challenges" (Dunning, 2001, p. 64). In a case of ENP, for instance, "following the rules" is identified as a "blind spot" (Dunning, 2001, p. 73). Planning and following the rules are considerable parts of conscientiousness. In spite of that our research results didn't confirm the lower level of conscientiousness among EP types. Correlation studies of the MBTI and NEO questionnaires (Furnham, 1996; Furnham, et al., 2003) showed the greatest connection of JP with sub-scales order and deliberation. „Order, which makes them efficient in work“(McCrae & Costa, 2006, s. 50). „Deliberation, making plans in advance and thinking carefully before acting“(McCrae & Costa, 2006, p. 50, 51). Because of stated we think that overlapping of conscientiousness and JP can mean an autonomy at defining aims and values. It could be said that EP are willing to accommodate more and cooperate or follow social rules, while IP rely more on their own rules. IT and IF reached the lowest level of conscientiousness because they can refuse the rules from either "non-logical" or "inhumane" reason. The ET together with IS reached the highest level. They are often in responsible positions where they monitor fulfilling the duties and following the rules (Čakrt, 2009).

Overlapping of Jungian preferences with the NEO dimensions has been not always shown as a significant. For example (Furnham, Jensen, & Crump, 2008) in a sample of 3000 managers did not confirm the relationship between NEO-PI-R traits and SN, JP preferences. Similarly M. Kősegiová (2009) did not confirm relationship between conscientiousness and P. As for limits to our research we consider a proportionality of the research sample and then an absence of ENTJ representatives in ET. Another limit is the fact that the research sample was made up by students, predominantly by women, while main comparison studies were comprised of men in manager positions. For further research we suggest examination of differences between types at the level of NEO-PI-R sub-scales. Sub-scales would allow more precisely define the overlapping of the NEO dimensions and the types' preferences. Furthermore, a manifestation of type preferences depends on various factors, for instance on a balance and maturity of the type (Lawrence, 1982) as well as on a degree of emotional stability and currently experiencing stress (Quenk, 2002). In further research it would be therefore interesting to monitor relationships of the personality traits and type preferences in a dependence on a degree of experiencing stress, emotional stability or age.

5 Conclusion

Personality traits differences in this study indicated that types differ in extraversion the most, then mediumly in conscientiousness and neuroticism, and weakly in agreeableness and openness to experience. If we consider biological condition of personality traits (McCrae & Costa, 2006), we could conclude that EI preferences are the most temperamentally conditioned from all type preferences and therefore less changeable over time. JP preferences should be changeable more than EI, but less than preferences of SN and TF. Weak relationship between personality traits and SN, TF indicate a developmental potential for these function preferences. Resulting from these findings we could conclude relative stability of types attitudes (EI, JP), so-called „attitude types“(Jung, 1921/1990, p. 330) and relatively changeable nucleus of the type which is made from psychological functions of SN and TF, so-called „function types“(Jung, 1921/1990, p. 330). As to tense & calm preferences authors (Bents & Blank, 2009) claim that the scale is not stable

over time which should be confirmed by next research, regarding the medium relationship with neuroticism trait.

Comparison of NEO traits among eight psychological types confirmed several propositions of the theory (Jung, 1921/1990) as well as the empirical characteristics of the types (Čakrt, 2010; Dunning, 2001). Differences in personality traits among types showed the importance of attitude (introverted or extraverted) for psychological function preferences manifestation.

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Primary Paper Section: A

Secondary Paper Section: AN

STRESS, BURNOUT, AND SELF-CARE AMONG PEDAGOGUES

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The paper is published within the frame of grant APVV-14-0921 Self-care as a factor in coping with negative consequences of the implementation of the helping professions.

Abstract: The aim of the paper is to point out to the stress and burden that arise from pedagogical work. The paper defines the possibilities of school social work it is specifically dedicated to pedagogical staff members as a possible target group of school social workers. Attention is also given to the negative phenomenon of work - stress and burnout. Their relationship with pedagogical staff is verified in a research study. At the end of the paper, the self-care possibilities for pedagogues are presented.

Keywords: Stress. Self-care. Burnout. School social work. Pedagogues. Burden.

1 Stress and Burden

Society expectations from teachers and their profession are high, especially in the area of education and training of children and youth. Although the pedagogues have a direct impact on intellectual state of society, it is a profession that has been financially starving for a long time. Emphasis on continuous education and self-development, as well as long-term and regular contact with people, where pedagogues are expected to be professional but human too, are the key factors that can be defined as the burden of the teaching profession (Gulzar et al. 2016).

With the society development, new social problems are constantly arising. (Nová 2016). All this has an impact on the educational process and the demands placed on teachers, despite the fact, that they often exceed their competences and solution possibilities. Failure to meet these requirements and stress factors can lead to burnout and contributes to increased level of stress.

From a historical point of view, the stress was first investigated from a biological point of view. Cannon and Selye are considered to be the authors of the first theories of stress (Evans et al. 2012). Cannon is the author of the physiological theory, which is based on the principle of Sympathetic-Adrenal medullary (SAM) system - stress is seen as a particular alarm reaction of the organism in terms of attack-escape.

Selye (1978) considered stress to be the general reaction of the organism to the demands that are placed on it, a condition that manifests by a specific syndrome based on all nonspecifically induced changes in the organism. His first theories have evoked a great interest in the scientific world and, of course, contradictory opinions.

Psychological stress models developed themselves independently from biological models and are focused on the impact of psychological factors to the response to stress. The best known of these models is the transactional model developed by Lazarus and his colleagues (Lazarus, Folkman, 1987). According to this model, stress results from the interaction between man and the environment. Stress does not rise merely from the occurrence of some events, it is related to the cognitive evaluation of the event and the coping strategy that is used to solve the event and which also affects the level of stress experience (Evans et al. 2012).

Currently, the literature provides various definitions of stress as such. It is important however, to look at man as a bio-psycho-social-spiritual being in the characterization of this term. If we perceive an individual in the context of an ecological perspective, the stress definition should also focus on the external environment, which threatens the individual. From this

point of view, stress can be characterized as a specific example of burden. That is the burden case, which exceeds the rate of adaptation possibilities of the individual (Paulík 2010).

Lazarus and Folkmanová (1984) characterize the stress as a result of an imbalance between the requirements placed upon the individual and his ability to cope with these requirements.

It is possible to distinguish five basic stressful situations which threaten an individual, in general:

1. inappropriate tasks and requirements - are the most common type of stressful situations that usually cause a mental stress and puts qualitatively more claims on the individual, whose extent is not possible to handle in a given period of time,
2. problem situations – the type of burden that binds to the structure of the conditions that are imposed on the individual,
3. frustrating situations – the type of psychological burden when the individual is not able to achieve the goal or to satisfy his or her needs,
4. conflict situations – the type of stressful situation when there is a contradiction of forces and this causes emotional pressure in decision making and increased tension,
5. stressful situations – the psychological burden that affects the individual during the realization of the target activity, which makes it difficult to progress (Kredátus 2010).

In general, teacher stress can be defined as the long-term effect of negative emotions resulting from the work itself, which may affect the effectiveness of the teacher's work and his inappropriate treatment of students. The results of so-called "teacher stress" are serious because they can lead to low efficiency at work, frequent absences or low satisfaction with their work, which can cause burnout or depression. (Klassen 2010)

Researchers have been engaged for a long time with the issue of stress and its level, and different target groups have been investigated, among other students of helping professions (Cohen, Kamarck, Mermelstein 1983; Lesage, Berjot, Deschamps 2015; Palekar, Mokashi 2014; Rajkumar, Nehra, Arya 2014; Jacob et al. 2012) and the workers of helping professions (Lesage, Berjot, Deschamps 2015; Stauner, Konkoly 2006; Ting, Jacobson a Sanders 2011; Waszkowska, Andysz, Merez 2014).

2 Burn-out

The burnout syndrome is caused by chronic stress. While stress is the cause, burnout is a consequence. It is caused by a long-term imbalance between the burden and the idle phase, between activity and rest. According to Stock (2010), three major symptoms are included within the burnout syndrome:

1. Exhaustion. The individual feels emotionally and physically exhausted. He/she experiences feelings that are associated with depression. In particular, it is helplessness, sadness, hopelessness, feeling of emptiness, fear, loss of self-control. Physical exhaustion is associated with a lack of energy, sleep and memory disturbances, muscle tension, pain.
2. Alienation. This symptom is characterized by the fact that man has an indifferent attitude to his work and surroundings. There is not only an alienation towards colleagues and employer, but also to the working climate, the internal resignation and passivity of workers arises. Work enthusiasm starts to disappear and cynicism occurs, where clients are seen as a burden and colleagues as a source of threat. Alienation can escalate to aggressive behavior toward one's own surroundings.
3. Performance decrease. There is a loss of confidence in own abilities and the individual is deemed incompetent. This is a subjective assessment, but it significantly decreases the

labour productivity, one needs more energy and time for the work, which he used to manage without difficulty before. One feels uncertain, loses motivation, has a sense of failure, the time dedicated for the body regeneration is extended, as the vacation or long weekend are not sufficient for relax.

Kebza and Šolcová (2010, s. 1) state that: "The burnout syndrome occurs especially in certain professional groups due to a combination of factors, particularly chronic stress and a marked drop in motivation, interest in performed activity and job satisfaction". In particular, people whose job is highly demanding on communication and empathy, are at risk. This syndrome's accompaniments are also lack of appreciation from the employer, fear of job loss and frequent organizational changes. The occurrence of burnout is also linked to one of the negative factors, the frustration. The individual does not adequately meet the needs and expectations. It arises particularly where people are not able to say thank you, show respect. In this stage people do not understand the meaning of life, work and own needs. Another factor that contributes to the burnout formation includes bad interpersonal relations. These occur when the workplace is dominated by misunderstandings, conflicts and quarrels. In this case, there is a disruption of the protective social network to which the closest family and friends belong, that feeds into burnout. (Španková 2010)

Nôtová and Páleníková (2003) state that burnout is caused by the long-term existence of situations that are very emotionally demanding. It is most common in the workplaces where chronic stress occurs, that is, in helping professions and wherever the work with people is done. It is possible to observe its manifestations at three levels, namely psychological, when there is an increase in emotional effort, negativism, depressions, then physical level, which is characterized by fatigue, apathy and increased risk of addiction. The third level is the social one, where there is a reduction in sociability and empathy, an aversion to work and frequent occurrence of conflicts.

Burnout syndrome is the most common in professions where the workers are in constant contact with people, especially in helping professions. The potential source of burnout may therefore be the work-related stress, which results from the workload and requirements that are placed upon the worker. (Balogová, Lorincová 2015)

Kyriacou (1996) talks about the teacher stress, which is defined as a situation in which the teacher feels angry, frustrated, depressed, feels stress and anxiety as a result of a situation that is related to the pedagogical activity of the teacher.

For many teachers, the burden and stress result in burnout. It leads to a feeling of job dissatisfaction, decreased desire to be with children, increasing psychological stress and physical weariness. (Višňovský, Kačáni et al. 2002)

Hennig a Keller (1996) understand burnout as a consequence of long-term stress and bad coping with mental and physical burden.

3 Options of school social work with

School social work is a specialized area of social work practice as such. It is based on social work with youth, which represents a professional form of action by individuals or organizations (Šiňanská 2015). The philosophy of school social work is based on four values, including the human dignity, the right to self-realization, respect for the individual's potential and individuality and the right to respect differences. (Allen-Meares 2007)

The main goal of school social work is to prevent risky behaviors among the children and youth, to strengthen the family and to ensure open communication between the school and the family (Dupper 2002). The school social workers play an important role in the educational and learning process as they provide students with opportunities and resources in order to be successful in the school environment, as well as in social life (Openshaw 2008).

Franklin, Gerlach and Chanmugam (2008) add that school social workers are equally focused on providing social and emotional support to students in the school environment through social services and advocacy. Bland a Esmalle (2012) consider school social workers as professionals designed to identify emotional and social issues that contribute to inadequate school attendance and poor school results.

The school social workers are not working alone, but as members of a school multidisciplinary team. This causes that sometimes different roles and responsibilities overlap, or ideally complement each other. (Dupper 2002) The competencies of school social workers are defined in the standards of various professional associations and organizations that cover the activities of school social workers such as the School Social Work Association of America, the National Association of Social Workers, the International Network of School Social Work.

Tab 1 Roles of school social workers

	Tasks
1. Representative	To help students design resources to achieve their needs and to develop their own proposals for solving their problems, related to their development stage and adaptation to school life, so that they can use their resources effectively.
2. Counsellor	To help students to better understand themselves and their feelings, so that they are able to solve their problems adequately their development stage, adapting to the school environment.
3. Social pedagogue	To help students and their families to develop positive social values, stances and behavior. To promote harmonic interpersonal relationships and a sense of responsibility towards society.
4. Consultant	To provide consulting services to pedagogues and to help in the sphere of social problems of students and their personality development.
5. Resource mobilizer	To locate and mobilize resources of the student, his/her family and community for the student's benefit.
6. Researcher	To evaluate own services and to collect data and information about their work in order to develop their services.
7. Advocate	To familiarize themselves with the general education system and to prepare recommendations for education improvement.
8. Mediator	To strengthen links between the student, his/her family, school and community and to promote the harmonization of these relationships.

The source: Chui, Ling (2013)

The school social work standards have been issued by the National Association of Social Workers (2012). The main objective of these standards is to specify the expectations placed on school social workers and their services, their code of ethics, procedures for defending the client's rights, and also to lay the foundations for the education of school social workers and to provide continuous education programs and materials.

The activities of school social workers in the USA are also defined by the Education Act, which defines these activities as service, which purpose is to provide assessments, diagnostics, counseling, education, therapeutic and other services in order to secure the complex needs of pupils and students (Raines 2013). The competencies of school social workers in countries where school social work is a normal part of the school system include performing systemic changes when adopting and implementing

intervention procedures to improve students' learning results (Clark, Alvarez 2010).

Kelly (2008) emphasizes that a social worker must have special knowledge and skills to ensure the complexity of social work at the micro, mezzo and macro levels. This results in the roles of school social workers (tab 1).

The intention of the previous table was to point out to the roles belonging to the school social worker profession and to highlight the role of teacher's consultant. Chui a Ling (2013) outline the basic objectives, on which the school social workers should concentrate while working with teachers:

- to help students to fully develop their potential,
- to focus on healthy personality development of children and youth,
- to help students to obtain adequate school achievements,
- to promote harmonic interpersonal relationships in school, family and community,
- to help students to solve their personal, family, interpersonal and school problems,
- to strengthen links between student, family, school and community.

The primary role of school social worker is to help students to solve their academic, social and emotional problems and to develop their possibilities and potential (Chui, Ling 2013). However, they also intervene and act preventively in the case of occurrence of any risk behavior manifestation (Textoris, Lichner, Šlosár 2014). Nevertheless, students and their families are not the only target groups of social workers working in the school environment. It is equally important to focus on pedagogues.

In the context of the defined issue, it seems to be necessary to work with the teachers as well and to guide them to better use of self-care with an emphasis on burnout prevention. The same is pointed out by Openshaw (2008), who states that the competence of school social workers include performing the intervention between children and parents as well as the counseling to members of the pedagogical school team and assistance in programs development (prevention, projects, etc.).

Jarolmen (2014) points out that an individual adapts to his/her environment, as well as the environment adapts to the individual. They are constantly changing systems. It follows that the role of a school social worker should be to identify the problems that cause the obstacles in the performance of teachers's profession and to help him/her with solving these problems. The appropriate method is social counseling for teaching staff of the school and providing consultation.

Bland, Esmalle (2012) appeal to the need to be aware of the broader context of relations between the school and the family of the student, which may affect the teachers's performance and can have an impact on his/her career. In the context of described problematics, the role of school social workers should be:

- to understand school organization and its subsystems,
- to understand the impacts of the institution on the teachers's social functioning,
- to gain insight about the teacher from different sources and to systematize them,
- to identify the effects involved in the teacher's burnout,
- to ensure complex interventions at all levels,
- to focus the attention on the interaction and teacher-environment transaction.

4 Self-care among pedagogues

Social work in the school environment can be divided into three levels to simplify its understanding:

- work with students,
- work with teachers,
- work with parents.

This second level allows the ideal use of self-care models for pedagogues. The fundamentals of social work in the school environment have a great potential and possibilities for the successful application of self-care programs among pedagogues, who belong in the terms of the occurrence of negative phenomena in work, to the most risk occupations of all.

Self-care has been in a center of research interest for a long time. Health care has been perceived as a bearing area of self-care. In this connections, it has been investigated in the context of various diseases and disorders. It is currently a multidimensionally perceived concept that deals with various disciplines. Each of these uses evaluates and examines self-care from their perspective.

The pioneer in the self-care topic is Dorothea Oremová, who introduced the Deficit Theory of Self-Care (Oremová 2001). According to her theory, it is the realization of activities carried out within certain time. The deficiency lies in the fact that there are situations in man's life where the increased attention to self-care is essential. The basis is to support and sustain well-being, healthy functioning, and continuing development throughout the life. The very important piece of knowledge resulting from this theory is the fact that self-care is the result of learning. Oremová (1991) uses the term "self-care agency," which represents a certain ability of the individual or the potential to care for himself/herself.

Self-care currently covers various fields and represents a complex of performed activities - that is the essence of it. Its goal is to maintain physical and mental well-being and it is carried on the individual's own initiative. In the past, the factor of health care dominated in the self-care. Godfrey et al. (2010) analyzed 139 definition of self-care, outlining seven of the main aspects that most often appeared in the examined definitions and that were related to the health area, pursuit of purposeful actions or preventive activities.

Today the situation is different and although health care is still one of the most important domains of this issue, it is supplemented by additional components, for example psychological (Rehwaldt et al., 2009) and spiritual (Ellisová, 2000). From social work perspective, four components are usually distinguished in terms of the activities carried out (Figley, 2002; Newell, Nelson-Gardell, 2014; Moore et al., 2011; Aguilar, 1997): physical, psychological, social, spiritual.

In Slovakia, only a few authors are concerned with the self-care problematics. Some of them focus on the creation and verification of methodologies - measurement tools to capture the perception of self-care requirements in the professional life of helping professionals, the actual realization of individual activities as well as their effectivity (Lovaš, Hricová 2015; Hricová, Janečková 2015; Lichner, Lovaš 2016; Halachová, Lovaš 2015, Mesárošová 2017). Part of them deals with the relationship between self-care and the various negative phenomena among workers in helping professions (Hricová, Vargová 2014; Ráczová, Vasková 2015, Köverová, Ráczová 2017a; Köverová, Ráczová 2017b; Mesárošová 2014), but even among students - future helping professionals (Mesárošová 2016).

5 Pilot study

The aim of the research was to investigate the correlation between stress and burnout in the pedagogical profession. Two questionnaires have been used: PSS 10 and MBI.

The Perceived Stress Scale methodology measures the extent to which an individual considers life situations as stress (Cohen, Kamarck, Mermelstein 1983). The name, resp. the content of this scale is most commonly referred to as the "level of perceived stress". The questionnaire consisted of 10 questions focused on feelings and thoughts that respondents experienced during the last month. Respondents responded to each item in the questionnaire through a 5-point scale. 1 meant that they had

never met with the feelings and thoughts during the month. 2 represented that they almost never felt those feelings and ideas. 3 meant that respondents sometimes met with these feelings and ideas. 4 represented the answer that respondents often encounter these feelings and ideas. 5 presented the response that respondents encountered these feelings and ideas very often.

The Maslach Burnout Inventory (MBI) questionnaire is the best known for tracking burnout in helping professions (Maslach, Jackson, Leiter 1996). It consists of three factors. The first two factors are focused on emotional exhaustion and depersonalization. The third factor means personal job satisfaction. The questions 6, 8, 13, 16 and 20 represented the factor of emotional exhaustion. The second factor, depersonalization, was displayed by questions 5, 10, 11, 15 and 22. The area of personal job satisfaction was formed by 8 questions, namely 4, 7, 9, 12, 17, 18, 19 and 21. The questionnaire consisted of 22 statements focused on how often the respondents felt the specific feelings. For each item in the questionnaire respondents answered through 6-point scale. 0 meant that the feelings of the respondents never occurred. 1 presented the occurrence of those feelings several times a year. 2 meant an answer that indicated that feelings among respondents occurred once a month. 3 meant the occurrence of reported emotions several times a month. 4 was the response of the respondents, who experienced the feelings once a week. 5 represented the occurrence of these feelings several times a week. 6 corresponded to the answer of respondents experiencing these feelings on a daily basis.

5.1 Research sample

The research sample consisted of elementary school teachers. Occasional selections has been used. The respondents were elementary school teachers aged 24-62. Of the 100 addressed elementary school teachers, 74 completed questionnaires were returned. The research sample consisted of 62 women and 12 men.

5.2 Results

Tab 1 Correlation MBI-SPSS

MBI	Spearman's correlation coefficient	SPSS
personal job satisfaction	r	-0,358**
	p(α)	0,002
depersonalisation	r	0,333**
	p(α)	0,004
emotional exhaustion	r	0,340**
	p(α)	0,003

Significant relationships have been confirmed between the level of stress and the individual burnout areas in the observed sample of pedagogues. For depersonalization and emotional exhaustion, there was a positive correlation, thus it can be concluded that respondents who experience higher levels of stress, have higher scores in depersonalization and emotional exhaustion. It has been also confirmed that a positively oriented area - job satisfaction will negatively correlate with the level of perceived stress.

6 Discussion and conclusion

Kolibárová (2012) conducted a research in Kosice and Presov, which was attended by 70 gymnasium teachers. She stated that teachers with longer practice achieve higher levels of burnout in the personal performance dimension. Antoniou, Ploumpi and Ntalla in a survey conducted in Greece in 2013 on a sample of 388 teachers states, that women who perform the profession shorter, endure higher level of burden and stress. Yavuz, in his research conducted in Turkey in 2009 on the sample of 280 elementary school teachers stated that the level of depersonalization is higher in men than in women.

Mendez and Lira (2015) in their research in Spain on a sample of 28 teachers found, that 85.7% of the teachers feel burdened by their work. As the main cause of stress they reported their students, especially those who are confused or pose a threat to the teacher, teacher role stress, school organizational conditions and professional role. In the dimension of depersonalization, teachers experienced negative attitudes, cynicism and insensitivity. Hannelová and Preisingerová (2013) conducted research on gymnasium on the research sample of 55 teachers. The results of the research indicate that depersonalization was higher in men than in women.

It can therefore be concluded that in general it is confirmed that stress is one of the basic factors associated with burnout and its severity. One of the ways to eliminate both of these phenomena is self-care, which possibilities are described above. This paper presented a pilot study of a bigger research design, the next step being the verification of relationships between the self-care and work-related negative phenomena.

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Primary Paper Section: A

Secondary Paper Section: AN

SELF-CARE AND COMPASSION FATIGUE IN THE HELPING PROFESSIONS

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The paper is published within the frame of grant APVV-14-0921 Self-care as a factor in coping with negative consequences of the implementation of the helping professions.

Abstract: The paper deals with the self-care in helping professions – more specifically social workers and police officers. It verifies the connection between self-care and compassion fatigue on a research sample of 104 respondents. It was discovered, that the more exhaustion and compassion fatigue employees feel, the more they are interested to seek appropriate self-care. Their attention is primarily directed to the field of personal growth and development in their profession.

Keywords: Self-care, compassion fatigue, police officers, social workers.

1 Self-Care

Self-care involves a wide range of activities that contribute to mitigate the workload of helping professions, support the better execution of the profession and eliminate the negative phenomena occurrence rate.

The concept of self-care can be divided into the terms of "self" and "care" from a linguistic point of view. The "self" describes the basic characteristics of a person who has the consciousness, it is capable of acting as well as taking the responsibility for its own actions (Halmó 2014).

For a long time, the health-care represented a main area of self-care. It has been investigated in relation to various diseases and disorders, in this context. Many studies have dealt with self-care e.g. in connection to patients with diabetes, where it has been repeatedly confirmed that self-care helps these patients to achieve higher metabolic control (Toljamo, Hentinen 2001; Shrivastava, Ramasamy, Shrivastava 2013; Raaijmakers, Martens, Bagchus, de Weerd, de Vries, Kremers 2015). Another research area is represented by the patients with cardiovascular problems, where self-care, self-efficacy and self-management has repeatedly proved to be very effective (Vellone, Riegel, Cocchieri, Barbaranelli, D'Agostino, Antonetti, Glaser, Alvaro 2013; Marti, Georgiopolou, Giamouzis, Cole, Deka, Tang, Dunbar, Smith, Kalogeropoulos, Butler 2013). It is similar for the patients with certain types of cancer (Brown, Cheville, Tchou, Harris, Schmitz 2014; Gaston-Johansson, Fall-Dickson, Nanda, Sarenmalm, Browall, Goldstein 2013; Berry, Hong, Halpenny, Partridge, Fann, Wolpin, Lober, Bush, Parvathaneni, Back, Amtmann, Ford 2014).

In fact, self-care includes other mental health and well-being activities that are important while performing helping professions. The self-care is well described by Orem (1997), she describes it as a conscious human behavior and activities that individuals perform in order to preserve the life and well-being as well as the health.

Although the present health-care still represents one of the most important domains of this issue, it is complemented by additional components, for example psychological (Rehwaldt et al., 2009) and spiritual (Ellis, 2000). From the social work perspective, 4 components are the most often distinguished in terms of the activities carried out: physical, psychological, social, spiritual (Figley 2002; Newell, Nelson-Gardell, 2014; Moore et al., 2011; Aguilar, 1997).

2 From the history to the present of social-care

Self-care is not a new topic, in the past people used to be concerned with the thoughts of caring for themselves, as evidenced by works by well-known philosophers who have

dedicated themselves to this subject. They mainly focused on the issue of self-knowledge in relation to human abilities, possibilities and limits, self-control and a responsibility in behavior and actions.

Xenophanes Socrates attributed to man, apart from the body, the soul. According to him, it is not enough to care only for the body, but for the soul too, which has been called the greatest gift of man by Socrates. Without soul, there could not be neither thinking nor self-consciousness "myself" (Wollner 2010a).

Xenophon (1972) in his book *Memories of Socrates* points to the inscription of "Know thyself" in Delphi on the basis of which Socrates developed his ideas about self-knowledge. People thought they would know themselves, but Socrates thought that until they knew their abilities, they did not know themselves. And they will know their own abilities only after they acquire more of the self-knowledge.

Dorion (2006) states that according to Socrates, self-knowledge means to recognize one's own limits and what one is actually capable to do or not to do on his own. Socrates further says that whoever is lacking in self-knowledge and who is not able to estimate his or her potential, has trouble contacting people, does not know who to associate with, makes mistakes, and ultimately falls into misery.

Plato, like Xenophon, deals with the problem of self-knowledge in his work *Gorgias*. Wollner (2010b) is understanding the self-care as based on the fact, that self-knowledge and self-control in Plato's *Gorgias* work are making the two components of self-care. According to Sokrates, the dialog with another person should contribute to self-understanding. It helps to understand the own inner world, but also to explore oneself, which should lead to self-knowledge. Its goal is to form not only the opinions but also the personality in order to do good. Self-knowledge is not only about knowing of what we are, but also how we should be.

The care of yourself from a medical point of view is often meant as self-care, but it also includes mental health care (mental health). As it is apparent from the history of self-care, such a complex psychological and medical care of themselves should be a natural part of life of every human being. It plays an important role in helping professions because helping professionals are in systematic contact with the client.

The view of social work is also linked with the self-care deficit theory. The emphasis is also placed on supporting the independence of clients in solving their problems (Lovaš 2014). Insufficient attention paid to care for ourselves and our needs can lead to burnout syndrome. Professional approach at work and respecting boundaries when working with the clients facilitates carrying out the work, thus enables the social workers personal and professional self-care and serves as the prevention of negative phenomena at work.

Each individual has the need for self-care and this need can only be fulfilled by carrying out self-care activities that are individual and different for each. The differences relate to the culture of an individual, internal and external factors, or individual personality characteristics that encourage self-care, while the amount of necessary self-care is crucial. (Orem 2001).

The area of self-care involves a large number of activities and it is therefore difficult to define them all. Generally, however, it contains activities that are designed to cope with different forms of stress. Due to the nature of work of the helping professionals, which involves day-to-day contact with clients, usually living under difficult life situations, it is possible to include helping professions to the risky occupations (Lichner 2016). With this in mind, self-care has an important place, while carrying out these professions.

Self-care is not a natural to man, it is not an integral part of life, but it is an activity performed from the individual's own initiative. It represents the body's response to the identified needs, ergo it is not congenital but it is the result of learning, self-care is the goal-oriented. (Orem 1991). To be initiative means to be active. People dependent on their surroundings react only to stimuli coming from the outside environment, i.e. they are only controlled by external conditions and do not react consciously to their own internal stimuli on their own initiative, they also do not have to feel responsible for their actions. While active people are influenced by the external environment, they react consciously to their internal stimuli (proactive orientation), the reaction is their own choice. They take their own initiative and are taking responsibility for the fact that things will happen in a certain way and in specified direction (Frank 2015).

Lovaš (2014) further describes that self-care activities are consciously regulated, meaning that they are self-regulation based. Self-regulation is seen as a tool to achieve own goals based on preferred interests, it allows the individuals to decide for themselves and to manage their actions in desirable way. Thus, self-regulation forms a basis for self-care in order to regulate and adapt own actions and behavior to the needs and interests. Hartl and Hartl (2010, p. 56) describe the conscious self-regulation of human psychological activity as "one of the basic abilities of man to manage his actions and to consciously strive to achieve the stated goal". Psychological regulation runs continuously throughout the whole life, its essence is to create the optimum consistency between man and the environment in which he can be found at that moment. This consistency results in homeostasis (a state of psychic balance), which allows a person to flexibly change his behavior in relation to internal as well as external stimuli (Szarková 2009).

Self-regulation is closely associated with self-control. Regarding the self-control, two self-regulation approaches could be discussed. In one direction, the key role belongs to goal-orientation, in second, broader view of self-regulation, the self-control has a dominant role, and in this view self-control is understood as part of self-regulation in terms of "ability to change internal processes and behavior in accordance with the superior goals and requirements of the situation" (Lovaš 2011, p. 16). Hartl and Hartl (2010) describe the self-control as self-management, which means general management, management of self, of own behavior and actions, suppression of impulse activities and instincts based on previous experience with the use of reason and will, and it is the activity acquired via social learning. The problem of self-control is the loss of the control over yourself due to impulsivity, such action has unpleasant consequences that the individuals would like to avoid (Paulík 2010).

Hricová and Lovaš (2015) in their research created a model focused on identifying the differences in care of the psychological and physical well-being in terms of proactive orientation (self-regulation) and self-control. Proactive orientation (self-regulation) with a focus on the future are oriented on healthy lifestyle (physical well-being) and personality growth and development (psychological well-being). Self-control, understood as avoiding negative phenomena and factors, focuses on health control in the sense of avoiding the risk to health (physical well-being) and controlling emotions, such negative emotions and suppressing negative emotional states (psychological well-being). The model also serves to measure the degree of physical and psychological well-being, resp. the level of proactive goal-orientation and the self-control orientation in the area of health care.

3 Self-care and compassion fatigue

Experts in helping professions enter the practice with the inner conviction that they can contribute to a positive change in their clients' lives. They expect that their work will fulfill them and that is usually the time, when problem arises. Job requirements and the often slow progress with clients in work may instead lead to compassion fatigue. The compassion fatigue was first

discovered in connection to the burnout among nurses. It represents a cumulative process due to the constant and intense contact with the client. It starts with some discomfort in compassion, continues as fatigue from stress, and ends with complete exhaustion. At this point, the ability to cope with excessive strain and return to the original condition is already impaired. (Berry 2012)

Self-care can act as a factor in eliminating the negative impact of the consequences of helping professions, ev. negative phenomena at work as such. Several studies confirm a real link between the self-care activities and negative phenomena at work. Figley (2002) in his study examined the syndrome of compassion fatigue among the psychotherapists who work with chronic disease. He found that they tend to overlook their own needs in the area of self-care as they focus on the needs of clients. The author describes compassion fatigue through a multifactorial model, which emphasizes the value of care, empathy and emotional investment to help with suffering. This model suggests that the ability to limit the stress from compassion and addressing the traumatic memories along with efficient caseload management, are effective ways to avoid the compassion fatigue. The model also indicates, that reducing the stress from compassion, psychotherapists with chronic symptoms need to develop methods to increase their satisfaction and learn to emotionally and physically break away from work, thus increasing their competence in self-care, in order to achieve recovery.

4 Research

Methodology

The questionnaire battery consisted of two standardized questionnaires - Self-regulation in self-care and Compassion fatigue (ProQOL).

The questionnaire Self-regulation in self-care (SRSC) was created in 2014 by Lovaš. It consists of 32 items in total, constructed to detect self-regulation and self-control in the field of physical and mental self-care. In our research, via the analysis of the research file we have reached the reliability of this questionnaire of 0.88. The questionnaire items are divided into 4 factors - self-regulation in the field of personal growth and development (13, 14, 17, 6, 20, 12, 16, 5, 19, 3, 4, 18, 11, 10) the reliability in this factor was 0.84; self-regulation in favor of a healthy lifestyle (32, 25, 30, 22, 23, 29, 24, 26, 27) reliability was 0.89; emotional control - control of emotions (31, 7, 15, 21) reliability was 0.70 and physical control - health control (2, 8, 28, 9, 1) with reliability of 0.66. A 5-point Likert scale without verbal anchors was used for answers, with the intensity of the self-care activity stepping up with a higher number of the answer (1 = not at all - 5 = very much). (Lovaš 2014)

The second questionnaire is part of ProQOL (Professional Quality of Life), which consists of a battery of three questionnaires - Job Satisfaction, Burnout Syndrome, and Compassion Fatigue scales, that examine the overall professional quality of life. For research purposes, only one of its parts - Compassion Fatigue scale (CFS) - was used. The author of the questionnaire is B. Hudnall Stamm. The questionnaire consists of 30 items that are dealing with an emotional side of helping. It approximates the extent to which the workers in helping professions are affected by the compassion of those they help. Ten items of the questionnaire reached reverse score (items 2, 5, 7, 9, 11, 13, 14, 23, 25 a 28); for correct data analysis, the polarity of these items was reversed. Respondents were given the opportunity to respond to individual questionnaire items via a 5-point frequency scale with following verbal anchors (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = very often). The questionnaire reliability was 0.70. (Stamm 2010)

Research sample

The research sample consisted of workers in the social sphere (n = 53) and police officers (policemen of PZ SR) from (n = 51). Sampling was intentional. A total of 120 participants were interviewed (N = 120, of which workers in the social sphere n =

60 and police officers $n = 60$), the return of the questionnaires was 86,66 %, 104 questionnaires were finally included in the analysis ($N = 104$, 56 women, 48 men – social sphere 42 women, 11 men; PFSR 14 women, 37 men). The average age of respondents was 40,417 (social sphere 40,245; PFSR 40,588), the average length of practice was 15,138 (social sphere 13,334; PFSR 16,941).

5 Results

Based on the Kolmogorov-Smirnov test, parametric statistical methods were used for both groups of the research sample and for both questionnaires (the level of significance α in all of these categories reached $p = 0.200$).

Tab. 1 The level of feeling compassion fatigue and the level of self-care

	social sphere ($n=53$)	police officers ($n=51$)
CFS	120,17	118,35
SRSC	102,81	101,04

The Table shows the average scores of both scales. SRSC scale scores are between 32-160, the average score is 96. The results indicated above-average value for both groups of the research sample. Compassion fatigue scores, after polarity change of the items, reaches 30 - 150, average score is 90. Given that the compassion fatigue is a negative effect at work, these results demonstrate the above-average level of occurrence of this phenomenon in the examined professions.

Tab. 2 The correlation between the level of self-regulation in the self-care area and the level of compassion fatigue among the workers in social area

social sphere ($n=53$)	Pearson's Correlation Coefficient rho (ρ)	CFS
SRSC	r	0,503**
	p	0,001
SRSC F1	r	0,568**
	p	0,001
SRSC F2	r	0,214
	p	0,124
SRSC F3	r	0,363**
	p	0,008
SRSC F4	r	0,194
	p	0,164

$p \leq 0,05^* p \leq 0,01^{**}$

For workers in the social sphere, the positive correlation of compassion fatigue has been confirmed with an overall score, the first factor (personal growth and development) and the third factor (emotional control) SRSC at $p \leq 0.01^{**}$.

For police officers the positive correlation of compassion fatigue has been confirmed with an overall score SRSC at $p \leq 0,05^*$, the first factor (personal growth and development) and the third factor (emotional control) SRSC at $p \leq 0,01^{**}$ (tab 3).

The results indicate that the more workers feel exhaustion and compassion fatigue, the more they are interested to find appropriate self-care. The attention is primarily directed to the area of personal growth and development in their profession (participation in training, special courses, SPV) and the development of self-control in emotional area when working with clients. Beneficial in this regard could be a professional approach to the client on their side (adequate education, adherence to ethical principles, respecting the boundaries when working with client).

Tab. 3 The correlation between the level of self-regulation in the self-care area and the level of compassion fatigue among the police officers

police officers ($n=51$)	Pearson's Correlation Coefficient rho (ρ)	CFS
SRSC	r	0,329*
	p	0,018
SRSC F1	r	0,537**
	p	0,001
SRSC F2	r	0,011
	p	0,936
SRSC F3	r	0,435**
	p	0,001
SRSC F4	r	0,013
	p	0,926

$p \leq 0,05^* p \leq 0,01^{**}$

5 Discussion and conclusion

The objective of the presented research was to capture the level of self-care in two selected helping professions - workers in the social sphere and by police officers and to verify the link between this phenomenon and the compassion fatigue, that is often present while carrying out these professions. Analyses of the author's data resulted in the observation of the above-average scores in both studied phenomena, as well as the studied groups of the research sample. A statistically significant relationship was demonstrated between SRSC and the Compassion fatigue, namely between the first and the third factor of SRSC and the Compassion fatigue. Differences in results between the two groups surveyed - workers in the social sphere and members of Police were not found.

Alkemova, Linton and Davies (2008) conducted a research study on a sample of 37 hospice workers ($N = 37$), the average age of respondents was 46.35 and the average length of practice was 4.41 years. The aim of the research was to investigate the relationship between all three PROQOL scales, including Compassion fatigue and Self-care. These phenomena were pursued with relation to each other, but also with socio-demographic factors, age, gender, length of practice and education. The length of practice has positively correlated with self-care, did not correlate with age or education, nor did the gender differences demonstrated in self-care. Compassion fatigue correlated with self-care, did not correlate with length of practice or other socio-demographic factors.

Research on a large sample of police officers ($N = 1390$) was performed by Battle (2011) in the United States. The aim of the research was to determine the relation of compassion fatigue with job satisfaction and burnout in terms of length of practice and previous experience. Police officers have achieved above average scores on a Compassion fatigue scale. The length of practice correlated with compassion fatigue. (Battle 2011).

Another similar research was conducted in Europe in Slovenia. The aim of the research was to verify the relationship between work-related stress, burnout, job satisfaction, and compassion fatigue. The research sample consisted of staff of the specialist medical center $N = 118$, of which women $n = 101$ and men $n = 17$. The age of respondents ranged from 26 to 45 years. The socio-demographic factors were age, gender and length of practice. The correlation between the length of practice and the compassion fatigue, as well as between the gender differences and the compassion fatigue, was not confirmed. (Tabaj et al. 2015)

The research among the police officers in SR was done by Vasková (2015). A total of 156 respondents working in risky occupation took part in the survey, of which $n = 60$ are police officers (PZSR), to collect data SRSC questionnaire was used. 85% of the sample were men and 15% were women. In terms of gender, significant differences has not been confirmed. Above-

average scores were achieved in the self-regulation of personal growth and development (F1) and in emotional control (F3).

High scores of self-care, compassion fatigue and statistically significant relationships between them have been confirmed in Slovakia, in Europe and in other foreign countries, gender differences have not been confirmed in any of the investigated phenomena in any country. Differences occurred only in the length of practice and compassion fatigue correlation, in which the USA confirmed statistically significant results, which is paradoxical, since the self-care is commonly available there, compared to Europe, more specifically to Slovakia and the compared European countries.

Only a couple of authors are concerned with self-care in Slovakia. Some of them are dedicated to the creation and verification methodologies - measurement tools to capture the perception of self-care requirements in the professional life of helping professionals, the actual realization of individual activities as well as their (Lovaš, Hricová 2015; Hricová, Janečková 2015; Lichner, Lovaš 2016; Halachová, Lovaš 2015, Mesárošová 2017). Part of them deals with the relationship between self-care and the various negative phenomena among workers in helping professions (Hricová, Vargová 2014; Ráczová, Vasková 2015, Mesárošová 2014; Köverová, Ráczová 2017a; Köverová, Ráczová 2017b), but even among students - future helping professionals. (Mesárošová 2016).

The limits of the authors' findings rest in the small number of samples in the individual groups studied and in the uneven distribution of the sample from the gender point of view. In the future, we could focus on a more representative sample and extend it to include other groups of helping professions. Consideration could also be given to examine the context of all PROQOL scales, not just Compassion fatigue, with self-care.

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Primary Paper Section: A

Secondary Paper Section: AN

COMPETENCE APPROACHES: REVIEW OF CURRENT CONCEPTS AND THEORIES

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Project: Identification of leadership competencies which support their successful work in the international environment. Reg. No. FP-J-17-4284.

Abstract: Purpose of the article: Purpose of the article is to provide an overview of the original ideas and theoretical approaches in the field of competence approach of project managers. Methodology/methods: A comprehensive review of the most cited scientific literature and articles published predominately in past ten years in personnel oriented journals was carried out. Scientific aim: The contribution is the identification of the different understanding of competence and competency definitions and competence based approaches (Management by Competencies, Competence models) to obtain holistic view and the ability to perceive competences/competencies as an important part of project management in all its contexts. Findings: There had been identified differences in perception of competence and competency. Next up competencies were classified and application of competency model in work of project managers thanks to management by competencies had been introduced. Conclusions: The paper provides better understanding of the topic and are subsequently a basis for processing research in the current state of managerial competencies in Czech companies with project passed organizational structure.

Keywords: competence, competency, management by competencies, model of competencies, project management, competency models

1 Introduction

Drawing on the theoretical insights from the resource-based view of strategic management, Lado and Wilson, 1994 in their article explored the potential of human resource systems to facilitate or inhibit the development and utilization of organizational competencies. (Lado and Wilson, 1994). Human capital competencies, understood as those talents, skills and capabilities that contribute to multi-factor productivity gains, are perceived as a key element for sustainable economic growth and development in the globalize economy (García-Aracil and Velden, 2008).

The identification of a competency profile for superior project managers could therefore form an important step in the development of improved HRM approaches in the industry, especially given the key importance in managing people at the operational level (Cheng et al., 2005). Successful organizations rely on their employees acquiring a range of core competencies (Brophy and Kiely, 2002).

Since the recognition of projects as the major business endeavors for executing new business opportunities in a rapid changing market environments (Brady and Davies, 2004 and Söderlund and Tell, 2011), the evolution of project management in theory and practice has placed the project manager and his/her competencies at the center of a project's, and an organization's, success (Loufrani-Fedida and Missonier, 2015). From the incessant project failures, project delay and cost overrun to extreme difficulty in agreeing on what constitute project success and project management success, project management practice is more challenging in the 21st century than previously propounded (Alotaibi and Mafimisebi, 2016). Faced with this problem, both the demand for project managers and the interest in project management competencies have increased (Bredillet et al., 2015).

2 Competency vs. competence

There is no one broadly accepted approach toward the terms of competency and competence in the reviewed publications and each author define these two expressions with their own definitions.

Even many people consider the competency and competence as the same, the researchers differ these two words with different

explanations, argue that competence and competency models have been used in three different areas: recruitment, skill assessment and development (Rowe, 1995). Definitions' overview of 6 most cited authors is shown in following table.

Table 1. Competency/competence definitions

Author/s (publ. year)	Competence	Competency
Woodruffe (1993)	Is what a person brings to the job	Is a set of behavior patterns that the incumbent needs to bring to a position to perform its tasks and functions with competence
McConnell (2001)	Individual's capacity to perform job responsibilities.	Focuses on an individual's actual performance in a particular situation.
Teodorescu (2006)	The state or quality of being adequately or well qualified; ability. A specific range of skill, knowledge, or ability	The quality of being adequately or well qualified physically and intellectually
Hroník et al., (2008)	Expertise - knowledge and skills necessary for the performance of eligible roles, which are also referred to as a hard skill. They may be referred to as the minimum qualification requirements and are derived from a specific post.	Soft skills that are necessary for successful job performance. It is the ability to behave in a manner that results in achieving the objectives.
Khan and Ramachandran (2010)	It could be the ability to make satisfactory and effective decisions or to perform a skill in a specific setting or situation. It includes metacognition, because competent individuals are assumed to reflect upon their knowledge, skills and functioning	The habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served
Leung et al. (2016)	Competence is a combination of the complex attributes of knowledge, skills, and attitudes; with the ability to make professional judgement and to perform intelligently in specific situations.	Is described as an underlying characteristic of performance; it is multifaceted and difficult to measure

Source: self-processed, 2017.

To compare the meanings authors in their definitions perceive the competency as mostly knowledge, skills, mindsets, thought patterns, and the like used whether singularly or in various combinations, result in successful performance and on the other side the competence is a function of worthy performance, which is a function of the ratio of valuable accomplishments to costly behavior. (Teodorescu, 2006) Broadly speaking, competence reflects a person's cognitive approach to a task, encompassing the multiple attributes of knowledge, skills and attitudes whereas competency highlights a person's ability to perform those tasks within the defined context of professional practice (Leung et al., 2016).

Moreover Raines (2010) argues that competencies are characteristics that drive performance in a given job, role, or function with self-reflection is an integral process to recognizing and assuring competency (Raines, 2010). Maintaining and improving competence and competency is challenging, their retention depends to a great extent on continued use and familiarity with the subject matter - moreover, research reveals a

distinction between the retention of knowledge and skills (McConnell, 2001).

3 Classification of competencies

There exist some differences in perspective on how competencies should be categorized. Sparrow and Hiltrop (1994) suggest that competencies fall into three categories: behavioral, managerial, and core. Heijke et al. (2002) distinguish three groups of competencies: those acquired in school, which are of direct use in later work; those acquired in school, which facilitate acquisition of new competencies after graduation from school; and those acquired mainly in a working context. A well-known classification of competencies is Becker's distinction between general and firm-specific competencies, which Nordhaug (1993) refined and extended by distinguishing between competencies specific to firms (firm-specificity), tasks (task-specificity), and economic sectors (industry-specificity)(García-Aracil and Velden, 2008).

Kuijpers (2000) adopts an even broader perspective and proposes a typology of competencies which consists of three levels:

1. General working competencies, which she defines as competencies required for different working situations and at different time periods.
2. Learning competencies, which consist of a bundle of competencies which facilitate the development of working competencies.
3. Career related competencies, which are defined to manage working and learning competencies within a personal career path.

Various dimensions of the measurement debate are articulated in the literature: specifically, the lack of a universal model of competence and a universal understanding of the phenomena of competence. Many contributions have sought to present classifications or typologies of competency, moreover specific measurement and classification issues emerge (García-Aracil and Velden, 2008).

4 Competency models

In today's competitive and constantly changing business environment, competency models may be able to help professionals improve the skills set and efficiency level of their workforce to match changing market trends, in order to face competitive business challenges (Gangani et al., 2008). A competency model refers to a group of competencies required in a particular job (according Bozkurt (2011) it is usually 7-9 competencies) depending upon the nature and complexity of work along with the culture and values of the organization in which the work takes place, which can be developing for specific jobs, job groups, organizations, occupations or industries (Bozkurt, 2011). The competency model is useful to identify capabilities and attributes needed to meet current and future staffing needs of managers, and to its development efforts to eliminate the gap between capabilities needed and those available, moreover it would enable managers to perform more effectively, and lead to develop the dimensions of effective management and leadership behavior (Wu and Lee, 2007). Hogan and Kaiser (2005) we review the concept of competency—the usual outcome of the learning process—and show how all competency models can be organized in terms of a hierarchical domain model:

Table 2: The Domain Model of Competencies

Domain	Definition of competencies
Intrapersonal	Internalized standards of performance; able to control emotions and behavior (courage and willingness to take a stand; career ambition and perseverance; integrity, ethics, and values; core self-esteem and emotional stability; patience; tolerance of ambiguity)

Interpersonal	Social skill role-taking and role-playing ability; talent for building and maintaining relationships (political savoir faire, peer and boss relations, self-presentation and impression management, listening and negotiating, oral and written communications, customer focus, approachability)
Business	Abilities and technical knowledge needed to plan, budget, coordinate, and monitor organizational activity (business acumen, quality decision making, intellectual horsepower, functional/technical skills, organizing ability, priority setting, developing effective business strategy)
Leadership	Influence and team-building skills (providing direction, support, and standards for accomplishment; communicating a compelling vision; caring about, developing, and challenging direct reports; hiring and staffing strategically; motivating others; building effective teams; managing diversity)

Source: Hogan and Warrenfeltz (2003)

In brief, this model identifies four broad classes of managerial competencies with 3 main properties: developmental (Intrapersonal skills develop first leadership skills as last); hierarchy of increasing trainability (intrapersonal skills are hard to train and leadership skills easiest to train); model is comprehensive (every existing competency model can be organized in terms of these four domains) (Hogan and Kaiser, 2005).

5 Competencies of project managers

Project management is a complex process targeting multiple outcomes and project management competency is just as complex, requiring the acquisition of a variety of knowledge and skill sets that often cross areas of expertise, including instructional technology, management, information technology, engineering, and manufacturing (Brill et al., 2006). Project from the definition has specific objective to be completed within certain specification; has a start and end dates; has funding limits; consume human and nonhuman resources and it is multifunctional process, what defines the project management as 5 process groups within the project: initiation, planning, execution, monitoring and control, closure. Brill et al. (2006) identified 10 top competencies with influence on the project success:

Table 3: Top 10 competencies of project manager needed

Rank	Category	Competence
1	Context Knowledge	know the goals of the project
2	Context Knowledge	know the scope of project
3	Problem-solving Expertise	conduct business ethically
4	Context Knowledge	know the mission of the project
5	Context Knowledge	know how project success is measured
6	Communication Expertise	listen effectively
7	Leadership Expertise	share credit for successes
8	Context Knowledge	know the available resources (funds, equipment, people, and the like)
9	Communication Expertise	have strong verbal communication skills
10	Problem-solving Expertise	be able to recognize a problem

Source: (Brill et al., 2006)

From previous cases of project failures can serve as useful tool to avoid mistakes in managing present projects (Kerzner, 2013). Usually all failures can be used as lessons learned for the future projects and improve the success factor, but Alotaibi and Mafimisebi (2016) argues that is also important to acknowledge that not all cases of project failures may be useful to project managers in practice because of the unique characteristics of project.

6 Management by competencies

The systems of competency management are based on the various models and approaches in different countries (Aubret et al. 2005). Plamínek and Fišer (2005) claim that there is a connection between all the successes and failures of an organization and competencies of its employees. For this reason, all problems can be resolved through competencies (so-called competency rule) and then we can say that management of organizations that is based on competencies (Lišková and Tomšík, 2013).

The essence of this approach is the harmony between the world of "human resources" (the potential to performance) which defines the organization's possibilities and the world of "human work" (the real performance) which is based on performance requirements (Plamínek and Fišer, 2005). The staff Management by Competencies must be lined up with the objectives and goals of the company and aims to provide the company or its managers with a logic methodology, which focuses on people, their development and, consequently, it focuses on corporate results; moreover, it has also targets in boosting immediate results and in granting sustainable long-term development (Aravena-Reyes et al, 2005)

On the other side, there is also many disadvantages, this approach has to deal with:

- Biggest problem in the use of competency models lies in the lack of homogeneity in its definition and also in its amplitude (Markus et al., 2005)
- difficulties are often associated with the process complexity required in order to identify the appropriate competencies and also those associated with the construction process of a suitable model to the organizational reality (Svetlik et al., 2007)
- There is a great difficulty that companies face in the alignment of competencies and strategies (Fleury and Fleury, 2004)

Because of these and many other barriers, the management by competencies model eventually loses its usefulness, going often to be more a hindrance in the organization, rather than a system of management support.

7 Conclusion

In the overview has been debated the appropriate set of research fields related to competence approach of project managers. This set consist of five general topics allowing us to create adequate theoretical background for the future research.

When discussing the difference between competency and competence, to compare the meanings we can say the definition of competency as knowledge, skills, mindsets, thought patterns, and the like used whether singularly or in various combinations, result in successful performance and on the other side the competence is a function of worthy performance, which is a function of the ratio of valuable accomplishments to costly behavior. (Woodruffe, 1993; McConnell, 2001; Teodorescu, 2006; Hroník et al., 2008; Khan and Ramachandran, 2010, Leung et al., 2016)

Classification: Where it's possible to find scientific approaches to the classification depending on the most cited authors. In our future research related to project management seems to be most appropriated to focus on classification into 3 groups of competencies according to Sparrow and Hiltrop (1994) -

behavioral, managerial, and core. In case the research specific requirements will show this classification as inadequate, other classification will be considered.

Model of competencies: This model refers to a group of competencies required in a particular job (usually 7-9 competencies) depending upon the nature and complexity of work along with the culture and values of the organization in which the work takes place, which can be developing for specific jobs, job groups, organizations, occupations or industries (Bozkurt, 2011)

Project management competencies: Due to Brill et al. (2006) understanding, project management is a complex process targeting multiple outcomes and project management competency is just as complex, requiring the acquisition of a variety of competencies - knowledge and skill sets that often cross areas of expertise, including instructional technology, management, information technology, engineering, and manufacturing.

Management by Competencies: According to Lišková and Tomšík (2013) the competency management system can help to improve the leadership and management of organizations that is based on competencies (MBO). In relation to our research it is perceived as powerful instrument.

We are going to explore the perception of competence / competency understanding among Czech project managers. As well management by competencies (MBC) is perceived as very actual topic (Lišková and Tomšík, 2013) which should be precisely researched in Czech companies to identify the current state of application of this approach and to be able to suggest adequate improvements.

Next up the model of project managers competencies will be designed through qualitative interviews in focus groups and then quantitatively validated. We presume that this model of project manager competences will be useful for a lot of personnel activities in a company. Whether it could support recruitment decisions, evaluation of project managers or indicate the appropriate field of competence development.

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Primary Paper Section: A**Secondary Paper Section: AE, AH**

FINANCIAL DECISIONS IN THE CONTEXT OF THE FINANCING OF CZECH COMPANIES IN AN INTERNATIONAL ENVIRONMENT

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Abstract: This paper deals with the evaluation of financial and non-financial indicators of small and medium-sized Czech companies with international activities using mathematical and statistical methods. The bases of interaction are the non-financial indicators of the international environment: international accounting standards and Czech accounting standards. Financial ratios are selected: ratio indicators, equity and foreign capital, venture capital and profit. By analyzing the data, the information is the key to the financial decision making on the type of financing. Conclusions of our own research confirm that Czech companies use universally known forms of financing, e.g. own capital. The use of Czech venture capital lags behind other European countries is very slow moving to a real improvement.

Keywords: Small and medium-sized companies, financial indicators, non-financial indicators, financing, own sources, foreign sources, venture capital.

1 Introduction

At present, the international business environment is marked by big changes. There has been a significant shift of thought about the rating of the company from traditional indexes towards market value. If the company wants to successfully develop, it must monitor and continually assess the ability of management having a direct impact on company performance (Pavelková et al., 2012). It is appropriate to compare the results of the financial performance evaluation not only in the context of its development in time, but also for example according to CZ-NACE categorization codes, as the field of activity has an impact on financial and economic performance of firms (Santis et al., 2016). It is appropriate to examine the company performance evaluation also from the perspective of the categorization of business entities. From the perspective of business economics, we divide companies to small, medium and large companies. The term 'company' is absent from accounting, this term is replaced by the term 'accounting unit'. The categorization of an accounting unit is based on the European Union directive and its categorization (micro, small, medium and large accounting unit) is dependent on the implementation of the directive in the particular country. In accordance with the rules of the European Union (Recommendation 2003/361/EC, 2003), an enterprise is considered medium-sized if the number of employees does not exceed 250, the annual turnover EUR50 million and the annual balance sheet total EUR43 million, the classification limits for a small and micro enterprise are lower. The specifics of small and medium-sized entrepreneurship in the current market environment are analyzed by e.g. Mikušová (2013). Regular economic analysis in connection with financial decisions and the management of the company has become a common tool for businesses, which can speedily draw attention to emerging problems in specific areas of business, particularly in problems in the financial management of the company, whose eventual failure by the stakeholders and the shareholder may have a negative impact on both the profit and the future development of the company (Elliot et al., 2011). A positive relationship between entrepreneurial orientation and business performance was found out by studies Darko et al. (2016), Mugomo et al. (2016), Pomar et al. (2016) investigated, among other things, the influence of the company size, the subject of business and financing in the context of return on investment. The increasing share of international activities also influences the way the company finances itself. It is necessary to address the interrelationships of financial and non-financial indicators that are underlying information of the company's decision about the form of financing. The need for financing of businesses is caused both by the need to set up in business and in every period of business development. Each business entity must calculate the necessary amount of funds. Significant area of decisions is the source of financing of business activities, including investment decisions that affect the financial management in the context of funding sources. If a company has insufficient of its own funding sources

or its resources are exhausted, than the enterprise is forced to obtain additional resources from the available forms of financing, most often foreign capital. Deciding on the structure of funding sources is one of the most important decisions of the enterprise and translates into cost of capital, reduction or increase of prices and margins, profitability indicators and the creation of resources for other business activities etc. It is necessary to emphasized that not all sources of funding of the SMEs may be used and are available to them. This limitation is due to: legislative changes in individual countries, the provisions of the Accounting Act and other regulations or simply unavailable, which can be used by, for example, only large listed companies, such as stock exchange (a bond issue and shares). In addition to the well-known forms of financing there is a growing importance in a riskier form of finance which is known as venture capital in the Czech Republic (Pomykalski, 2014; Sato, 2013; Příhodová et al., 2013).

The aim of the article is selected to use mathematical and statistical methods to analyze selected financial and non-financial aspects in relation to the form of financing small and medium Czech enterprises with international activities. Own research is focused on SMEs, which are forced to considerably streamline business processes, carefully manage risks and deliberately assess resources and funding methods in the context of international activities. Business activities are also influenced by international accounting harmonization. The need to maintain accounting records and prepare financial statements is caused by legislation, the requirements of the international environment and business partners. Selected financial indicators are profit, private and foreign capital and ratio indicators. Non-financial indicators are international accounting harmonization and Czech accounting standards.

1.1 Theoretical Framework

The choice of capital structure influences not only the degree of indebtedness, but also the amount of profit or the measure of operating leverage. When searching for the optimum resources to finance assets it is appropriate to respect the golden rule of balance sheet financing, which means that fixed assets are financed by long-term funds (own capital) and long-term foreign capital and current assets are financed by short-term resources. Dittmar (2004) found (who observed the financing structure of selected enterprises) that the ratio of representation of own and foreign sources depends on the subject and nature of the business activities of the analyzed subject. Businesses with growth potential choose a lower leverage ratio. Using debt financing is too conservative and the quantity of stable and profitable enterprises is very low (Strebulaev, 2007). Titman et al. (1988) stated that the determinants influencing capital structure include the collateral value of property, the tax shield, company growth, industry classification, size and profitability. Wald (1999) analyzed in detail the impact of corporate characteristics on capital structure. His results show that institutions are also important determinants of capital structure. Abora et al. (2009) conducted examined of the factors influencing the components of capital for small and medium-sized enterprises. Molinari et al. (2016) analyzed the mutual influence of the financial structure, liquidity and expansion of businesses in Italy, Khidmat et al. (2014) analyzed the influence of liquidity and solvency on profitability. The cost of capital comprises two components, the cost of external (debt) and equity. Modigliani et al. (1958) Analyzed in detail of the average total cost of capital. Aliyev-Ada et al. (2015) investigated the effect of interest rates on financing. Large enterprises have a higher debt ratio than smaller firms. The fact that the capital structure also affects the phase of the economic cycle, is confirmed by the conclusions of Rodriguez-Masseur (2016).

Many studies on the sources and methods of funding exist in theory and practice. The conclusions of each of the searches are very similar and indicate that the measures adopted thus far for

the support and financing of SMEs is not sufficient, and is only very slowly moving towards a genuine form of corporate financing. Problematic areas of financing are designated phases: planning, decision-making and business management, tax liability and the possibility of obtaining capital for the further development of SMEs. Development phase of an enterprise has an impact on the specific arrangements for financial management, forms of financing and tools used for the internationalization of the company, Fig. 1. Each stage of development has different characteristics that are manifested variously in international markets in both cash flow and management style and business development in international markets (Block et al., 2004; Dluhošová, 2008). The factors influencing the capital structure in micro, small and medium-sized enterprises in countries of Central Europe examined Mateev et al. (2013). Fundamental factors of internationalization in relation to business financing are the areas of: financial planning, decision making and management, reporting and accounting standards.

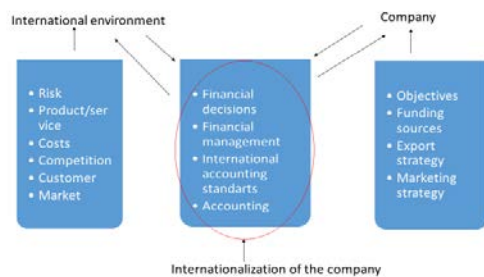


Figure 1: Influence of business processes on the internationalization of the company
Source: modified by the author, Block et al. (2004), Dluhošová (2008)

According to the different stages of company development the form and method of financing is defined (Machková, 2015; Marek, 2009). Financing through venture capital has grown in importance in the last decade. In spite of this there exists very few practical studies. Many forms of venture capital exist. The investor does not usually provide only financial resources, but usually becomes part of the business (Juříčková et al., 2013; Zinecker et al., 2013). They participate in business risk and have the same rights and responsibilities as a business owner. The development of venture capital in the Czech Republic is typified by managerial buyouts of profitable groups of large companies. The management of such groups requires takeover and self-management (Dvořák et al., 2008; Nývltová et al., 2007; Czech Invest, 2017). The professional literature describes venture capital differently and there exists a number of definitions. Venture capital can be considered as a subordinate name for, "private equity".

2 Methodology

The author's own research on sources of SME financing is for the period 2009-2016 and this research is continuing (Meixnerová et al., 2017). The primary objective of my own research is the analysis of financial decisions on the financing method of companies in the Czech Republic in the context of international activities. When analyzing the links between the indicators it is assumed, that the selected indicators have their information used and they are a necessary source of information for the decision-making activity on the form of financing the enterprise. Variables considered in the model are not static, but cointegrated. When variables considered in the model are not static, but cointegrated, we applied the error correction model is applied by error correction model (VEC model indicated, also referred to as the EC model). According to Hinds et al. (2000) in a linear relationship can be expressed provided that the variables x_t and y_t are the first order and integrated by means of an error correction mechanism in the form:

$$\Delta y_t = \alpha_0 + \gamma_0 \Delta x_t + \eta (y_{t-1} - \beta x_{t-1}) + u_t, \text{ kde } \eta < 0 \quad (1)$$

where β is the cointegration parameter. β type parameters describe the long-term cointegration relationship between variables entered into the so-called cointegration vectors of type (1, β). The paper model error correction to change the profit (Δv_h) described by the equation:

$$\Delta v_h = LevRatio_t, ROA_t, ROE_t, ROC_t, VK_t, CK_t, VC_t, IS_t, CS_t \quad (2)$$

where indebtedness (LevRatio) is perceived as a temporary growth indebtedness (marked "minus"), which leads to increased profitability indicators (ROA, ROE, ROC) (marked "plus"). Use of foreign capital (CK) is cheaper (marked "plus"), venture capital (VC) (marked "plus") and equity (VK) (marked "minus") should not be used in greater amounts (quantities) than foreign capital. It is preferred to use international accounting standards (IS) (marked "plus") and Czech accounting standards (CS) (marked "minus") are not significant for the international environment. The economic model is formally written as follows:

$$VH = f(LevRatio_t, ROA_t, ROE_t, ROC_t, VK_t, CK_t, VC_t, IS_t, CS_t) \quad (3)$$

$$VH = (-, +, +, +, -, +, +, +, -) \quad (3a)$$

3 Research

Comparison of the venture capital of the European market with the US can't be compared sufficiently yet. The European venture capital market is small. Fig. 2 defined EVCA (2016a) shows that the proportion of investment in venture capital in proportion to the gross domestic product for the year 2016 for the Czech Republic amounted to 0.002%, which is quite far from the European average, which amounts to 0.027%. Venture capital values have tripled in the Czech Republic compared to 2014 and it has been a strong year for venture capital (EVCA, 2016). In venture capital, a typical investment of profiling business is in activities which lead to product/service expansion to other markets or working capital in connection with rapid revenue growth. Investors are usually satisfied with minority stakes, as the usual functioning of a young companies is very often directly dependent on the personality of the owner and a stable management team is still being created. Most of the investors operate on a fund basis in the Czech Republic. However, the fund itself is preceded by a time when the fund's future fund manager must find sufficient financial resources to manage. The main venture capital investors are usually pension funds, funds of funds, state institutions, banks and family offices (under this term can be represented, in particular, wealthy individuals or families who could obtain funds from, for example, the successful sales of their companies, etc.). The typical investment duration is between 3 and 7 years. According to the analysis EVCA (2016), it can be stated that venture capital is mostly used by large enterprises. For SMEs, venture capital opens up new possibilities. Besides financial barriers SMEs must solve infrastructure barriers (small cooperation between enterprises, insufficient cooperation between enterprises and higher education and research institutions) or information barriers (insufficient information on technological opportunities, insufficient information when starting a business, etc.).

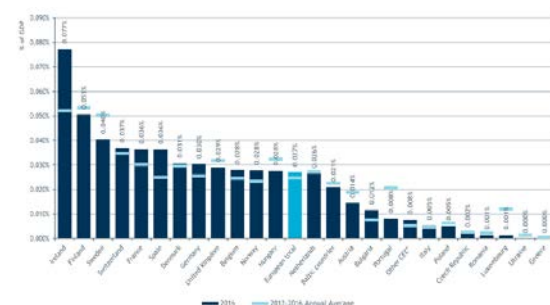


Figure 2: Percentage proportion of investment in venture capital in relation to GDP in 2016

Source: EVCA (2016a)

Fig. 3 shows a comparison of SMEs with international action to finance assets using foreign sources. The figure shows a positive trend of development, which means that companies finance their activities from foreign sources. The main motive of financing business activities by foreign resources is a relatively lower price in comparison to their own resources. These decisions on which funding method is used is reflected in the profit and loss account. The growth in the value of the company in the international environment will depend on the achievement of positive results and the dynamics of sales.

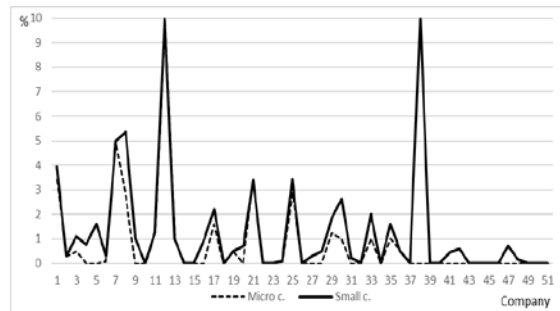


Figure 3: Comparison of indebtedness SMEs

Source: own research

The estimation of the VEC model for the detected cointegration binding is given in Tab. 1. An estimated VECM model describes the short-term dynamics and the process of returning to balance. The long-term equilibrium relationship is interpreted using the cointegration vector. Normalized cointegrating vector VEC model β_t ($vh_t, LevRatio_t, ROA_t, ROE_t, ROC_t, VK_t, CK_t, VC_t, IS_t, CS_t$) is a predetermined limitations standardized so that the first component is the unit. The shape of the cointegration vector for profit is (1, -10.9808, 1.3092, 8.7774, 3.0644, 0.2897, -15.7610, 4.5697, 3.4575, -0.4745). From the values of coefficients R2 is shown the various degrees of tightness of dependence between the analyzed variables (indicators). It can be stated that the change of the dependent variables in the equation are 62.5% explained by changes in the independent variables and 37.5% of those changes are unexplained (Tab. 2). Given the character of the analyzed relationships is considered satisfactory we can say that we are able to adequately explain changes in profit and loss based on the selected indicators. The statistical significance of each variable in the equations was tested using t-statistics, and it is apparent that some of the delay values can be omitted in the model. The detected cointegration equation in comparison with the equation (2) proves that the "signs" of the coefficients in the cointegrating vector are in accordance with equation (3, 3a). The positive equity ratio (the opposite coefficient of the equation) shows that growth of equity by 1% causes a decrease in of the investigated dependent variable of about 0,2897%. The increase in own capital does not have a significant effect on profit or loss. It was also assumed the opposite effect of foreign capital, ie. that foreign capital should replace its own capital in a certain proportion. The impact of venture capital is small and the slow development of venture capital in small and medium-sized enterprises is confirmed. It can be stated that one's private model could be extended for other variables, that would make the impact of equity in the long run more economically viable.

Cointegrating Eq:	CoIntEq1
vh(-1)	1.000000
levratio(-1)	-10.98087 ***
	(1.83990)
	[-3.86664]
roa(-1)	1.309265 ***

roe(-1)	(0.56521)
	[-2.31644]
	8.777465 ***
	(2.15265)
roc(-1)	[4.07751]
	3.064423 ***
	(0.90214)
vk(-1)	[-3.39683]
	0.289728 ***
	(0.16980)
ck(-1)	[-1.70631]
	-15.76105 ***
	(0.27464)
vc(-1)	[-6.92902]
	4.5697 ***
	(0.2564)
is(-1)	[-3.02023]
	3.457509 ***
	(0.17656)
cs(-1)	[-3.54050]
	-0.474571 ***
	(0.15074)
C	[-3.14825]
	-25.36453

*** Correlation is significant at the 0.001 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

Table 1: Estimation of VEC model for profit

Source: own research

Error Correction:	CoIntEq1
D(vh)	-0.624283 ***
	(0.06103)
	[-0.85907]
D(levratio)	0.000789 ***
	(0.00272)
	[0.29029]
D(roa)	0.032178 ***
	(0.03261)
	[0.98672]
D(roe)	0.010977 ***
	(0.00433)
	[2.53403]
D(roc)	0.030480 ***
	(0.00704)
	[4.33189]
D(vk)	0.133143 **
	(0.07069)
	[1.88351]
D(ck)	0.014713 **
	(0.00405)
	[3.63536]
D(vc)	1.065203
	(0.91604)
	[5.61042]
D(is)	-0.009648 ***
	(0.00763)
	[-1.26446]
D(cs)	0.096023 ***
	(0.07966)
	[1.20545]

*** Correlation is significant at the 0.001 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

Table 2: Error correction of VEC model

Source: own research

Tab. 1 shows that the result of the VEC model has demonstrated the statistical significance of the correction component of the profit or loss model. The model is statistically significant and is capable of explaining short-term dynamics and convergence to

long-term equilibrium. Changes in the development of the economic result are explained by changes in the variables included in the model, which are in Tab. 1 marked in bold. It can be said that businesses use different forms of financing in relation to the profit. Management style and the size of the company, mostly for micro and small enterprises, have an influence on the form of financing. For micro and small enterprises the personal (ties or connections) predominate in the conceptual management system. Personal management style is not perceived as a threat in the context of decision-making and financing. Equity is, with regard to the risk, a credible form of financing. This confirms the conservatism of Czech entrepreneurs who understand the development of the company as a monetary value and not as a way or means for creation and development of the business.

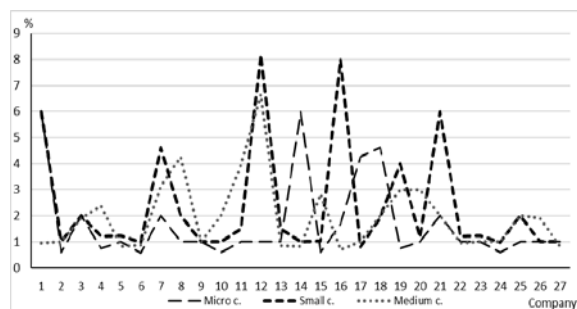


Figure 4: Return on assets by SMEs in year 2016
Source: own research

A comparison of the ROA level achieved and the average interest rate (discount rate in 2016, at the Czech National Bank (CNB) was 0.05% (CNB 2016)) shows that all large companies are able to receive and repay foreign sources, Fig. 4. For micro, small and medium enterprises a similar trend is shown. If we do not consider the effect of taxation, we can state that the SMEs would see only a change in the structure of foreign resources, which affects the development of ROA. SMEs are financing with foreign sources less actively, which can be caused by worsening conditions of availability of foreign resources, but also by the responsibility for managing the company on a "debt". It confirms that when reach the level of ROA and average interest rate, businesses would be able to receive and repay foreign sources. Adherence to the use of a certain proportion of foreign capital to finance the assets of a business should always correspond to the level of the company's liquidity and funding rules as it significantly affects the profitability of the enterprise. Other factors which affect the property and capital structure of the company are: capital costs, inventory, accounts receivable, interest, taxes, liquidity, dividend policy, risk, etc. The growing ROA trend shows the positive evaluation of equity, which is one of the most important indicators of the financial performance of the company for shareholders and prospective investors. The development of profitability indicators is similar and equally volatile in the observed enterprises. Trend indicators are continuously growing in time, see Fig. 5. The current trend of low interest rates (repo rate in year 2016, according to CNB was 0.05%) and excess of bank sources has an impact on the growth indicators of return on equity and can't be described as a cause of disproportionate indebtedness of enterprises. The volatile development of the return on revenue ratio can be attributed to a well-established company strategy and a sufficient resilience of foreign sales to market developments. Growing sales and profit results tell of a healthy business. Companies that want to exist on the international market for a long time have to be reasonably profitable and must strive for a structure with minimal cost of own and foreign capital. However, profitability indicators are not a measure of the company's success because it does not reflect the risk of doing business, using foreign capital, liquidity or insolvency. The low level of funding with long-term resources and the high level of corporate inter-firm indebtedness is one of the major problems of managing the company's international activities.

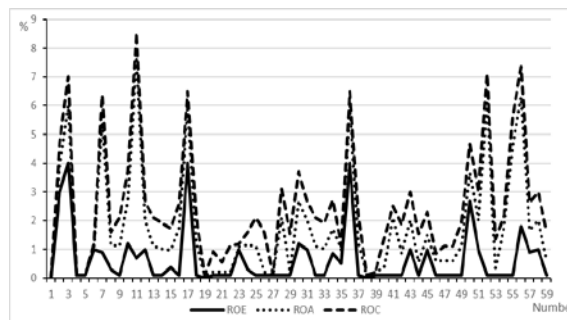


Figure 5: The development of profitability indicators in year 2016

Source: own research

4 Discussion

Examination of the variables laws and their interrelations confirmed the economic theory, which defines the interrelationships between the monitored indicators. Researching of the laws of variables and their mutual relations confirmed the economic theory that defines the interaction between monitored indicators. The development of profitability indicators for micro, small and medium enterprises is constant. That means that businesses are actively using the invested capital. The reason for the constant development of the return on equity is the stagnation of foreign resources for SMEs due to the cautious approach of banks, investors and other intermediaries on the basis of the global economic crisis in 2008-2009 and the historically high proportion of outstanding loans. The cause is that businesses are so small that they can't offer a guarantee in the form of assets (fixed assets). Another influence is the change in the accounting methodology or the establishment of micro and small enterprises due to redundancies during the global economic crisis in the context of the establishment of new businesses without business and payment history. It is important to point out that not all sources of funding can be used by micro, small and medium-sized enterprises and that limited or no rights are created by the use of foreign capital by the business owner. Or, part of the production or business is provided to a foreign partner, which limits powers and is usually more expensive than a bank loan.

This confirm the well-known claim that micro and small businesses, from a lack of formation of own resources, which are wanting to increase the support of foreign resources who have an insufficient payment history will not gain it. An important role for companies with international equity ownership of the parent (due to the guarantee) is to provide financial resources under more favorable and more affordable terms. The optimal capital structure arises from the creation of a ratio of own and foreign capital with the lowest total capital cost. Decision-making on the way of financing an enterprise confirms the analysis of the impact of profitability, debt and capital management. Problem areas for micro and small businesses are to secure financial resources and their effective use in connection with limited bargaining power, limited classical and alternative sources of funding in relation to the duration of the operation on the international market and unequal access in taxation and tax treatment. The decision on how to finance the company affects the profitability, debt and capital management. It can be stated that due to the historical development of the Eastern economies their instead of is development status and use of financing through venture capital is lagging behind. The influence on decision-making and enterprise management in the context of financing confirmed the interdependence of accounting, tax and other legislative and financial aspects in the areas of:

- corporate activities (planning and decision-making, management, financing, etc.),
- market system,
- the use of financial analysis as part of the evaluation of corporate success in the domestic and international markets.

Non-financial indicators are growing in importance – the accounting harmonization process is overcoming existing differences between local accounting standards. The Czech Republic, if it wants to integrate into the global economy, must reconcile with this development. In addition to the knowledge of Czech accounting, the issue of international accounting harmonization, through the support of counseling, regional or higher education centers, or other knowledge-raising assistance, must be a matter for the general public.

5 Conclusion

Conclusions of own research confirm that Czech companies use generally known forms of financing: a combination of own and foreign sources. The problem area of an SME is to decide on the way of financing due to a lack of information, knowledge and legislative regulations. The use of venture capital lags behind other European countries and is very slowly moving towards real improvement. The basis for compiling international business plans and objectives, including defining and using funding sources, is business accounting analyzes that significantly affect the financial management of an enterprise. Above all, accounting is a control tool to analyze and document business activities in an international environment. Compliance with international accounting standards should ensure a comprehensive overview and full control of international business in the context of funding.

Practical research has been to design and identify appropriate variables that will influence decision-making in relation to business financing. Previously in this article, it was possible to work with data that had the character of non-stationary time series. The actual model variable in the contribution became the difference, not the original series of selected indicators, which motivated the creation of the VEC model. Long-term analysis has highlighted the fact that long-term relationships characterizing financial and non-financial areas exist among the selected indicators. The long-term equilibrium state was interpreted in the contribution by the cointegration vector in the VEC model. Certain identical impacts were identified, according to their own design, on the economic result. Nonetheless, the cointegration equations have unequivocally demonstrated and confirmed the view of the economic theory that with the growth of the economic result, the costs of using equity and the debt of the company are decreasing. This significantly influences the behavior and decision-making of an enterprise in the current competitive and international environment.

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Primary Paper Section: A

Secondary Paper Section: AH, BB

IMPACT OF FINANCIAL PERFORMANCE OF OUTDOOR WEAR PRODUCERS ON BRAND PERCEPTION OF CONSUMERS

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Financial performance of company is considered as one of the most crucial area, on which companies focus on. Similar approach is in field of outdoor wear production. Contribution is focused on finding, which financial indicators are key for the outdoor wear producers in connection with perception by final customers in Czech Republic. According to our findings it is obvious that companies use profit indicators mainly medium and large size, and in western and northern regions of Europe. Empirical evidence was realised in two groups: (1) companies, (2) customers. For analysis of companies there were used data from 4996 subject. For customers' analysis there was employed questionnaire survey, on which participated 292 persons. For the analysis of gained data there was factor analysis and correspondence analysis with validation technique based on chi-square nonparametric tests and for transparent representation of the structure of dependence and interpretation is used symmetric correspondence map.

Keywords: Financial performance indicators, business, consumer perception, outdoor production

1 Introduction

Outdoor-wear industry has become most popular in past ten years. Many producers accepted customers' requirements and apply them into individual products. All customers want to use such outdoor wear in day-to-day life in cities, which is developed mainly for extreme nature environment. Many producers decrease quality level of own products according to general use with low requirements of extreme clothes conditions.

Some customers perceive outdoor-wear as kind fashion style, on which producers have not adapted in past and now they change own production. Because of wearing of outdoor clothes become fashion, many producers try to get part of market share in own region or in global market. Outdoor clothes combine technical level of material and products, high usage value, fashion trends and image. In each of these areas could participate customers by co-creating value and sharing own opinions, which provide better value perception of final product. Increasing product values is usually supported by suppliers and material producers, other clothes producers and of course by sellers.

Financial performance evaluation, including economic results, constitutes an important part of company management, as the evaluation figures help us to monitor and evaluate accomplishment of the basic economic objectives (Zhang, Lawrence, Anderson, 2015; O'Sullivan, Abela, Hutchinson, 2009; Loeschenbrand, 2016; Hornungová, 2015).

2 Theoretical background

Recently, performance evaluation methods have significantly changed. Evaluation of performance in company can be defined as the ability of a company to boost investments, put into business activities, contributing to continuous self-improvement and accomplishment of business objectives (Šulák, Vacík, 2005; Maria, 2009; Muchiri et al., 2010). Performance evaluation is one of the tools helping the company management to decide how to do the business activity effectively (Arena, Azzone, Bengo, 2015; Lebas, 1995).

Traditional financial indicators (calculated from accounting data) are still used today to evaluate performance; this approach to performance evaluation and comparison has been recognized as the most appropriate for a long period of time in spite of different accounting and financial indicators. Since 1980 traditional methods have been facing various views, identifying contentious issues in the use of these models, resulting in the

search for other opportunities for performance evaluation (Mohamed et al., 2014; Neely, 2004).

Over the time, the performance has been measured either by the company size or its productivity and profit. The scientific literature divides financial indicators of the company performance into three categories:

- Accounting results and derivative indicators – the accounting result is the result from the financial statement. The basic indicator, which can be explained by means of the structural analysis of the profit and loss statement. Accounting indicators express the company's performance in absolute values. The application of these indicators is recommended for various comparisons: proportion of personal costs to turnover; productivity rate; proportion of business margin to turnover, etc. These indicators provide a clear picture of productivity (Brignall, 2007).
- Traditional production indicators (indicators of financial productivity) – these indicators provide information through the value of invested assets. The best known indicator is ROI (return on investment), calculated as the ratio of the economic result to the cost of investment. Another traditional productivity indicator is the ratio of the net economic results to the equity capital (ROE = return on equity). Ratio indicators of financial productivity provide information helping the company to compare its productivity, expected by shareholders, i.e., to evaluate so-called financial attractiveness.
- New category of financial indicators – represented by the metrics EVA (Economic Value Added); its positive value indicates that from purely financial point of view the company has successfully generated value after the payment of all capital investments, in particular from capital shareholders (Nicu, 2009).

Recently, researchers have begun to examine firm performance as a function of alternative managerial orientations such as an entrepreneurial orientation (Ross, Westgren, 2009), market orientation (Verhees, Meulenberg, 2004; Sychrová, Šimberová, 2012), and strategic choice. For a firm to achieve success in implementing orientations different from a production orientation, the manager must have a willingness to change and to question current business strategies (Micheels, Gow, 2015).

3 Methodology

The main aim of this paper is to find key indicators in grouped factor in the field of financial performance for companies in automotive industry (as one of the most important part of engineering industry). Partial aim of the paper is to identify relationship between observed factors and company size and NACE classification. Main hypothesis suggests dependence between realization of individual activities and their performance in connection with outdoor-wear industry.

Data have been gathered from Amadeus database and processed by the statistical program IBM SPSS Statistics 24; subsequently, (1) factor analysis, (2) dependency between two nominal variables by means of contingency tables and Pearson's chi-squared test, and (3) correspondence analysis have been studied. To graphical design complex view on agriculture field there were used correspondence analysis.

The conditions for choice of companies:

1. geographical location of Europe (West, East, South, North);
2. dividing according corporate size;
3. classification of economic activities according to NACE classification, reduced to 1413 – Manufacturing of other outdoorwear.

Size of company is defined according to regulation of European Commission (Table 1). According to selected NACE groups, the basic population has been defined for individual country as follow in Table 2. Sample population of agriculture companies consist 4996 from whole Europe (see Table 2).

Table 1 Limits for splitting of companies into individual categories

	Staff headcount	Annual turnover	Annual sum of balance
Micro	< 10	≤ 2 mio €	≤ 2 mio €
Small	< 50	≤ 10 mio €	≤ 10 mio €
Medium	< 250	≤ 50 mio €	≤ 43 mio €

Source: Evropské společenství, 2006

Table 2 Pivot table: company size and European region

	Micro & Small	Medium	Large	Missing	Total
Western	105	24	7	159	295
Southern	2259	304	41	120	2724
Northern	134	20	10	36	200
Eastern	1026	476	108	167	1777
Total	3524	824	166	482	4996

Source: own work by authors

Questionnaire survey as part of customers' analysis was targeted on field of outdoor clothes, knowledge the producers' brands. This survey was realised during spring of 2017 in Czech Republic. From group of customers there were selected 851 respondents in random way to participate. From that amount 292 questionnaires were returned back (relative amount is 34,31 %).

Factor analysis is based on the selection of correlation and partial correlation coefficients. The correlation coefficient represents the closeness of linear dependence of individual variables and partial correlation coefficients. The partial correlation coefficient shows a similarity of two variables in such a situation that the other variables are assumed constant. If it is possible to explain the dependence of variables using common factors, the partial correlation coefficients are very small, close to zero. To assess the suitability of the factor analysis, two tests can be used (Tarnanidis et al., 2015; Conti et al., 2014):

- Kaiser-Meier-Olkin (KMO) is a coefficient which could reach values between 0 and 1. Its value consists of the rate of squares sum of the correlation coefficients and squares sum of the correlation and partial coefficients.
- The use of Bartlett's sphericity test lies in testing the null hypothesis stating that the correlation matrix of variables is unit (on diagonal, there are only ones, others are zeros). If the null hypothesis is rejected, the factor analysis may be used for the defined variables.

For the purposes of verification of the factor analysis Cronbach's alpha indicator must be used. This indicator is understood as a reliability coefficient, used as a kind of analogy with the correlation coefficient. Normally, values oscillate in the interval (0;1). Zero, as the extreme value, describes the situation in which individual variables are uncorrelated. On the other hand, the value 1 describes correlated variables. When the value is closer to 1, a higher degree of conformity is reported (Hrach, Mihola, 2006; Cronbach, 1951; Řehák, Brom, 2016).

However, high Cronbach's alpha does not imply that the measure is dimensionless. If, in addition to measuring internal consistency, you wish to provide evidence that the scale in question is dimensionless, additional analyses can be performed. Exploratory factor analysis is one of the method to check dimensionality. Cronbach's alpha is not a statistical test; it is a coefficient of reliability (or consistency). The value could be expressed as the function of number of test items and the average

inter-correlation among the items. Below, for conceptual purposes, we show the formula for the standardized Cronbach's alpha:

$$\alpha = \frac{N \times \bar{c}}{v + (N - 1) \times \bar{c}}$$

where N equals to the number of items; c-bar is the average inter-item covariance among the items; v-bar equals to the average variance.

The values of Cronbach's alpha could be from 0 to 1. If the values are close to 0.5, it signifies a bad level of internal consistency. Over 0.7 means that the value is acceptable and values close to 1 are excellent. A "high" value of the alpha is often used (along with substantive arguments and other statistical measures) as evidence that the items measure an underlying (or latent) construct (Hinton et al., 2004).

Correspondence analysis describes relation between both two nominal variables in pivot table and individual categories. In pivot table there is category combination which should become significant or not. If any categories are similar or associated, there are located in graph near themselves. Correspond analysis itself is focused on association rate, usually by chi-square measure. There are nominal variables as input into correspond analysis, and kind of premise, that there is no ordering between variables (McGarigal, Cushman, Stratford, 2000; Beh, 2010, 2008). Correspond analysis processes dimensional homogenous data which consist only positive values or zeros. Chi-square range has become coefficient which excludes zeros, and help to define relations between rows and columns.

Calculation of correspondence analysis includes three steps: (1) pivot table transformation into table with support of Pearson chi-square; (2) individual value decompositions are applied into defined table, then there are calculated new values and new vectors; (3) new matrix operations serve as input to graph design. Basis for two dimensional pivot tables is data matrix $n \times 2$, in which categorical variable A get r values (a_1, a_2, \dots, a_r) and categorical variable B get s values (b_1, b_2, \dots, b_s). Due realised observation there is created table by two dimensional separations of both variables. In the table is used n_{ij} frequency, which represents intersect of both variables. This n_{ij} provides number of observations, where are both a_i and b_j . Except n_{ij} there are used marginal frequency n_{i+} , where own observation with a_i value are observed (similar approach is for n_{+j} in column). After estimating the theoretical frequencies there is designed chi-square statistics. This statistic has chi-square distribution and number of degrees of freedom $(r-1)(s-1)$. On this basis, it is decided if exist dependency between variables in the population, and by using correspondence analysis is also possible to determine the structure of dependence (Beh, 2010; Kudrats, Money, Hair, 2014).

4 Results

Based on the economic data from Amadeus database, it is evident that companies commonly use traditional financial indicators for measurement of their own performance. These indicators were analysed:

- x_1 – Cash flow [th EUR];
- x_2 – P/L for period (Net income) [th EUR];
- x_3 – Operating revenue (Turnover) [th EUR];
- x_4 – ROA using P/L before tax [%];
- x_5 – ROE before tax [%];
- x_6 – Gross profit [th EUR];
- x_7 – Shareholder funds [th EUR].

Based on the statistical characteristics of the examined groups the conclusions could be presented as an approximate result, limited by the resulting reliability. In the results of the paper there are characteristics of research barriers and future research possibilities.

For the purpose of factor analysis the value of Kaiser-Meier-Olkin test should reach the value of at least 0.5 (value range is between 0 and 1). In order to assess whether it is possible to use the factor analysis, Kaiser-Meyer-Olkin method (KMO) and Bartlett's test of sphericity have been used. The KMO method is based on selective correlation and partial correlation coefficients. For the indicators in factor analysis KMO are observed according to the highest level of acceptance, which means that the performed level of usefulness of the factor analysis reaches high value. Bartlett's test of sphericity is a statistic test used to examine the hypothesis that the variables are correlated or uncorrelated.

Value for KMO test was reached by 0,764 and for Bartlett's test by 0,000. Therefore, factor analysis itself could be applied. The total variance of the performance indicators is explained by means of eigenvalues, representing the total variance explained by each factor. The eigenvalues show that only three items have reached the minimum value of 1. From this point of view, Extraction Sums of Squared Loadings with cumulative percentage are important. Factor analysis has extracted different numbers of factors, which explains variances of all cases (81,54%).

Table 3 Results of factor analysis

			Cronbach's alpha
Factor 1	Cash flow	0,994	0,779 ACCEPT
	P/L for period (Net income)	0,994	
	Operating revenue	0,987	
	Shareholder funds	0,973	
Factor 2	ROA using P/L before tax	0,813	0,437 NOT ACCEPT
	ROE before tax	0,857	

Source: own work by authors

Results of factor analysis provide in two factors, from which are acceptable value of Cronbach's alpha only for one of them. Last factor has Cronbach's alpha value under minimal acceptable value (under 0,500). Final values calculating acceptable factor need the transformation of individual coefficients. These coefficients express significance of the used elements. Their sum total must be 1. The individual factor indices have been defined by the procedures as follow:

$$\text{Factor 1} = 0,2518 \times x_1 + 0,2518 \times x_2 + 0,25 \times x_3 + 0,2464 \times x_7$$

Value of this factor can be calculated for the individual outdoor producer and on the basis of their results a list of businesses can be compiled. Indices can determine important factors of business, playing the key role in achieving the set of objectives. Proposed financial performance indicators should help companies to demonstrate a progress towards the objectives of sustainability. Also we can see basic statistics of observed indexes in Table 4.

Table 4 Descriptive statistics of observed factor

	Mean	Median	Variance	Std. deviation
Factor 1	2016,6704	165,8953	295000,99809	870,08888,3
Factor 1 - grouped	3	3	1,414	2

Source: own work by authors

Pivot tables have been employed to find possible dependencies between observed factors and company size and region of company, for results of the dependency tests see Table 5. Results of the dependence examination in individual variable categories are depicted in the following results of Pearson's chi-square test.

Maintaining the % reliability of the test, the values for connection between individual factors and company size have been determined within 0.05, which represents 5% reliability level. Established values of Pearson's test for the variables are showed in Table 5 (i.e., less than 0.05). Therefore, that bring us to the conclusion that an alternative hypothesis is applied – there are dependencies between all observed factors and company size for all observed indexes. Past results have revealed the relationship between indexes and company size and European region. Subsequently, degree of such dependence has been examined. To that end, the intensity of dependence determined by means of contingency coefficient.

Table 5 Pearson's test of the relationship between individual indexes, company size and European region for observed factor

	Corporate size		European region	
	Value	Signif.	Value	Signif.
Pearson χ^2	2010,429	0,000	225,020	0,000
Contingency coefficient	0,555		0,208	

Source: own work by authors

The intensity of dependence ranges between {0;1}. That means that the higher the absolute value, the greater the intensity of dependence. Table 5 shows that observed factor is close connected within the size of the company and region of Europe – all significance values are in 5% of limit of error. Intensity of the dependence is given by Contingency coefficient, which provides view in this connection. All four defined connection between observed indexes and corporate size and region reach accurate values and there are confirmed dependency between them.

Load indicators (Mass) indicate load line which represents the percentage of information across the table in appropriate category. That loads are obtained as the ratios of the row and column marginal frequencies (n_{i+} , n_{+j}) in whole table of individual categories (n).

Score in dimension describes individual variables score in two main dimensions. These dimensions don't represent any specific area, because they are reduced to from multi-dimension space. All data in rows and columns have been usually in multi-dimension space, which are reduced into two. Providing information of raw data has not been modified after multi-dimension space reduction of these variables. Inertia indicator represents the share comprehensive information on the profile (on the relevant point). This characteristic is independent of the number of dimensions. Corresponding map includes a graphical representation of both row and column categories according to their dimension scores (Hebák et al., 2007; D'Esposito, de Stefano, Ragozini, 2014).

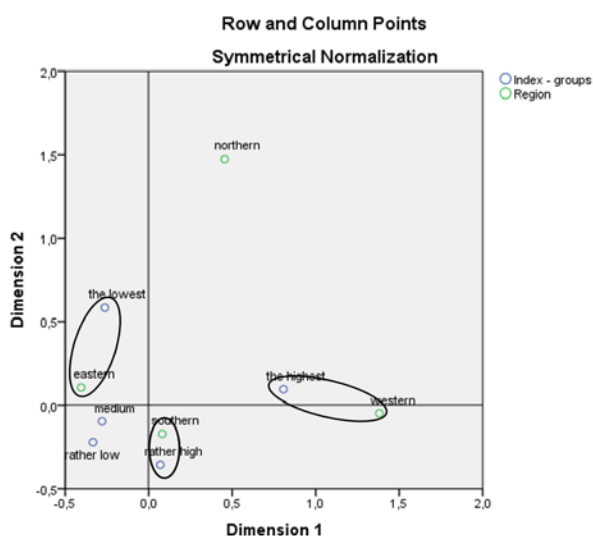
Table 6 Significance summary of observed dimensions

European region		Singular value	Inertia	Chi-square	Sig.	Proportion of Inertia		Confidence singular value	
						Accounted for	Cumulative	Std. dev.	Correlation
	1	0,183	0,033			0,743	0,743	0,015	-0,035
2	0,107	0,011			0,181	0,917	0,015		
3	0,010	0,000			0,083	1,000			
Total			0,045	225,02	0,000	1,000	1,000		

Corporate size		Singular value	Inertia	Chi-square	Sig.	Proportion of Inertia		Confidence singular value	
						Accounted for	Cumulative	Std. dev.	Correlation
	1	0,573	0,328			0,737	0,737	0,010	0,409
2	0,284	0,080			0,181	0,917	0,012		
3	0,192	0,037			0,083	1,000			
Total			0,445	2010,43	0,000	1,000	1,000		

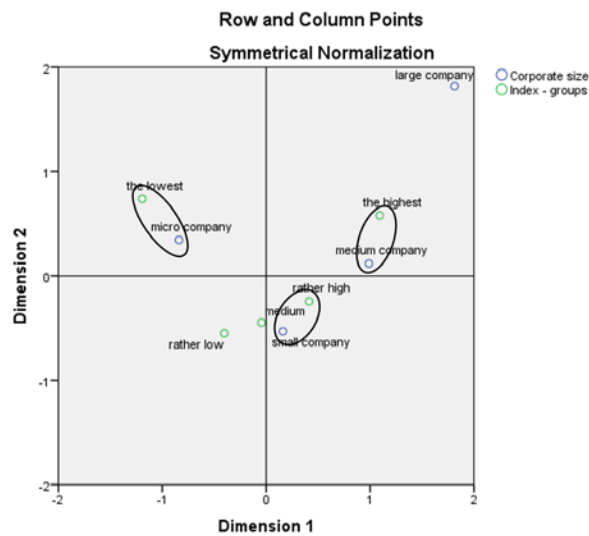
Source: own work by authors

Picture 1 Symmetrical correspond map of indexes and European region



Source: own work

Picture 2 Symmetrical correspond map of indexes and corporate size



Source: own work

Table 7 Influence of country origin of outdoor wear

	Czech Republic		Scandinavian countries		Alpen countries		Eastern Europe		Asian countries	
Absolutely positive	61	20,89	132	45,21	141	48,45	3	1,03	0	0,0
Rather positive	156	23,42	108	36,99	111	38,14	31	10,65	4	1,37
No influence	63	21,58	50	17,12	39	13,40	142	48,80	103	35,27
Rather negative	12	4,11	2	0,68	0	0,0	104	35,74	144	49,32
Absolutely negative	0	0,0	0	0,0	0	0,0	11	3,78	41	14,04
Total	292	100 %	292	100 %	291	100 %	291	100 %	292	100 %

Source: own work by authors

Results of correspondence analysis are included in graphs, which illustrate relations between individual categories and variables. By using symmetrical normalization simplifies examining the relationships between individual categories of the variables. Gained results are confirmed by significance value of Chi-square test. According to computation significance relationship between observed factor and both of corporate size and region are at value 0,000 (see Table 6).

Picture 1 displays the relations among the individual categories and variables, specific links among European region and factor 1, is the output of the correspondence analysis. Three separate groups of categories can be identified. We can say that western companies are at the top of the performance level, on which they focus on. Second highest connection have companies from south Europe. Last, third region are eastern companies with

the lowest focus on measurement performance. Vice versa, companies from northern Europe are in segment within the highest performance, but outside of this connection.

Furthermore, a relation between the size of the company and factor 1 has been investigated in three separate groups. Generally, Picture 2 indicates that micro-companies don't care about performance measurement (reach the lowest level). Vice versa, medium companies look after the most performance production. Large companies are situated too far from the observed groups.

5 Discussion

According to results of correspondence analysis there is obvious, that behaviour of outdoor producers are different due they

country. All companies are focused mainly on two parameters such (1) price, (2) production costs, (3) quality. From the correspondence analysis of region and index typical results are shown. Both of western and southern companies are focused mainly on financial performance and profit results. Eastern companies particularly focus on cost level (they describe lowest costs such indicator of effectiveness). On the other hand, focus of northern companies is put into quality area. Country origin of outdoor producer could impact their purchase behaviour. For confirmation of this prediction there was applied research in consumer market.

According to the observed results (see Table 7), consumers chose brand of outdoor wear from mainly from Alpen countries (86,59 %), Scandinavian countries (82,20 %), and from Czech Republic (74,31 %). Such the main reasons for chosen producer from one of these three region are association of outdoor activities and tradition of outdoor production. Asian producers are not well adapted in Czech market, because there are still perception Asian products as low quality. Because of the globalization and opening world markets, that customer's perception bring to producers challenge for better innovation in various products for leisure time activities.

6 Conclusions

Process of evaluation financial performance usually traditional indicators, developed from accounting data. These financial indicators provide relatively easy traceability as such data constitute the part of obligatory reporting (financial statements, balance and profit/loss statement form the part of annual balancing). Many authors (Cardinaels, Van Veen-Dirks, 2010; Philips, Louvieris, 2005; Fernandes, Raja, Whalley, 2006) employed diversity of financial indicators on specific corporate activities.

Financial indicators are consider as kind of ratios, employed in strategic management activities to provide reached results to all key stakeholders by e.g. balance sheets, income statements, and statements of cash flows. In general, financial ratios are expressed in connection to other variables by various terms as percentages or fractions (Kotane, Kuzmina-Merlino, 2012; Suarez, Lesneski, Denison, 2011).

The main objective of the paper is find out which indicators in field of financial performance are used, and identify relationship between these indicators (in factor form) and corporate size, and European region. Realised research showed, that companies in outdoor-wear industry look on financial statement of own performance. For observed factor there was applied Pearson chi-square test of independence, by which were evaluated connection within size of company and region of the company.

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Primary Paper Section: A

Secondary Paper Section: AE, BB

AN EFFORT TO INCREASE THE LEGAL PROTECTION OF ANIMALS IN THE SLOVAK REPUBLIC

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Abstract: The author deals with problems related to the protection of the animals in the Slovak Republic in this article. In the introduction, the author assesses the legal regulation of the protection of the animals in the Slovak Republic. Subsequently, the author discusses the legal regulation of the protection of the animals in the Slovak Republic and expresses its attitude towards the legal regulation of the protection of the animals in the Slovak Republic, underlining the possibility of adopting legislative changes. It is also concerned with the Amendment to the Protection Animal Act and with the practical problems associated with the Amendment to the Protection Animal Act.

Keywords: protection of the animals, Amendment to the Protection Animal Act, problems in application practice.

1 Introduction

A stimulus for writing this scientific article comes from the fact that nowadays, this topic is discussed by the wide public as well as the expert community in the Slovak Republic. The attention is paid especially to the legal status of animals in the Slovak Republic, as well as to the related legal protection of animals in the Slovak Republic.

This scientific article focuses specifically on legislation related to animal protection at the national level in the Slovak Republic. While evaluating this legislation, the attention is paid mainly to the ongoing legislative changes in the field of legal protection of animals in the Slovak Republic. After many attempts, considerations, and promises, the legislative changes started to be implemented by the Ministry agriculture and rural development of the Slovak Republic.

There are two basic legal regulations with the force of law related to the protection of animals in the Slovak Republic. These are Act no. 39/2007 Coll. on Veterinary Care, as amended (hereinafter referred to as the "Veterinary Care Act") and Act no. 300/2005 Coll. the Criminal Code, as amended (hereinafter referred to as the "Criminal Code"). Except these two mentioned basic legal regulations, there is other subordinate legislation¹.

The Veterinary Care Act, however, does not only deal with the legal protection of animals, but its subject matter is as follows:

- (a) the veterinary requirements for the health of animals, hatching eggs, semen, embryos, and ova of animals from the point of animal health as well as requirements for the protection of animals,
- (b) the veterinary requirements for products of animal origin, including animal by-products and derived products and selected products of plant origin, in order to protect the health of animals,
- (c) veterinary requirements for animals, hatching eggs, and products of animal origin, including animal by-products in order to protect human health,
- (d) the rights and obligations of natural and legal persons in the field of veterinary, as well as the professional veterinary activities and conditions of their realization,
- (e) the organization, competence and powers of authorities performing public administration in the field of veterinary
- (f) penalties for breaking the obligations laid down by this Act.

The Criminal Code governs a criminal liability for the animal abuse - Section 378 of the Criminal Code, as well as a liability

for neglecting the animal welfare - Section 378a of the Criminal Code.

However, the comprehensive animal protection legislation in the Slovak Republic is absent. Under the comprehensive legal framework, we understand both the definition of the concept of an animal, as well as the determination of the special legal status of animals and the determination of the requirements and conditions for the protection of animals against abuse; the rights and obligations of natural persons and legal entities in the field of animal protection; system, scope, and competence of the authorities performing public administration in the field of animal protection, as well as the measures and sanctions used to ensure adequate protection of animals in the Slovak Republic. The animal protection legislation is a standard in advanced countries of the European Union. What is more, in such countries, the animal rights have not only existed in the form of protection of life and health for a long time, but many European Union countries have legislation, which deals with animal welfare. In the Slovak Republic, even until today, we do not have separate legislation that would regulate the status of animals and their rights and obligations. The legal protection of animals in the Slovak Republic is only one of the parts of the Veterinary Care Act.

In view of the above, we think that the Slovak Republic has one of the weakest legal regulations providing legal protection for animals. Let us give you some examples. In the Republic of Austria, the basic legislation on the protection of animals constitutes a separate legal regulation - the "Bundesgesetz über den Schutz der Tiere (Tierschutzgesetz – TSchG)"². In the Czech Republic, the basic legal regulation of animal protection includes a separate legal regulation - "Act no. 246/1992 Coll. on the protection of animals against cruelty, as amended (Animal Welfare Act)". In the Republic of Poland, the basic legislation on animal protection is the "Ustawa z dnia 21 sierpnia 1997 r. o ochronie zwierząt, Ustawa z dnia 16 września 2011 r. o zmianie ustawy o ochronie zwierząt oraz ustawy o utrzymaniu czystości i porządku w gminach".

At the same time, one cannot forget the fact that in the Slovak Republic, there is the absence of legislation dealing with restriction and prohibition of performances with animals (scenting or domesticated) in circuses, or at least established precise rules and conditions under which animals can perform in circuses. The Slovak Republic is currently considered to be one of the most important countries of the European Union in terms of circuses in which animals perform since there is no legal regulation restricting the performance of animals in circuses.

On the contrary, in countries such as France, Germany, Hungary, and other countries of the European Union, animal circuses have already been completely banned or restricted. This means that these countries, in addition to the separate animal welfare legislation, there exists a separate legislation dealing with the prohibition or restriction of using animals in circuses. For example, in the Republic of Austria, the legislation on prohibition of using animals in circuses is as follows – BGBL II No. 489/2004 Regulation of the Minister of Health and Women on the protection, management and involvement of animals in circuses, variety shows and similar facilities (Animal Protection Regulation Circus - Tierschutz-Zirkusverordnung TSch-ZirkV); BGBL II No. 485/2004 Regulation of the Minister of Health and Women on the minimum requirements for the keeping of horses and equine, swine, cattle, sheep, goats, deer, llamas, rabbits, poultry, ostriches and fish culture (1st livestock Regulation - Tierhaltungsverordnung); BGBL II No. 486/2004 Regulation of the Minister of Health and Women on the keeping of vertebrates that do not fall under the first Livestock Regulation, on wildlife with special requirements on the keeping

¹ E.g. Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic no. 143/2012 Coll. on the breeding of dangerous animals; Government Regulation no. 432/2012 Coll., which Lays down requirements for the protection of animals at the time of their killing; Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic no. 123/2008 on details of the protection of pets and on the requirements for quarantine stations and animal shelters.

² Animal welfare Act.

and wildlife species for which keeping is forbidden for reasons of animal welfare (2nd Livestock Regulation - Tierhaltungsverordnung).

The importance of the discussed issue is highlighted by the fact that in the Slovak Republic, there are efforts for a "big" amendment to the Act on Veterinary Care. This amendment evolves mainly from the need to increase the legal protection of animals in the Slovak Republic. The amendment to the Act on Veterinary Care³ was prepared by the Ministry of Agriculture and Rural Development of the Slovak Republic (hereinafter referred to as "the Ministry"). Subsequently, following the preparation of the own text of the amendment to the Act on Veterinary Care, the Ministry initiated an inter-ministerial commentary procedure⁴.

The interest of the professional public and the general public in increasing the legal status of animals is enormous in the Slovak Republic, which was also reflected in the number of comments on the amendment to the Veterinary Care Act in the inter-ministerial commentary procedure. The number of mass comments⁵ on the amendment to the Act on Veterinary Care in the inter-ministerial commentary procedure is 1 and the number of ordinary comments on the amendment to the Act on Veterinary Care in the inter-ministerial commentary procedure is 195. The draft law has not been submitted for its approval to the National Council of the Slovak Republic yet. What is more, the inter-ministerial commentary procedure has not been completed by the Ministry, and the phase of evaluation is still in the process. In general, it is not common that the phase of commentary procedure lasts almost three months (to this date). On the one hand, this says about the considerable interest of the public in the discussed issue and, on the other hand, the number of comments raised in the inter-ministerial commentary procedure and the fact that this draft law does not reflect the needs of the area concerned also reflect the poor quality of the prepared draft law.

2 En effort to increase the legal protection of animals in the Slovak Republic

The Ministry of Agriculture and Rural Development of the Slovak Republic has prepared a new amendment to the Act on Veterinary Care, as a draft law amending and supplementing Act no. 39/2007 Coll. on Veterinary Care, as amended (hereinafter "the draft law"). Subsequently, after the own text of the amendment to the Act on Veterinary Care was prepared, the Ministry initiated an inter-ministerial commentary procedure.

The draft law was prepared by the government and sets out several fundamental tasks:

1. "The draft law sets out the relevant provisions on the identification and registration of animals, specifically dogs, in relation to the provisions on live findings of animals and on the placement of animals in shelters and quarantine stations. It also regulates the obligations of private veterinarians in relation to the identification and registration of pet animals".
2. "The draft law should simplify conditions and shorten the time period after which the former owner of the abandoned or lost animal loses the proprietary rights and the ownership is transferred to the state."⁶
3. "The draft law also deals with the situation when the animals are involved in circus performances. Specifically,

the draft law addresses checking the conditions and approving the circuses."⁷

4. "The draft law supplements the Civil Code in terms of the exclusion of a live animal from the definition of a thing as such, considering that the provisions on things will also apply equally to the live animals unless it is contrary to their nature."

The draft law itself not only fails to meet the stated objectives, which are involved in the reasoning report to the draft law, but in many cases, instead of transparent adjustments, it also brings confusion and the possibility of a various interpretations, which in the end will cause problems with its application in practice. At the same time, it should be noted that the draft law itself cannot be described as a "big" amendment to the Act on Veterinary Care, which will provide increased legal protection of animals in the Slovak Republic. The draft law amends and supplements some parts of the Act on Veterinary Care, but there are no major changes.

In view of the above, it is necessary to deal with the individual parts of the draft law, while paying attention to the most important changes in the Act on Veterinary Care. We evaluate positively the idea of major changes in the new legislation, however, the draft law itself we evaluate rather negatively.

2.1 The definitions of "holder" and "person entitled to dispose of animals"

Generally, in term of the issues of definitions of "holder" and "the person entitled to dispose of animals", it should be said that this solution cannot be considered the most appropriate. Also with regard to the regulations adopted in foreign countries, two entities are distinguished, i.e. the owner of an animal and the keeper of an animal. This of course also affects the relation of responsibility for the animal. Responsibility for the animal should be primarily placed on the owner, unless it is shown that at the time the offense was committed, someone else was responsible for the animal, whether by written or oral agreement, i.e. the keeper of the animal. By defining both the concept of the holder and, on the other, the concept of the person entitled to dispose of animals, application problems can occur in practice.

At the same time, the intends of the Ministry to define these two entities - the holder and the person entitled to dispose of the animal is not obvious. We have a negative opinion on these definitions since they will lead to practical problems in identifying whether there is a holder or a person entitled to dispose of animals. We also expect problems in the practice of the state authorities since the basic assumption is to determine the subject of law as well as whether the subject is an owner, holder or person entitled to dispose of animals. In view of the above, we suggest, within the proposals de lege ferenda, creating only two basic entities, as is preferred also by the legislation adopted in foreign countries, namely:

1. the owner - a person listed in the register or a person who may be identified as the owner also in another way than by being entered in the register, and
2. an entitled person - a person who can clearly prove that the animal is in their possession or care, or a person authorized to perform any legal acts on the basis of a proven act - adoption agreement, lease agreement, etc.

2.2 Prohibition of performances of animals in circuses

If the aim of the new legislation is to protect animals and our task is to eliminate the suffering of circus animals caused by dressage, transport, and inappropriate accommodation conditions (the three most serious problems), it would be appropriate to adopt legislation which broadens the prohibition on animal performances in circuses. The proposed legislation still has gaps

³ Act amending Act no. 39/2007 Coll. on Veterinary Care, as amended, and on amendments to certain laws.

⁴ Inter-ministerial commentary procedure – The Legislative process no. LP/2017/684

⁵ Section 14 paragraph 7 of the legislative rules of the Government of the Slovak Republic, cit.: "The contradictory proceedings with the representative of the public shall take place whenever the petitioner does not comply with a mass comment (with at least 500 persons identified). If a mass comment has been applied electronically via the portal, the list of persons who have identified with a mass comment may be sent to the submitter in a manner other than through the portal."

⁶ Reasoning Report – general part

⁷ Reasoning Report – general part

which may be misused by circuses, and the effort of the new law may not have its originally intended effects in the end.

Within the *de lege ferenda* proposals, we suggest that the definition which involves the prohibition of performance of animals in circuses is modified in a way, that any animal circus performance, further specified in the ministerial decree, is prohibited. The restriction should discourage the owners of circuses, as much as possible, to carry animals with them, since the problem is not just the performance but also exercise, dressage, transport, etc. In the proposed law, there is a problem with proving by the state authorities whether or not a demonstrated exercise was trained by man. For example, if the elephant moves across the ring and overcomes some obstacles, for the state authority it is difficult to prove whether it has been taught or whether it was just a natural overcoming of the obstacle. The legislation must be unambiguous in order not to allow different interpretations of the law.

Despite the above, it is necessary strictly adhere to the minimum standards for the size and furnishing of dwelling for the individual species (cats, bears, elephants, giraffes, primates) set out in Decree no. 143/2012 Coll. on dangerous animals breeding. E.g. lion or tiger requires: minimum enclosure size of 300 m², elevated places with shelter, conditions for climbing, sharpening their claws; a tiger also needs a swimming pool with a minimum depth of 1,2 m, indoor dwelling with a minimum temperature of 15 °C, shelter, conditions for isolation against aggressive individuals. The draft law, however, does not take into account all these aspects at all.

At the same time, despite lack of the law regulating circuses, there is still within the competence of the state body (the Regional Veterinary and Food Administration) to adopt an exemption despite the legal prohibition, which gives a permission for a circus to perform on the territory of the Slovak Republic. Such competence of the state authority - Regional Veterinary and Food Administration creates a situation in which the decision of the state authority is above the law and at the same time creates a space for corruption, which cannot be a purpose of any legislation. On the contrary, the legislation has to be designed to provide the smallest space for corruption.

2.3 Register of stray animals

First of all, the purpose of this register of collected stray animals is not obvious to us, since, according to the Decree no. 123/2008 Coll. the quarantines and shelters for animals have to keep records of trapped animals. Therefore, it is not clear to us why the central register of stray animals should be set up, when they also create the additional costs and administrative burden for the quarantine and shelters, while many of them are civic associations and their funding depends on donations from citizens only. This creates a duplicate obligation for quarantines and shelters, namely the obligation to keep records of stray animals and the obligation to enter data into the register of stray animals.

We consider such legislation to be inappropriate and unjustified. However, if such duplicate legislation enters into force, it has to be adjusted in the context of *de lege ferenda* so that this legislation does not obviate its intended effect. Therefore, we suggest, that the information regarding the operation, records and obligations arising from the creation of such a register is clearly specified and legally modified. Consequently, we also suggest specifying the range of data to be maintained by such registry. At least, the central register of caught stray animals should contain the same information as the records that have to be kept by quarantines and shelters.

2.4 Authorization to enter the dwelling

In our opinion, in terms of this change, it was and still is possible to open and enter the dwelling even during the current legislation, however, only in the presence of the police.

If we want to remove all the doubts, it is suitable to adjust better the authorization of veterinarians to enter the dwelling. The new legal framework deals only with the situations that, if the owner is in the dwelling and does not let the veterinarian enter the dwelling, he may be fined. However, this does not bring the desired effect which is animal welfare. It is necessary to adopt a legislation so that the veterinarian, even against the will of the owner, could enter the dwelling and adequately overcome the obstacle (locking, etc.).

In order to achieve the desired effect, it is necessary in the draft *de lege ferenda* to adjust and specify properly under what conditions this can be done, i.e. the presence of the non-party, how to proceed after the dwelling is opened, the obligation to inform the owner immediately as well as the obligation to inform the police forces.

2.5 Transfer of animal ownership by the municipality

The draft law takes into account the possibility of transferring an animal ownership from the municipality to a natural or legal person. However, this transfer is not specified in any way.

Within the *de lege ferenda*, we suggest that the transfer of ownership is precisely specified and modified by the draft law in order to avoid a different approach by different municipalities. For example, to avoid cases when the transfer of ownership is possible after 7 days in one municipality and after 2 years in another one and also after fulfilling the nonsense conditions.

In this regard, we point at legislation in the field of municipal property and exact rules even in the case of transferring the property of municipalities, which is the Act no. 138/1991 Coll. on municipal property, as amended. Also, the animal will be the municipal property, which the municipality will transfer to a natural person or legal person, and thus it is necessary to reflect the above mentioned legal regulation.

2.6 Acquisition of animal ownership

In order to achieve a further shift towards better legal status of animals in the Slovak Republic, the proposed legislation clearly specifies the transfer of ownership to the state in case of stalking animal that was captured, quarantined and kept in the shelter for longer than 3 months. It means that there was no change in this field, only the period of 1 year was shortened to 3 months.

Based on the practical experience, it is not appropriate for the ownership right of the captured animal to be shifted to the state, but we suggest that within the *de lege ferenda* proposal, animals are not owned by the state because the state does not exercise any powers in this field. We think that more appropriate is when the ownership is shifted to the village or to quarantine station or shelter. In this respect, it is also necessary to amend the provisions of the Civil Code. Our claims support also the fact that the similar legislation is contained in the Civil Code of the Czech Republic.

2.7 Definition of the animal

The draft law also brings a change in the Civil Code, i.e. the animal will no longer be considered a thing. However, in order to achieve the best legal status of animals, defining an animal as a living creature is not enough, since it is only a legal definition without further links. We believe that by defining the animal, it will be created a new subject of law to which it is necessary to attribute the rights and duties.

For this reason, we consider it appropriate to specify the legal status of animals and the transfer of ownership of animals, to add a responsibility for animal, liability for damage caused by animal, and liability for health damage, etc., so that the definition of the concept of an animal and the consequent non-acceptance of subjective rights for this newly created subject of law was effective.

2.8 Prohibition of keeping the animal on the chain

With regard to the amendment to the Veterinary Care Act, it is necessary to resolve the ban on keeping dogs on the chains, since the proposed law does not touch this issue at all.

The best and the most straightforward way to ban keeping dogs on the chain is to edit a direct ban on keeping dogs on a chain or other similar medium that prevents a free movement of dogs (under the chain we understand any binder such as a twine, rope, wire or other alternatives). In order to meet the requirements for free movement, physiological and ethological needs, the dog has to be allowed to move freely every day without being fastened. Also in order to develop their own givens and physiological expressions, the dogs shall not be chained except the time necessary for their feeding, cleaning, checking, medication procedures or any other serious cause and just for a limited time period.

3 Conclusion

The article focuses on the "major" amendment to the Act on Veterinary Care which emerges from the need to increase the protection of the legal status of animals in the Slovak Republic. The amendment to the Act on Veterinary Care was prepared by the Ministry of Agriculture and Rural Development of the Slovak Republic. Subsequently, after the own text of the amendment to the Act on Veterinary Care was prepared, the Ministry initiated an inter-ministerial commentary procedure.

The need to amend the Act on Veterinary Care is also evident from the interest of the professional public and the general public in increasing the protection of the legal status of animals in the Slovak Republic. The considerable interest was also reflected in the number of comments submitted on the amendment to the Veterinary Care Act in the inter-ministerial commentary procedure.

The draft law itself, however, in many ways brings confusion and the possibility of a varied interpretation, which in the end will cause application problems in practice. It will not increase the protection of the legal status of animals in the Slovak Republic, but, on the contrary, will increase the public's mistrust in the legal regulation in this field.

Literature:

1. Act No. 39/2007 Coll. Veterinary care Act as amended
2. Act No. 300/2005 Coll. Criminal Code Act as amended
3. Act No. 40/1964 Coll. Civil Code Act of Slovak republic as amended
4. Act No. 246/1992 Coll. Protection of animals against cruelty as amended
5. Act No. 89/2012 Coll. Civil Code Act of Czech Republic as amended
6. Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic No. 143/2012 Coll. about keeping dangerous animals
7. Decree of the Ministry of Agriculture of the Slovak Republic No. 123/2008 Coll. on details of the protection of pets and requirements for quarantine stations and animal shelters.
8. Government ruling (of Slovak republic) No. 432/2012 Coll. which stipulate requirements for the protection of animals during slaughter

Primary Paper Section: A

Secondary Paper Section: AG

ECONOMIC FREEDOM – CLASSIFICATION OF ITS LEVEL AND IMPACT ON THE ECONOMIC SECURITY

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Scientific Paper was elaborated within the framework of the projects KEGA 001UCM-4/2016, KEGA 035PU-4/2016 and VEGA 1/0139/16.

Abstract: The published material focuses on the correlation between the economic freedom and economic growth, including other factors as well. The characteristics, number and importance of these factors are different by various authors. Different findings are the result of the multi-factor structure of the economic freedom indicator, as well as the multicollinearity of economic freedom factors. Various methods of the economic freedom evaluation are analysed in this article, as well as the generalization of relationship between the Index of Economic Freedom and indicators of the economic independence and development. According to the results, there are differences between the tightness of the assessed economic variables and the Index of Economic Freedom. Relationship between the development of the EFW index and public debt, tax burden, export and unemployment has been detected.

Keywords: economic freedom, economic security, economic security factors, macroeconomic characteristics.

1 Introduction

An effort to define the economic freedom and to determine the variable that has a direct impact on the level of economic freedom is a part of this finding. We were trying to answer the question how to ensure conditions for the economic security.

The answer is reflecting the solution for the issue discussed: Which type of economic entity should be considered to be a reference object? Which risks are important from the perspective of the economic security? To solve a problem means to define the conditions of the security or define its threats?

The current approach to the issue considers the socio-economic system as a decisive reference object. Economic security determines the capacity of self-development, the presence of institutional conditions and guarantees and the autonomy of the country without endangering relations with the external environment. Economic freedom is considered to be the main factor of the economic security. Freedom of decision making, competitiveness and protection of personal rights and property are identified as the main components of the economic freedom. Freedom of decision making is related to sufficient sources.

This paper is based on the assumption that the level of the economic freedom in the country may have a significant influence on the economic security and the economic security of residents. The main objective of this paper is to confirm the existence and character of the relationship between the values of the Index of Economic Freedom and indicators characterising the source of the economic system, its stability and independence.

Historically, the security expresses to the ability of the state to secure its autonomy and stability. The issue has been a subject of interest in ancient times. Aristotle, Platon, Cicero and Xenophon have analysed the positive impact of peace to cumulate welfare as a source of socio-economic growth. Their philosophical reflections discuss the deterioration of the country's economic potential because of the use of resources for war purposes.

Solution for security on the level of socio-economic system came later. According to European mercantilists, security is closely connected with the establishment of conditions for economic growth. The ability of a country to accumulate financial wealth is referred to as a prerequisite for growth and development. Problem solution is essential to identify tools that

ensure economic efficiency, as well as tools providing financial wealth for the country.

Economic security is considered to be a basic condition of military, political and global security. Similarly, defining conditions appropriate for development and autonomy of the economic system is a subject of liberal interests.

According to Smith (2001) and Švec (2011), economic security is determined by stable markets and free decision making ability of the individuals on the markets.

Security relates to the interests of business entities. According to utopians, economic security of the market can be achieved by ensuring economic security of the individual. The possibility of developing the economic system is based on the ability to accumulate capital. Similarly, the differences between the economic interests of the individual and the state are identified by Freeman (2003), Dudáš and Dudášová (2016).

He refuses to accept the positive impact of prioritization of state interests in relation to economic security of both reference subjects. The impact of the interventionist policy on functioning of the economic system and its entities is also described by other authors (Friedman, 1992; Lawson 2006; Bilan et al., 2016).

The current approach to solution of this issue is represented by Buzan (2008). He based his assumptions on the fact that security risks are from different spheres (he distinguishes political, economic, social and environmental sectors). He relates the economic security of the country with an ability to develop the economic system of the country smoothly. He considers this ability as a result of internal development of the economic system, as well as its level of international dependence (Grancay, 2015). Moran (1990, 1991), Korauš et al. (2015), Kapstein (1991) and Ključnikov (2016) require to analyse the impact of trade, financial and monetary integration and define economic security on transnational level. Many authors (Buzan, 1991; Buzan et al 1998; Grizold, 2000; Prezelj, 2008; Špírková et al., 2015) are dealing with the definition of security risks on regional, national and transnational level (Bicekova et al., 2015). Their goal is to identify the risks threatening the autonomy of the economic system.

Despite differences between the opinions about the status, conditions and factors of the economic security, a common feature can be identified - a demand for economic freedom. Its main components are defined as personal choice, voluntary exchange, competition of the markets, protection of individuals and property, existence of institutions and policies that enable voluntary exchange and protection of individuals and property.

Index of Economic Freedom by the Heritage Foundation and Economic Freedom of the World by Fraser Institute are presented as a reaction to differences in presented opinion. Their goal is to gain information that enables to compare the level of economic freedom in countries and to compare annual changes and trends. Various authors are dealing with this issue. De Haan a Sturm (2000), Easton a Walker (1997), Korauš (1999), Dawson (1998), Kotulič et al. (2015), Heckelman (2000) conducted a research to identify the existence and strength of the relationship between the economic freedom and some of the economic characteristics, most often the growth rate of the economy. They confirmed a relationship between the economic growth and economic freedom. This result can not be generalized. Weed a Kämpf (2002) did not confirm this result. They confirmed the influence the economic freedom has on the economic growth.

2 Methodology

Practical usefulness of the indicators of economic freedom in economic policy is verified by verification of the correlation of

data set about the economic freedom and data set of selected indicators that limit economic freedom of various economic entities in a significant way.

The selection of the economic freedom indicator is based on the results of previous analysis of their comparability. As there are not statistically relevant differences, we do not expect significantly different results when evaluating the correlation between the economic freedom and the selected macroeconomic indicators using any indicator of the economic freedom.

Respecting the opinion that economic security of the socio-economic system is determined by the situation of the economy, government institutions assure the protection of national interests, social orientation of the policy and sufficient defensive potential provided by internal and external development conditions and its level depends on economic freedom, we have chosen the index of Economic Freedom of the World by Canadian Fraser Institute to conduct our research.

The selected macroeconomic indicators should describe the fulfillment of the criteria of economic independence, the ability of independent development of the economic system and the level of its relations with the external environment: EFW assessed the relationship with the rate of economic growth, tax burden, net exports, government debt, inflation and unemployment. Verification of the character and strength of correlation is based on the correlation and regression analysis; i.e. on the quantification of their degree of dependence. Classification by Cohen (1998) was applied in quantification of linear correlation. Regression model is based on the least squares method.

Our findings are based on data published by Fraser Institute and The Heritage Foundation, Eurostat and World Bank. The data has been processed by MS Excel, Statistica 13 and Statgraphics.

2.1 Criteria of Economic Security and Economic Freedom

The situation in which neither the autonomy of the reference object nor the autonomy of its economic decision-making is compromised is an objective on the level of economic security. Black and Baldwin (2010), Buzan (2008), Šimák (2005), Kingsford (2011), Casey (2016) connect the security in any system mainly with utility, resistance and stability. Criteria of economic security are summarized in four points: 1. Economic independence, 2. Ability to develop independently, 3. Presence of institutional conditions and guarantees, 4. Level of integration, dependence and relation with the external environment.

Fulfilling the criteria can be objectively rated by indicators that describe the structure of the system and its subsystems, as well as their relationship, status, quality, functions, their place and role in this system. They enable the analysis of the real situation and level of the system security, recognise potential and real danger and its influence, recognise the causes of danger, recognise critical situations and occurrence of further risks and threats. There are two insights into the economic security – what is the assumption and what threatens the economic security.

These factors are important to define the socio-economic system:

- Sufficient sources for economic activities and for implementation of effective social policy,
- Efficiency of the financial and capital markets,
- The degree of economic openness non-threatening its autonomy.

This set of factors considers primary those factors that limit economic independence and the ability to develop independently from the state. Secondly, it also includes factors affecting the economic security of low-level economic entities. If the main criterion of the evaluation is the severity of impact of the risk factor on the reference subject then the internal economic, legal and social factors are the most important. The impact of external factors may be significant due to the opening-up processes,

globalization and internationalization. The most important ones are political and economic.

3 Results

Many methods have been developed and used to monitor and evaluate the economic freedom. In 1990 Block, Gwartney and Lawson introduced the first version of the Index of Economic Freedom. Then, in 1992 Fraser Institute presented results of the research of economic freedom in the publication Rating Global Economic Freedom. Even nowadays, Fraser Institute cooperating with other institutions evaluates economic freedom and the results are published in publication: "Economic Freedom of the World". The scientific work of Fraser Institute inspired Heritage Foundation analysts to elaborate similar methods to measure economic freedom on global scale. The first index of the economic freedom by the Heritage Foundation was published in 1995. Both indexes have become respected.

The Index of Economic Freedom by The Heritage Foundation covers 10 freedoms in four main fields – rule of law, limited government intervention, regulatory efficiency and open markets. Categorization of a country into any category of economic freedom represents an average value made up of partial freedoms. Each of them represents the same importance. Five levels of the economic freedom are differentiated due to total score: free – mostly free – average free – mostly non-free – non-free.

The Index of Economic Freedom of the World by Fraser Institute has been elaborated as an alternative to the method of The Heritage Foundation. According to this method the economic freedom should express how much the economy is directed by market principles. Key features are the right of personal choice, competition of markets, existence and availability of the competitive markets and protection of the rights and property of individuals. The five main index categories are: the size of government expenditure, legal system and property rights, sound money, freedom to trade internationally, regulation. 24 components including totally 42 variables are directly or approximately reviewed in these five categories annually. Rating within the sub-indices is realized in interval mode. Achieved score depends on the level of fulfilling the considered criterion.

The overall score of the economic freedom indicator is different and depends on the methodology applied. The observed differences between evaluations do not show the same results in different countries: in the group of the best evaluated countries (evaluation of the economic freedom in numeric terms is approaching the maximum, is in the range 85-100¹) regardless of the methodology applied, the total score is similar, even identical. Statistically significant difference between the values of the total score was not identified in this group of countries evaluated by Fraser Institute and Heritage Foundation, neither by comparing annual changes. Difference between the values in countries evaluated by total score as mostly free, average free or mostly non-free is statistically significant (Table 1).

Based on the analysis performed on a set of EU countries, we can find the same homogeneity of indices in most countries. We can see index difference by comparing their median and distribution function only in Czech Republic, Ireland and Luxembourg.

Table 1

Country	Index	Me	min	max	δ^2	$\Gamma_{IEF, EFW}$
EU 28	IEF	68,750	48,700	82,600	42,118	0,505
	EFW	73,739	52,400	85,000	21,250	
	T_{IEF}	0,268	-8,126	11,708	4,537	0,098
	T_{EFW}	0,127	-8,924	12,977	6,639	
Czech Republic	IEF	69,400	64,600	73,200	5,950	0,798
	EFW	71,800	65,400	75,300	7,025	

¹ EFW scale has been modified to 100 for analysis needs

	T _{IEF}	1,002	-3,582	2,786	2,260	0,196
	T _{EFW}	-0,407	-5,703	3,444	3,645	
Hungary	IEF	66,100	62,700	67,600	2,476	0,523
	EFW	72,000	65,600	73,600	3,765	
	T _{IEF}	-0,303	-2,326	4,321	2,615	0,067
	T _{EFW}	0,486	-1,250	5,183	2,419	
Poland	IEF	63,200	58,100	69,300	12,433	0,571
	EFW	69,600	61,400	74,200	12,736	
	T _{IEF}	1,222	-5,016	4,809	7,789	0,005
	T _{EFW}	1,140	-3,155	7,980	7,445	
Slovak Republic	IEF	67,200	59,000	70,000	11,196	0,829
	EFW	74,200	62,000	76,300	17,648	
	T _{IEF}	0,073	-3,597	9,492	10,600	0,001
	T _{EFW}	0,396	-2,252	9,209	8,620	

Source: own calculation based on The Heritage Foundation and Fraser Institute data

Both indices are linearly correlated in 13 countries (e.g. Bulgaria, Romania, Slovak Republic), while this correlation can be defined as great or even perfect.

Even the annual growth rate of indices is similar, considering the median and distribution function.

3.1 The Importance of EFW in Economic Policy

Index evaluation of economic freedom provides only a retrospective comprehensive status evaluation. If the evaluation is applicable by decision making and tools of national economic policy, the usefulness of information is low, the way of monitoring and evaluating the economic freedom may be considered deficient.

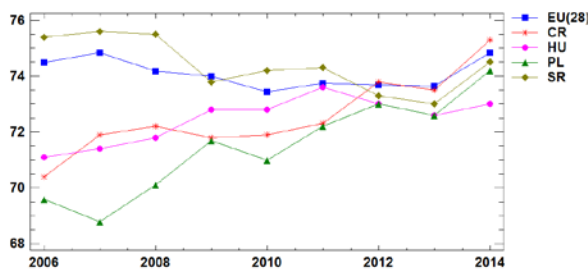


Figure 1 Time series of EFW in V4 countries

If the economic freedom is a consequence of the activity of economic entities of the system and the system itself, as well as of the conditions, then the analysis of the interrelationship between the values of the economic freedom indicator and the indicators that characterize the economic activity in a larger set of countries or the examination of the correlation between the historical values of the economic freedom indicator and the indicators that characterize the economic activity in a particular country are possible ways to monitor the economic freedom (Table 2).

Table 2 Economic Freedom of World in the context of macroeconomic characteristics

	EU (28)	Czech Republic	Hungary	Poland	Slovak Republic
EFW		7,53	7,30	7,42	7,45
GDP per inhabitant (€)	27 600,0	14 900,0	10 600,0	10 700,0	14 000,0
GDP growth rate (%)	1,6	2,7	4,0	3,3	2,6
Inflation (%)	0,8	2,5	3,4	0,5	-0,2
Export share to GDP (%)	42,7	82,5	88,7	47,6	91,8
Tax burden (% GDP)	40,0	35,3	35,7	31,7	28,8
Gross public debt (% GDP)	86,7	42,2	75,7	50,2	53,6
Unemployment (%)	11,6	6,1	7,7	9,0	13,2

Source: based on the data of the World Development Indicators 2016 and Fraser Institute: Economic Freedom of the World 2016

Looking for linear correlation between the EFW index and the single macroeconomic indicators (Table 3), we can assume that heterogeneous composition of the EU caused zero hypothesis confirmation. The EFW index linearly correlates with the public debt in all V4 countries. If the index is rising, the public debt is growing in the countries. The opposite happens in Slovakia. Tax burden and inflation do not linearly correlate with the EFW index.

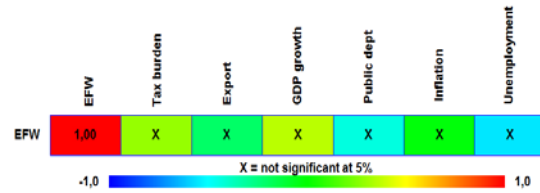


Figure 2 Correlation of the EFW index and the selected macroeconomic indicators in EU(28)

Table 1 Correlation of the EFW index and the selected macroeconomic indicators

per GDP	Coefficient	Tax Burden	Export	GDP growth	Public debt	Inflation	Unemployment
EU (28)	r _s	0,2941	-0,2000	0,3667	-0,4333	-0,0167	-0,5500
	p-value	0,4055	0,5716	0,2997	0,2203	0,9624	0,1198
Czech Republic	r _s	0,4202	0,8452	-0,2773	0,7866	0,0167	-0,2194
	p-value	0,2347	0,0168	0,4328	0,0261	0,9622	0,5349
Hungary	r _s	-0,1688	0,8152	-0,0672	0,8320	-0,4346	0,6456
	p-value	0,6331	0,0211	0,8492	0,0186	0,2190	0,0679
Poland	r _s	-0,4268	0,7615	-0,7667	0,7333	-0,2762	0,0669
	p-value	0,2274	0,0312	0,0301	0,0381	0,4348	0,8498
Slovakia	r _s	0,2500	-0,2667	0,8667	-0,7500	0,3000	-0,7167
	p-value	0,4795	0,4507	0,0142	0,0339	0,3961	0,0427

Source: author, processed according the World Bank data: World Development Indicators 2016

We can monitor the same trend in V4 countries, as well as in the EU by using linear correlation that does not depend on GDP or inflation. The development of the EFW index can be compared linearly with the V4 public debt.

The EFW index development can relate to the evolution of tax burden, exports, public debt and unemployment, using regression models. The EFW regression models with tax burden, export, public debt, and unemployment can be considered as high-availability models (Table 4).

Table 2 Regression models of the relation between the EFW index and the chosen indicators

regression model	Model	CD
EU (28)	EFW = 1,8984*TAX BURDEN	0,9998
	EFW = 1,85685*EXPORT	0,9905
	EFW = 11,1443*GDP GROWTH	0,1261
	EFW = -0,977635*PUBLIC DEBT	0,9771
	EFW = 29,0017*INFLATION	0,8345
Czech Republic	EFW = 7,9314*UNEMPLOYMENT	0,9783
	EFW = 2,16663*TAX BURDEN	0,9994
	EFW = 1,03212*EXPORT	0,9924
	EFW = 9,14372*GDP GROWTH	0,2216
	EFW = 1,93148*PUBLIC DEBT	0,9724
Hungary	EFW = 20,2795*INFLATION	0,6377
	EFW = 11,1112*UNEMPLOYMENT	0,9795
	EFW = 1,89971*TAX BURDEN	0,9991
	EFW = 0,880642*EXPORT	0,9969
	EFW = 4,57347*GDP GROWTH	0,3811
Poland	EFW = 0,966551*PUBLIC DEBT	0,9957
	EFW = 13,4875*INFLATION	0,7818
	EFW = 7,57548*UNEMPLOYMENT	0,9745
	EFW = 2,14441*TAX BURDEN	0,9971
	EFW = 1,7154*EXPORT	0,9949
Slovakia	EFW = 14,963*GDP GROWTH	0,8095
	EFW = 1,41182*PUBLIC DEBT	0,9964
	EFW = 21,076*INFLATION	0,7572
	EFW = 7,11111*UNEMPLOYMENT	0,9661
	EFW = 2,55515*TAX BURDEN	0,9989
Slovakia	EFW = 0,884317*EXPORT	0,9903
	EFW = 8,46*GDP GROWTH	0,4225
	EFW = 1,70188*PUBLIC DEBT	0,9414
	EFW = 21,8377*INFLATION	0,6831
	EFW = 5,68731*UNEMPLOYMENT	0,9842

Source: authors, own calculation

4 Conclusion

The importance of economic security is confirmed by number of theoretical and empirical analyses conducted to determine criteria and factors of economic security. Their conclusions are influenced by the level of economic and social development and economic freedom in the selected countries.

Our main objective was to prove the existence of the Index of Economic Freedom and its importance regarding the economic policy. Generalization of the evaluation of the relationship between the Index of Economic Freedom and the macroeconomic indicators by group of countries meeting the criteria of economic freedom in a comparable manner has become a subject of interest in our analyses.

A comparison of EFW values in a set of EU countries confirms limited practical applicability of the EFW indicator. Variability of the values of subindices and the total score of the Index of Economic Freedom has an important impact on the identification of the mutual relationship between the Index of Economic Freedom and indicators characterizing source sufficiency, public sector, autonomy and the economic stability.

We did not find an indicator that can be generally used to predict the trend of the development of economic freedom. By linear regression, no relativity of EFW index on GDP or inflation was defined. In V4 countries EFW index linearly correlates with public debt. Tax burden and inflation are not linearly related. Therefore, we can state limited usefulness of the economic freedom indicator in practical economic policy. Comparing its value with the values of macroeconomic indicators is considered to be an autonomy criteria and describing the objectives of the socio-economic system seems to be a solution for this problem. In each case, prediction of future economic freedom requires identification of indicator that is the most closely related to the EFW characteristics.

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Primary Paper Section: A

Secondary Paper Section: AH

SLOVAK FOLK SONG IN THE COMPOSITIONS OF BÉLA BARTÓK

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Abstract: Several bonds connected the important composer of the 20th century Béla Bartók with the territory of present Slovakia – family relations, beginning of his music studies, his concert, artistic and ethnomusicological work. For the Slovak folkloristics his collection of Slovak folk songs is priceless. The submitted study presents those particular Slovak folk songs which Bartók arranged, or inventively used their melodic and rhythmic elements in his works.

Keywords: Slovak Folk Song, Béla Bartók, Composer, Composition.

1 Bartók and Slovakia

The affinity for using Slovak folk melodies in his compositions resulted above all from Bartók's family relations, and his later ethnomusicological activity on the territory of Slovakia. In this context it is necessary to expound his family background and professional bonds to Slovakia. His mother Paula, nee Voitová, and her family came from Bratislava. During his first stay in Bratislava (1892–1893) Bartók lived with his widowed mother and sister Elza with their relatives (at present No. 5, Obrancov mieru Street). Having spent one year in the (today Romanian) village of Bistrița, teacher Paula Bartóková settled in Bratislava in 1894 together with her children and sister Irma. Their stay in Bratislava strongly influenced Bartók's intellectual development. In Bratislava he became a student at the Royal Catholic Hungarian High School in the former Poor Clares Convent, from which he successfully graduated in 1899. Later Bartók taught several Slovak pupils, besides his second wife Ditta Pásztoryová, who came from Rimavská Sobota, also Alexander Albrecht, Helena Gáfforová and Štefan Németh-Šamorínsky.¹

Bartók played at school concerts, but he performed also in other cities on the territory of Slovakia: Košice, Prešov, Lučenec, Komárno and Rimavská Sobota. In the interview from 1941 his mother said his first public performance had taken place on January 22, 1904 in Bratislava. "For the performance I had a place reserved in the first row. But I remained standing in the rear for the whole time, till he was applauded and gave an encore."² Bartók had nine concerts in Bratislava, five in Košice and he appeared as a guest in Prešov twice. In Lučenec, Komárno and Rimavská Sobota he performed just once.³

1.1 Ethnomusicological Activities of Béla Bartók

Bartók was tied to the territory of Slovakia by his important ethnomusicological activities. He began to collect folk songs in Slovakia regularly in 1906 in the small villages of Gemer county and then continued in Nitra county (1906–1910), Komárno (1906, 1910) and Hont counties (1910, 1914), as well as in the villages of Pohronie and Zvolen counties (1915–1918). In the period of 1906–1918 he collected more than 3,409 melodies and approximately 4,000 lyrics of folk songs.

In collecting and ethnomusicological work Bartók was joined and assisted by Štefan Németh-Šamorínsky, Alexander Albrecht and Anton Baník. Their activities in Slovakia resulted in an extensive three-volume collection *Slovak Folk Songs*, containing not only 3,223 melodies collected by Bartók, but also 145 folk songs from László Vikár's collection, 113 melodies from Kodály's records and 73 folk songs from the collection by

Anton Baník.⁴ The time span between 1919–1928 Bartók dedicated to the finalization and analysis of the whole obtained song material including the Slovak collection which was taken up by Matica Slovenská in 1928.⁵

For the Slovak ethnomusicology Bartók's collection is of the utmost importance. It embodies the results of an immensely coherent method of work with the documentation material, used first in the field, then in transcription, analysis, assortment of material and a way of its preparation for the publication. In the 1920s, the editorial method used by Bartók occurred in Slovakia only sporadically. Although the collecting had a certain tradition in Slovakia even prior to Bartók's activities, and although many years of relentless and intense work of a number of ethnomusicologists have passed since the origination of this collection, the publication of Bartók's *Slovak Folk Songs* has remained one of the most important tasks of the music folkloristics up to the present.

For the work with the material Bartók devised a detailed system of assortment, based on the "formal, rhythmic, metric and cadential structure of the songs." The preparation of the whole Slovak material for publication did not take Bartók much time. He started to work on it in 1919 and as soon as in the autumn 1920 he finished the overall schedule of the publication and completed a part of the manuscript. He terminated the first volume of the collection in October 1922, the second one in August 1924 and the third one in May 1928. The particular parts of the manuscript were handed by him item-by-item to Matica Slovenská. However, the editorial as well as technical problems still delayed the print of the whole manuscript. The mentioned problems lingered on even after Bartók himself decided to set about the editorial work in 1935.⁶ The first two volumes of the collection were published only after Bartók's death, in 1959 and 1970 respectively, by the Department of Music Folkloristics of the Institute of Musicology of the Slovak Academy of Sciences.⁷ Bartók's manuscript of the so far unpublished folk songs is still stored away by Oskár Elschek and Alica Elscheková, the scientific editors of the first two volumes, who also assumed the preparation of the two final volumes.

The presentation of the third volume took place on June 22, 2009 on the premises of the Euro Info Centre in Bratislava under the auspices of Ján Figel', member of the European Commission, responsible for the education, training, culture and youth. A concert took place on this occasion, presenting *fujara* (shepherd's pipe) tunes from Bartók's collection from 1906 rendered by Marián Plavec, then Bartók's phonograph recordings, as well as samples from documentaries tracking Bartók's journeys in Slovakia. The highlight of this outstanding event was the presentation of the publication by its editor Oskár Elschek, as well as the lecture *Bartók and Slovak Music* given by Ladislav Burlas. The collection is an important milestone of the scholarly and documentary work by Béla Bartók, a collector and internationally renowned expert on European traditional music. It was especially due to this fact that Bartók's collection of Slovak folk songs was nominated for the UNESCO international program *Memory of the World* in 2004. Bartók's collection contains 3,409 Slovak folk songs and instrumental pieces and 4,500 lyrics of the Slovak folk songs. The collection consists of various materials:

⁴ BARTÓK, Béla: *Slovenské ľudové piesne I*. Bratislava: Slovenská akadémia vied, 1959, p. 12.

⁵ Matica Slovenská is a national Slovak cultural organization based in Martin. Historically the MS was established at the First General Assembly on August 4, 1863, which took place in Martin. On January 1, 1919 its activities were revived. At present its functioning is ruled by the Act No. 68/1997 on Matica Slovenská and Statutes of Matica Slovenská. By its mission and position in the society Matica Slovenská carries out an irreplaceable task of integration of the Slovak society disregarding the social status, religion or political affiliation of its members.

⁶ BARTÓK, Béla: *Slovenské ľudové piesne I*. Slovenská akadémia vied, Bratislava, 1959, p. 13.

⁷ ELSCHÉKOVÁ, Alica: *Béla Bartók a slovenská ľudová pieseň*. In: *Hudobný život*, vol. 13, 1981, No. 5, p. 6.

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³ CSEHI, Ágota: *Bartók és a felvidék*. Komárom-Esztergom: Komáromi Lapok, Komárom-Esztergom Megyei Önkormányzat, 1994, p. 28-37.

1. Autograph, the complete manuscript of Bartók's collection of Slovak folk songs containing 1,200 pages.
2. Audio material of Slovak folk songs consisting of 220 phonograph recordings.
3. The collection of photographs made by Bartók during the research in Slovakia which document his way of work, as well as performers, singers, their way of life, costumes and architecture.
4. Printed volumes I – III and prepared volume IV, including analytical and systematic lists of melodies and lyrics, as well as comparative data.

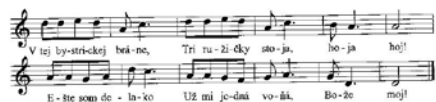
The work is administered by the *Slovak National Library* in Martin. It is the biggest and most complete volume of Slovak folk songs collected by Béla Bartók. In it he presented an excellent knowledge of the Slovak language, which enabled him to write down also song lyrics of various dialects and difficulty. Due to its demanding and extensive comparative comments and references, melody records, it is one of the most complicated texts for editing which has ever originated in ethnomusicology; the collection is Bartók's masterpiece and one of the most significant works of European ethnomusicology.⁸ The project was presented and prepared by Prof. Oskár Elschek helped by the Slovak Committee of the *Memory of the World* on June 9, 2004 and it was unanimously approved that the project be submitted by the Slovak Republic to UNESCO as a proposal for the entry into the register of the UNESCO *Memory of the World 2004*.

1.2 Slovak Folk Song in the Compositions of Béla Bartók

In Bartók's compositions four kinds and methods of arrangement of folk songs can be found:

- A simple arrangement, transcription of a folk song;
- An arrangement of a folk song;
- Free usage of melodic or rhythmic elements of folk songs;
- Bartók's inventive independent works.

Bartók quoted and arranged Hungarian and Slovak folk songs collected on the territory of Slovakia in the following compositions: *Four Slovak Folk Songs* (BB 46, 1907), *Fourteen Bagatelles, for piano* (BB 50/5, 1908), *For Children – vols. 3 and 4* (BB 53, 1908 – 1909), *Slovak Folk Song "Krúti Tóno vretena"* (BB 73, 1916), *Slovak Folk Songs, for male chorus* (BB 77, 1917), *Four Slovak Folk Songs, for mixed chorus and piano* (BB 78, 1917), *In the Village, for female voice and piano* (BB 87a, 1924), *Three Village Scenes, for four (or eight) female voices and chamber orchestra* (BB 87b, 1926), *44 Duos, for two violins* (BB 104, 1931). Hungarian folk songs found and recorded in Slovakia can be detected in the following compositions: *For Children – vol. 1* (BB 53, 1908 – 1909), *Four Old Hungarian Folk Songs, for male chorus* (BB 60, 1910 – 1912), *Fifteen Hungarian Peasant Songs, for piano* (BB 79, 1914 – 1918), *Twenty Hungarian Folk Songs, for voice and piano* (BB 98, 1929), *44 Duos, for two violins* (BB 104, 1931).⁹ Bartók elaborated the first song from *Four Slovak Folk Songs* (BB 46, 1907) on the basis of a Slovak folk song tune *V tej bystrickej bráne...*, from his own collection from 1906. He recorded a 40-year-old singing woman from Gemer, Hrlíca village, on the phonograph. This folk song appears not only in *Four Slovak Folk Songs*, but also in the third volume of his instructive piano series *For Children*.



Music sample No. 1. *V tej bystrickej bráne*. Source: Slovenské ľudové piesne III, No. 1160b)

⁸ Information about the activity of the Slovak committee for the UNESCO programme *Memory of the World*: The present state and new nominations to the world register of the UNESCO *Memory of the World* [online]. [s.a.]. [Quoted 2008-04-08]. Accessible on: <<http://www.ulib.sk/index/go.php?id=1997>>

⁹ LAMPERT, Vera: *Népzene Bartók műveiben: feldolgozott dallamok forrásjegyzéke*. Budapest: Helikon, 2005, p. 15.

The following song is based on the Slovak folk song *Pod lípkou, nad lípkou*, which was sung by Zuzana Drábová (then 17-year-old girl), also from Gemer, Hrlíca village, in 1906. This song, too, was elaborated in the third volume of *For Children*.



Music sample No.2: *Pod lípkou, nad lípkou* (Source: Slovenské ľudové piesne II, No. 531a)

The third song is based on the Slovak folk song *Nebanova bi*, sung for Bartók by an unknown child from Gemer, Filiar village in 1906.



Music sample No. 3: *Nebanova bi* (Source: Slovenské ľudové piesne I, No. 47b)

In the fourth song Bartók arranged the Slovak folk song *Priletel ťták* from Dražovce village, Nitra county. Jozefína Homolová sung for the record in 1907.



Music sample No. 4: *Priletel ťták* (Source: Slovenské ľudové piesne III, No. 1440g)

In the composition *Fourteen Bagatelles for piano* (BB 50/5, 1908) Bartók elaborated the folk song *Ej popred naš, popred naš, popred naše dvere*, sung by Zuzana Drábová from Hrlíca village, Gemer county.



Music sample No. 5: *Ej popred naš, popred naš, popred naše dvere* (Source: Slovenské ľudové piesne II, No. 692a)

The biggest number of Slovak folk songs were arranged in the third and fourth volumes of the work *For Children* (BB 53, 1908 – 1909). The complete title of the series is *Easy piano pieces for beginners without octave double-stop on the subject of Hungarian and Slovak folk songs (Könnyű zongoradarabok kezdők részére oktávfogás nélkül magyar, és szlovák népdalokra)*. Originally its four volumes contained 85 pieces, which were later (1945) reduced to 79 pieces in two volumes. The pieces in the collection are easy arrangements of folk songs. Bartók used here 43 Slovak folk songs and melodies in total. He derived them from his collection *Slovak Folk Songs I and II*, as well as from the printed collections of other authors as follows: *Slovak Songs I* (1880), *Slovak Songs II* (1890), *Detva* (K. A. Medvecký, 1905), *A Collection of Slovak Folk Songs, for middle voice and piano accompaniment II* (M. Sch. Trnavský, 1917). In his instructive compositions from the third and fourth volumes of the series *For Children* Bartók compositionally elaborated the following folk songs: *Keby boli čerešne...*, *Kalina, malina...*, *Pod lípkou...*, *Ej, Lado, Lado...*, *Lecela pava...*, *Stará baba zlá...*, *Ked som išol z vojny...*, *Hej, na prešovskej turni...*, *Zabelej še,*

zabelej..., V mikulášskej kompanii..., V tej bystrickej bráne..., Šuhajova mati..., Anička mlynárova..., Ore, ore šest' volou..., Tancuj, dievča, tancuj..., A keď bolo dievča..., Služilo dievča na fare..., Mav som tá, d'ovča, rád..., Ďateľ na dube žalostne d'ube..., Nechocže ty, Hanulienka..., Sadla dole, plakala..., Hnali švární šuhaji..., Já som bača veľmi starí..., Keď som išov cez horu..., Syroky jarček, Bistra vodička..., Už je noc, už je noc..., Ej, šija to džiaušina..., Sedí káčer na doline..., Dosti som sa nachodiu..., Spím, spím, spalabi..., Zahradka, zahradka..., Ej hory, hory..., Viem ja jeden hájiček..., Bol by ten Jánošík..., Kebych ja vedela..., Pri Prešporke pri číchom Dunajku..., Ešte raz sa obzrieť mám..., Pášou Janko dva voli..., Hej, pojukuj, povievaj vetriček..., Hej, ten stoličný dom..., Ňebanova bi...

Bartók worked with various sources of folk music in an endeavour to disclose their essence, differences, as well as common signs. Indubitably Bartók's interest in Slovak folk song inspired also the following generations of artists, composers and musicologists. In his preface to the first volume of the published *Slovak Folk Songs* Oskár Elschek wrote: "it is obvious his folkloristic work with its meaning, extensiveness and its innovative results in method and material brought the same permanent values to the modern ethnomusicology as his compositional work brought to artistic music of our century."¹⁰

The aforementioned facts and brief data prove that Bartók's relation to Slovakia was exceptionally intense, meaningful and contributive.

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Primary Paper Section: A

Secondary Paper Section: AL

¹⁰ BARTÓK, Béla: *Slovenské ľudové piesne I*. Slovenská akadémia vied, Bratislava, 1959, p. 8.

BURNOUT AND HELPING PROFESSIONS: MEASUREMENT OPTIONS, PREVENTION AND INTERVENTION

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This research was supported by the Slovak research and development agency under contract no. APVV-14-0921.

Abstract: The main aim of this study was to assess the level of burnout among helping professionals and explore which stress reduction activities they already use as well as which stress reduction activities they would appreciate having the opportunity to use within their work. The research was carried out on a sample of 745 helping professionals (89 % women), the age range was 20-65 years ($M = 44.04$; $SD = 10.33$). All participants completed two instruments measuring burnout syndrome (MBI-HS and a subscale of ProQOL) and answered several open questions regarding stress reduction activities at work. The obtained results showed that helping professionals on average reported relatively low levels of burnout in its measured aspects. In spite of this finding however, further statistical analysis identified groups within our sample with a higher risk of burnout (mainly health professionals, social workers and professional with longer work experience). Finally, it was found that the most frequently reported activities used by helping professionals to reduce stress and those which they would appreciate at their workplace overlapped and were represented by supervision, educational activities, teambuilding and relaxation activities. These findings can provide a background for the development of intervention and prevention programs aimed at reducing the negative effects which are often experienced in helping professions.

Keywords: Burnout, Helping Professionals, Intervention, Prevention.

1 Burnout among professionals in helping professions

Burnout syndrome is one of the most frequent negative effects identified in helping professions. The term burnout has been used in scientific literature since the end of the second half of the 20th century to denote a failure at work which is caused by physical and emotional exhaustion (Kebza, Šolcová, 2008; 2013). However, the original concept of burnout has undergone many changes since its inception. This can be seen in the fact that many different definitions of burnout syndrome exist (Perlman, Hartman, 1982). Moreover, these definitions differ in various aspects. For example, Pines and Aronson (Kristensen et al., 2005) define burnout as a state of physical, emotional and mental exhaustion caused by emotionally draining situations. It is a state which lasts over a long time and is more common to occur in certain professions. On the other hand, Maroon (2012) has focused more on the specific symptoms of burnout in his definition. He defines burnout as a psychological state which can be characterized by a lack of energy, low resilience against illness, increased pessimism and feeling of dissatisfaction. All of these can cause low work effectiveness and high absenteeism. Further, Cherniss (1990) highlights the significance of the loss of enthusiasm and a decrease in conscientiousness when performing one's job. Finally, Storli (Skoryk, 2013) has added that a burned-out individual performs his or her job rather mechanically and without any emotional involvement. While many theoretical definitions have been formulated, the most accepted complex definition of burnout syndrome can be found in Maslach's concept (Maslach, Schaufeli, Leiter, 2001). Maslach has developed a three-dimensional concept of burnout syndrome. According to this author (Maslach, Schaufeli, Leiter, 2001), burnout can be understood in terms of emotional exhaustion, depersonalization and reduced personal satisfaction with achievements at work. These symptoms can be found especially among professionals who work in helping professions. Within this model, the three mentioned characteristics are defined as components of burnout syndrome (Maslach, 2003; Maslach et al., 2006).

In general, there are two basic approaches to burnout syndrome within psychology. One approaches burnout as the state which we have addressed so far. The second emphasizes the processual element in burnout. By this, the amount of stress gradually increases in the process of burnout and the resources of an individual for coping become diminished. From this perspective, individual components of burnout can rather be understood as

phases of a chronological process (Maslach et al., 2003). Finally, it is also important to add that chronic psychosocial stress, experienced mainly in situations in which coping resources become diminished, is a generally accepted cause of burnout syndrome (Maslach, Goldberg, 1998; Kebza, Šolcová, 2008). Helping professions are at the highest risk for the occurrence and development of burnout syndrome (Lourel, Gueguen, 2007). The most common characteristic of these professions is the direct and intensive contact with clients/patients which makes this kind of profession very challenging emotionally (Zapf et al., 2001). Honzák (2009) has attributed the high risk for burnout syndrome to the very nature of helping professions which involves considerable personal engagement without getting much in return. Whitaker et al. (2006) have studied social work professionals and identified several sources of stress in this context. These sources are represented by long hours spent with clients, pressures caused by deadlines and limited time, professionally challenging cases, limited resources, low salaries, feelings of decreased security, increasing worry and long-lasting crisis situations which can cause stress exceeding one's resources and lead to the development of burnout syndrome in a professional. Graham and Shier (2010) see burnout along with a decrease in moral competence and high work fluctuation as the most negative aspects when working as a social worker. The motivation behind the interest in the exploration of burnout syndrome may be given by its far-reaching influence which affects not only the health of the provider but also her/his quality of life including job satisfaction, work performance and efficiency (Rössler, 2012). Empirical evidence regarding the relationship between burnout and helping professions has been documented by many published studies (e.g. burnout among teachers – Skoryk, 2013; among medical students – Pagnin et al. 2013; medical staff – Griner, 2013; social workers – Kim, Kao, 2011; emergency services - Katsavouini, Bebetos, 2016 etc.).

1.1 Burnout – measurement options

As the result of the increasing interest of researchers in studying burnout syndrome, several measuring instruments have been developed. One of the most popular is the questionnaire known under the acronym MBI (Maslach Burnout Inventory). The original version of this questionnaire developed by Christina Maslach and Susan E. Jackson (1981) is based on the three-component model previously mentioned. It has mainly been developed for the helping professionals (Maslach, Jackson, Leiter, 2006) and will be described in detail in the empirical part of this article. Throughout the years it has been revised several times and has also served as the inspiration for developing new methods (Kebza, Šolcová, 2008; 2013). These methods have made it possible to measure burnout in other professions. An example is the MBI-GS version (Maslach Burnout Inventory – General Survey) which is more general and has been used in several research studies (e.g. Hayes, Weathington, 2007; Goodger et al., 2007). The MBI-SS (Maslach Burnout Inventory – Student Survey) has been developed to measure burnout syndrome among students (e.g. Schaufeli et al., 2009). Throughout the years of research in burnout syndrome, a discussion about its nature has fully opened. Some authors consider burnout syndrome to be the equivalent to exhaustion (Kristensen et al., 2005; Shirom, Melamed, 2006). The critique of the MBI questionnaire lead to the development of new measures such as the Burnout Measure (Pines, Aronson, 1988, according to Kristensen et al., 2005), Copenhagen Burnout Inventory (Kristensen et al., 2005) and Oldenburg Burnout Inventory (Demerouti, Bakker, 2008). In comparison with the MBI, these inventories are not strictly aimed at helping professionals. In spite the fact that these alternative inventories have been developed, Maslach's concept of the burnout syndrome as well as the corresponding MBI is considered to be the gold standard for assessing burnout (Schaufeli, Taris, 2005).

1.2 Self-care as the basis for development of prevention and intervention programs

Self-care represents a set of consciously and purposefully executed activities which enable an individual to maintain or return to the state of physical and psychological well-being (Lovaš, Hricová, 2015). These are represented by different types of activities in several domains of self-care (Lichner, Lovaš, 2016). The performance of these activities in preventing one from developing burnout syndrome has been supported by several studies. For example, Richards et al. (2010) found that there is a relationship between burnout and these self-care activities and indications for a positive influence on the subjective well-being on employees was also found. According to these authors (Richards et al., 2010), self-care activities are related to the physical, psychological, spiritual as well as professional sphere. Barnett et al. (2007) has added that self-care acts as a buffer, protects against and minimizes the symptoms related to burnout as well as other negative consequences of helping. Activities which can decrease overload are represented by the ability to set priorities, searching for social support, time management of tasks, reappraisal or self-monitoring. Jones (2005) highlights the traditional means of decreasing the risk of burnout by adherence to a healthy lifestyle and mental hygiene (open conversation about problems and feelings; healthy diet; sufficient level of rest and exercise; avoidance of risk behavior; using relaxation techniques).

The effectiveness of self-care prevention programs whether based on raising awareness of different self-care techniques and mastering them individually or under the supervision of a professional has been documented in a number of studies (Awa, Plaumann, Walter, 2010; Lindo et al., 2015). For example, Alkema et al. (2008) found evidence for a positive effect of an educational program which focused on coping with stress and was carried out among nurses on the level of emotional exhaustion as an important component of burnout. Newell and Macneil (2010) emphasize that it is important to increase competencies in self-care as part of any professional training. They highlight that it is important to teach students to be able to detect the key symptoms and warning signs of professional burnout as well as teach them the strategies and techniques of self-care as an important means of preventing burnout (Newell, Macneil, 2010).

The aim of the present study is to evaluate the level of burnout among helping professionals in Slovakia and investigate, on one hand, which activities they use to deal with work stress and on the other, which activities they would like use at their workplace.

2. Method

2.1 Research sample

The sample consisted of helping professionals employed in state and private social-care institutions. The institutions were selected randomly in all eight Slovak regions from the list of social-care providers which is available on the web-site of the Ministry of Labour, Social Affairs and Family of the Slovak Republic (<https://www.employment.gov.sk/sk>). Then, the selected institutions were contacted by telephone and after agreeing, data collection was carried out. This was done by posting batteries of questionnaires which consisted of seven questionnaires and a set of open questions focused on positive and negative consequences of helping. The response rate was 71%.

The sample consisted of 745 helping professionals (89% women), age ranged 20-65 years ($M = 44.04$; $SD = 10.33$) and work experience 0-44 years ($M = 13.11$; $SD = 10.49$). The following helping professions were represented in the sample: health professionals (32.1%), educators (26.3%), social workers (26.2%), psychologists, teachers and therapists (13.2%) and managers (1.7%). All respondents worked directly with their clients and the time spent in direct contact with clients per week was represented in our sample as follows: less than 3 hours (2.6%), 3-10 hours (14.9%), 11-18 hours (12.2%), 19-27 hours (11.1%), 28-36 hours (26.7%), more than 36 hours (31.3%).

2.2 Measures

Three measuring instruments were used in this study:

The Maslach burnout inventory (MBI-HS; Maslach et al., 2006), Slovak translation. The instrument consists of 22 items measuring the level of burnout syndrome, i.e. the level of emotional exhaustion (e.g. "I feel emotionally drained from my work."), depersonalization (e.g. "I don't really care what happens to some recipients.") and reduced personal accomplishment (reverse coded, e.g. "I feel I'm positively influencing other people's lives through my work."). Respondents indicate the frequency of experiencing work-related feelings using a 7-point scale (0 = never; 6 = every day). The internal consistency estimates (Cronbach alpha) for emotional exhaustion, depersonalization and personal accomplishment were .90, .79 and .71, respectively (Maslach et al., 2006). In the current research, the Cronbach alpha estimates were .878 for emotional exhaustion, .601 for depersonalization and .768 for personal accomplishment. A translation agreement number TA-673 was purchased to create and use the Slovak version of the questionnaire. The English version was created by back-translation.

Professional quality of life scale (ProQOL; Stamm, 2010; Slovak adaptation Köverová, 2016). The professional quality of life scale consists of 30 items measuring the level of the positive and negative effects of helping. For the purposes of this study, only burnout subscale was used in the analyses (10 items, e.g. "I feel trapped by my job as a helper."). The answers are rated on a 5-point scale (1 = never; 5 = always). Higher scores indicate higher levels of burnout. Stamm (2005) has reported adequate internal consistency (Cronbach alpha) for burnout subscale (.90). In the present study, internal consistency (Cronbach alpha) for burnout subscale was .690. The author's permission to use ProQOL for research purposes was obtained through the online form at http://www.proqol.org/Request_Use_Permission_WTRJ.html. We consider it necessary to explain that the purpose of using two similar methods was to capture a wider range of symptoms of burnout, since the administered ProQOL questionnaire concerns mainly symptoms of emotional fatigue (Figley, 2002, Stamm, 2010).

Open questions. Three sub-sets of questions developed by the authors were administered together with the battery of questionnaires. The questions addressed the issue of perceived sources of stress by respondents as well as stress reducing strategies used within the workplace. Since these questions were added as an additional part of the questionnaire battery and their completion was voluntary, the response rate to these questions was lower than that to the questionnaires. In total, 135 respondents provided answers to the open questions. For the purposes of this study, the question: Do you use any stress reduction activities at your workplace to reduce stress resulting from helping? (Additional questions: If yes, which?; If no, would you welcome this kind of activity at your workplace? If yes, would you be able to provide suggestions which activities could be helpful? Which areas should these activities target, which areas should they be related to, so they can help to reduce the stress caused by helping?).

2.3 Statistical analyses

Descriptive and differential statistics (t-tests, ANOVA) were used in the analysis of the MBI and the ProQOL and the data were analysed using the IBM SPSS 21. The responses to the open questions were analysed by using the content analysis.

3. Results

3.1 Description of the subscales of the MBI-HS

The results of the analysis suggest that, in general, helping professionals experience only low levels of burnout syndrome. A closer look at the individual components of MBI-HS shows that

respondents reported only slight emotional exhaustion ($M = 2.09$; $SD = 1.21$), very low levels of depersonalization ($M = 0.85$; $SD = 0.90$) and a medium level of personal accomplishment ($M = 4.36$; $SD = 0.95$). More detailed information is provided in the Table 1. Due to the significant disproportion of women and men in the sample it was not possible to analyse differences between genders. When the respondents were compared according to different categories, significant differences were found only in two components. Specifically, respondents were found to differ in the component of emotional exhaustion when they were compared according to their years of working experience ($F = 7.029$; $p < 0.001$) and type of profession ($F = 5.590$; $p < 0.001$). Furthermore, differences were also observed in the component depersonalization but only when they were compared with

regard to the type of their profession ($F = 3.134$; $p < 0.001$). These results show that the starting professionals significantly differ from their experienced colleagues in the component emotional exhaustion when the professionals with longer working experience (10-20 or more years) show higher levels of exhaustion than the starting professionals. Similar results were found when different types of professions were compared. Health-care professionals experienced emotional exhaustion statistically significantly more often than psychologists and educators. With regard to depersonalization it was found that social workers suffered from this component of burnout more frequently than psychologists and therapists. No differences were observed with regard to personal accomplishment. These findings suggest a well-known trend which reflects the risks related to working in health care.

Table 1 Means of burnout according to the categories of measured variables

Variables	Categories	N	Burnout ProQOL	MBI-HS		
			M (SD)	EE M (SD)	DE M (SD)	PA M (SD)
Age	20-33 years	138	2.27 (0.42)	1.88 (1.09)	0.87 (0.90)	4.23 (1.01)
	33.1-44 years	218	2.35 (0.44)	2.08 (1.16)	0.89 (0.92)	4.26 (0.90)
	44.1-55 years	252	2.43 (0.46)	2.20 (1.30)	0.85 (0.91)	4.48 (0.90)
	55.1-65 years	114	2.36 (0.50)	2.10 (1.23)	0.79 (0.81)	4.49 (1.03)
Work experience	0-3 years	154	2.20 (0.41)	1.72 (1.08)	0.84 (0.94)	4.34 (0.99)
	3.1-9.9 years	182	2.37 (0.43)	2.04 (1.19)	0.85 (0.84)	4.36 (0.97)
	10-19.9 years	194	2.40 (0.46)	2.24 (1.22)	0.86 (0.89)	4.31 (0.95)
	20 and more years	203	2.45 (0.49)	2.25 (1.25)	0.83 (0.87)	4.45 (0.93)
Profession	Social workers	194	2.42 (0.47)	2.22 (1.25)	0.98 (0.94)	4.29 (0.94)
	Psychologists, teachers and therapists	97	2.22 (0.42)	1.81 (1.12)	0.64 (0.72)	4.45 (0.86)
	Educators	196	2.32 (0.45)	1.89 (1.16)	0.87 (0.98)	4.42 (1.01)
	Health professionals	235	2.42 (0.46)	2.28 (1.22)	0.85 (0.86)	4.37 (0.96)
	Managers	13	2.12 (0.35)	1.43 (0.56)	0.43 (0.42)	4.32 (0.73)
Time spent in direct contact with clients per week	Less than 3 hours	18	2.52 (0.60)	2.12 (1.41)	1.14 (1.21)	4.19 (1.03)
	3-10 hours	110	2.35 (0.45)	2.05 (1.24)	0.91 (0.86)	4.30 (0.91)
	11-18 hours	91	2.41 (0.41)	2.21 (1.16)	1.05 (0.95)	4.30 (0.86)
	19-27 hours	83	2.34 (0.44)	1.92 (1.15)	0.86 (0.79)	4.31 (0.83)
	28-36 hours	197	2.45 (0.46)	2.15 (1.19)	0.78 (0.90)	4.27 (1.02)
	36 and more hours	231	2.29 (0.46)	2.08 (1.25)	0.80 (0.86)	4.51 (0.98)

Low levels of emotional exhaustion and depersonalization has not changed when either time spent with clients or education of the professional were considered. Nevertheless, the mean scores still show an interesting pattern. The highest mean score in personal accomplishment was observed among those professionals who spend 36 or more hours in direct contact with their clients per week and the lowest mean score was found in the group which spends the shortest time in direct contact with their clients (less than 3 hours per week). The explanation for this could be probably found to the content of the work which can be perceived as meaningful when more time is spent in direct contact with clients and this way lead to the satisfaction with one's competence which increases with the amount of experience.

3.2. Description of the burnout subscale of the ProQOL

Helping professionals reported a relatively low level of burnout when the scale ProQOL was used ($M = 2.36$; $SD = 0.01$ total sample). Mean values for burnout are displayed in the Table 1 and are presented according to the assessed demographic categories. Statistically significant differences in burnout between individual groups of helping professionals were found in groups with different age ($F = 3.467$; $p = 0.016$), length of working experience ($F = 1.055$; $p < 0.001$), type of profession ($F = 5.563$; $p < 0.001$), type of institution ($F = 3.643$; $p < 0.001$) and different number of hours spend with clients ($F = 3.512$; $p = 0.004$).

In the case of age, two differences were observed: older helping professionals (44-55 years old) reported higher level of burnout than the younger professionals (20-33) (Table 1). With regard to the length of working experience, differences were found between the starting helping professionals (0-3 years of

experience) who reported lower levels of burnout than the other three groups (Table 1). With increasing age and years of experience subjective experience of burnout increased. In spite of these changes in time the mean score still stayed on a relatively low level.

When different professions were considered, the highest levels of burnout were reported by social workers and health professionals (Table 1). Both these groups differed from psychologist, teachers and therapists who reported lower levels of burnout (Table 1). When different institutions were compared, significant differences were found only between the employees of the Central Office of Labour, Social Affairs and Family (the highest level of burnout) and the employees of private care institutions for seniors (the lowest level of burnout). The group with the highest risk was represented by the social workers at the Central Office of Labour, Social Affairs and Family.

When time spent with clients per week was analysed, differences between two groups were observed. Specifically, the difference in burnout was found between those who spent the most time with their clients: 28-36 hours and 36 hours or more. The lowest reported level of burnout was found among those who spent 36 hours or more with their clients (Table 1). This finding could appear paradoxical at the first glance, but it may suggest that professionals who spend more time with their clients adapt to the challenges of their work and find problems of their clients less exhausting.

3.3 Open questions

Out of the total number of 135 obtained responses to open questions, 49.6% of respondents wrote that they use stress

reduction activities at their workplace with the aim to reduce their stress caused by the nature of their profession. Three respondents (2.2%) reported that they do not use such activities at their workplace. The rest of the respondents (48.1%) did not provide an answer to this question. All responses were categorised. Helping professionals most frequently reported that as a stress reduction method they use *supervision* (26.8%) and *educational activities* (20.9%). These were followed by *time-management* (13.4%) i.e. creating a system for work tasks, alternating between different tasks, taking breaks during work; *creating pleasant working atmosphere* (11.9%) i.e. doing activities to help to create a positive atmosphere at work, good relationships with colleagues as well as friendly and cosy working environment; *teambuilding* (10.4%); *work meetings* (10.4%) and *trips paid for by the employer* (10.4%). The rest of the suggestions varied individually and were all included in the category „Other“ (8.9%) containing activities such as mindfulness training, memory training, music therapy, art-therapy, relaxation or sport activities during the working time.

The question asking about the stress reduction activities which would respondents like to have at their workplace was answered by 117 respondents. This means that this question was also answered by those professionals who reported that they already use certain stress-reduction activities but would welcome more of them. Out of 117 employees 47% answered the question positively and 53% in addition to their positive response provided also concrete suggestions which were then categorized. As a means for reducing work stress, helping professionals would mostly welcome the following: *educational activities* (29%; e.g. lectures, workshops, internal educational program, education in coping with stress, social skills trainings – assertiveness, communication, cooperation, dealing with conflicts) and *teambuilding activities* (24.2%). Helping professionals would also welcome *trainings in relaxation methods* (17.7%), *trips paid for by the employer* (9.7%), *sport activities* (8%), *consultations with a psychologist* (8%), *supervision* (4.8), *music therapy or art-therapy* (4.8%).

4. Discussion and conclusion

Generally, the findings of this study are positive and show that positive outcomes such as personal satisfaction with work performance and competence are experienced frequently by helping professionals. Based on the results, it can be said that helping professionals experience only a low level of burnout. However, individual aspects of burnout show significant differences which is in line with our findings in other published studies so far (Köverová, Ráczová, 2017; Köverová, Ráczová, in press). It was also found that when the role of socio-demographic factors was taken into consideration, emotional exhaustion showed a stronger effect (subscale of the ProQoL questionnaire and emotional exhaustion in the MBI) which has led us to the identification of those professionals who are at higher risk for burnout. These were usually older and more experienced professionals, employed in social services and health care (employees of the Central Office of Labour, Social Affairs and Family, social workers, nurses, carers) but also professionals who spend too little time with their clients (less than 3 hours per week). A higher level of exhaustion among older professionals has also been shown in a number of studies (Köverová, Ráczová, in press; Śliwiński et al., 2014; Tuveson et al., 2011).

Supervision and education were found to be the most frequently used stress reduction strategies by helping professionals from those available at the workplace. However, the results also suggest that helping professionals saw the provision of activities for stress reduction provided by their employers as insufficient. More opportunities for educational, teambuilding and relaxation activities would be appreciated during work time.

The accounts of the employees mainly reflect the importance of education (development of professional skills), maintaining positive relationships at the workplace and mental hygiene which suggests that helping professionals really care about

responsible and competent performance of their profession. Suggestions concerning the possibilities of psychological consultations and supervision showed that such consultations and supervision is either not used sufficiently or that demand for it is too high.

Based on the presented findings, it seems important that employers pay more attention and dedicate more of their employees' working time to these activities (taking into account their possibilities). This has been identified as important for reducing the negative effects of working in helping professions (mainly burnout and stress which are the most frequent; Figley, 2002; Stamm, 2010). Prevention programs for helping professionals should contain up-to-date information about burnout and especially about its prevalence in (but not only) those occupations which are at high risk. For professionals who are experiencing the symptoms of burnout there should be intervention programs focused on the reduction of the negative effects related this profession.

The presented findings should be interpreted in the context of what needs to be improved in the work of helping professionals which eventually increases the quality of the provided care. The development, implementation and evaluation of a prevention and intervention program aimed at improving the competence in self-care as a means for reducing the negative effects related to working as a helping professional is the main goal of the project of which this study is part of. Thus, the presented findings along with other findings of this project provide the background for the development of such program.

Education in self-care can be seen as an opportunity for self-realization which is one of the factors improving the resilience of individuals against stress as such (Mesárošová, 2014). According to several authors (Newell, Macneil, 2010; Cunningham, 2004), prevention and intervention programs aimed at education are the ideal solution for preventing burnout as well as other negative consequences common in helping professions. This has been supported empirically by showing that these programs are effective (Awa, Plaumann, Walter, 2010). In Slovakia, several researchers in social work have studied this problem e.g. Šiňanská, Šandlová (2013) and Lovašová (2016) who also argues that life-long education, supervision and psycho-social trainings as individual components of self-care are a necessary part of the education and training of professionals. However, it has not yet been addressed comprehensively and subsequently should be addressed by the future research of this topic.

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Primary Paper Section: A

Secondary Paper Section: AN

ATTITUDE OF YOUNG PEOPLE TOWARDS ENTREPRENEURSHIP

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Abstract: Entrepreneurship has a very important role in every economy. Small businesses are flexible, they can react to demands on the market much faster, and they are a source of innovation. Supporting young people's businesses is therefore very important. The objective of this study was to find out what the attitudes of secondary school students are to entrepreneurship. 373 students of secondary schools were selected. It was found that only a small number of respondents (4 %) has an interest in entrepreneurship and that there is a statistically important gender difference. Men have the intention to do business statistically significantly more than women. It was simultaneously found that the respondents that stated that they want to do business also expect a higher wage than students who don't want to do business. It was also found that the amount of the expected gross wage isn't related to the type of high school (technical versus economic field of study and grammar schools.)

Keywords: entrepreneurship of young people, attitudes towards business, gender differences, expected wages

1 Introduction

Entrepreneurship and its development has a very important role in every economy. It is not only a tool to develop innovations but it also helps economic growth and to create new job vacancies. It has an irreplaceable place not only in developed but also in developing and transitional economies (Ateljevic, 2013). If small and medium-sized businesses are compared in less developed areas and in developed economies, it can be seen that small and medium-sized businesses have a lower business quality in economies with lower incomes (Fernández-Serrano & Romero, 2013). It also plays an important role in the development of regions and rural areas (Paresishvili, Kvaratskhelia & Mirzaeva, 2017). The institutional environment also has a significant impact on the level of business, as it can create barriers to the development of business. These barriers can be political, regulatory or economic (Yukhanaev et al., 2015). An explanation as to how public policy levers influence small businesses is brought by (Dennis, 2011). He creates four typologies that involve institutions and culture, competition and expected immediate income, barriers and support for economic competition, and the aims of politics and direct/indirect actions. One of the problems in developing businesses is financing small companies. Zarezankova-Potevska points out that a shortage of financial funds is exactly what prevents the realization of business intentions and innovations (Zarezankova-Potevska, 2017). At the same time, she points to the fact that banks are not very willing to provide adequate loans to entrepreneurs and small and medium-sized businesses, which also have the biggest potential in the field of innovations. Majková, Ključnikov and Solík (2017) had similar findings. According to their conclusions, small businesses have trouble acquiring capital which they can use for further development and activities across borders. The lack of financial resources is a very limiting factor. In the Czech Republic, a survey was made that involved more than 1 000 respondents – entrepreneurs. The results of the survey showed that 45 % of the respondents think that small and medium-sized businesses have limited access to external sources (Klučikov et al., 2016).

As a consequence of the difficulty in accessing financial resources, entrepreneurs choose the conservative financial strategy of maximum liquidity, which is not an ideal situation for further development of the business. Svatošová carried out a research survey in the field of agriculture where she identified an absence of company strategy focused on further development of entrepreneurship (Svatošová, 2017). Empirical data are not available in other fields of entrepreneurship but it can be assumed that the situation is similar.

Balla, Carpenter a Robinson (2017) researched the motivation of banks in being involved in a special program (Small Business Lending Fund) that is focused on a change in attitude of banks on a segment of small and medium-sized entrepreneurs. It seems that this program brings positive results as in the banks that joined the program, greater growth of credit provided to small companies was registered compared to the banks that were not involved.

Another barrier to business can be circumstances of a social character like, for example, a shortage of social capital or high rate of crime (Sleutjes & Schutjens, 2013). The state can also help in the development of businesses. In some countries, support from the state is non-existent or very limited (Jaafar, Rasoolimanesh, & Lonik, 2015). Směkalová et al. (2014) state that most government policies mostly focus on the question of financial support but support for entrepreneurs should be broader and should also include an effort to create positive attitudes to entrepreneurship and business. These attitudes are negative nowadays. As far as financial support from the state is concerned, this field is also very weak in the Czech Republic. Only 10 % of entrepreneurs evaluated the usable state financial support as positive (Klučikov et al., 2016).

There is no doubt about the contribution of small and medium-sized businesses. Unlike big companies, they are more flexible and able to react to fulfilling local or specialized demands on the market. (Burch et al., 2016). They are also the main source of innovations (Booyens, I. 2011). For an increase in the output of small and medium-sized businesses, Campbell and Park (2017) suggest the combination of an approach based on resources (social capital and business orientation, intellectual capital and strategic control).

However, not every person has the precondition for business. Coda, Krakauer and Berne (2017) looked into characteristics that entrepreneurs show. They found that they are, besides other things, significantly more competitive, they focus on resources and concentrate on innovations, and on improving the planning and organizing of a small business. Personal initiative, time management, goal setting and the ability to overcome barriers are said to be further important features for an entrepreneur (Frese, Hass, & Friedrich (2016). Another necessary condition is also the ability of business decision-making and identification of business opportunities (Xueyan & Hisrich, 2016). A very interesting discovery was made by Dai and Cole (2017), who looked into the role of business optimism. They came to the conclusion that optimistic entrepreneurs often have better loans and lower costs. Many more authors are concerned with the specific characteristics of entrepreneurs, for example, Lofstrom, Bates & Parker, S. C. (2014). Other researchers focus on gender differences in business (Webster & Haandrikman, 2017).

Although there is no doubt about the benefits of entrepreneurship and the business activity is welcome, this activity can be lower in many countries than many would expect (Urban, 2011). In this article, we focus on business from the point of view of young people and their willingness to do business.

2 Materials and Methods

The aim of the research was to find out what sort of attitude towards business students of secondary schools have. 373 students were selected (166 men and 207 women) from secondary schools in Ústecký region. The respondents were students from the 3rd and 4th Years, who we can assume are thinking about their future professional careers. The research questions were focused on finding out if the students have the intention to do business after they finish secondary school and if there are differences between men and women. Another intention was to find out if the students that have the intention to do business also expect a higher wage than those students who

do not have any intention to do business. The last research question was focused on identifying differences in the expected amount of the wage connected with the type of school that the students are currently studying at (technical versus economic field of study). The questionnaire was in written form.

The SW Statistica was used to evaluate the data (Chi test, Test of correspondence of two parameters with binomial division, Kruskal-Wallis and Mann Whitney test).

3 Results

From the results it emerged that almost a quarter of the secondary school students who are at the end of their secondary school studies (3rd and 4th Years) are not thinking about their future career yet. More than 50 % of respondents assume that they will continue their studies at college, 10 % want to start working after their school leaving exam and only 4 % of respondents state that they will do business.

Table 1 Visions of secondary school students about their further plans after finishing secondary school

What are your plans after finishing secondary school?	absolute frequency	relative frequency in %	relative frequency in %	relative frequency in %
	total	total	men	women
I want to study at college	199	53.35	45.78	59.42
I want to start working	38	10.19	11.45	9.18
I want to do business	15	4.02	7.23	1.45
I don't know, I haven't thought about it	91	24.40	27.11	22.22
Either studying at college or working	12	3.22	3.01	3.38
Business is stated as one of the options	18	4.83	5.42	4.35
sum	373	100.00	100.00	100.00

Source: own

From Table 1 it can be seen that men think about their future career differently than women. The questioned women often have the intention to continue in their studies at college, less often think about starting to work right after finishing secondary school than men, they think about doing business very sporadically but overall, they think about their future more than men. With the Chi-Square test, it was verified that these plans between sexes are statistically significantly different. The found p value = 0.028668 confirmed that the ascertained gender differences in future plans of secondary school students are statistically important.

The intention to do business was expressed by more than 7 % of men but less than 2 % of women. The test of correspondence of two parameters with binomial division established that the percentage of men who plan to do business is statistically significantly higher than the percentage of women (p = 0.010301102). Given that almost a quarter of the respondents answered that they have not thought about their future career yet, it was also tested whether there is a significant gender difference in this matter. It was found that the attitudes of the yet undecided are not that big of a statistically important difference between men and women (p = 0.137232).

Table 2 Wage expectation of students

	1 category	2 category	3 category	4 category	5 category	6 category
I will start doing business	Less than 15,000 CZK	15,000 – 19,999 CZK	20,000 – 24,999 CZK	25,000 – 29,999 CZK	30,000 – 49,999 CZK	50,000 CZK or more

Absolute frequency	17	43	82	71	75	85
Relative frequency	0.046	0.115	0.220	0.190	0.201	0.228

Source: own

Every student also answered the question of what gross wage they would expect if they were to start doing business. Wage categories were created and the students marked their wage expectations in the chosen category (Table 2).

In the next step, the respondents were divided into three categories depending on their answer to what will they do after finishing secondary school (i.e., whether they have the intention to do business or not), see Table 3.

Table 3 Categorization of respondents according to their future plans

What are your plans after finishing secondary school?	Category of group	Absolute frequency
I have no intention to do business (I will work or study)	1	249
I have the intention to do business	2	33
I do not know, I haven't thought about it yet	3	91

Source: own

Afterwards, whether the median of wages of each group (Table 3) differ statistically significantly was ascertained. The Kruskal Wallis method was used because the data did not show a normal distribution. The results of the test are stated in Table 4.

Table 4 Statistical test of differences of the median of wages

Test Statistics ^a	Ascertained values
Chi-Square	9,584
df	2
Asymp. Sig.	0.008

a. Kruskal Wallis Test

Source: own

From Table 1 it can be seen that the expected amount of wage (or the wage category) in case the students have the intention to do business in the monitored groups (I have no intention to do business, I have the intention to do business, I do not know, I haven't thought about it yet) is statistically significantly different.

Next, it was researched in which category (according to the intention/plan of what they will do after finishing secondary school) the median of the expected wage is the highest. We compared the medians of two categories at a time. First, we compared the group who have the intention to do business and the group who don't.

The Mann Whitney test was used to test it and the results are shown in Table 5.

Table 5 Statistical significance of differences in expected wages according to future plans (I have the intention to do business versus I do not have any intention to do business)

Test Statistics ^a	Ascertained values
Mann-Whitney U	2,832.00
Wilcoxon W	33,957.00
Z	-2.955
Asymp. Sig. (2-tailed)	0.003

Source: own

From the results it emerged that students who have the intention to do business after finishing secondary school also expect a

higher wage than those who do not have any intention to do business.

On the other hand, if we compare the medians of the expected wage of the students who have not decided yet what they want to do after finishing secondary school and who want to do business, then a correspondence of medians on the 5 % level cannot be denied. (Even though it is very close). The results of the Mann-Whitney test are shown in Table 6.

Table 6 Statistical significance of differences in the amount of the expected wage according to their future plans (undecided versus plan to do business)

Test Statistics ^a	Ascertained values
Mann-Whitney U	1,177.00
Wilcoxon W	5,363.00
Z	-1.888
Asymp. Sig. (2-tailed)	0.059

Source: own

The last question was focused on finding out whether the type of secondary school plays any role in the expected income or not. The respondents were divided into two groups. Students who study at a school with technical specialization were put in one group and students who study at an economics school or a grammar school were in the other. The results of the Mann-Whitney test are shown in Table 7.

Table 7 Statistical significance of differences in wage expectation according to the type of secondary school

Test Statistics	Ascertained values
Mann-Whitney U	15,381.50
Wilcoxon W	24,426.50
Z	-0.65
Asymp. Sig. (2-tailed)	0.52

Source: own

From the results it emerged that the correspondence of medians cannot be denied. There were no statistical differences found in the amount of the expected wage in connection with the type of secondary school using the Mann-Whitney test.

4 Discussion

Within the research, it was found that women are less interested in entrepreneurship than men. Civelek, Rahman and Kozubikova (2016) carried out a rather extensive research in which they surveyed 1141 small businesses. Their objective was to identify differences in business orientation in gender as well as in other socio-economic characteristics (age, education). However, no gender differences emerged from the conclusion of their study. Education appeared to be a substantial criterion where entrepreneurs with college education were identified as more innovative and independent. Other authors who did their research similarly to this research found gender differences in business intentions within their selected students. They claim this is down to different personal attitudes and behavioural control (Maes, Leroy, & Sels, 2014). It also emerged from their conclusions that women are less oriented towards doing business.

It was mentioned in the introduction of this article that one of the significant barriers in business is the difficult access to external financial resources. Gicheva and Link (2015) ascertained, based on data from the National Research Council of the National Academies that small businesses that are owned by women are less likely to receive financing from the program Small Business Innovation Research than small businesses that are owned by men. This disadvantage in accessing financial resources was seen especially in some areas in the USA. Other authors, for example, Mijid and Bernasek (2013), came to the same conclusion, and they proved a higher rate of declined loans and lower rate of utilization of loans by female entrepreneurs compared to male entrepreneurs.

One of the important findings of this article is that students who claim that they want to do business also expect a higher wage. That is exactly in compliance with the conclusions of another study that was interested in the question of why some people become owners of small businesses and some don't. The conclusions show that what makes an entrepreneur different are the different rewards (Lofstrom, Bates, & Parkern, 2014).

5 Conclusion

In this study, the attitudes of students are towards entrepreneurship were ascertained. Component research questions were focused on the willingness/intention to start doing business and on gender differences in these attitudes. Then it was found that students who want to do business also expect a higher wage than those who do not want to do business, and finally, whether there are differences in the expected wage connected to the type of school that the students study at.

It was found that only a small percentage of the secondary school students (about 4 %) has a positive attitude towards entrepreneurship. A considerable number of the 3rd and 4th year students of secondary schools (about a quarter) are not thinking about their future careers yet. Most frequently, students said that they have the intention to continue studying at college (about half of the students). Their visions are statistically significantly different depending on gender.

Men are statistically significantly more interested in entrepreneurship than women. Students who think about doing business after they finish secondary school also expect a larger income than those who don't plan on doing business. Even this difference was statistically significant. A statistically significant difference in the amount of the expected gross wage in case of doing business was not confirmed between the students who are planning on doing business and those who have not decided yet what they will do after secondary school. No statistically significant difference was found between the amount of the expected wage and the type of secondary school (economic and technical field of study).

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Primary Paper Section: A

Secondary Paper Section: AE

INNOVATION CENTRES AND THEIR SIGNIFICANCE IN A COMPETITIVE ENVIRONMENT

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The article is prepared as one of the outcomes of a research project VEGA no. 1/0305/15 "Impact of environmental tools on the growth of competitiveness and sustainability of businesses" conducted by Department of Production Management and Logistics of University of Economics in Bratislava, Slovak Republic.

Abstract: Innovation management is an important part of an overall management in a company, depending on it from point of existence and prosperity. It is broad knowledge and process system, useful tool not only in company management, but in a whole social system. The aim of this article is mainly current situation in selected area, there is an analysis and implication of author's own thoughts, their presentation and their explanation and expressing an opinion on development of start-ups in businesses in Slovakia. This is all discussed within the context of knowledge and experience from abroad and in connection with conditions and their development in European Union. On the basis of statistical verification, we verified the links and the dependence between the data obtained from the survey.

Keywords: *innovation, incubators, start-up*

1 Introduction

In current conditions of development, where elements of globalisation and internalisation are strongly presented and there is a stress on involvement of governmental institutions, but also internal innovation process of business units, the centre needs to be shifted corresponding cultural development in organisations and management of business development. It needs to be emphasised and explained, that innovation process should be understood as development of new products, from point of acquiring or exercising of innovation to introducing the product on a market. It is a preparation and continual application of innovation changes in given process. The outcome of innovation process might be utilised change, or realised innovation. Research and results of the study in general confirmed that innovation process may be divided into three main parts:

- Creation of invention,
- Creation of innovation,
- Penetration of innovation.

Each of these parts has its own internal solution. This will not be further discussed in this context. Content and expectations are given by theory and practice of businesses. It needs to be added that during innovation process there is a decrease of thoughts, initiatives and ideas. This attribute belongs to innovation process standards. Not even "thought through" business plan must be an accelerator of innovation process changes of a business unit. Mistakes in business calculations may regard costs of innovation process, lifecycle of product, marketing, financial analysis, human resources. We believe that within this process, marketing analyses have the greatest meaning. Those include consumption needs and need for products, market research, and competition, production potential, quality, scientific and technological development. Marketing preparation of innovation in a business should come to so called production and business marketing. Management of project in innovation development is closely connected to innovation development. Management of projects contribute to acceleration of scientific and technological development in following ways:

- Connects all phases of innovation process from the moment of deciding when innovation will be realised to its implementation.
- Induces clear responsibility for the whole innovation.
- Executes strict preparation for all phases of innovation process.

- Controls of fulfilment of planned objectives and aims of innovation project are responsibly secured and top management of given organisation can be promptly informed.
- Accelerates innovation realisation.
- Successful deployment of innovation.

When we look into a linguistic aspect of a word incubator, we will find out it comes from Latin. In medicine it is a machine maintaining the same temperature and other conditions for life of underdeveloped organs. Expertly it means artificial hatchery. In economics, incubators proved themselves as an institute preventing needless business failures of starting companies on a very competitive market. Their aim is to create certain business connection between newly created innovation companies and later own commercialisation of production on a market. They help new small businesses to overcome first difficult years of their existence. Incubators are known in the world under numerous terms such as, innovational, technological, business centres or scientific and technological parks, or technopolis.

2 Literature review

In scientific literature we can find such terms as "scientific park" or "innovation centre". In summary, they are workplaces that support effective flow of innovation process from results of science and research till practice, further there is successful development of small innovation companies, transfer of technologies and high-tech provided by their own background, services of all kinds. Szabo et al. (2017) emphasize the importance of information technologies in all sectors of the economy. The growing importance of information technologies in business adds to the dependence of subjects on information technologies. Good and accessible information today has a strategic economic and social importance for management and is an important element of innovation.

Here belong also so-called establishment centres, whose mission is to help in forming new small and medium businesses, creating space for these businesses, so they would have a chance to survive starting phase and further development. They offer variable spaces, common administration and further services, consulting services in management, research and consulting institutions. Small starting businesses have advantageous financial conditions (tax allowance, lower rent, active loan support). Start-ups are young, starting, quickly and dynamically growing businesses expected to develop quickly and exponentially and to achieve high return of invested means in a relatively short time and therefore their business is often built on innovations, improvement of high technologies and formation of user applications (Ljudvigová and Slávik, 2017). Those businesses are requested to achieve technical and technological standards using their technologies in time period of two or three years.

Synonym of establishment centres are incubators that help with the start of small innovating companies to prove themselves on a market and decrease their risks. In practice, incubators have different forms, the most common are these:

Public and non-profit incubators. They are financed by government or non-profit institutions with priority aim of economic development of regions (share of these incubators in USA reaches 49%).

University academic incubators. They tend to be built close to universities and are related to university research. They differ in significant share of own sources and clearly educational aim when achieving economic development in a region (their share in the USA is 17%).

Private incubators. They are set up by professional entrepreneurs individually, mostly from their own resources, then there are

capital businesses of risky capital with aim to partake on innovative business of companies with residence in these incubators. They focus on transfer of technologies and application of technological novelties. This way, new profession of incubator businesses is created (share of private incubators in the USA is 20%).

Incubators with profitable development of ownership. They are aimed at acquiring profit from property rental and from services provided. Primary condition of candidate acceptance is their ability to pay the rent.

Incubators as non-profit corporations. They focus on creating new working possibilities. The condition for acceptance is potential to create conditions for unemployment decrease in a region.

Academic incubators. They are created on a base of commercialisation of university research and cooperation of faculties with an industry. The motive for acceptance is technological intensity of company from the point of connection with the university.

Profitable capital incubators. They are created by strong investors with an aim to broaden possibilities for investment businesses.

To offset the risks associated with start-ups, European governments increasingly support them through incubators: organizations that provide start-ups with a broad range of services and resources needed for survival and growth (Aerts et al, 2007; Bergek and Norrman, 2008; Bruneel et al, 2012). It is estimated that there are currently over 1000 European incubators, 85% of which is located in Western European countries, and that their number has seen a fivefold increase between 2007 and 2013 (Aerts et al, 2007). Accordingly, incubators are considered to be 'the mainstays of high-technology industrial development in Europe' (Oakey, 2012), and 'an institutionalized component of the EU's and its member states' national innovation systems' (Ahmad and Ingle, 2013).

The efforts of Western European policy makers to support start-ups through incubators are in line with a global trend: the number of incubators increases rapidly around the world, which has led to a diverse global population of incubators and related start-up support initiatives (Aerts et al, 2007; Chandra et al, 2012). This provides an 'immense opportunity' for incubators all over the world to learn from each other and improve themselves (Ahmad and Ingle, 2013; Aernoudt, 2004; Tavoletti, 2013; Terjesen et al, 2013).

From the current perspective it is obvious, that in a practice there is no clear line between individual forms of innovative workplaces or new incubator companies. They share a common activity, directed towards establishment of prospering innovative companies. As a kind of superior term it is used in science-technology parks, which subsumes also mentioned types. In Slovak conditions, there is acceptable such solution, that the term science-technology park is a term superior to all other types of parks, centres and it includes these three main types:

- Science park (centre),
- Technological park (centre),
- Business-innovation centre (in countries of EU as well as in Slovakia called Business Innovation Centre - BIC).

If we were to find out causes of establishment of current centres, we would get to two important moments.

First phase leads us to urgent need to solve unemployment issue, which appears in different regions and countries due to various structural changes and crises. For example, establishment of the first business incubator ever. It happened in the USA in 1957, when company Massey-Ferguson dismissed 2000 employees in a town with 17 000 inhabitants, unemployment level rose over 20 %. Empty industrial objects with an area over 70 000 m² were

purchased for a very favourable price by Joe Manccuso with a promise to provide for the town different industrialist and start production. He could not find anybody. Later, he came up with an idea to divide object into smaller parts and offer them to small businesses. He not only rented empty spaces, but also organised committees and help to young entrepreneurs, such as how to obtain starting capital. How was term incubator created? One of first tenants owned company dealing with chicken hatchery. Joe Manccuso, inspired by this idea, named his business centre an incubator. From that time, he "hatched" in his incubator more than 600 companies, all have been successfully developed and contributed to employment as well as economic development of town Batawia as well as its surroundings.

Second phase directs us to maybe distant need of solving problems of difficult and timely implementation of results into technological research and development into practice. There was a broad gulf between university science and industrial practice that was very difficult to overcome. There is another example from American practice, where unsatisfied university graduates as well as university assistant staff started founding small flexible companies, in very simple conditions, but with a huge enthusiasm, they applied theoretical knowledge into specific and commercially usable form. These companies made a history as "garage companies".

Their business inexperience had some negative aspects, such as a high rate of company failures: 50 % of them did not survive two to three years and 80% did not survive from four till five years. How was the phenomena of "Science Park" created? We could not find out exactly which American university first came out with an idea to create more dignified conditions for their activities. It is said, it was University City Science Centre of Philadelphia, which in the 60's years built a centre with functions of an incubator. There were other centres created nearby universities, they were named Science parks.

Currently, not only in the USA, but also in the EU we can observe that business incubators copy many elements from science parks. There is a higher interest to include preferably such companies that are innovation and technology oriented and which are anticipated to be big competitor. It means, that these companies start their business plans more often from offers of university centres of technology transfer.

Science-technology parks located nearby universities are getting closer to business incubators, because here is still more often exercised commercial side and requirements for every high-tech company to be successful on a market. Therefore, management of science parks must focus on marketing, searching for consumption possibilities or organising common expositions at exhibitions and fairs. In Slovakia, business incubators can help to:

- create new work places with high added value,
- strengthen competitive ability of Slovakia and earn "hard" money,
- commercialise accessible technology,
- develop experience in system of free business.

In accordance with opinion of ours as well as foreign experts, business innovation as well as birth of business incubators in our country should incline especially to fields of technological business.

One of the most serious causes of economic development, improvement of Slovak economic is generally low effectivity of production system caused by lower level of technologies. Success of economic reform is conditioned by creation of capital resources, by quick technical development and wide application of modern technologies. Overall process will be successful in production sphere only under assumption that in our production-economic units will be realised high-tech, progressive and outstanding technologies corresponding world level. One of the main processes securing modern technologies in business sphere and their transfer. It is process of realising technical solutions,

applied knowledge and experience in field of creation and information supplies in field of practical application or transfer from one application area into another one. It must be understood also as a process of mutual influence of science-technical potential on one side and sphere of business management on the other side. It should be a permanent movement (flow) of tangible and informational values such as:

On a vertical line (from basic through possible applied research till development of new products and processes) including individual phases of research, development, production preparation till realisation phase,

On horizontal line (e.g. between two or more production businesses, between different workplaces of research etc.) monitoring completion of individual disciplines participating on final production.

Concluding this part, we would like to add that incubators are places supporting start-up establishment, places where start-ups are hatched. They also offer support start-ups in a long term. It takes a certain time for an idea to become a functioning start-up. Incubator offers support to start-ups mainly during first three years of their existence, via external guidance and leadership, lower rent for office spaces, infrastructure. Incubators tend to be connected to science-technical parks or universities.

3 Methodology and data

The aim of this article is mainly current situation in selected area, there is an analysis and implication of author's own thoughts, their presentation and their explanation and expressing an opinion on development of start-ups in businesses in Slovakia. This is all discussed within the context of knowledge and experience from abroad and in connection with conditions and their development in European Union. On the basis of statistical verification, we verified the links and the dependence between the data obtained from the survey.

To verify association we apply Pearson's χ^2 -test of independence. Essence of the test is comparison of theoretical frequency agreements with real measured frequencies and balancing of difference importances between them.

Condition of the test is for the scale of elective file to be bigger than 20, it means $n > 20$, and for all theoretical frequencies to be at least 5, it means $E_{ij} \geq 5$.

Tab. 1 Pearson Correlation Coefficients

Pearson Correlation Coefficients, N = 22				
	Growing importance of start-ups in crisis situations	Growing knowledge would precede uncertainty, so original ideas would be involved in this process ending	Start-ups in the exercise of its activities relies solely on its certainty	Relations with the start-ups is based on high risk
Growing importance of start ups in crisis situations	1.0000	-0.2301	0.1254	-0.323
Growing knowledge would precede uncertainty, so original ideas would be involved in this process ending	-0.2301	1.0000	0.1573	0.4180
Start-ups in the exercise of its	0.1254	0.1573	1.0000	-.2879

activities relies solely on its certainty	0.5403	0.4528		0.1629
Relations with the start-ups is based on high risk	-0.3233	0.4180	-.2879	1.0000
	0.1015	0.0268	0.1629	

Source: Authors

4 Risk management in innovation creation

Risk management plays an important role in innovation creation. It is connected with decision making. The level of risk, when making decision grows, especially due to lack of experience, certainty. Business model should be result of many persuasive or maybe contradictory opinions, flows and factors that may influence requested result. They may prevent or restrain execution of decision making, which will not be approved in "higher article". Requested result is actually deciding between assumed and real result. In relation with innovation projects (business modes) come forward two main categories of risk in Slovakia:

- Technical risk,
- Commercial risk.

Risk of ingeniousness. Use of innovation principles in practice may result in difficulties or time of their use will be very long. Problems may appear in process conceptions, wrong estimation of operation of various mechanisms, in control, choosing of materials, stock, technology advances, space arrangement etc. Moreover, conditions of market and required specifications may change (disturb) phases of research and engineering.

Science risks. They result from the fact, that some principles are not good and sufficiently exercised, or that their importance was not understood correctly.

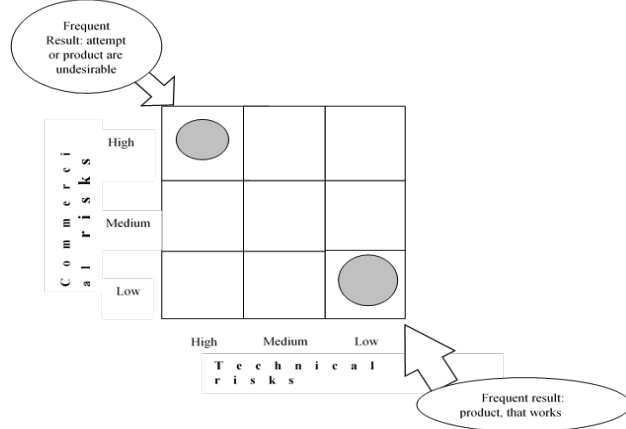
Production risks. In final phases (prototype preparation, test series) were revealed difficulties and problems with delivery, costs of stock and materials, specialised work power, facilities or energy rise.

Unpredictability and obsolescence. Innovation project (business model) may become obsolete due to quick technical development or unpredictable appearance of competitive product on a market.

Commercial risk involve excessive valuation of supplier, alteration is orders, pressure caused by competition and different attitude of customers. Important moment is also entering market in time when there are no favourable conditions created.

Methods for estimation of stated kinds of risk are presented in Tab. 2. It is a matrix, where in three levels are lined technical and commercial risks. If the proposal is situated on left top, company requires marketing expertise. On the contrary, in case the proposal fits matrix on the right down, it is necessary to exercise technological expertise. Tab. 4 shows variability of possible risks in time when innovation intentions are materialised, beginning with explorer phase till test series and product commercialisation.

Tab.2 Methods for estimation of stated kinds of risk



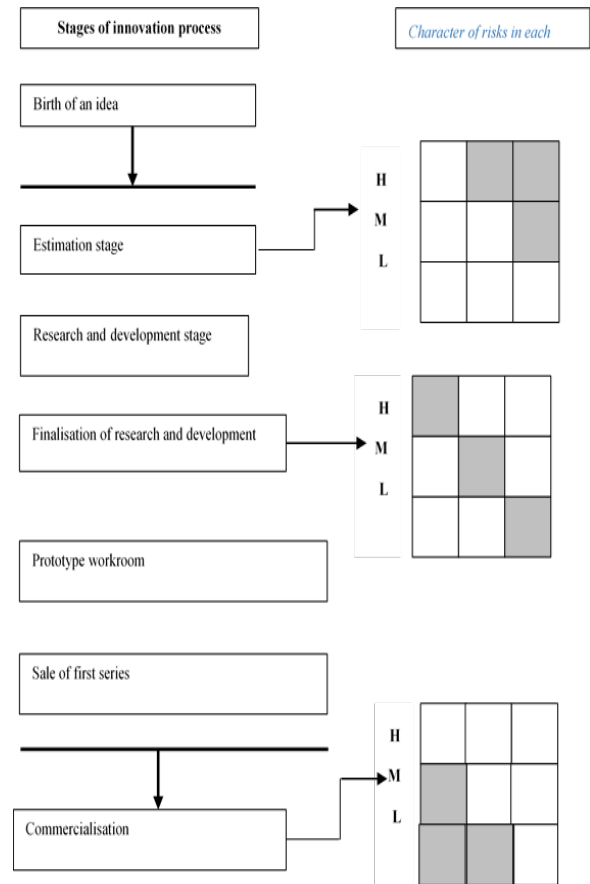
Source: Authors

Tab.3 A degree of product novelty or technology and a market

Proposal	Traditional	Improved	New
Technology			
Traditional		Risk rises	
Improved			
New			

Source: Authors

Tab. 4 Variability of possible risks in time when innovation intentions are materialised, beginning with explorer phase till test series and product commercialisation



Source: Authors

Different attitude towards risk estimation is given by a degree of product novelty or technology and a market - Tab. 3, or innovation intensity - Tab. 5, where relationship between technology and conception (business model proposal) is described. Of course, level of risk rises with insufficient knowledge of markets, or with low knowledge of technical or technological possibilities.

Tab. 5 Innovation intensity

Product Technology	Known	Unknown
Market		
Known		Risk rises
Unknown		

Source: Authors

Innovation projects or business models in start-ups are necessary to orient in a way that knowledge would precede uncertainty, so original ideas would be involved in this process ending in successful commercialisation. In innovation projects (business models) are risky following eventualities: kind of knowledge

process, process of knowledge application into invention - innovation formation, as well as process of knowledge realisation itself. Important moment, as well as tool to reduce risk in start-up development in Slovakia is usage of so called risk capital. Starting forms in Slovakia are as follows:

Seed capital represents risk capital provided for research, development and other help offered in cases such as formation of business model, before company exists as autonomous legal subject.

Venture capital works on bases of partner relationship between entrepreneur and professional (private) investor.

Start-up capital presents finances provided to companies with an aim to finance research and development of certain product (process) and its launch on a market.

Other forms or options for risk reduction are usage of reserve fund of organisation, set up of individual funds form no divided profit (e.g. risk fond), or utilisation of fundamental property (primary capital, primary property, statutory fond) to even up permanent losses not covered by e.g. reserve fund.

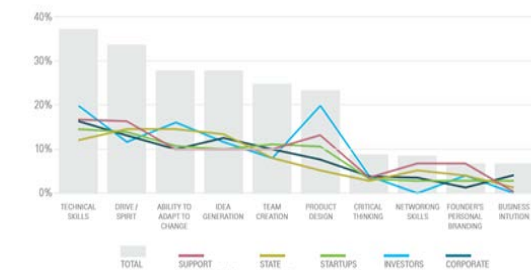
4 Empirical data and analysis

In field of innovation and support of young innovators, there is currently a trend of Start-ups. Uniqueness of start-ups in comparison with profit oriented companies is in their innovativeness. Objective of start-ups in comparison with business companies is not in earning as much as possible, but putting needs of consumer first and searching for empty space on a market. Main idea of start-up is to build something new. Some businesses understand motivation as profit coming from the activity of start-up. 57% of asked companies state that establishing a start-up means creating product or service that could change a sector and bring something new for consumers in utility factories and services provided.

Problem regarding establishing and functioning of start-ups is their financing. Slovak start-ups finance their business mainly from private savings. Abroad, situation is solved in financing way of "donors", who invest into business and take part on their profit in case of success. Risk of return of invested money is high, but in case of success, the profit is multiple times higher. Solution could be found for to start financing starting businesses, or also accepting tax stimulations.

In accordance with research results, strength of Slovak start-ups lays in technical skills. There are also creative skills such as generating ideas and product design. Stated facts are displayed in Fig. 1, which shows strengths of Slovak start-ups.

Fig. 1 Strengths of Slovak start-ups



Source: <http://www.startupers.sk/prehľad-slovenskeho-startup-ekosystemu-vsetko-co-potrebuje-vediet-o-slovenskych-startupoch-za-rok-2014/>

Fig. 2 Weaknesses of Slovak start-ups



Source: <http://www.startupers.sk/prehľad-slovenskeho-startup-ekosystemu-vsetko-co-potrebuje-vediet-o-slovenskych-startupoch-za-rok-2014/>

5 Results and discussion

79 % of start-up establishers in Slovakia have higher education of second and third degree. In comparison with starting entrepreneurs in USA it is only 43 %. In-between national start-up establishers, the majority are men, when 76 % of asked do not have in founding team a single woman. Almost two thirds of respondents stated that they work in two or three membered team and only 17 % of starting businessmen work alone.

Fastest developing industry in start-up establishment is a field of information technologies. Newly found start-up project in field of information technologies came from Google. It is creation of application Google classroom aimed for education sector to make work of both students and teachers simpler. The tool is supposed to improve communication between teachers and students outside school facilities. Application allows to go through subjects, create them, or even erase. It mediate look into classroom and basic settings or posting comments. Classroom could be a very strong tool, which can move educational system forward, especially in Slovakia.

Another news was introduced by Samsung, which tries to increase safety on roads using see-through truck. It is technological idea - improvement of safe traffic on roads, specifically in case there is a truck in front of us. Concept or study of ART Lebedev received the name Transparentus and Samsung now works on its innovations. The thought is based on placing camera in front part of the car. This projects situation ahead of a truck, on a screen in the rear part of the truck. This way it is simple to inform drivers driving behind trucks about possibility to overtake in parts with particularly low visibility. However, it opened the question about success of this innovation on a market. From the point of investigation return we can assume high risk, as implementation of this innovation brings extra investments.

Right after information technologies and electrotechnical industry there is car industry with high importance for start-ups. Flying car is being developed. It is an experimental development of key components of innovative vehicle for movement on the ground as well as in the air.

Thanks to the research we found out that out of asked respondents, 69 % type of experimental company start-up (mainly concentrate on creative work, unexplored and untried new products, models, designs or technologies and services) does not exist. Number of Slovak companies that create new innovative work places of start-up type represent 31 % out of asked respondents. Main causes of failure of mentioned work places in Slovak companies are mainly barriers in establishing start-up kind of business, tax duties, low risk tolerance, that is expressed in a way that Slovak market is not an ideal sample for entering product on a market. Also we can point out that knowledge of start-ups is still in phase of expansion. First step of start-up establishment is a new idea, which comes from deficiency, or need of consumers, in case of need or need for quick solution of a problem and is strongly connected to technological progress. Difference between usual business and

start-up when it comes to implementation phase of business establishment is variability, exchange of phases. The most valuable about start-up is not the thought itself, idea of experimental workplace, but the team of people, who works on this thought and help to form it. In case, company wants to break through and succeed on new markets must bring new innovative ideas, difficult to copy. These ideas, knowledge and thoughts are in result product of science and development. As key points are considered phases of implementation starting from development, through service, design of a product until marketing and finance. Considering analysis of answers of companies, we can state that the foundation of successful establishment of start-up work places is to invent successful product, launch it on a local market and after the demand grows expand the product internationally.

6 Conclusions

Business model design is critical for a start-up. A successful design must be developed and tested with limited resources and under conditions of great uncertainty related to both internal and external factors. At the same time, this lack of definition is an excellent opportunity for business model innovation. In this paper, we present the Innovation Pivot Framework, a practical tool aimed at assisting entrepreneurs in identifying alternative uses of their innovation and deciding which applications and target markets they should pursue first. This process leads to a formulation of the source of competitive advantage based on the innovation envisioned. This tool may be useful both at the first moment of a start-up's conceptualization and when the new venture needs to redefine its competitive advantage. Beyond the area of entrepreneurship, it could also be an effective analysis tool to achieve better business model designs in well-established companies.

In order to release correct innovation project (business model) in which it is suitable to invest financial and other means and effort with an aim of final commercialisation, becomes an important requirement for business and management of every organisation (production, guidance, services, etc.) in an environment of globalisation and internalisation of markets and customers.

Each control, every decision step in innovation project (business model) it should meet these objectives:

Release resources for further studies of semi - finished new product, process. Verify latest achievements of requested quality results. Investigate possibility of suggested progress in the next step. Set priority solutions (advantageous source assignment). Innovation project (business model) should be finished by assessing implementation success of its solution, so detailed and persuasive answers for these questions were obtained:

- What main results might be achieved by realisation of innovation project (business model)?
- What comes from observations of these results with project objectives?
- What was success, what was not, what would be appropriate to do differently?
- What lesson comes from realisation of innovation project?
- What other precautions are necessary to improve competitiveness of new product?

What really are start-ups? Given term appears very often in business environment. Many, however, do not know what this English term describes, or what project can be addressed as a start-up and which „only“ a starting business is. Even though this term has started to appear in Slovakia only recently, its meaning and popularity started to raise very evenly. Especially young and innovation thinking businessmen have found themselves in this concept, where there is no condition to only purchase, produce, fixed to stone shops.

Find universal definition for start-up project models is clear or slightly difficult. However, in general they are understood as innovative, therefore very quickly developed, especially technologically oriented companies with global potential and

high level of "scale" and ability, or possibility of sudden expansion reacting to actual needs and possibilities of development of market and costumers.

Characteristic attribute of start-ups are as follows:

- Low starting costs,
- Innovation in certain area,
- Higher business risk on one side, potentially higher return of investments on the other side.

Important is also legal framework. Legal order of Slovak Republic is not familiar with the term start up, this should be chained shortly. From the legal point it is understood as newly started business (or the business in the process of establishment), which will attempt to materialise or materialises certain thought into productive (process) form. Added value should lead to exceptionality on a market and problem solving, where solution have not been found yet. From the long-term point, emphasis is put on ability to scale company based on products, processes, services with them aim to provide them later on a market.

Start-up project (business model) must include:

- Technological or research base,
- Information technologies for sale,
- Offer services.

Practise has showed so far, that start up projects with more people participating on them have bigger chance to succeed on a market, compare to those who start to establish business on their own. Work in a team is however more important than work of an individual. Due to a stated reason, success of a business is influenced not only by creating the team but also by correct relations within team. In this paper, we will not discuss any other incentives, questions that exist in this situation and are tractate. It will be the next step of our research: e.g. possible new forms of start-ups, establishment of a start-up, investor relations, failures, causes of start-up failures, etc.

Big challenge for exercising and development of start-ups in business in Slovakia are so called Eco-innovations. Even in this field it is held, that thought, idea or simply creative thinking might be, even must be immanent part of a business. Due to living conditions of a planet getting worse, which is mainly fault and way of not respecting rightfulness in creation and protection of environment, it is necessary to support development of start-up ecosystem in Slovakia, in a sense of prepared governmental conception. It can be achieved by stimulating of business environment, system of state support and forming or improving legislation in this area. We believe these matters may activate Slovak subjects and individuals with unique ideas, attract foreign subjects with innovative ideas, also make investing into start-ups more attractive and form adequate image of Slovakia in international context.

Outlined and stated way of start-up development in general, but also in connection with ecosystem in Slovakia faces many barriers, obstacles and blocks. For example, poor offer of financial and non-financial tools, insufficient connection of start-up community with science institutions or universities. Another barrier is also low level of mutual cooperation of individual members of Slovak start-up ecosystem, non-sufficient business skills, low motivation and also low interest in entrepreneurship as a career choice. These barriers need to be overcome in Slovakia.

Enterprises are forced to research and development to compensate for other activities, such as alternatives. The creation of start-ups, start-up offices. This form of alternative research and development companies also require substantial capital. The most commonly beginning of start-ups interested large corporations, which have a fixed market background and profitable. Start-up businesses to create workplaces of the problem, and quickly when needed alternative solutions tasks. A good initial idea or ideas that the firm may obtain participation

of workers in decision-making respectively. Rationalization proposals. Another proposal is to acquire know-how and new technologies to improve the image of your own company, penetrate new markets, strengthen competitiveness and reduce business risk. Compared to the old-ump are more convenient form strategic alliances mainly because spreading the risks inherent in the start-ups borne by the company itself. The main disadvantage of strategic alliances in comparison with start-up the unwanted outflow of know-how, which is caused by working together and deciding on strategic enterprise.

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Primary Paper Section: A**Secondary Paper Section: AE, AH**

USABILITY OF INTANGIBLE ASSETS IN THE TERMS OF MANUFACTURING COMPANIES

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The article is prepared as one of the outcomes of a research project VEGA no. 1/0305/15 "Impact of environmental tools on the growth of competitiveness and sustainability of businesses" conducted by Department of Production Management and Logistics of University of Economics in Bratislava, Slovak Republic.

Abstract: As it was already mentioned, intangible assets are source of economic benefits of quality and commercialisation increases prosperity of a business and strengthen competitive position on a market. We believe, it is more advantageous for business to use intangible assets within company, than licensing as it maintains its monopoly position in area on certain intangible asset.

From research results it is possible to conclude that most designs 55% are registered by large businesses, middle sized businesses register number of designs in share 28% and small businesses in share 17%. Apart from patents, know-how, trademarks and licenses in research we found out that businesses register industrial patterns and designs in share 48%, improvement ideas 40% and 12% utility models.

Keywords: *intangible assets, tangible assets, patents, know-how, design*

1 Introduction

Severe competition is a reality. Market has changed, new players have entered and competitiveness is higher. Slovak production businesses must carefully monitor changes on a market and react to demands of domestic and international markets. Especially, they must consider meeting conditions of foreign markets, as Slovakia is highly dependent on product export. Currently, rapid growth requires connection of tangible resources with intangible assets as a core of successful existence of businesses. In order to achieve desired effect is necessary to minimise tangible resources and concentrate on intangible assets. Increased awareness of business regarding existence and application of intangible assets contributes to improvement of other areas of business, e.g. environment, ethical behaviour of businesses. Businesses should be opened and flexible towards new market options, global productions trends, modern technologies, innovations, research and development, modernisation of production program, product quality assurance, quality working labour and creation of new organisational forms.

2 Literature review

Intangible assets (intangibles) are long lived assets used in the production of goods and services. They lack physical properties and represent legal rights or competitive advantages (a bundle of rights) developed or acquired by an owner. In order to have value, intangible assets should generate some measurable amount of economic benefit to the owner, such as incremental turnover or earnings (pricing, volume and better delivery, amongst others), cost savings (process economies and marketing cost savings) and increased market share or visibility. (American Institute of CPAs, 2012)

The study of authors Flatt and Kowalczyk and Stanley (2008) offers some useful contributions to the significance of culture and its relationship to reputation and financial performance. First, we validate prior studies linking reputation to performance and culture to performance. Second, our results support theoretical claims that there is a significant positive relationship between culture and reputation. Third, our findings suggest that culture has a direct and indirect effect on performance. This means that culture not only directly enhances financial performance, but also is able to indirectly influence financial performance through reputation. Therefore, practitioners should be aware of this dual effect that culture has on performance and seize opportunities to develop positive cultures to create a sustainable competitive advantage.

Intangible assets are characterized as more influential than tangible assets because they are more likely to meet Barney's (1991). Hall (1992) refers to intangible assets as the "feedstock" of capability differentials essential for a sustainable competitive advantage. Kaplan and Norton (2004) apply this perspective and develop a "strategic map" to demonstrate how intangible assets, like culture, may be used to attain a strategic advantage and higher performance outcomes.

The quest to identify key variables that predict reputation is important, since without these knowledge researchers can not advise firms how they might improve their reputation to augment their competitive advantage to increase their financial performance. Different researchers have explored non-economic factors in different ways. Rindova et al. (2006) use a stakeholder approach to better capture the predictors of reputation, perceived quality and prominence.

Intellectual property is a central source of wealth in almost all industrial sectors. Establishment of business strength has moved from capital resources to intellectual property. In reality, definition of capital resources is being moved. Term capital resources resemble cash balance or picture of extensive industry hall. Intellectual property, such as technological know-how, patents, trademarks, author rights and trade secret dominates over capital resources (Gordon and Russell, 2000).

Why are intangible assets so important? Strong brands influence decision making processes of customers, as well as assurance premium process would be charged. The same approach is applied in many consumer businesses. In better cases they represent quality assurance and sometimes in case of luxury brands, brand distinguishes social status of consumer. This can also support fast development of new markets.

In 21. Century, the most valuable strategic resources for business subjects are no longer tangible assets, such as properties, machines as it was back in 20. Century, but these are intangible assets, such as knowledge, know-how and intellectual property rights.

Intangible assets, therefore, provide potential competitive advantage, but as assets they clearly demand specialist management and communication skills. Management's ability to deliver its strategy is highly reliant on its customer relationships, brands and performance of key employees – all of which are typical intangible assets for accounting purposes. The relevance of these factors is clearly vital to a company's profitability and to the sustainability of its future performance. So the question should be more about how to improve the management of such assets – rather than why (Rea and Davis, 2009).

Moreover, several authors stated that in order for business to be successful in most of industry sectors, it must have competitive advantage in technology area, which enables it to provide excellent products. Especially technological development is constantly growing in comparison with the last century. The main aim is for the average length of product life cycle and technological progress not to decrease, but to increase strategic importance of technological expertise. Hence, businesses are forced to constantly learn, create and update new technological competences, as well as forget old fashioned practices, to stay competitive in a world and to be distinguished by quick technological advancement (Jennewein, 2005).

Different studies using different designs and methodologies have found that while financial performance is an important predictor of reputation, financial performance has accounted for as little as 11 to 15 percent of variance (Hammond and Slocum, 1996; Roberts and Dowling, 2002) as much as 38 to 59 percent (e.g., Brown and Pery, 1994; Fombrun and Shanley, 1990), leaving at least 40 to 89 percent of the variation unexplained by economic variables. Hence, while researchers have been able to

demonstrate that economic factors predict reputation (Sabate and Puente, 2003) less is known about non-economic factors influencing reputation.

In modern, globalised world is often mentioned term know-how, which for business represents certain intangible wealth, which is possible to be used and transferred into something tangible. It represents source of investments into business, in form of direct participation in transformation process, or sale. We consider know-how as knowledge, wisdom, information from different areas, production, research and development, technological processes. Know-how in business is expressed in form of different procedures, solution methods, which helps to eliminate deficiencies, to improve real production status, to improve working conditions and environment. Results of successful application of know-how are benefits such as profit, increased competitive ability of business, expansion of foreign markets. Currently, there is preferred know-how in area of environment that is exchange of knowledge, experience in order to improve and protect environment. Businesses try to connect production know-how with environmental know-how. They implement into production process policies decreasing emissions, harmful substances and contribute towards production of more ecological products. We could also point out another connection of environmental know-how and other modified item of intangible assets – eco-design. In production of products with eco-design there is applied knowledge and processes, know-how, for successful entrance of product on a market.

We could establish, that know-how represents source of economic benefits from quality for businesses. They are an indirect part of the product, they assess it and in process of commercialisation they create profits. If product is accepted by market, interest on market grows and product is exported to international markets and hence its share on both domestic and international market increases. In advanced economies, investment in intangible assets – knowledge and intellectual property, for example-exceeds that of tangible, such as factories and equipment (Haskel and Wallis, 2013)

Industrial design has primary function to fulfil needs of today's generation – material, esthetical, functional, while it cannot omit future generation to do the same. It is necessary to protect design as it creates added value of the product. Customers perceive it and it can be a mean for sales. Design protection should be part of business strategy of every producer. Why do we protect design? Design represents business property of any company, which is able to increase commercial value of a business. Registration of design encourages fair competition, which supports production of products. It is crucial for businesses to keep documents of design registration, as it is important in proving ownership and author rights.

According to the resource dependence or resource based view (RBV), assets, skills and capabilities create value for the firm that leads to a sustainable competitive advantage and superior financial performance (Barney, 1991). Resources used to create a competitive advantage are categorized as tangible (e.g., financial assets, capital, production capability, etc.) or intangible assets (e.g., intellectual property, trade secrets, corporate reputation, culture, employee know-how, etc.) (Hall, 1993). These resources create value and meet the following conditions: 1) It is valuable due to its ability to add financial value to the firm (sources of differentiation); 2) It is rare (only some firms have it); 3) It is imperfectly imitable by other organizations; and 4) there are no substitutes (Barney, 1991). Culture and reputation are considered intangible assets because each add value through differentiation, is rare, difficult to imitate, and without substitution (Barney, 1991; Hall, 1993; Fombrun, 1996; Porter, 1996; Roberts and Dowling, 2002; Kaplan and Norton, 2004). Significant part of company value (potentially more than 60%) is represented by intangible assets. For many of these companies brand presents majority of this value. These data, of course, are not currently monitored or assessed in most of financial reports.

3 Methodology and data

In research of collected background material there were used especially methods of analysis, method of synthesis, comparison, monitoring, induction and deduction. In processing of scientific part we have used also special methods, mathematic – statistical and method of directed interview. In scientific part there was also applied combination of stated methods with an aim to obtain high quality incomes of research and to obtain possibly most relevant information. Application of statistical methods for questionnaire assessment and obtained dependencies we reached further subjects for scientific researches.

Objects of research are small, medium sized and large production businesses in Slovak Republic, businesses which meet recommendation of European commission 2003/361/EC:

- Number of employees according to following classification:
 - microbusiness (0 – 9 employees),
 - small business (10 - 49 employees),
 - medium sized business (50 - 249 employees),
 - large business (250 and more employees).
- For small and medium sized businesses annual turnover does not exceed 50 mil. €
- For large businesses annual turnover exceeds 50 mil. €
- For small and medium sized business annual balance (asset volume) does not exceed more than 43 mil. €
- For large businesses annual balance (asset volume) exceeds 43 mil. €

As these are categorical data, we used area of statistical analysis of categorical data. There are two alterations of questions asked for both questions (yes/no). Appropriate test for mentioned type of variables is Persons chi-quadrat-test of independence, which was applied in analysis. Core of the test is comparison of consensus of theoretical frequency with real researched frequencies and assessing importance of differences between them (Sodomová, 2013).

Another method applied in analysis of questions submitted in the questionnaire was Correlation analysis exercises statistical methods and practices to assess intensity (tightness) of free (statistical) dependence between quantitative variables and to assess quality of equalizing by regression functions (Pacáková, 2009).“ In the following part of the article we interpret synthetic results of research.

Critical area: $\chi^2_p > \chi^2_{1-\alpha} [(r-1).(s-1)]$ while α is chosen level of importance, or $(1-\alpha)$ is responsibility. $\chi^2_{1-\alpha} [(r-1).(s-1)]$ value can be found in statistical tables, or in statistical software.

If inequality is valid, we accept hypothesis H_1 , hence we can confirm dependence. If inequality is not valid, we do not have enough evidence to dismiss hypothesis H_0 hence dependence between symbols A and B cannot be confirmed.

$$\begin{aligned} \text{In level of importance } 0,1: \\ \chi^2_{1-\alpha} [(r-1).(s-1)] = \chi^2_{0,90} [(2-1).(2-1)] = 2,718 \\ 12,39 > 2,718 \end{aligned}$$

Inequality is valid = we accept H_1 .

With reliability 0,90, or on level of importance 0,1 we accept hypothesis, that between variables 8 and 11 there is statistically important dependence.

4 Results and discussion

Based on questions answered within the questionnaire we found out that the biggest share of intangible asset elements in transformation process represents know-how with 34%. In deeper understanding we regard production know-how, which is not a result of scientific activities, but it represents production processes, formulas, knowledge, technical parameters, technology applied in production process. Production businesses

dispose of strong engineering know-how, which ensures them competitive advantage on domestic and international market.

Know-how of a business is tended by business secret and their number is secret due to competition. Second largest share of intangible assets represents designs with 25%. Design enters product in every phase of transformation process, from pre-production phases through main production up to post-production services. It takes not only formal aspect, but also functional function of product. It is part of the product value and customer experience. In pre-production phase, in phase of development and construction there are considered aesthetic and functional aspects of product, for which it was created.

In main production, product is given such shape or content as it was determined by constructor in technical documentation, to achieve level of usefulness with required level of quality and minimal production costs. Post-production phase of transformation process most commonly includes packaging, loading, expedition, and acceptance by customer. As we can see, intangible element of design enters value and core of produced item in every stage of production phase.

Third largest share of intangible assets represents licenses with 21%. Licenses enter transformation process in form of software, computer programs, purchased patents and trademarks based on license agreements. Relationship between granted patents and licences is closely dependant. It is based on the fact, that business with possibility to patent own products is not obliged to enter license agreement to be able to produce a new product. In Slovakia, number of granted patents is lowest amongst countries of European Union. Also results of the research prove the fact, that the second lowest share in transformation process represents patents with 11%. It is a result of stagnation and downfall in area of research and development in Slovakia. Prior privatisation of Slovak businesses by foreign businesses almost every production business had research and development department. However, after sell out mother companies kept research and development as main process subject and daughter companies were only delegated with production construction and technological preparations.

Patents are currently considered one of the means for competitive advantage of business on domestic and foreign market. The more patents business owns, the more its credit grows. It becomes strong competitor for domestic and international businesses. Number of patents and licenses also plays important role in sale of the business. Often it is critical factor in strategic decisions of management of business. Negligible share of intangible assets, which enter production process covers goodwill with 9%.

Businesses perceive goodwill in general as "good name of a business" and not as business value of all intangible holdings of business. Based on an interview realised throughout the research, top managers of businesses, which consider goodwill as element entering production process stated, that primary element included in goodwill is loyalty of employees emerging from their share on production of quality products. Loyalty of employees and customers are the best feedback for business management, to achieve prosperity of the business in the future. Especially when it comes to loyalty of customers, it is important to realise that „customer satisfaction has time dimension and long term character. Product approval requires time and repeated opportunity of use. One time experience with product does not lead to strengthening positive opinion of customer. The more experience is worth mentioning and the stronger is the establishment the more difficult it would be to change the opinion.“

Businesses who took part on questionnaire research stated they register know-how as intangible asset, consisting of various knowledge, information, experience, from several production areas, areas of business and economics. As knowledge and experience are considered different results of research, scientific development, technological, advisory and other professional

papers. Out of the number of business, that register know-how is 37% medium sized and 44% large businesses and 19% represent small businesses. Result emerges from the fact that large businesses with their mass production apply in larger degree production know-how, as for successful operating and uniqueness of their products there are necessary knowledge, experience and technological procedures. As a benefit, business achieves by application of know-how, businesses state improvement of production processes, elimination ineffective production procedures or reduction of material and energy. Initial benefits are reflected in achieving higher profits, improving working conditions or environment, which could not be achieved without application of know-how.

Number of registered know-how depends in high degree on industry sector, in which business operates. The highest number of registered know-how is recorded in electro-technical industry (22%) and in sector of information technologies (28%). Significant number of production know-how was demonstrated in industrial production (35%), while the highest number of know-how was recorded in automobile industry and automobile component producing businesses. Number of know-how in businesses depends in high degree on production type, on construction, development and technological base of transformation process.

Apart from above mentioned intangible assets such as patents, know-how, licences, businesses register other industrial rights. Based on the research it was found out that businesses register industrial patterns and design in share 48%, improvement ideas 40% and 12% utility models. Improvement ideas in businesses represent new knowledge, ideas, proposals obtained from employees, who take part on improvement and effective operation of business on market. They help to put final touches and improve products in individual phases of transformational process. Implemented improvement ideas of business are archived and registered as valuable intangible assets of business. Utility models belong to industrial rights. Their character is similar to patents; however, the difference is in simpler registration, lower expenses and abidance requested for evidence. In the next part we deal with analysis of design evidence, which represents highest share of other industrial rights recorded in businesses.

Analysis of research performed in area of designs, we came to results, that highest number of designs 55% is registered by large businesses, middle sized businesses register number of designs in share of 28% and small businesses in share of 17%.

In implementation of designs, design constructors emerge from certain idea, which should represent core of the product, highlight main idea or purpose of the object. Supporting tool for success of product design are marketing activities, which influences sales of product on a market. However, design alone does not fully grant sales of products. It is especially quality of a product, sum of development factors, sales, while design is assisting factor in assuring of long term sales and loyal customers. Important role has also design management, which manages activities connected with proposal, implementation of design into production. Depreciate design may not only producer, but also design technician. Technician is assigned to prepare product prototype based on ideas and sketches of design. Product prototype should be 100% identical to sketch, however, after number of attempts it happens that constructor is not able to create design in accordance with sketch and applies design wrongfully. Hence, design does not correspond with real idea, which can lead to depreciation of design and decrease of product sales.

5 Conclusions

Every company protects its good name on a market, because it represents a tool that opens door for them to foreign markets. As well as brand and other parts of intellectual property good name of a business is valuable intangible property of any business. License itself does not grant successful sales. Tool to profit from

license is item itself, to which license is related to. Business, which tries to achieve profits, must be aware how to effectively use subject of license. To achieve profits can guarantee only success of license agreement subject on a market and hence strengthen good name of a company and its impact. Company chooses licensing if it is not capable producing product, or it is not able to produce it in sufficient amount and quality to cover market demands. Business success of licensed subject depends on different factors such as product design, price, demand and marketing.

As it was already mentioned, intangible assets are source of economic benefits of quality and commercialisation increases prosperity of a business and strengthen competitive position on a market. We believe, it is more advantageous for business to use intangible assets within company, than licensing as it maintains its monopoly position in area on certain intangible asset.

From research results it is possible to conclude that most designs 55% are registered by large businesses, middle sized businesses register number of designs in share 28% and small businesses in share 17%. Apart from patents, know-how, trademarks and licenses in research we found out that businesses register industrial patterns and designs in share 48%, improvement ideas 40% and 12% utility models.

Businesses apart from applying intangible assets in transformation process are forced to monitor development trends. There is modification of basic intangible assets and connecting production area with area of environmental protection and design. Currently, it is expected from quality design to not only function and look aesthetically, but to be ecological. To design ecologically means thinking about product as functional entity. Task of designers is to create form and function of product as well as to create environmental profile of product and hence ensure sustainability of environment. Environmental product from designer perspective must meet all criteria influencing ecology of product, i.e. saving energy, materials, packaging transport, including solving problems related to waste disposal. Ecodesign, as the whole product, is also result of live, creative, intellectual work of employees. Ecodesign in reality represents live creative ability to seek alternative systems, technologies and production strategies.

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Primary Paper Section: A

Secondary Paper Section: AE, AH

ADVENTURE THERAPY IN THERAPEUTIC COMMUNITY FIDES – QUANTITATIVE OUTCOMES OF THE RESEARCH

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The report represents quantitative outcomes from a grant project of the students of Ostrava University. The project took place in the years 2015 and 2016 and analysed 168 clients' statements.

Abstract: The report represents quantitative outcomes from a research focuses on the analysis of the opinions of the clients of therapeutic community of the adventure therapy. Among the most significant the clients described getting new experience, increasing the responsibility for themselves and their decisions, improving the cooperation abilities, the possibility to solve problems in new ways. Following the activities they were thinking about the values in life, they realized greater resistance to stress and they said this experience will be useful after the treatment ends. Based on the verification of the set hypotheses four were confirmed which described differences in client's opinions of their self-respect development, the ability to cooperate, independence and the ability to consider life values, the verification took place during the first and third phase of the treatment.

Keywords: adventure therapy, therapeutic community, client of therapeutic community, drug addiction, opinions analysis

Introduction

Most people need transcendent experience. For some it is only reality escape, for others it is a need to view life from other than mundane perspectives. People who we worked with during our two-year research study (student grant project of the Pedagogical Faculty of the Ostrava University) are among those who were repeatedly looking for this kind of experience in drug use. Their hobby gradually became an addiction. One possibility how these people can become free and get rid of the addiction is treatment in a therapeutic community.

There are a number of methods and means how to support clients in their treatment and prepare them for life out of the closed community. One possibility is the adventure therapy which our research focuses on.

Ten students of MA social pedagogy and two academic workers participated in this research. It took place in Therapeutic Community Fides where both the clients and workers were present. The design of the research was mixed, its goal was to find out the clients' opinions of the adventure therapy. One part of the project – the quantitative analysis of the clients' opinions will be presented in this article.

1 Research problem

The preparation and realization of the adventure therapy (in the therapeutic communities the expression "stress activity" is sometimes used) is demanding in both special personal requirements (both mental and physical) and safety ensuring during these activities. Some therapeutic communities consider adding these activities into their programmes. The analysis of the opinions of clients who take part in these activities may be the beginning of deeper observation of the therapy benefits. From the point of view of subjective individual perception of a client in therapeutic community a qualitative research was realized which aimed at deeper understanding of the clients' experience. Quantitative research was focused on the benefits of the adventure therapy and the verification of their significance. The research of the efficiency and use of the adventure therapy in the drug addicts' re-socialization is lacking in the Czech Republic. The only exception is the research of Romaněnko (2012), Rataj's chapter (In Nevšimal at al, 2007) focused on stress activities in therapeutic communities in the Czech Republic or the texts of Kirchner and Hártl (2011). As opposed to abroad where there is a lot of research focused on the adventure therapy used in

working with the risk groups including the drug addicts (e.g. Bandoroff, 1989; Crisp, 1998; Paxton, Mc Avoy, 2000; Autry, 2001; Caulkins et al, 2006; Tucker, Norton, 2012; Gass, Gillis, Russell, 2012; Norton et al, 2014; Revell, Duncan, Cooper, 2014; Bowen, Neil, Crisp, 2016).

1.1 The research goal, research questions

The goal of the research was to get the opinions of the clients of the therapeutic community Fides on the efficiency of the stress activities in particular phases of the treatment. In this article the quantitative part of the research is presented, two research questions were set:

Research question 1: What are the prevailing opinions of the clients of the Therapeutic community Fides Bílá Voda of the curative efficiency of the adventure activities shortly after their ending?

Research question 2: How do the opinions of the clients of the Therapeutic community Fides Bílá Voda (TK Fides) differ in individual treatment phases?

1.1 Basic concepts definition

Among basic concepts used in this research there are adventure therapy, therapeutic community and the opinions of a client. Adventure therapy is used mainly abroad. Therapeutic communities in the Czech Republic call these activities mentally and physically stressful activities. They are regarded to be the key elements of the adventure therapy. For the needs of the research we work with the stress activities definition in therapeutic community by RichtEROVÁ at al (2015), the definition is as follows: „*Stress activities are part of the treatment process, they are psychically and physically demanding and they are realized in the form of several day long trips of touristic-sport-learning character.*” (Comp. Rataj M. In Nevšimal at al. 2007). These activities in TK Fides focus mostly on hiking, cycling, cross-ski running, water sport etc. Clients as well as responsible workers in any treatment phase take part in them.

Kirchner, HátlOVÁ (2011) prefer using the term adventure therapy in the Czech environment. They describe it as a therapeutic school which emphasizes the experience in nature, it is both physically and psychically demanding and is connected with risk, danger and adventure. RomaněnkOVÁ (2012), KellerOVÁ and Ješina (2013) also prefer using the term adventure therapy. The authors Kirchner and HátlOVÁ (2011) or Svatoš and Lebeda (2006) work with this concept in experience pedagogy. Gass (2012) works with the use of adventure therapy abroad and describes it as adventure activities which are prescribed to activate the moving of clients on affective, behavioural and cognitive level. There are synonyms to adventure therapy coming up abroad too, mainly within the cultural and environmental context. Still adventure therapy is used most frequently. Unlike in Australia, New Zealand, Canada and some parts of the USA, where „wilderness therapy is used”.

Therapeutic community (TK) can be defined according to Kratochvíl (1979) in two ways – in broader form of organization of the treated unit and in more narrow sense as an independent psychotherapeutic method. TK Fides located in Jeseník district in the village Bílá Voda represents the broader definition. TK Fides is a part of Mental Health Hospital Marianna Oranžská. It focuses on the treatment of the drug addicts (except the alcohol addicts) and is for clients over 18 years of age. Making the decision to start the treatment and life in this community is absolutely voluntary and is divided into three phases. The first phase – takes 4 weeks, the second phase 18-20 weeks and the third phase 16-18 weeks. TK Fides applies bio-psycho-socially spiritual approach in the addict care. It provides environment free of drugs and presents everyday reality with all its aspects. The goal of the treatment is drug abstinence, gaining view of

one's life, self acceptance, acceptance of the environment and total attitudes change in different aspects of life (Milby at al. In Johnson, 2010).

The research part of the work focuses on acquiring the clients' opinions. Drug addiction profoundly influences attitudes, values but also opinions of the addicts. Value orientation moves to a different level as opposed to the majority's. One of the goals of the therapy is to help clients to find new life priorities. As for the question what an opinion is and how to define it, there are considerable contradictions among the experts. Everybody agrees that it is not a synonym of attitude and that it must be kept distinct. An opinion in a certain way displays attitude mostly in verbalized expression. Unlike attitude it is less stable and is affected by number of factors. There are disagreements in the question of the opinion's components. Some authors understand opinion as neutral, subjective claim that the person regards as truthful. According to this definition, opinion only has one part and that is cognitive. When the clients' opinions were analysed, it proved they were formulated subjectively, they are convinced about their truthfulness, they have some information about the object and moreover evaluation and emotions manifestation was projected. This research prefers the definition of an opinion described in Velký sociologický slovník (1996), it says that opinion is composed of two parts – rational and emotional (Velký sociologický slovník, 1996; Hayesová, 1998).

2 Research methodology

The reality in quantitative research is rendered by means of the variables; the values of the variables are gained by measurement. The primary goal is to find how the variables are spread, what relationships there are among them and why (K. F. Punch, 2008, p.12). The advantages of quantitative research are clearness, brevity, systemic nature of the outcomes, accuracy (Chráska, 2011, p. 237). The philosophical base is new positivism and basic elements of empiricism (sense experience brings us to knowledge) and rationalism (the importance of logic thinking and indisputability of deductive thinking). There is objective reality that we can explore and is independent on our feelings and persuasions (Gavora, 2011, p. 37).

2.2 Research method

The key method of the quantitative part of the research was a questionnaire made of 41 entries. The first part of the questionnaire is made of the entries 1-21 which are about basic demographical data of the respondents. The second part of the questionnaire is made of the entries 23-40 which find out the respondents' opinions in defined areas after they take part in the adventure activity. E.g. entry 22 was focused on four areas; perceived activity, the feeling of self-realization, work success and feeling of personal comfort. The entry 41 was made for qualitative working of free answers of respondents. Their task was to give personal experience after adventure activity.

The validity and reliability of the questionnaire was found out in pre research. Content validity was consulted with experts from the field of addictology and direct work with clients in therapeutic community. After pre research some entries of the questionnaire were reformulated to be better understandable for the respondents. Reliability was checked by the Cronbach alfa in entries with scale answers. The value of Cronbach alfa after the first adventure activity was 0,889 (Pindáková, 2015). At the end of the data collection after 11 adventure activities it was 0,709. The questionnaire can be regarded reliable, most authors regard the values around 0,700 as appropriate reliability border (Evangelu, Neubauer, 2014, p.78).

2.3 Sample – research respondents

The research sample was made of the clients of the Therapeutic community Fides in Bílá Voda. They participate in the middle term or long term treatment of the substance addiction. The condition of their participation in the research project was their adventure therapy participation. It was realized by means of

adventure activities which are part of the treatment in the therapeutic community. The respondents were over 18 years of age, both men and women. Those who decided to participate signed the informed consent.

The measurement unit was not the respondent but their testimony after the adventure activity. 168 testimonies were analysed altogether from all the clients from different treatment phases which were collected during the two year research (2015 – 2016). Middle term treatment was represented by 23 written testimonies, long term treatment by 145 testimonies. The data about the testimonies spread throughout the treatment phases were also important; 31 testimonies were made by clients in the first phase of the treatment, 96 in the second and the longest phase and 41 came from the clients in the third outcome phase.

2.4 Data collection and their analysis

Data collection for statistical evaluation was made by questionnaire. The respondents got a questionnaire shortly following their adventure activity, they answered it and handed it in. During the hypothesis verification of the middle values of the clients in the first and third phase were compared. Working with the middle values is similar to working with the number of answers. Acceptance of an alternative hypothesis we understand as acceptance of the option when the middle value of the first phase testimonies of clients is lower than the middle value of the clients in the third phase. During the data preparation for the hypothesis evaluation it was necessary to verify whether their spread corresponds with natural spread or not. This was done by means of statistical test chi square. The questionnaire entries 23-25; 27-35 and 37-40 had unnatural data spread. Therefore U-test by Mann and Whitney was made to verify the hypothesis.

3 Results

In the following chapter the results and interpretation of the answers to research questions will be presented. Relative and absolute frequencies were used in the statistical processing. Mann's and Whitney's U-test were used to verify hypothesis.

3.1 Results and interpretation

The first research question was to find out the prevailing opinions of the clients of Therapeutic community Fides about the effect of the adventure therapy. Figure 1 shows the evaluation of the entries 23-39 in the questionnaire, which processed the clients' opinions after they finished an adventure activity. The answers well – rather well (or much – rather much) were included in the positive scale. In neutral answers clients did not choose any offered option. In negative scale worse – rather worse (little – rather little) the clients described the deterioration after they finished an adventure therapy.

Fig. 1 Prevailing opinions of clients of the effect of the adventure activities after their ending

n=168 entry	Opinions	Positive scale		Neutral		Negative scale	
		n_i	f_i	n_i	f_i	n_i	f_i
23	Overcoming limits	96	0,57	48	0,28	25	0,15
24	Self-confidence	106	0,63	57	0,34	5	0,03
25	Self-respect	11	0,66	55	0,33	2	0,01
26	Independence	116	0,69	50	0,3	2	0,01
27	Tolerance to differences	118	0,7	47	0,28	3	0,02
28	New experience	138	0,82	24	0,14	7	0,04
29	Responsibility	136	0,81	45	0,27	3	0,02
30	The ability of cooperation	136	0,81	29	0,17	3	0,02
31	New skills	116	0,69	37	0,22	15	0,09
32	Negativism management	97	0,58	59	0,35	12	0,07
33	New ways for solutions	124	0,74	37	0,22	7	0,04
34	Thinking about values	134	0,8	30	0,18	3	0,02
35	Feelings in the group	118	0,7	42	0,25	8	0,05
36	Communication skills	116	0,69	49	0,29	3	0,02
37	New experiences	146	0,87	19	0,11	3	0,02
38	Stress resistance	121	0,72	40	0,24	7	0,04
39	Use for future	123	0,73	34	0,2	12	0,07

Rem. n_i - expresses absolute frequency of the respondents answers after they finished the activity, f_i - expresses relative frequency.

By choosing the neutral part of scale (on average 25% answers), the respondents said they did not notice any change in the given field. 71% respondents on average expressed in the positive scale and described improvement shortly after the activity. 4% of respondents marked the negative scale. The entries where the respondents realized the most benefits are: getting new experience (82%), realizing bigger responsibility for themselves and their decisions (81%), improvement in the ability to cooperate with others (81%), the ability to solve things in new ways (74%). Adventure activities helped the clients in thinking about life values (80%). Gaining new experience was marked in 87% of total answers. More than 70% answers marked the greater stress resistance and the ability to use new experience in future, in life out of the community.

The second research question focused on the differences in clients' opinions during different phases. Hypotheses were made based on the specialized literature, the hypotheses were further verified. Four hypotheses proved to be possible to accept. They say that in four aspects of clients evaluation of adventure activities there is statistically significant difference among the respondents who find themselves in the first and third that is the last phase. The clients in the third phase evaluate better the development of self-respect, independence, the ability to cooperate with others and considering life values during the last adventure activity than the clients in the first phase. The differences between clients of the first and third phase in other areas did not reach the statistical significance.

The hypothesis H3 concerned about the self-respect evaluation: H3_A: The clients of the first phase of the treatment evaluate the change in their self-respect after the adventure activity differently from the clients in the third phase.

Data to verify this hypothesis were gained in the questionnaire entry 25. The data was processed through U-test of Mann and Whitney. The result was 0.023 and based on its comparison with the level of significance 0.05 it was possible to accept the alternative hypothesis and claim that the clients in the first phase evaluate their self-respect change after the last adventure activity differently from the clients of the third phase. It was possible to accept H3.

Hypothesis H4 focused on the respondents' independence after the adventure activity: H4_A: The clients who found themselves in the first phase of treatment evaluate their independence change after the last adventure activity differently from the clients in the third phase.

The data to verify the hypotheses are to be found in the questionnaire entry 26. The acquired data were processed again by means of the U test by Mann and Whitney with the result 0.005. When compared with the significance level 0.05 it was possible to accept the alternative hypothesis. We can say that the clients in the first phase are less optimistic as for their evaluation of their independence than the clients in the third phase and that means during the treatment the independence evaluation improves.

The hypotheses H3 and H4 base on the knowledge of Zášková (2004, p.36), who says that in the personality of a drug addict there are so called inadequate ambitions as for the individual's possibilities, drug gives the addict the feeling of inner strength, self-respect, and self-confidence which he in fact lacks. The Rataj's claims (in Nevšimal, 2007, p. 168) and Kudy (2007, p. 66) inspired us too. They make a link between the number of adventure activities and the treatment phase and the increasing ability for self-respect and adequate evaluation of person's possibilities. Out of these premises we considered that clients in higher level of treatment will better evaluate their self-respect and independence than clients in the lower phase.

Hypothesis H11 evaluated the cooperation after the adventure activity: H11_A: The clients who find themselves in the first phase of the treatment evaluate the change in the area of cooperation differently from the clients who find themselves in the third phase.

We evaluated this data processing the data acquired from the entry 30 of the questionnaire. The data were evaluated by U test with the result 0.080, which was compared with the significance level 0.05. Alternative hypothesis was rejected. It can be said though that among the data of the research groups there is difference which only approaches statistical significance. Therefore we compared it with the significance level 0.1 which is commonly used in science and for this it was possible to accept H11.

Hypothesis H11 comes from the claim of Kooyman (2004), who says that a drug addict's personality goes during the treatment through the process of realizing how people handle their emotions. The author calls this a process of new identity the part of which is also identification with community life. The ability to take responsibility in interpersonal relationships is developed. Another base for hypothesis is the claim of Rataj (in Nevšimal 2007, p. 167), who points out that psychologically and physically demanding situations that arise during adventure activity lead clients of the Therapeutic community to cooperation and make them face their ability to be considerate and tolerant to others. The Guide of the stay at the Therapeutic Community Fides states that one of the main targets that a client should meet by the end of the stay client is to be able to communicate plainly and sincerely. These claims compiled a hypothesis - that the clients' cooperation should improve.

Hypothesis 20 was about the consideration of the respondents' life values: H20_A: The clients of the first phase evaluate their life values after the last adventure activity differently from the clients in the third phase.

The values for the hypothesis were gained from the 34 questionnaire entry. The U test which followed provided the result 0.080, which was compared with the level of significance 0.05. Although the difference approaches statistical significance even here it is not possible to accept alternative hypothesis for the significance level 0.05. Just like above mentioned we decided to compare with the significance level 0.1 and that way the hypothesis could be accepted.

Hypothesis 20 was based on the claims that the value system of the addicted person changes as well as their emotional bonds to the close people become obsolete. The drug addicted person neglects their hobbies, duties and other values and spends most of their time with themselves and their drug (Nešpor et al., 2011, p. 25). Rataj (in Nevšimal, 2007, p. 168) describes the adventure activity environment as space where one rocks the bottom in both physical and mental sense. This situation leads to the confrontation with the core of their personality without any hypocrisy. Based on these two premises we consider that the adventure activities are space where one thinks over their values and the longer in the treatment the more they consider this aspect.

3.2 Research limits

This research can be regarded to be the initial research in the field of exploring the adventure therapy in therapeutic communities for the addicted in the Czech Republic. There are a number of limits that must be taken into account. Although when setting the independent variables the authors searched in the specialized literature they observed only those opinions of the clients that can be influenced by many factors. Therefore it may be more of a tentative view of how the clients perceive their experience from the adventure therapy and not objective reality. To collect data a non-standardized questionnaire was used. Although it was a quantitative research where a basic sample (all the chosen clients of a therapeutic community who underwent adventure activities in 2015 and 2016), a generalization is not

possible because only one therapeutic community was involved in the research.

The statistical hypotheses' testing does not show the adventure therapy efficiency either. It only shows all the used methods and treatment means in the therapeutic community.

4 Discussion and conclusion

The presented results of the quantitative part of the research correspond with some research studies. Autry (2001) describes that her respondents - girls from 13 till 18 years with risk behaviour improved their trust after the adventure therapy and that is both self-confidence and trust in others in group. The girls showed greater level of responsibility for themselves and they joined team work more. Paxton and Mc Avoy (1999) studied social psychological advantages of adventure therapy. They found improvement with their respondents in the field of self perception, feeling of being part of the group, and greater responsibility. The Romaněnko research (2012) was focused on the adventure therapy benefits from the point of view of the therapists. Again we find similarities with our results mainly in the question of the use of experience after the therapy ends. (Romaněnková describes this as gaining stimuli for their future free time activities), better self-confidence, responsibility, self-respect, breaking their limits and improving the physical condition. The adventure therapy is realized in very different ways. Although all mentioned research fulfils the main definition, the length and activities differ largely.

The results of the quantitative part of the research show that clients after the adventure therapy in the therapeutic community are aware of their benefits. There are also statistically significant differences in the opinions of the clients of the first and third phase of the treatment. The clients of the first phase assess their self-respect, independence, the cooperation ability and thinking about the life values differently from the clients in the third phase who are about to finish their treatment and leave the community. These results show not only the benefit of the adventure therapy but the benefits of all the complex treatment in therapeutic communities which aims at both quitting the addiction and the inner personality setting change.

We consider the results of the research as initial mainly because of the limits of this research mentioned above. At this moment the realization of the ongoing research project was approved. It will work with standardized tests and their application before and after the adventure therapy in six therapeutic communities in the Czech Republic.

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Primary Paper Section: A

Secondary Paper Section: AM

HUMAN FACE ATTRACTIVENESS ASSESSMENT: THE ROLE OF EXTRAVERSION AND VERBAL INTELLIGENCE ON THE SIDE OF THE ASSESSOR AND THE ASSESSED

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Acknowledgement: This work was supported by the Slovak Research and Development Agency under the contract No. APVV-15-0294.

Abstract: Extraversion plays a role in the behaviour and face assessment. Intelligence is discussed from two points of view: (1) as a feature carrying evolutionary information and (2) as a feature that enables the observer to detect information from the face. The aim of this research is to study (1) the role of verbal intelligence and (2) the role of extraversion within the process of attractiveness and intelligence evaluation of composite faces. Results are in favour of the evolutionary assumptions. The verbal intelligence of the observers ($N=2106$, $M=24.10y$, $SD=10.15$) is associated with the preference of extraversion in faces, the preference of higher intelligence, and with the ability to identify the level of intelligence from face. Moreover, extraversion of the observer is connected to the preference and assessment of the intelligence of the face.

Keywords: Face attractiveness assessment, extraversion, verbal intelligence, composite faces.

1 Introduction

The human face has been in the centre of interest for scientists in a number of scientific disciplines, professional knowledge led directly to rapid progress in understanding many aspects of face perception and processing. The face is usually the first visual information available to humans in social contact and is continuously visible during most types of interactions (Little, Jones, & DeBruine, 2011b). Therefore, it is more than understandable that a face becomes a part of our implicit personality theories.

Implicit personality theories (Schneider, 1973) are cognitive structures that are composed of attributed personality traits and their interrelations. The link between these implicit theories and stereotypes about group members become apparent when we consider the group membership as one of the personal attributes that are associated with other attributes from the same implicit theory (Ashmore, 1981). A very good example in this area is the link between facial attractiveness and extraversion. Physical attractiveness is associated with some implicit personality theories (attributed personality traits). The level of attractiveness is associated with interpersonal abilities and traits in the area of sociability, respectively extraversion, and the consequences of these abilities, respectively popularity (Eagly, Ashmore, Makhijani, & Longo, 1991).

The link between attractiveness and extraversion is apparent in the process of selecting a partner. In assessing the attractiveness of the human face, people can make decisions based on personality traits that match their ideal partner. If a person appreciates the personality trait extraversion, he/she may prefer an extraverted face because it means that the person can really be extraverted. The reason for relying on personality attributions of the other person is that facial information is more accessible than stable behaviours (Little, Burt, & Perrett, 2006b).

Not only do people prefer faces that represent an ideal partner but as it seems these preferences can be influenced by the assessor's own personality. Little, Burt, & Perrett (2006a) found out that the preference of extraverted male faces is relatively direct. Male faces, which are attributed to a higher degree of extraversion, are preferred by women who are extraverted as well. Couples often resemble each other. This similarity is fueled by an evolutionary mechanism that can be observed in various animal species (Burley, 1983); it is a nonrandom mating called assortative mating, in which the pair is formed on the basis of a phenotype. In this case, we could say it is a positive assortative mating strategy (homogamy) because people choose partners on the basis of similarity with themselves (Thiessen & Gregg, 1980).

Extraversion can be attractive for evolutionary reasons. The continuity of extraversion as a personality trait reflects a compromise between reproductive benefits and costs (Ashton & Lee, 2007). Extravert behaviour facilitates the establishment and preservation of social relations (Ashton & Lee, 2007) and supports the social status (Anderson, John, Keltner, & Kring, 2001). On the other hand, extravert behaviour is associated with competitive behaviour and its possible consequences (Lund et al., 2007). The mentioned compromise leads to the fact that extraverts are usually more successful when selecting a partner as introverts, but are also more likely to be injured (Nettle, 2005). We can contemplate that if extraversion is visibly reflected in the face of a person, the socially desirable characteristics from it may increase the overall interest in such a partner. It can lead to the evaluation of an extraverted face as being attractive in the sense of "what is good is beautiful" hypothesis (Little et al., 2006b).

In addition, extraverts usually have a symmetrical face that is generally considered to be one of the most attractive faces (Zaidel & Hessamian, 2010). The relationship between facial symmetry and attractiveness is stable, the face is more attractive if it is symmetrical. This relationship is valid even when one side of the face is removed from the photograph, when only the left or right side of the face is presented (Scheib, Gangestad, & Thornhill, 1999). Moreover, this knowledge suggests that the established connection between facial symmetry and attractiveness arises because symmetry is covaried with other attractive facial features more than that symmetry is perceived as attractive by itself. The relationship of extraversion and symmetry of the face arises because they have a common basis. Developmental stability leads to a symmetrical face phenotype and extraverted personality (Pound, Penton-Voak, & Brown, 2007). For this reason, we can say that an extravert face carries evolutionary information since it signals person's quality as a mate.

Another feature visible in the faces evaluated as a sign of "good genes" and overall health of the beholder can be intelligence (Miller, 2000; Prokosch, Yeo, & Miller, 2005). In this research, intelligence is discussed from two points of view: (1) as a feature visible in the face, carrying evolutionary information and (2) as a feature that enables the observer to detect relevant information from the human face.

(1) Intelligence has been connected with the beauty ideal for a long time (Etcoff, 1999). In general, attractive faces are considered to be more intelligent than unattractive faces (Zebrowitz, Hall, Murphy, & Rhodes, 2002; Kazanawa, 2011). And vice versa, the faces which show the signs of intelligence are perceived as more attractive (Talamas, Mavor, & Perrett, 2016; Demuthova, 2016). The explanation for the mentioned association between intelligence and attractiveness is provided by the "good genes" hypothesis. According to the hypothesis, attractive faces are a signal for a mate quality. The preferences for attractive individuals has evolved due to the enhancement of reproductive success (Berry, 2000; Zebrowitz & Rhodes, 2002). Therefore, attractive faces may signal high intelligence (Zebrowitz et al., 2002). Attractivity of intelligent faces may have arisen because "more intelligent mates conferred survival benefits on their offspring through the heritability of intelligence or through their ability to provide better parental care and more resources" (Zebrowitz & Rhodes, 2004, p. 169).

(2) Research in person perception has documented high accuracy in judging intelligence and health from facial appearance (Zebrowitz & Rhodes, 2004). As was proven by several research studies (Zebrowitz, Hall, Murphy, & Rhodes, 2002; Anderson, 1921), people are able to detect the level of intelligence from a face. Higher intelligence of the observer enables them to respond adequately to social situations and make good social judgements (Taylor, 1990). From this reason, we can assume that more

intelligent people make more accurate assessments about the intelligence of the judged face. As was found out by Borkenau & Liebler (1995), there was a strong correlation between the observer's intelligence and perceived intelligence from a face. In contrast, Kleisner, Chvatolova, & Flegr (2014) found out, that the accuracy of the perceived intelligence correlated with the intelligence of the observer only in men.

The evolutionary advantage to detect intelligence from a face is quite straightforward, already subtle deviations from average attractiveness can signal low fitness (Zebrowitz & Rhodes, 2004). People with asymmetrical faces can be perceived as having lower intelligence and health than those with symmetrical faces even though this perception may be erroneous (Rhodes et al., 2001, Zebrowitz et al., 2002), but the benefits of acquiring a high-quality mate are higher than the possibility to fail in responding to the mate fitness information (McArthur & Baron, 1983).

As mentioned above, at the individual level, people may exhibit different preferences for an ideal partner, which originate from the premise that people prefer partners who have similar personality traits as they do. Assortative mating occurs in many areas, from socio-economic, educational, psychological to physical (Domingue, Fletcher, Conley & Boardman, 2014; Silventoinen et al., 2003). To be an extravert and to obtain an extravert partner has an evolutionary advantage, as well as, to be intelligent and to have an intelligent partner. Extraversion and intelligence represent specific features visible in the faces which can be signs of "good genes" and overall health of the beholder. Within the meaning of assortative mating premise, one's own mate quality is related to the choice of a high-quality mate. Therefore, the aim of this research is to study (1) the role of verbal intelligence and (2) the role of extraversion within the process of attractiveness and intelligence evaluation of composite faces.

2 Method

Composite faces - Stimuli were composite introvert/extravert faces and faces representing three different levels (low, middle and high) of intelligence.

Extravert/introvert faces - The used stimuli are composite faces of extravert/introvert male and female faces prepared by Penton-Voak et al. (2006). Any face is a composite 10% of participants (15 faces) scoring highest and 10% scoring lowest on the big five self-report personality dimension - extraversion. The mean X and Y coordinates of each feature point were calculated to generate average shape information. The procedure in this task was to answer the question: "Which face do you like more?" and to choose from two possibilities: an extravert face or an introvert face.

Faces representing three different levels of intelligence - The stimuli are composite faces prepared by Kleisner, Charvatova, & Flegr (2014). Three photographs of female faces (see picture 1) and three photographs of male faces representing three levels of intelligence were used. The more is a face intelligent the more it shows overall dilations in the area between the eyes and mouth, the root of the nose is enlarged, and the nose is prolonged. The area of the chin is more constricted. By contrast, faces with a lower attribution of intelligence have eyebrows closer to each other, the base of the nose is narrowed, the nose is shorter, and the area of the chin is dilated (Kleisner, Charvatova, & Flegr, 2014). The procedure in this task was to choose the prettiest face from three faces and after several other tasks, these three faces appeared again with the task to choose the most intelligent one.



Figure 1: Composite female faces representing three levels of intelligence (Kleisner, Charvatova, & Flegr, 2014)

Measurement of the Intelligence - The Test of Intellectual abilities (Vonkomer, 1992) has been used to measure verbal intelligence. The test is standardized in the Slovak population. The subtest of verbal abilities consists of twenty items. The task is to create a word from the group of letters arranged in incorrect order using all of the letters. The word is a noun in singular and basic form (since Slovak language has declinations in nouns). The subtest was taken under a time limit.

Personality traits - Personality Inventory KUD (Miglierini & Vonkomer, 1986) was used for quick assessment of personality traits. These personality traits are included: dominance/submissiveness, rationality/sensuality, and extroversion/introversion. Each trait is represented by 8 items, with these possible answers: agree/disagree/neither. Sample items: "I'm calm even if I decide about something that I really care about", "Generally, I act upon a predetermined schedule". Only extraversion/introversion is analyzed in this research.

Research sample - The research sample consists of 2106 participants ($M=24.10$, $SD=10.15$), from which 1253 are female (59.4%) and 853 participants are male (40.4%). Participants gained the mean score in verbal intelligence 15.42 points which equals 6-7th sten (in compliance with Slovak norms).

3 Results

First, we analyzed participant's face preferences using one-sample chi-square to compare the number of trials on which participants chose the more extravert face as the more attractive with what would be expected by chance alone. Similar results are provided by the comparison of extravert/introvert male face preference and extrovert/introvert female face preference (tab. 1). The number of participants who prefer extravert male face over introvert male face differs significantly ($X^2=52.457$; $df=1$; $Sig=0.000$). In addition, the preference of the extravert female face shows the same tendency as in the case of the extrovert male face, the number of participants who prefer extravert female face is significantly higher than the number of participants who prefer introvert female face ($X^2=542.516$; $df=1$; $Sig=0.000$).

Table 1: One sample Chi-Square for the attractiveness of the images of introvert/extrovert faces

	Observed N	Expected N	Residual	Chi Square	Sig
Introvert male face preference	873	1038.0	-165.0	52.457	0.000
Extrovert male face preference	1203	1038.0	165.0		
Introvert female face preference	507	1037.5	-503.5	542.516	0.000
Extrovert female face preference	1568	1037.5	503.5		

We analyzed participant's face preferences using one-sample chi-square to compare the number of trials on which participants chose the most intelligent face as the best choice (tab. 2). We have obtained similar results as in the first comparison, the most intelligent face is considered to be the most attractive in both cases - male face ($X^2=677.066$; $df=2$; $Sig=0.000$) and female face ($X^2=827.555$; $df=2$; $Sig=0.000$). Results show that the most

intelligent face (regardless the sex of the face) is considered to be the prettiest, and participants, in general, prefer extravert female and male faces. Results are in favour of the evolutionary assumptions.

Table 2: One sample Chi-Square for the attractiveness of the images of faces according the level of intelligence

	Observed N	Expected N	Residual	Chi Square	Sig
Low intelligence male face preference	151	697.3	-546.3	677.066	0.000
Middle intelligence male face preference	860	697.3	162.7		
Highest intelligence male face preference	1081	697.3	383.7		
Low intelligence female face preference	199	697.0	-498.0	827.555	0.000
Middle intelligence female face preference	626	697.0	-71.0		
Highest intelligence female face preference	1266	697.0	569.0		

Next, we analyzed the possible differences of verbal intelligence of the observer according to their preference of extraversion in faces using the t-test, the preference of higher intelligence, and the ability to identify the level of intelligence from faces using ANOVA.

Participants with the extravert male face preference manifest higher scores of verbal intelligence ($t=-2.628$; $Sig=0.009$) than the participants with introvert male face preference. A very similar result was found in the participants with the preference of an extravert female face, they are significantly more verbally intelligent than the opposite group ($t=-3.590$; $Sig=0.000$).

Table 3: Observed differences in verbal intelligence according to extrovert/introvert face preference

	N	M	SD	t	Sig
Introvert male face preference	871	15.20	3.373	-2.628	0.009
Extravert male face preference	1203	15.57	2.913		
Introvert female face preference	507	14.99	3.385	-3.590	0.000
Extravert female face preference	1566	15.56	2.995		

Through the analysis of the differences of verbal intelligence of the observer according to their preference of higher intelligence, we have found out that the group of participants who prefer the highest intelligence in male faces are themselves the most verbally intelligent ($M=15.66$) with declining level of intelligence in compliance with the intelligence preference in male faces [middle intelligence male face preference: $M=15.37$, low intelligence male face preference: $M=13.92$]. These differences are significant (tab. 4).

Very similar are the results of the verbal intelligence comparison according to the attractiveness evaluation of female faces ($F=7.938$; $Sig=0.000$). The most verbally intelligent participants

are those who prefer the highest intelligence female face ($M=15.61$).

Table 4: Observed differences in verbal intelligence of the observer according to intelligence male and female face preference

	N	M	SD	F	Sig
Low intelligence male face preference	151	13.92	3.994	20.959	0.000
Middle intelligence male face preference	859	15.37	3.262		
Highest intelligence male face preference	1080	15.66	2.813		
Low intelligence female face preference	198	14.75	4.305	7.938	0.000
Middle intelligence female face preference	625	15.24	3.175		
Highest intelligence female face preference	1266	15.61	2.858		

As we were interested in the role of verbal intelligence in the process of evaluation of intelligence from human faces, we analyzed the possible differences of verbal intelligence of the observer according to their ability to identify the level of intelligence from faces using ANOVA. Different results are provided by the comparison of the level of intelligence assessment in male faces and the level of intelligence assessment in female faces (tab. 5). The verbal intelligence of participants correctly identifying the highest intelligence of the male face doesn't significantly differ from the other groups ($F=0.042$; $Sig=0.959$). On the other hand, the difference in verbal intelligence of the observers is significant in the case of the female face assessment. The group of participants who correctly identified the highest intelligence in the female composite face is the most verbally intelligent group ($F=8.670$; $Sig=0.000$).

Table 5: Observed differences in verbal intelligence of the observer according to intelligence male and female face assessment

	N	M	SD	F	Sig
Low intelligence male face	248	15.41	3.151	0.042	0.959
Middle intelligence male face	816	15.47	3.183		
Highest intelligence male face	982	15.43	3.057		
Low intelligence female face	320	14.89	3.823	8.670	0.000
Middle intelligence female face	808	15.29	3.163		
Highest intelligence female face	963	15.68	3.130		

Lastly, we analyzed differences between participants in extraversion according to their preference of the intelligence of the observed face. As can be seen in table 6, participants with the preference of the highest intelligence in male faces are typical by highest extraversion, the difference is statistically significant ($F=6.670$; $Sig=0.001$). The same tendency is apparent when the participants are asked to choose the more attractive female face, those who have the preference for the highest intelligence female face are the most extravert ($F=5.360$; $Sig=0.005$).

Table 6: Observed differences in extraversion of the observer according to intelligence male and female face preference

	N	M	SD	F	Sig
Low intelligence male face preference	145	9.88	4.010	6.670	0.001
Middle intelligence male face preference	784	10.79	3.661		
Highest intelligence male face preference	1013	11.03	3.495		
Low intelligence female face preference	182	10.39	3.926	5.360	0.005
Middle intelligence female face preference	564	10.55	3.742		
Highest intelligence female face preference	1195	11.05	3.485		

4 Discussion

Extraversion is a trait that is considered to be one of the frequently desired personality traits in a partner. The advantages of having an extraverted partner are in the establishment of social relationships (Ashton & Lee, 2007) and a higher social status (Anderson et al., 2001). For this reasons, people who have facial features resembling extraversion are evaluated as more attractive. We tested this possibility. As we found out, the number of participants who prefer extravert male face over the introvert male face is significantly higher. Extravert male face is considered as more attractive by 57% of participants. The same tendency, even more straightforward, manifested as well when the participants evaluated the attractiveness of female faces. The number of participants preferring extravert female face was higher than the preference of introvert female face, namely 74.3% of the research sample evaluate the extravert female face as attractive.

We can conclude that in addition to the fact that extraversion manifested in a face is attractive in a partner choice, it is more attractive than introversion regardless the sex of the assessor and the sex of the assessed. The evaluation of an extraverted face as being attractive is in compliance with the “what is good is beautiful” hypothesis (Little et al., 2006b). It can be contemplated that the developmental stability connected with extraversion (Pound, Penton-Voak, & Brown, 2007) carries not only evolutionary information in the form of person's quality as a partner. Extraversion as a trait can be understood as a consequence of the strength of response to naturally rewarding stimuli (like sex, food and physical pleasure). Extraverted people invest more time and energy on acquiring the stimuli because they are more salient for them than for introverted people (Eysenck, 1976; Swickert et al., 2002). These stimuli are rewarding because they are fitness enhancing and extraverts are more successful in mating and as well in attaining fitness relevant resources (Nettle, 2005).

Intelligence is as well considered to be very attractive (Etcoff, 1999; Talamas, Mavor, & Perrett, 2016; Demuthova, 2016). Similarly, as extraversion, intelligence can be explained in terms of the “good genes” hypothesis. Intelligent faces may confer survival benefits on the potential offspring because intelligent people have the abilities to provide better parental care and resources (Zebrowitz & Rhodes, 2004). As stated by Moore, Fillipou, & Perrett (2011, p. 206): “A relationship between intelligence and a “fitness factor” could account for the association between facial attractiveness and perceived intelligence, as individuals displaying visible cues to intelligence should be more desirable in a mate choice context”.

We tested the possibility if the most intelligent face is evaluated as the most attractive. And again, we obtained similar results as in the case of extraversion, because this result is in conformity with the evolutionary presumption as well. The highest

intelligent face is considered to be the most attractive for male composite faces and for female composite faces as well. 51.3% of the participants prefer the highest intelligence male face [for comparison: lowest: 7.2%, middle: 40.8%]. 60% of the participants have shown the preference for the highest intelligence female face [lowest: 9.4%, middle: 29.7%]. Results show that the most intelligent face (regardless the sex of the face) is considered to be the prettiest.

As we were interested in studying the role of verbal intelligence and the role of extraversion within the process of attractiveness and intelligence evaluation of composite faces, we compared the selected variables against each other to test the possibility of assortative mating. Assortative mating in extraversion towards extravert partners is direct, male faces which are evaluated as to possess a higher degree of extraversion are preferred by women who are extraverted (Little et al., 2006a). This positive assortative mating strategy may be applicable as well in the terms of the premise that one's own mate quality is related to the choice of a high-quality mate. Therefore we can assume that the intelligence and extraversion as psychological constructs representing evolutionary advantages can be mutually attracted characteristics. To test these assumptions we analyzed the differences of verbal intelligence of the observer according to their preference of extraversion in faces, the differences of verbal intelligence of the observer according to their preference of intelligence of the observed faces, and the differences between participants in extraversion according to their preference of the intelligence of the observed face.

The results show that higher verbal intelligence is associated with extravert male face preference and with extravert female preference. Secondly, as could be seen, higher verbal intelligence is connected to the preference of higher intelligence on human faces regardless the sex of the face. The former relationship is valid as well as in the opposite direction, participants differ in their score of extraversion according to their preference of intelligence on human faces (again, regardless of the sex of the evaluated face). We can consider this results as support for the assortative mating strategy.

The finding that higher verbal intelligence of assessor is connected to the preference of higher intelligence on composite faces can be explained by different possibilities. The mechanism behind the fact why more intelligent assessors consider the highest intelligence composite face as the most attractive can be due to the fact, that highly intelligent participants' environment is occupied more by intelligent people. The social environment of intelligent people includes the faces with visible intelligent features on their faces, which creates a higher frequency of intelligence facial features around the assessor. Since it is a known fact that the nature or hereditary component in intelligence causes greater variation than does environment (Leahy, 1935; Bouchard & McGue, 1981; Deary, Spinath, & Bates, 2006), it can be assumed that highly intelligent people are surrounded by intelligent facial features from their childhood (from their family members) which can form a “norm” for evaluation other faces.

In this research, we have been interested also in the question, if a higher intelligence of the observer enables him/her to make more adequate judgements about the presumed intelligence of a composite face. Research studies have found mixed results on this specific topic. Some have confirmed a strong correlation between the observer's intelligence and perceived intelligence from a face (Borkenau & Liebler, 1995). Others have confirmed mentioned relationship only in men (Kleinsner, Chvatalova, & Flegr, 2014). Our result doesn't support any of this conclusions, as we found out a higher verbal intelligence of the assessor facilitates the correct evaluation of intelligence from facial features only while judging a female face, not while judging the male face. This result is similar to the conclusion by Démuthová (2016), regardless the sex of the assessor - men and women did not recognizably differ between middle and high intelligent male face.

At the end, we can conclude that most of our findings are in favour of the evolutionary assumptions. The presence of differences among participants in their preference of faces shows us that people don't generally have an identical idea of an attractive person. Our results show that not only the desired personality (Little et al, 2006b) influences the perception of the attractiveness of a person of the opposite sex, rather, people are in their attractiveness evaluations influenced by their own characteristics (in this case extraversion and verbal intelligence). We cautiously conclude that the characteristics of participants can play a role in assessing the attractiveness of the face.

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Primary Paper Section: A

Secondary Paper Section: AN

THE CULTURAL-PEDAGOGICAL ASPECTS OF THE REGIONAL AND THE GLOBAL (ALSO BASED ON THE EXAMPLE OF THE SLOVAKS IN ROMANIA)

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This study has been produced as a part of the VEGA project (number: 1/0034/17) called Transculturalism and Bilingualism in Slovak and Hungarian Literature. Project leader: dr. habil. Mgr. Németh Zoltán, PhD.

Abstract: The paper deals with the multidimensional space of culture from a regional and global perspective. It points to a certain pulsation and influence of cultures in the life of a national minority, respectively describes regionalism as a specific determinant of their cultural existence. It analyses the pedagogical respect of these realities in the concretization of the national educational process (in the background of the pupil's consciousness in relation to these terms). It stresses the naturally present cultural relativism and gradual purposeful improvement of the cultural consciousness of the pupil in the environment and the surroundings of minority schools (also) during the acquisition of cultural codes. The text leads to a wider presentation of the multidimensional process of interpretation and its important segment: national literature as an important form of cultural heritage.

Keywords: culture, education, regionalism, globalisation, pedagogy

Introduction

The system of the region is in the broadest sense the problem of space and time. What characterizes the unity of time and space in a physical sense represents, in culture, art and literature, the unity of the regional or the global, respectively of creativity or tradition. It is the existence of multiple interrelationships and the interconnection of the present, the past and the future. Each new bond reveals a new meaning and value aspect of culture.

According to the declaration of the European Council (1993), the basic unit of the region is its cultural environment. It is a kind of concept which is reflected in the activities of the people living in the given environment. In the history of pedagogy, Alexander von Humboldt introduces the aspects of the determination of pupils and cultural environment. They are in a parallel relationship during the educational process.

In the history of culture, there is the so-called pulsation of expanding, but sometimes even shrinking space. However, the progress of culture also takes place as the dynamics of other, mutually interrelated regions. Irina Grigorjevna Neupokojevová emphasized her understanding of regional systems by matching the historical-cultural type in connection with sociology and cultural studies. She insisted on the historical approach, since regional systems are not equal during the course of their history, therefore their stability must be understood as a form of expression of historical dynamics.

Regarding the criteria for the allocation of the zone, I. G. Neupokojevová has several of them. Besides the proximity of individual historical fates, it is also the historical-cultural-geographical character of differentiation and the cohesive stability of the cultural code. The contribution of her theory lies in the methodologically natural association of cultural (sociocultural) analyses of societies that belong to the complex world of culture. These are all the same directions as the typological matches or lines that do not presuppose genetic affinity (the Romanian comparator Alexandru Dima's formulation). And these are the terms the concept of cultural region is connected with.

1 Cultural environment and its multidimensional impact on the region in and out of the school

The concept of culture is one of the central points of philosophy, history of education and human thinking. However, its individual partial fields are indistinguishable and interdependent. At present, the definition of culture is recognized from the aspect

of integrity and breadth (Kroeber, In: Bohannan, Glazer, 1997, p. 159). However, the institutional establishment of this concept is also important, which can be done the most effectively by the proper application of the so-called cultural policy of the state. This term was first mentioned in the German pedagogical journal (*Pädagogischer Revue*, 1840). Culture consists not only of the accumulated knowledge or the sum of values of pupils, but also of the correlated models of behaviour, customs and traditions. However, such a system only makes sense if it is permanently acquired by the individual (in our case, the pupil) during his life (at school, during the educational process). By this, pupils are engaged in their relations to their surroundings, refine their personality, they become part of the environment of the region and receive information from previous times – in our case about their own nationality (Malinowski, In: Bohannan, Glazer, 1997, p. 379). In the background of the theory of education, this principle points to the influence of the environment and the ways of social coexistence of the group (for example, pupils in the class).

What is important is the process of transferring cultural awareness to other generations. Generations transfer values as well as cultural practices. This is the so-called cultural transfer that goes hand in hand with biological transfer (Cavalli-Sforza, Feldman, 1981, p. 127). Cultural anthropologists often associate this issue with the pupil's educational process at school. This brings anthropology and pedagogy closer together in theory and practice. In the horizontal transfer of cultural codes, pupils learn from their classmates, while in the vertical transfer they learn from adults or institutions (such as the school itself, where the values of culture and tradition are transferred during this process. This process is interesting only if the mechanisms of learning by which information is transferred to pupils are also examined.

2 Global culture and its impact on the life of an individual (pupil)

Global culture does not count with geographical territory and common historical consciousness is absent. When looking for a connection between teaching global and regional culture, we must count on the fact that the goal of this process is also the self-identification of pupils with their own culture in the process of enculturation, but there is also a moment of getting to know and respecting foreign cultures. Interdisciplinarity – especially in a national context – is therefore very important in the educational process. Special attention is paid to this issue for example by Franek, who highlights the literary translation of this context (Franek, 2013, pp. 138-149).

The process of enculturation is also interesting, as the transfer of new knowledge to pupils takes place in the context of one's own culture, just like acculturation, since this process takes place in the environment of another culture. The term was introduced by Melville J. Herskovits (1948), when he claimed that the individual (pupil) is surrounded by their own culture, which they gradually acquire through learning. The final "outcome" of this process is a pupil who is fully able to integrate into micro-society. In the case of the Slovak national enclave in Romania, it is more or less enculturation. The pupils have a number of lessons devoted to the subject of their own regional culture and the already mentioned pulsation significantly shapes their personal profile. Their space is expanding with new knowledge about a particular nearby region, but is also narrowing, for example, they are also interested in regional cultural personalities. Today's regions of Slovaks in Romania are based on a regional-cultural aspect, for example, they are associated with applied sociology – for example the demographic development of Slovak nationality in relation to the influence on culture. Their effort of sticking to regional elements is the concretisation of the above-mentioned historical dynamics of the last two centuries. Their current culture is basically stable, it is based on historical (hundreds of years existence), cultural

(permanent creation of mental values) and geographical (steady geographical position) characteristics. The Slovaks in Romania can therefore be characterized as being in the so-called zone position.

Art historian Ján Bakoš pointed out the unsustainability of the centristically absolutist and regionally separating concept, saying that the creativity of the regions needs to be examined not in isolation but always in relation to higher systemic units. The cultural potential of the Slovaks in Romania is characterized not only in the background of their own pulsation, but also in relation to other contexts (different region, different language code, different state, different cultural life, different educational model, etc.). Literary scientist Oskár Čepan claimed that topographical issues have topological (and therefore value) backgrounds. Obviously, these values of Slovaks in Romania are valid society-wide, but it is necessary to select and properly determine the height and depth of their "value" from a global aspect. What may be interesting for schoolchildren in Nadlak (for example local superstitions) might not mean anything for pupils in Bratislava. The decisive moment is not the fact that the birth value arises in the centre or on the periphery, but whether it moves with the world. It is about transferring the issue from geographic to socio-psychological soil. Its characteristic feature is a certain closure of the region, which is permeable in terms of system dynamics. Also the Slovaks in Romania (for example also at school) are creating values, and today they are taken into account not due to the aspect of living in Banat but because they have created excellent values of their own existence. In their relations to the external environment, culture and literature are oriented according to the particular regions. Energy sources include the singular, the local and the regional – and the inner diversity of the local becomes the source of the increasing complexity and momentum of the global. The creativity of the region is gradually becoming the condition for the creativity of the entire global system; however, the systemic links of the region are a condition of its momentum – and hence its lifetime (Zajac, 1993, pp. 128-137). In the Central European cultural context, in the background of literary history and literary theory, it is important to apply also a comparative point of view, of course, with the specifics of the nationality. This fact is also pointed out by the important Slavic expert Ivo Pospíšil (Pospíšil, 2008, pp. 137-148). In his later works, he also listed and specified characteristics in relation to the area as a geographical-cultural unit and literature (Pospíšil, 2010, pp. 61-73). Another important literary scientist Miloš Zelenka wrote about the meaning of the comparative approach in this constellation (Zelenka, 2005, pp. 1-15).

3 Regional identity of minority individuals (pupils) – Slovaks in Romania

The need for the emergence of regional elements – and the related strengthening of regional identity – is also reflected in schools due to the strengthening of globalization tendencies. In schools with the Slovak language of instruction in Romania, closely related to these elements, these aspects are particularly important. Even according to the OECD, there is a need to strengthen pupils' regional awareness in these schools. It is a process coming from below, that is, from enthusiastic teachers who do not hesitate to write a variety of texts and textbooks for lessons of history and social studies, etc. A special moment is the fact that at present a working team is being created at the State Educational Institute in Bratislava, which has the task of creating framework documents for the teaching of the regional culture of the Lowland Slovaks as an optional subject for pupils in Slovakia. Therefore, both primary sources and methodological guidelines are important. The development of the regional consciousness of pupils cannot be reduced to the simple description of folk customs and traditions. This consciousness should not only be preserved, it must also be extended with the typical topics of the region. The teaching of traditional culture must go hand in hand with the teaching of regional realities.

Already in the past, regionalism was understood as *"a resultant of cultural relations, not of the necessity of art... Art has a*

common universal home, which is mankind itself" (Rúfus, 1974, p. 62). These relations are also specified in the national culture of a particular region: for example, in Slovak culture in Romania.

Romania is a heterogeneous state with multiple minorities in terms of culture. As a curiosity let us mention that the current President of Romania – Klaus Iohannis – has Saxon nationality from Transylvania with German mother tongue. One of the minorities is (the above mentioned) Slovaks, whose differentiation is primarily done on the aspect of ethnicity. On a regional level, this means localities that are inhabited mainly, respectively partially by the Slovaks. These are located in the northern part of Banat, Romania, near the town of Nadlak. This is an economically and culturally relatively advanced population. The second, a less developed cultural component of the Slovak population inhabits the northwest of the country in the villages of the Romanian Ore Mountains, where they are a very special cultural group even today. Both territories are actually regional units that contribute to multiculturalism. Its degree in theory and practice also depends on the upbringing of the younger generation in schools, where concepts such as ethnicity, regionalism and globalization are specified.

Slovak compatriot literature is an important part of Slovak culture abroad. Its expressions are most naturally manifested through the relations mentioned, because this space is not only geographic: it also contains *"... a distinct spiritual dimension with its own past and present and definitely also the future. It contains and corresponds to the inputs and outputs of Slovak minority literature"* (Harpáň, 2004, p. 84). At the same time, it should be emphasized that minority culture is the integral, typical and integral part of Slovak culture (Harpáň, 2004, pp. 12-18).

The theoretical problem of migration, which is also typical for Slovak national culture in Romania, can provide impulses also for addressing the question of the author's two or multiple homelands. In this case, the question of the existence of specific inter-literary relationships and their periodization come to the foreground, which includes the developmental (a)synchronicity between the culture of the metropolis (i.e. the centre, for example Slovakia) and the culture of migration (i.e. the periphery, for example Slovak culture in Romania). As a supporting interpretative approach to the phenomenon of (this) migration, similarly for that reason, the following is pointed out: *"... the respect for its multi-contextualisation, which is understood not only as a political but also as an artistically diverse dialogue of cultures, which is primarily auto-communication within the structured and value-differentiated system ..."* (Zelenka, 2002, p. 46).

Therefore, more and more space is gained by the so called cultural relativism, which deals with the issue of literature as cultural memory. It stems from the hermeneutic tradition of empathy and Gadamerian understanding; accents the importance of the periphery; the need for mutual penetration of cultures (i.e. creolization). Several experts have written about the mutual Slovak-Romanian cultural relations in various aspects. From the scientific aspect of Slovak national culture in Romania, it was, for example, the Slovakist Dagmar Mária Anoca (Anoca, 2013, pp. 411-412). To a certain extent, there is an identifiable parallel with the theory of Dionýz Ďurišin, which rejects any axiological nature. On the one hand, there are the supporters of aesthetically delicate analyses of literary texts, on the other hand experts in interliterariness, who do not see aesthetically but poetically. Pupils in minority schools in Romania must be led to perceive the attributes of their own minority and region in the literary text.

In practice, it can be a question of nationality and its (self) identification. There is the open question about the proportion of canonized interpretation and the free description of the principles governing the (inter) cultural communication process. This mutual relationship – in the background of some liberalism – is thus a reflection bridge while working with literature as an

important component of culture. Its centre is a text that is to be understood as a systematic place for possible interpretations: their number refers to "... not only the given text, but also texts which, due to various contexts, are layered them, respectively, which, for the sake of better understanding, must be layered on them" (Corbineau – Hoffmannová, 2008, p. 40). This is the way knowledge of the surroundings, region and state is layered at pupils in Slovak minority schools in Romania – that is, there is a distinct spiritual path from the regional to the global (of course, while maintaining all aspects).

The text as a whole has an important deal with the foreign: with the influence of different cultures. This is how culture operates in interliterary contexts. Texts very often create images that must be captured perceptually and interpretatively by the reader through a critical analysis. For example, the journeys of heroes to foreign countries – cultural areas – can be the concretization of culture. So there is an image of the self and the image of the foreign (also) in Slovak minority culture and literature in Romania. The second aspect can only be identified on the bases of our own culture – as culture foreign to ours. This opposition between the foreign and the familiar is created not only by nationalities but also by several cultures (Corbineau – Hoffmannová, 2008, pp. 121-123).

From Aristotle's Poetics to the present day, authors feel the tension between the unique and the universal, that is, between the regional and the universal. It may seem that a certain motive, verbal expression or arrangement that we have and know within our (up to a certain extent a rather limited) cultural and literary world is not a local phenomenon but the feature of a wider reality (culture). Johann Wolfgang Goethe himself believed in the existence of national literatures, by which he allowed dialogue between the regional and the universal. Nevertheless, in this process it is important to observe also the starting points of the study of the issue of Slovak literary science and its theoretical initiatives. This was supported by Peter Zajac, too (Zajac, 2008, pp. 99-109).

The so-called Geertz method is an important methodological and pedagogically useful research method. According to her, the understanding of culture can only be in the background of the consistent interpretation of the individual's own national existence in the background not only of multicultural but also of regional education (Geertz, In: Bohannan, Glazer, 1997, p. 712). Geertz's understanding of culture is based on a semiotic aspect. According to this, an individual (pupil) lives in a certain network of meanings, which have been created by him/her. The network also includes abstracted meanings, later explanations and analyses. The centre of this analysis is interpretation that is one of the most important methods of understanding abstract and specific things as well as correlations for pupils in the school environment. Therefore, the variety of meanings in the cultural field is significant. According to John B. Goodenough, the pupils' knowledge, skills and habits create a system of cognitive knowledge, which is the basic pillar of the ability to understand and interpret the world.

4 The segment of national culture as the starting point and the objective of the regional and the global

The Slovak national minority in Romania was not created because of its own will but "... it is the result of complex historical and political circumstances and connections ... it is also a unique phenomenon ... The relationship between the centre and the periphery ... can be ... named as the consciousness of the twofold relationship between the whole and the part ..." (Harpán, 2000, p. 27 and p. 29). However, the phenomenon is not a closed and static system, defined state-politically but open and dynamic. Slovak compatriot culture can therefore be understood as a literary expression of the region. The very incorporation of "being Slovak" in Romania into the entire Slovak cultural context is "... unshakable, yet it is not a one-off and simple matter. It occurs on various levels ... The highest level all other levels are connected to emerges from the essence of the pluralist development of the entire literature in the

country: one of its developmental segments, forming a whole, is minority literature" (Harpán, 2004, p. 76). From this point of view, national literature as the manifestation of culture belongs to the specific interliterary community. This concept as a model phenomenon of the interliterary process in Slovak literary science was first defined by Dionýz Ďurišin, who claimed that the specificity of the national culture manifests itself in the fact that it develops and typologically determines itself in relation to several literary contexts: the context of national culture, the context of the regional, resp. state department, and its own developmental or typological context.

National culture involves the typological category of being special. The individual is to be understood as a national-literary context and the general as the interliterary; the special as the context of inter-literary communities. At a certain level, in the context of national literature, there is a tendency to stand apart from the individual category, when the special begins to function and typologically manifest itself as the new individual. This type of national literature in the inter-literary community "... is not subordinated by a more developed and larger national-political context, but is determined in relation to them ... The literary-historical material of national literatures points at their relations to several national-literary contexts quite clearly" (Harpán, 2000, pp. 13-14). In relation to the Slovak national-literary context, Slovak culture in Romania was manifested in thematic specialty, conditioned by its own ethnic environment and elements of regional colour. This actually starts with a certain development-typological parallel of the special and the individual context. In later development, however, the opposite process can be observed: the efforts of individual writers to overcome the typology of local colour and to give their literary testimonies a more universal form.

The category of the special, which is typologically characteristic for national literature, has not only a differentiation but also an integration and complementary function. This is reflected in most of the texts of authors of Slovak nationality in Romania.

From the middle of the 19th century until the first third of the 20th century there was a certain genetic contact with the mother country. This state of affairs was, of course, determined by the Austro-Hungarian Empire and by the (e)migration of population. In the development of the cultural activity and literary creation of the Slovaks there, we must mention Ľudovít Haan, Daniel Zajac, Ivan Bujna or Ondrej Seberíni, who came to Nadlak, the centre of the Slovaks in Romania, to be a priest, Jozef Gregor Tajovský, who came for occupational reasons from the northern region as an accountant, and Peter Suchanský, who (as the opposite case) left for Czechoslovakia in the inter-war period. In the post-war development of this literature, these life paths were determined mainly by university studies and the subsequent fulfilment of the position of Slovak intelligence in Romania. It mainly involved travels to Bucharest, Timisoara, Bihor, Moldavia and so on. It is important to create a time limit for this literary development: from 1853 (the first cultural mention of the Slovaks in Romania) until the first third of the 20th century, the above-mentioned genetic contact is reflected in their writings (for example, the journey of the heroes to the city of Martin by a steamship in the prose of Ondrej Seberíni). After 1945, this relationship changes. Until the end of the 1970s, there was a publication vacuum. From that period to 1989, we can talk about a kind of parallel development in the direction of mother culture and low interest of Czechoslovakia in the writings of Slovaks in Romania. At that time, Slovak writings in Romania were quite isolated, thematically "reduced", for example, as an interesting fact there was the description of a trip to the Black Sea coast or Bihor. This arc, of course, is also reflected in the testimonies and replicas of the heroes, in which both own and foreign elements are mixed. On this basis, texts or particular linguistic situations – dialogues, intertexts – are polyphonic. However, it is necessary to add that this phenomenon only makes the cultural context in question special, it is not a central phenomenon, but a unique one that concretises the aforementioned claims, and is in a certain sense - even to a minimal extent – an occasional and regional characteristic feature.

Conclusion

The issue of the cultural and pedagogical aspects of the regional and the global is always up-to-date in our multicultural world. For this reason, exploring this issue is of permanent importance. This applies more if special attributes are associated with generally valid statements. This paper was about the specification of a national minority, the Slovaks in Romania. The analysis was based on the multidimensional impact of the cultural environment in relation to the region itself – both in school and out-of-school settings. The natural pedagogical understanding of this phenomenon from the aspect of the pupil in the given region has been emphasised. Cultural awareness is extremely important for pupils in terms of the formation of their natural intellectual personality. We have not even forgotten the obvious impact of global culture on the complex development of the individual, whereas we have gradually narrowed the scope of our interest to the partial issue of the regional identity of the representatives of this national minority. We have gradually pointed out the specificities of the natural development of a national culture with regard to the literary-historical segment of this enclave in relation to the regional and the global. This methodological approach gave a multidimensional picture of the position of the selected starting point, while describing some procedures, theories, ideas and experiences characterized the specific shaping of the personality of the pupil from the position of various sociological fields: culture, pedagogy and sociology.

On the basis of the above, we can claim that the culture of a nationality lives especially in contact with another culture (context). It is only such diverse contacts that create "... *light, shining forward and backward engaging the text into dialogue ... This contact is a dialogic contact between texts ... Mutual understanding between centuries and millennia, among nations, nationalities and cultures provides the complex unity of all mankind, all world cultures ...*" (Bachtin, 1988, p. 395 and p. 401). Therefore, we agree with this unstoppable and always valid idea of Michail Machajlovič Bachtin, thus creating a united in a special, special in a unified, global in a regional, regional and global ... Therefore, we agree with this everlasting and always valid idea of Michail Machajlovič Bachtin, since this is the way of creating the universal in the special, the special in the universal, the global in the regional, and the regional in the global.

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Primary Paper Section: A

Secondary Paper Section: AL, AM, AN

THE IMPACT OF DEVELOPMENT OF INSURANCE MARKET AND ECONOMY ON THE COMPETITIVENESS OF THE COUNTRY ON EXAMPLE OF V4 COUNTRIES

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Abstract: Competitiveness is an important indicator, which clearly defines the position and maturity of the country. But what factors affect this competitiveness? Is it only economic performance measured by GDP? What role in this competitiveness is played by insurance market? We try to find answers to these questions. On the example of V4 countries, we try to identify, if the development of insurance market has influenced the competitiveness of the country and what role in this competitiveness economy indicators play.

Keywords: Insurance market indicators, Economy indicators, Global Competitiveness Index..

1 Introduction

Insurance industry plays an important role in all economies, especially in market economies. (Pukala, 2011) Insurability and insurance industry in the states of the European Union is one of the most important components of all economies. This sector fulfils a very important role in any country's economy and stability of people's life. (Pukala, 2012) Insurance industry as a sector of the national economy offers their goods (financial services) in the insurance market. They include all the relations between the "seller" and "buyer" who use insurance as the subject of their exchange. Insurance services are considered to be specific goods which execution takes place in the insurance market. Insurance helps to address the underlying problems that may arise in connection with an emergency of unexpected events. (Širá - Radvanská, 2014) It helps businesses to maintain economic stability but also ensures the standard of living of citizens under various unforeseen negative conditions.

Insurance covers the various risks as the need of every society. It represents a system of various market instruments and regulatory measures that ensure the flow of funds and insurance services among the insurance market on the principle of conditional return and non-equivalence. (Širá, 2012)

Insurance is divided into two main categories namely:

- life insurance,
- non-life insurance.

Life insurance is a personal insurance against death, survival, or a combination thereof. Non-life insurance contains insurance of tangible assets, intangible assets, liability insurance and personal accident insurance. Compared to life insurance, the insurer in this case clearly does not know whether the insured event occurs or not, and the questionable is the time of insured event. (Kafková, 2007) Based on the above division, commercial insurance companies can be divided into life, non-life and universal. If commercial insurance companies provide exclusively life insurance products, we talk about life insurance companies. If they provide products exclusively on non-life insurance, they are called non-life insurance companies. In case of providing products from both areas, we talk about universal insurance companies. In some countries, insurance market is operated by all three types of insurance companies, but in some countries there are only life or non-life insurance companies. (Širá - Radvanská, 2014)

However, even though the potential contribution of insurance market activity to economic growth has been recognized, the assessment of a potential causal relationship between insurance market activity and economic growth has not been as extensively studied as that of banks and economic growth. (Arena, 2008) We

found some studies, where foreign authors analyzed the impact of insurance on the economy of the country. E. g. Kozak (2011), Pukala - Kafkova (2014) and Pukala (2014) analyzes the determinants of the profitability of 25 general insurance companies from Poland during 2002 – 2009 and their effect on national economy. Haiss and Sümegi (2008) analyzed relation between premiums and GDP. Bahloul and Bouri (2016) analysed the efficiency of European non-life insurance to economy.

In case of Slovak authors, there are some studies about development of insurance market, e. g. (Grmanová - Jablonský, 2009), (Pastorakova - Drugdova, 2009), (Kafková, 2007), (Pastoraková, 2006), (Širá, 2012) but there are missing studies on impact of insurance on national economy. Many other authors as Adamišin, Kotulič, Kravčáková Vozárová (2017), Vavrek (2017a) or Kotulič et al. (2015) deal with similar research based on use of several indicators at local or national level.

2 Methodology

The aim of this paper is to identify, if the development of insurance market influenced the competitiveness of the country. We set up the relationship as follows:

$$GCI = f(GDP, UNEM, WP_{life}, Pen, Cr_5) + \varepsilon$$

where the independent variable represents competitiveness of the country measured by score gained in GCI published by World Economic Forum every year. Dependent variables were sets into 2 groups, where the first group of variables were economy indicators (GDP and UNEM - unemployment) and in the second group were indicators representing the insurance market (WP_{life} - written premium in life insurance, Pen - penetration rate and Cr₅ - concentration ratio 5).

We have analysed the countries belonging to the group named V4, it means the Czech Republic (CZ), Hungary (HU), Poland (PL) and the Slovak Republic (SK), in the years 2003 - 2015.

The relation between selected indicators was described by Kendall coefficient,

$$r_k = \frac{n_c - n_d}{n(n-1)/2}$$

where: n - number of observations of pair of variables
n_d - number of discordant pairs
n_c - number of concordant pairs

regression analysis and the methods of least squares

$$\sum_{i=1}^n (y_i - \hat{y}_i)^2 = \sum_{i=1}^n \varepsilon_i^2 \rightarrow \min$$

where: y_i - measured value of dependent variable
ŷ_i - estimated value of dependent variable
ε_i - random error of dependent variable

with expressing the force of the model using a determination coefficient (Vavrek, 2017b).

$$R^2 = \frac{\sum_{i=1}^n (y_i - \hat{y}_i)^2}{\sum_{i=1}^n (y_i - \bar{y})^2}$$

where: y_i - measured value of dependent variable
ŷ_i - estimated value of dependent variable
ȳ - average value of dependent variable

The analyses were made by MS Excel, Statistica 13 and Statgraphics programmes.

2.1 Indicators description

Global Competitiveness Index GCI - Competitiveness can be measured from a number of perspectives. We choose the Global Competitiveness Index, published annually by the World Economic Forum. Since 1979, this institution has published the Global Competitiveness Report on selected countries of the world. This report is one of the most comprehensive sources of information on the comparative benefits of economies around the world. The GCI index consists of 114 indicators, which are grouped into 3 subindexes. (Schwab et al., 2016)

The Gross Domestic Product (GDP) - Economic growth is usually defined as an increase in the goods and services produced by an economy in given period. (O'Neill, 2014) The GDP growth represents the total growth in goods and services for each country. (Bahloul - Bouri, 2016) This indicator is used in macroeconomics, to set the efficiency of the economy of the country.

Unemployment rate - The unemployment rate is the number of unemployed persons as a percentage of the labour force. (Layard, 2005) That rate means all persons, that are able to work and their age are between 17 and 64 years, but don't have work, compared to whole labour force of the country. The unemployment is negative phenomenon of the economy.

Written Premium - It is an important indicator of insurance market. Written premium is the sum of all premiums paid to insurance companies in one year. (Burca - Batrinca, 2014) When we divide insurance into life and non-life insurance, we can divide written premiums that way, too. So, the written premium in life insurance is an important indicator for insurance market and whole economy growth, because, in developing countries is this indicator very low. (Outreville, 1996) When compared written premium in life and non-life insurance, in developing countries in life area are values under 50 %. (Arena, 2008) In the case of market economy, the higher level of development shows the country's economy, the higher value (above 50 %) achieves the written premium in life compared to non-life. (Chen, Lee - Lee, 2012)

Penetration - There are two commonly-used indicators of the importance of insurance in the national economy (or alternatively, the level of insurance protection) – insurance density and insurance penetration. (Bernat - Grundey, 2007)

Insurance penetration is calculated as the ratio of total insurance premiums – or premiums at the market level – to the country's GDP. (Kwon - Wolfron, 2017) It is an important indicator for insurance. It measures the significance of the insurance industry in comparison to country's economic activity. (Bahloul - Bouri, 2016)

Concentration Ratio - As a measure of market concentration different indicators are used. The most commonly used are the Concentration Ratio (CR) and Herfindahl-Hirschman Index (HHI). (Hečkova - Chapčakova, 2011), (Kramaric - Pavic Kitic, 2013), (Sharku - Shehu, 2016) Concentration ratio is a simple measure of industrial concentration and is based on calculation of the size of the market share of m largest firms in the industry. In the example of insurance market it shows the share of gross written premiums that was achieved by the greatest competitors in relation to the total gross written premium that was achieved by the entire insurance industry in the respective year. (Brezina et al., 2012), (Širá, 2013), (Kramaric - Pavic Kitic, 2013)

$$CR_m = \sum_{i=1}^m s_i \quad \text{for } i = 1, 2, \dots, m; m \in \langle 1, n \rangle$$

where: s_i - market share and
m - number of measured firms

It is a simple sum of their market shares, where the number of companies for the calculation may vary depending on the study objective or the total number of companies in the industry. The number often ranges from 3 to 10. E.g. The world know Financial market supervisory authorities such as BaFin in Germany monitors the largest 15 companies, Finma in Switzerland monitors the largest 5 companies, EIOPA collects and publishes data on concentration in the largest 3, 5 and 10 companies. (Kwon - Wolfron, 2017) Bahloul and Bouri (2016) and other authors monitor concentration of 5 biggest insurance companies.

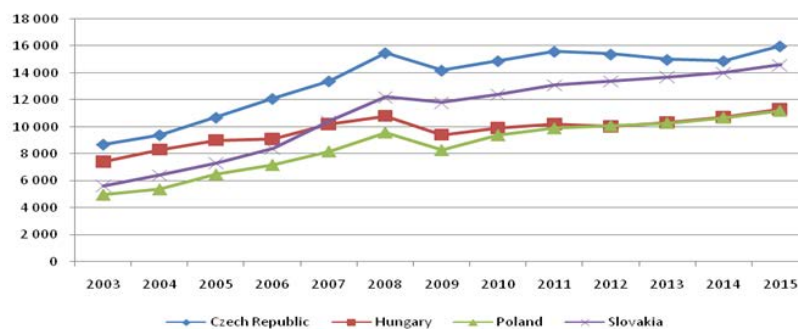
This indicator can take values from the interval $0 \leq CR_n \leq 100$. (Šira - Radvanska, 2014) A lower concentration ratio generally means a higher level of competition in the market or the country. Conversely, a high ratio implies the possible presence of monopolistic competition or oligopoly (a ratio of 100 means full control of the market by the largest companies or the market is probably not privatised). (Kwon - Wolfron, 2017), (Kramaric - Pavic Kitic, 2013).

3 Discussion

Firstly, we have shown the development of some indicators, and secondly, we have analysed the relationships among settled areas.

First of all, we analysed the development of GDP. For better comparison, we choose the values of GDP per capita. As we can see below, the highest values of GDP per capita were obtained for the whole analysed period in the Czech Republic, the lowest values were in Poland. GDP has had in all V4 countries growing tendency. The biggest growth was in the case of the Slovak Republic.

Figure 1 GDP per capita



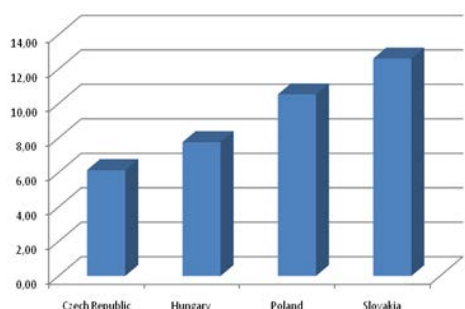
Source: own processing

The second indicator for evaluation of the economy's performance, was unemployment. The unemployment in the

monitored period was a moderately declining, or had steady trend (in the Czech Republic). But when we compare the average

values of this indicator, as mention in Figure 2, we can see, that the highest average values were in case of Slovakia and Poland, both over 10 %. The lowest value of average unemployment was in the Czech Republic, in the amount of 6,15 %.

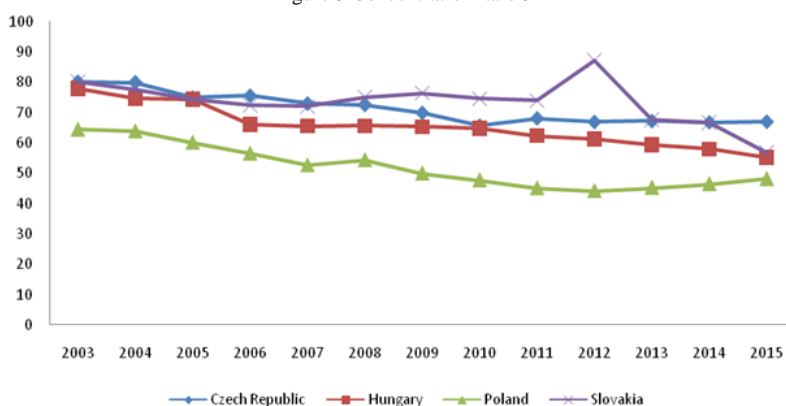
Figure 2 Average unemployment rate in V4 countries, 2003 - 2015



Source: own processing

Typical indicator for insurance and, of course, other industries, is concentration ratio. We calculated Cr₅, that means concentration of 5 biggest insurance companies on the market. Market share of insurance companies was calculated according to amount of total written premium of each insurance company. The development of Cr₅ in V4 countries gained slightly declining trend.

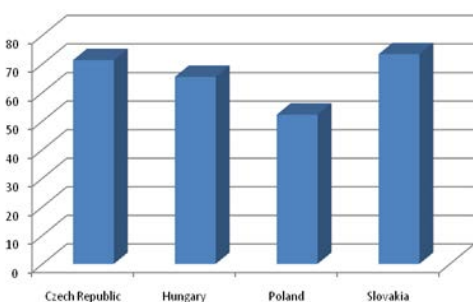
Figure 3 Concentration ratio 5



Source: own processing

Very important finding was, in the average value of that indicator in V4 countries. The average values of concentration in the 2003-2015 shown by Figure 4, show that the Slovak Republic and the Czech Republic has a significantly higher concentration rate than Poland and Hungary.

Figure 4 Average values of Cr₅ in V4 countries



Source: own processing

	0,0811		0,6221**	0,0270	
Poland	0,3626	-0,3358	0,0534	0,0552	-0,3203
Slovak Republic	0,0779	0,5360*	0,8572**	0,3676	0,0520

* the level of significance <0,05

** the level of significance <0,01

In this section we offer the findings from the verification of the relationship among the specified variables. The relationship among the GCI index and the selected markers is monitored primarily through the Kendall coefficient, which describes the linear relationship among the observed variables, with the following results.

Table 1 Linear Correlation of the GCI Index and selected indicators

	UNEM	GDP	WP _{life}	Pen	Cr ₅
Czech Republic	-	0,3842	-0,3159	-	0,2896
Hungary	0,1600	-	-	0,4384	0,5778**

Based on the results from Table 1 we note the linear relationship of the GCI index with the prescribed premium in two countries (Hungary and the Slovak Republic). In the case of Slovakia, a statistically significant linear series correlation with a year-on-year change in GDP was confirmed and, in the case of Hungary, a statistically significant linear market-to-market correlation was confirmed. With the rising value of the GCI index, life insurance premiums are decreasing, and at the same time a year-on-year change in GDP and market concentration in selected countries is rising.

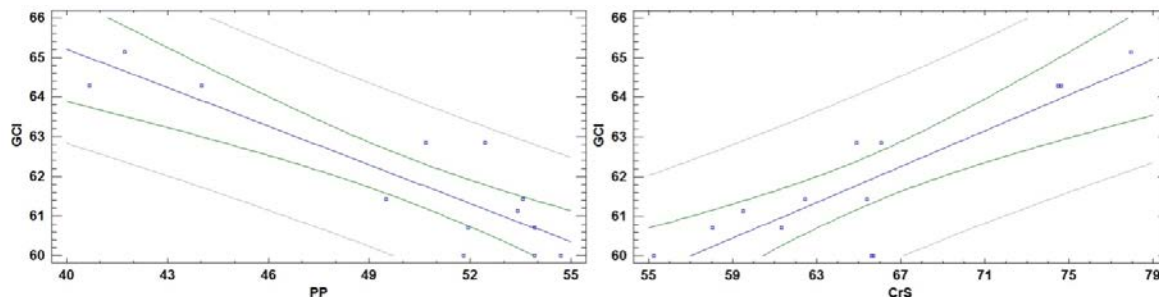
The above-identified statistically significant relationships are subsequently described using a simple regression analysis method, the results of which are captured by the following graphs.

The relation between the GCI index and the written premium in life insurance, respectively market concentration in Hungary can be described by these simple models

$$GCI = 78,1762 - 0,324166 * WP_{life},$$

$$GCI = 47,1591 + 0,22529 * Cr_5,$$

whose strengths, respectively the quality, expressed by the coefficient of determination ($R^2_{WP_{life}} = 0,7686$; $R^2_{Cr_5} = 0,7166$) pointing to the high impact of other factors.

Figure 5 Regression model $GCI \times WP_{life}$ a $GCI \times CrS$ in Hungary

Source: own processing

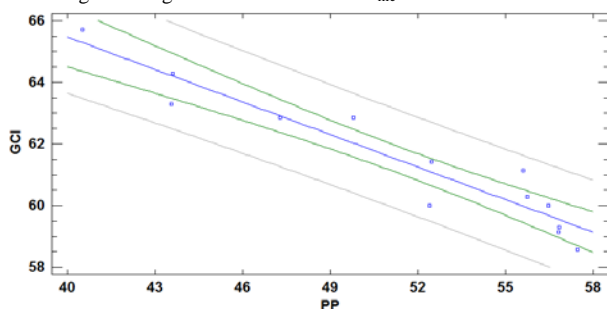
Note: PP - written premium in life insurance

In Slovakia, the relationship between GCI and year-to-year change in GDP and premiums written is monitored. These relationships can be described as

$$GCI = 60,0695 + 0,328465 * WP_{life}, \text{ respectively}$$

$$GCI = 79,5477 - 0,35187 * WP_{life}$$

While the power of the first model is very low ($R^2_{GDP} = 0,3447$), the second model allows the relationship of these variables to be considered as statistically significant ($R^2_{WP_{life}} = 0,9047$).

Figure 6 Regression model $GCI \times WP_{life}$ in Slovakia

Source: own processing

Note: PP - written premium in life insurance.

4 Conclusions

Although the development of the country's insurance market is linked to the growth of the economy, as we have seen on the development of selected indicators, we cannot confirm our thesis about the impact of the insurance market's development on the competitiveness of the country.

Based on the above results, we can state that the assessment of the competitiveness of the V4 countries is not determined by the development of the insurance market and the development of the economy expressed by the individual indicators. An exception is the relationship between the GCI index and the premium written in Slovakia, which makes it possible to assume that the development of the insurance market determines the country's performance in assessing its competitiveness.

This article may enrich our knowledge and provide scope for further exploration in this area in the future.

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Primary Paper Section: A

Secondary Paper Section: AH, AE

COMPARISON OF DEMOGRAPHIC INDICATORS IN THE CZECH REPUBLIC AND THE SLOVAK REPUBLIC AND THEIR INTERCONNECTION WITH THE LABOR MARKET

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Abstract: When it comes to the development of society, it speaks of its demographic structure. It has a large impact on the population living in their age distribution, fertility and birth rates, mortality, gender distribution, education, and various other demographic indicators. These have a direct interconnection on the labor market and its indicators. One of the problems are predicted statistics that predict that the structure of the demographic composition of the population will continue to change and population inflows into the post-productive age and the decline in the working-age population. Another problem is the migration of productive population abroad, and increasing the gap of missing the work force.

Keywords: Czech Republic, demography, labor market, sectors of national economy Slovakia

1 Introduction

Continuous changes in society development are a natural act caused by several factors. The most important factors inducing changes within society are, particularly, demographic development influenced not only by natural movement of the population, the political organization of the state, the educational level of the population, the level of innovation and the level of social and health security directly affecting the quality of life.

In recent years, unfavorable demographic development has often been spoken of, as one of main causes of the aging problem and its connection with the labor market. Worldwide differences in social, economic and population development have been increasing. Differences in development could be seen also in the two chosen countries, the Czech and Slovak Republic which until 1993 were parts of the Czechoslovak Republic.

This paper offers a comprehensive view on the development of demographic indicators in the Czech and Slovak Republic. Based on analyzes of demographic indicators, we would like to point at the prediction of the situation in the labor market, especially in terms of the predispositions of both countries. Via this paper we will point mainly to the ability to adapt state-supplied services not only to current, but also to future needs of their citizens.

2 Theoretical Background

The problem of demographic development and its connection with the labor market is currently the main theme of an increasing number of authors who confirm this to be a globally dangerous phenomenon due to its topicality and seriousness.

Continuous changes in the demographic structure of the population are a natural part of social development. These changes negatively influence the policy of employment (Strunz, Vojtovič, 2014)

The Czech and Slovak Republics are, by their territorial assumptions as well as their economic structure focused mainly on the primary and secondary sector of the national economy. These countries could be considered as rural landscapes, regarding their administrative, territorial, and demographic point of view. In addition to the primary and secondary sector, the national economy as a historically established set of economic subjects and economic relations, is divided into the tertiary and

quaternary sector. Primary sector of the national economy includes agriculture, forestry, and mining. A lot of activities of secondary sector include activities in processing industry. Territorial and quaternary sector are defined as sectors of services, while the quaternary sector includes education, research, science, or medicine activities (Vincúr, 2001).

The current trends in demographic development in the Slovak Republic are manifested in the form of slight population growth but also in population aging (Benkovičová, 2009).

Aging is a global demographic process that results from the previous economic and social development of the society (Vojtovič, Krajňáková, 2016).

The social trend of population aging suggests that, currently, the most numerous part of the population in these countries is formed by the citizens of the 55+ age group. If this problem is connected to the decline in birth rate or to migration, we will need to think about who will be working, if this subject leaves the labor market. With dominance of aging (as a component of labor market) and its necessity, we consider them a risky and most endangered group despite its stability, long-term work experiences or willingness to work for lower wage rates (Krajňáková, Vojtovič, 2017).

Demography is also associated with migration. It is a worldwide phenomenon, which is observable also in Czech and Slovak conditions. The migration of working-age people is an increasing problem for many countries. One of the most serious problems related to migration is the emigration of students who leave for foreign schools. These students (graduates) mostly stay living abroad also at their working-age, which means that the home country loses potential of creators of values (Grenčíková, Španková, 2016).

On the other hand, foreign migration experts in the V4 countries, which include both the Czech and Slovak Republic, think that the improvement in social and economic situation of these countries, especially in labor market, makes these countries more interesting for immigrants from other countries (Skibiński, Rączaszek, 2017). These immigrants could slowly fill the gap on the labor market which was caused mainly by the demographic development of society.

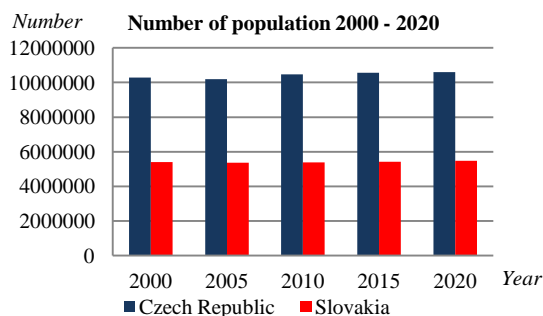
In addition to the negative demographic trends in both countries we must speak also about negative trend in labor market related to relatively high unemployment rate, which is one of the most serious problems of the current economy (Krajčo, 2014).

3. Comparison of demographic indicators in the Czech Republic and the Slovak Republic and their interconnection with the labor market

The current situation in labor market is undoubtedly a reflection of the political and socio-economic situation. The next part of the paper will focus on the comprehensive assessment of current demographic trends in Czech and Slovak republic related to conditions and position of employees on the labor market.

Figure 1 interprets the population development of the countries from 2000 to 2020. Both analyzed countries have had a slight increase in population over the period under review. Similarly, this trend should continue until 2020. In the Czech Republic, population should increase by 241 734 inhabitants in 2020, compared to the beginning of the monitored period. In the Slovak Republic there should be an increase of 189 963 inhabitants at the same period.

Figure 1: Population development of Czech Republic and Slovakia from year 2000 to year 2015 and prognosis for 2020

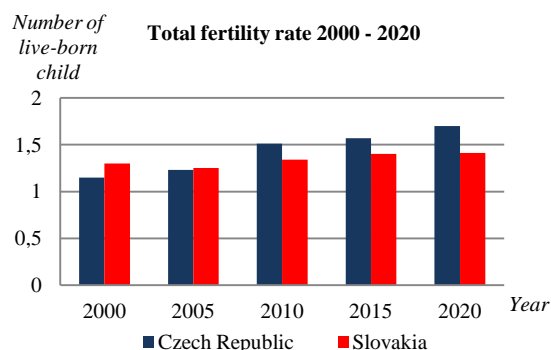


Source: own work of authors based on Eurostat data

Fertility in each of the countries is also an important demographic indicator. In most industrialized countries declining in fertility rates is the main reason for aging populations. (Fougere, Merette, 1999) We have selected fertility rates for the total fertility rate (Figure 2), which represents the average number of live births per one woman throughout her reproduction period, while maintaining the fertility level of the reference year and assuming zero mortality. (Megyesi, Bačo, Poništ, 2012)

Based on the above data, it can be stated that the development of total fertility is volatile, but in the current period but also within the forecasts it is possible to expect an increase.

Figure 2: Total fertility rate of Czech Republic and Slovakia from year 2000 to year 2015 and prognosis for 2020



Source: own work of authors based on Eurostat data

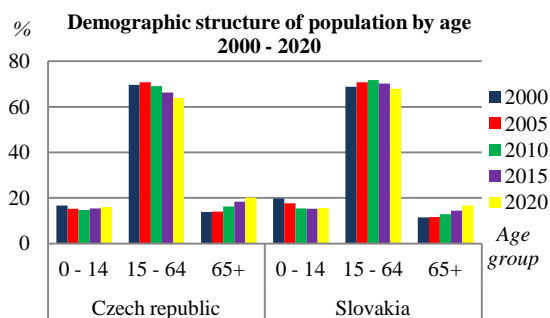
It is very important to know the structure of the population of the state: the percentage of the population in the pre-productive age (0-14 years of life), productive age (15-64 years of life) and post-productive age (65+ years of life).

The changes within the structure of the population in the Czech Republic and Slovakia can be seen in Figure 3. It also includes the calculated forecasts from the Eurostat database for the 2020.

Both monitored countries link the trend of a gradual decline in the number of productive inhabitants, a more pronounced increase in the number of post-productive populations and a decrease in the number of pre-productive populations.

This phenomenon defines the first problem, namely that the total number of the economically inactive population reaches almost the same value as the total number of the economically active population, which ultimately poses a serious threat to the economy linked to the absence of labor force.

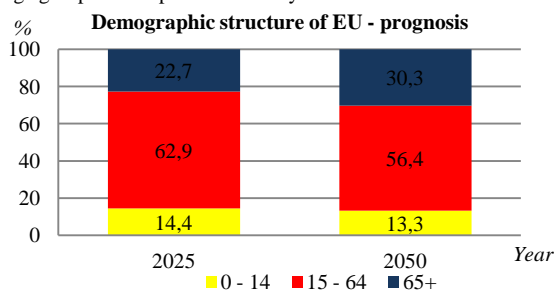
Figure 3: Development of demographic structure of population by age group of Czech Republic and Slovakia from year 2000 to year 2015 and prognosis for 2020



Source: own work of authors based on Eurostat data

The aging of the population is not a problem only in the Czech Republic and the Slovak Republic but also throughout the European Union. According to the prognosis of United Nations World Population Prospects (Figure 4), post-productive population should become the fastest growing age group. It is necessary to reflect on how these changes in the structure of the population should be linked to the ever-changing conditions in the labor market.

Figure 4: Prognosis of demographic structure of population by age group of European union for years 2025 and 2050



Source: own work of authors based on United Nations World Population Prospects

The labor market situation determines demographic indicators. Based on the data obtained from the statistical databases, we have created a table of indicators in Table 1 to reflect the level of economic burden. To calculate these indicators (Mládek, 2006) we used the following formulas:

$$\text{Economic dependency ratio} = \frac{\text{Pre-productive age group (0-14)} + \text{Post-productive age group (65+)}}{\text{Productive age group (15-64)}} * 100 \quad (1)$$

$$\text{Young age dependency ratio} = \frac{\text{Pre-productive age group (0-14)}}{\text{Productive age group}} * 100 \quad (2)$$

$$\text{Old age dependency ratio} = \frac{\text{Post-productive age group (65+)}}{\text{Productive age group (15-64)}} * 100 \quad (3)$$

The first monitored index was the Economic dependency ratio. The highest value of this index was in the Czech Republic in 2015. The prognosis shows that this should increase more. The value of this index points to the ratio of the economic burden of the economically active population. In the Czech Republic, this index reached 50.8 in 2015, representing approximately 51 productive inhabitants, working as if 100 people worked. In Slovakia, this index is significantly lower, creating a positive image for the future.

Young age dependency ratio and Old age dependency ratio are the other two monitored indexes. By comparing the two analyzed countries, it can be argued that the Slovak Republic, despite the increase in both indexes of dependency, have more favorable result than the Czech Republic.

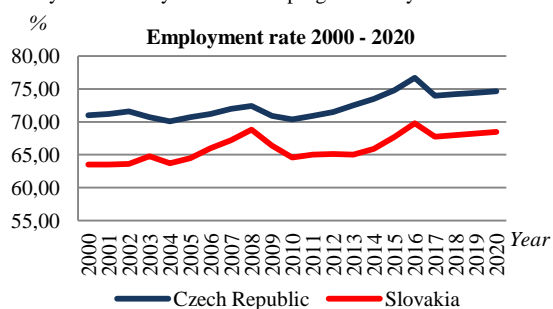
Table 1 Economic dependency ratio, Young age dependency ratio and Old age dependency ratio of Czech Republic and Slovakia from year 2000 to year 2015 and prognosis for 2020

Index	Country	2000	2005	2010	2015	2020
Economic dependency ratio	Czech republic	43,7	41,2	44,7	50,8	56,5
	Slovakia	45,3	41,2	39,3	42,3	47,3
Young age dependency ratio	Czech republic	23,9	21,5	21,3	23,2	25,0
	Slovakia	28,8	24,9	21,4	21,8	22,8
Old age dependency ratio	Czech republic	19,8	19,8	23,4	27,6	31,5
	Slovakia	16,6	16,4	17,8	20,5	24,4

Source: own calculation of authors based on Eurostat data

Figure 5 illustrates the progress and development of employment rates in the Czech Republic and in the Slovak Republic. This indicator has been monitored since 2000 with forecasts from 2017 to 2020. The indicators show that the employment rate in individual countries is very fluctuating. However, the forecast indicates a slight increase in employment compared to the current situation. It is also obvious that the employment rate in the Czech Republic is higher than that of the Slovak Republic.

Figure 5: Employment rate of Czech Republic and Slovakia from year 2000 to year 2016 and prognosis for years 2017 - 2020

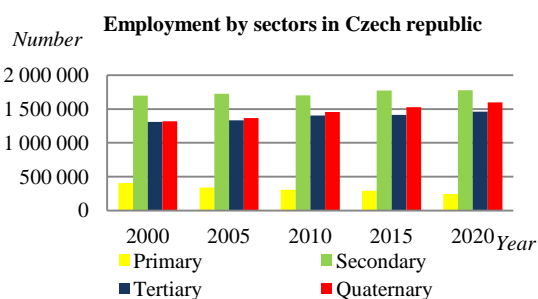


Source: own work of authors based on Eurostat data

Observing the development of the employment rate indicator, it is also necessary to monitor its sectoral distribution.

Figure 6 reflects the overview of the employment in sectors in the Czech Republic, together with the forecast for 2020. It can be seen from this picture that the dominant sector in the labor market is the secondary sector starting with industry. On the contrary, the primary sector is the least dominant sector in the Czech Republic, despite its assumption.

Figure 6: Employment by sectors of national economy in Czech Republic from year 2000 to year 2015 and prognosis for 2020



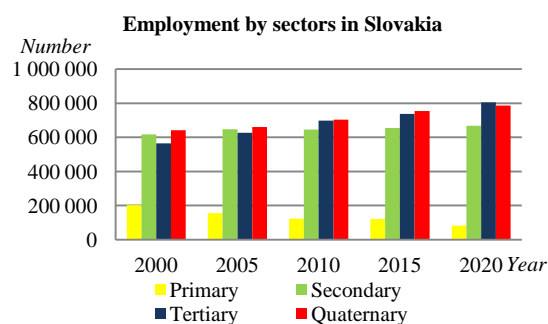
Source: own work of authors based on Czech statistical office

Regarding the development of sectoral employment in the Czech Republic, there is a gradual decline in employment in the primary sector and, on the contrary, a marked increase in employment in the secondary and tertiary sectors. From the perspective of forecasts, by 2020, there should be no significant change in sectoral employment, except for further employment

growth in the secondary and quaternary sectors, coupled with decrease in employment in the primary sector.

The development of employment by sectors in the Slovak Republic with a forecast for 2020 is processed in Figure 7. Looking at the scheme, as in the Czech Republic, we can observe the gradual reduction of the number of jobs in the primary sector of the national economy, while the secondary sector and the quaternary sector have an ever-increasing trend. The tertiary sector of the national economy, which includes of trade and services, maintains a relatively stable position. In terms of the forecast for 2020, Slovakia as well as the Czech Republic will achieve employment growth in the secondary and quaternary sectors of the national economy; on the contrary, in the primary sector, employment and therefore the number of employees should decrease again.

Figure 7: Employment by sectors of national economy in Slovakia from year 2000 to year 2015 and prognosis for 2020

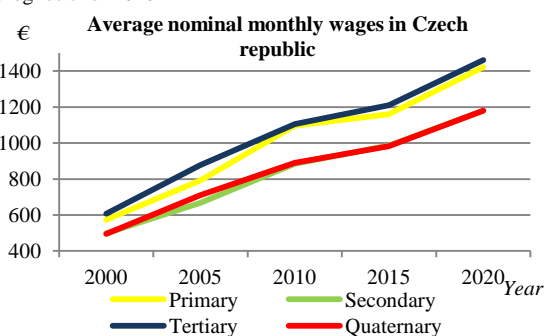


Source: own work of authors based on Statistical office of the Slovak republic

Another observed indicator in the sectors of the national economy is the average nominal monthly wages in the Czech Republic (Figure 8) and the Slovak Republic (Figure 9).

Development of average nominal monthly wages in the Czech Republic represent a gradual increase in income in all sectors of the national economy, with the highest average wage in the Czech Republic being in the tertiary sector, currently at the level of €1,250, while the lowest average nominal monthly wages is achieved by employees working in the quaternary sector; their average wage currently represents €850. From the perspective of the forecasts for 2020, the scheme indicates a sharp increase in revenues in all sectors of the Czech economy.

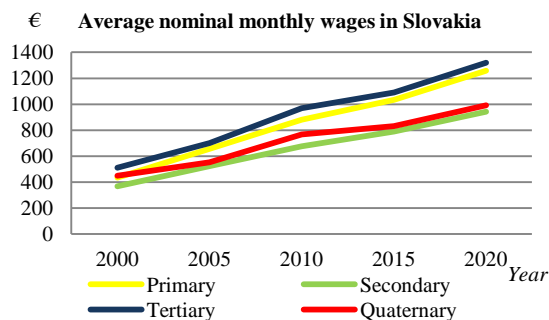
Figure 8: Average nominal monthly wages by sectors of national economy in Czech Republic from year 2000 to year 2015 and prognosis for 2020



Source: own work of authors based on Czech statistical office

Similarly, as in the Czech Republic, the level of wages achieved in Slovakia is increasing and this trend should continue until 2020. The highest level of income earned in Slovakia is achieved by workers in the tertiary sector, while the lowest level of income is achieved by the employed population in the secondary sector.

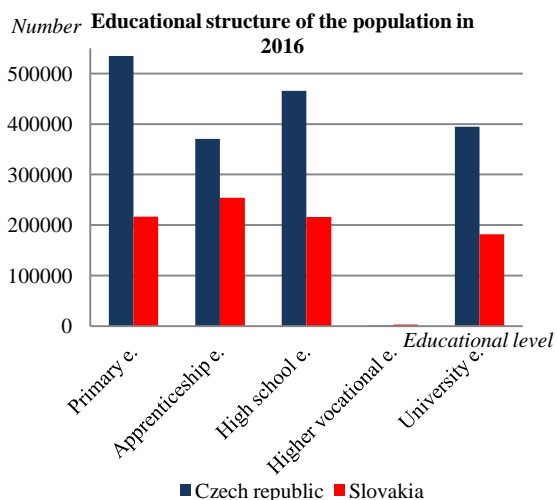
Figure 9: Average nominal monthly wages by sectors of national economy in Slovakia from year 2000 to year 2015 and prognosis for 2020



Source: own work of authors based on Statistical office of the Slovak republic

Between demography and the labor market is certainly linked to the educational structure of the population. We, therefore, processed the number of graduates in each degree of education in Figure 10. In the Czech Republic, the number of people with primary education prevails, while the number of graduates in higher vocational education in the Czech Republic is negligible. In the Slovak Republic, the number of people with the completed apprenticeship prevails. As in the Czech Republic, the number of citizens with higher vocational education is negligible.

Figure 10: Educational structure of the population of the Czech Republic and Slovakia in 2016



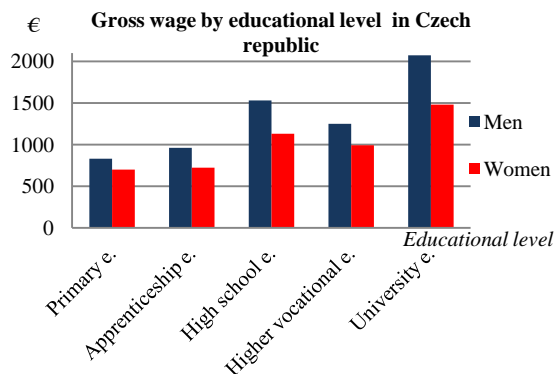
Source: own work of authors based on Statistical office of the Slovak republic and Czech statistical office

From the available data, we calculated the education index. The Education Index is calculated from the Mean years of schooling index and the Expected years of schooling index. (Human Development Reports, 2017) The education index of the monitored countries is 0.866 for the Czech Republic and 0.802 for the Slovak Republic.

As well as in the national economy also at the educational level, we have processed gross wage figures for the Czech Republic (Figure 11) and for the Slovakia (Figure 12).

From a general point of view, it can be stated that in the Czech Republic men are the better-paid employees than women. Under the conditions of the Czech Republic, the best wage valuation is obtained by graduates with the university education, while the lowest wage score is achieved by employees who are graduates with the primary education and with the apprenticeship education.

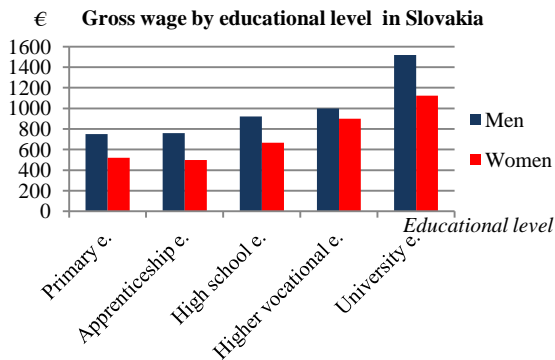
Figure 11 Gross wage by educational level in the Czech Republic in 2016 in €



Source: own work of authors based on Czech statistical office

Based on the statistical data obtained, men belong to the highest salaried workers unlike women, not only in the Czech Republic but also in the Slovak Republic. The highest wage rate for men in the Slovak Republic is achieved by university graduates, while the lowest wage score is reached by men with the highest level of education attained by the primary education. The highest wage for women in the Slovak Republic is achieved by university graduates as it is with men. The lowest wage evaluation is achieved by graduates with apprenticeship education.

Figure 12 Gross wage by educational level in Slovakia in 2016 in €



Source: own work of authors based on Statistical office of the Slovak republic

To assess the dynamics of structural changes in the labor market from a sectoral point of view, we chose the shift - share analysis method - the analysis of structural changes. The structural change analysis method can extract the competitive position of the regions from the economic context and points to the dynamics of the development or the lagging behind of the individual sectors of the national economy in the given region, at the national average, over a given period of time. The purpose of applying this method is therefore to assess the structural changes in the different sectors and countries in the period from 2000 to 2020, which is a forecast year.

When applying the method of structural change analysis, we implied measurement through the competitiveness effect, which shows whether in the given region, in our case in the country, the average change in employment for each sector of the national economy was higher than the average change in employment for the same sectors in both Czech and Slovak Republic.

Competitiveness Effect has the formula:

$$DIF = \sum_{E_{r0}}^{E_{r1}} * \left(\frac{E_{r1}}{E_{r0}} - \frac{E_{n1}}{E_{n0}} \right) \tag{4}$$

Table 2 interprets the results of the structural change analysis in the Czech Republic and in the Slovak Republic.

Table 2: Results of shift-share analysis

	Czech republic	Slovakia
Primary sector	-0,0099	-0,0233
Secondary sector	0,0042	0,0099
Tertiary sector	0,0325	0,0758
Quaternary sector	0,0009	0,0021

Source: own calculation of authors based on Statistical office of the Slovak republic and Czech statistical office

In the Czech Republic, the average change in employment in the primary sector was lower than the average change in employment of the sector in both the Czech Republic and the Slovak Republic. Similar changes occurred in the Slovak Republic, where the average change in employment in the primary sector was lower than the average change in employment in both countries in aggregate. This phenomenon arises by a persistent drop in the number of workers in the primary sector. In the end, employment decline in individual sectors of the national economy can only be seen as a decline in jobs in the primary sector only.

Concerning employment in other sectors of the national economy, there have been less significant changes, but have been reflected in employment growth. In the tertiary sector, the average employment rate has risen to the highest. This phenomenon can be explained by the fact that the sectors of the tertiary sector are the leading industries in the Czech and Slovak Republics providing the largest number of jobs. We also designate them as competitive industries. If we were to return to the primary sector, there was a significant reduction in employment, which naturally also indicates the loss of competitiveness of sectors such as agriculture and forestry that belong to this sector.

The shift-share analysis results suggest that countries such as the Czech Republic and the Slovak Republic with their potential for the primary sector change their orientation towards the tertiary and quaternary sectors where the so-called soft sectors - trade and services. In this sense, it will be very interesting to look at the changes that occur in the field of income generation as it is obvious that the lower-wage sector's primary sector produces lower wages. The decline in the labor force in the primary sector can be explained differently, whether in view of the shortage of workers in the labor market in general, in terms of their qualifications or in terms of the demanding and wage valuation of their work. Of course, this phenomenon may have several reasons that are not directly related to the labor market, but to the EU's common agricultural policy or to the protection of the environment.

Wage or income is one of the key factors in the labor market, which affects many others, not only economic and demographic indicators. The existence of income inequality is a common occurrence in every society.

The need to measure income inequality in comparison of labor market disparities results from the assessment of the level of income achieved by employees in individual sectors of the national economy in the Czech and Slovak Republics. Due to current demographic trends such as population aging, gradual increase in employment, educational attainment, or economic burden, there are changes affecting the overall quality of life of individuals. One of the basic indicators of quality of life is income. Previous surveys show that the pensions of the population of the Czech Republic and the Slovak Republic are gradually rising, reaching the maximum by 2020. Another very important factor in the changes in the labor market is the change in sectoral employment and the shift of employees from lower salaries to higher. Sectoral employment changes arise from gradual job liberalization due to demographic trends, such as migration, retirement age, but also economic trends such as increasing demands for living standards or innovations.

To measure income differentiation, we chose the Gini coefficient method.

$$G = \frac{\sum_{i=1}^Y [M_i(h) - M_i(d)] * k_{(p_i)} * [1 - k_{(p_i)}]}{\sum_{i=1}^{Y-1} [M_i(h) - M_i(d)] * [1 - k_{(p_i)}]} \quad (5)$$

The coefficient ranges from 0 to 1, with the value 0 representing absolute equality in the breakdown of pensions, and vice versa, the value of the coefficient approximating to 1 represents an increase in inequality in the distribution of income. The purpose of applying this method is to point out the income gaps achieved in individual sectors of the national economy.

Based on the above results, Table 3 shows that income inequality is relatively low, but has been growing steadily since 2000, reaching almost 0.29 in both countries by 2020. This means that, by 2020, the disparities in earnings should be gradually worsened.

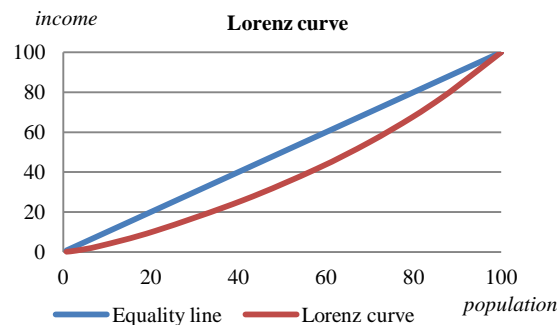
Table 3 Gini coefficient in Czech Republic and Slovakia

	2000	2020
Czech republic	0,239	0,289
Slovakia	0,248	0,284

Source: own calculation of authors based on Statistical office of the Slovak republic and Czech statistical office

The Lorenz curve points to the fact that the 70% of population of Czech Republic and Slovakia own together 50% of the total state wealth. (Figure 13).

Graf 13 Lorenz curve of Czech Republic and Slovakia



Source: own calculation of authors based on Statistical office of the Slovak republic and Czech statistical office

3 Conclusion

One of the biggest problems that can be encountered on the labor market in the Czech Republic and the Slovak Republic is the lack of workforce. The number of employers facing this shortage is unstoppable. We can now argue with certainty that this negative trend will cause cracks in all branches of the national economy by constantly deepening it. Fewer and fewer job seekers will respond to job offers, which will put pressure on wage increases. Potential rescue for this unfavorable situation may be, for example, "labor migration", but it still does not have to eliminate the damage caused by unfavorable demographic developments. It is also necessary to consider voluntary unemployment, changes in sectoral employment, the development of wages in individual sectors of the national economy, permanent emigration, or a rapid increase in university graduates. Given the potential of these countries, we pose the greatest threat to the primary and secondary sectors.

An increase in the number of post-productive populations from the total population will cause a significant drop in the labor force accompanied by an increase in average age, resulting in a sharp increase in the economic burden on the population. Thus, an economically active resident will be increasingly economically inactive. A major problem will also be the increase in the number and share of older people in the economically active population. These will need to be considered, especially in

matters of economic governance and social security and healthcare.

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Primary Paper Section: A

Secondary Paper Section: AH, AO

THE IMPACT OF POLICY MIX INSTRUMENTS ON THE EURO AREA ECONOMY IN LOW INTEREST RATES ENVIRONMENT

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Acknowledgement: This work was supported by the Polish Ministry of Science and Higher Education through research project for Young Researchers under the contract no. B1711200001674.02.

Abstract: The aim of the article is to examine the relationship between instruments of policy mix and selected economic variables in the euro area economy with regard to low interest rates. Moreover, the article verifies the hypothesis that policy mix instruments exerted a statistically significant impact on the euro area economy between 1999-2016. The research methods include a review of the relevant scientific literature and statistical analysis methods. The analysis is original as it emphasizes the importance of proper monetary and fiscal policies and reveals their growing significance for economic processes.

Keywords: policy mix, euro area, interest rate, monetary policy, fiscal policy.

1 Introduction

Monetary and fiscal policy to a great extent affect the economy of a given country. Decisions made by economic authorities influence each other, which is also reflected in the values of macroeconomic ratios. Economic literature defines a notion of *policy mix* as a combination of fiscal and monetary policy. A significant impact of *policy mix* on the economy was described, among others, by M. Buti and A. Sapir¹ as well as by R. Clarida, J. Gali, M. Gertler² or D.K. Foley, K. Shell, M. Sidrauski.³ Furthermore, the issue of policy-mix was discussed by R. Beetsma and X. Debrun⁴, L. Onorante⁵, A. Hughes Hallet, P. Mooslechner, M. Schuerz⁶ and others.

For central banks, interest rates are an instrument with which they shape the behavior of economic agents and consumers and regulate money supply, the supply and demand for loans, and the general economic situation. The extent to which interest rates can influence the economy depends on many factors, mainly on the lag with which the economy reacts to interest rate adjustments, economic slowdowns and financial crises. The recent financial crisis has had a particularly strong effect on economic variables, reflected in the levels of variables determined by monetary policy. In turn, an instrument of government fiscal policy that is the most frequently mentioned is budget deficit that to some extent affects, among others, GDP growth and inflation. Hence, while talking about the economic policy coordination of central bank and government activities is connected with consistent application of instruments of monetary and fiscal policy so that assumed objectives could be met. According to that approach a notion of coordination was formulated by W. Nordhaus⁷ who claimed that coordinated macroeconomic policy is observed when central banks interest rates adjust appropriately so that effects of fiscal policy can be neutralized. Therefore, the aim of the paper is to examine the relationship between policy mix instruments and selected economic variables in the euro area economy with regard to low interest rates. Moreover, the article verifies the hypothesis that policy mix instruments exerted a statistically significant impact on the euro area economy between 1999-2016.

2 Monetary and fiscal policy in low interest rates environment and the Eurozone economy

According to J. Skrzypczyńska, the core of the coordination of monetary and fiscal policy (policy mix) is based on the combination of the both policies to enable to achieve goals related to price stability and economic growth and employment.⁸ P. Jacquet, J. Pisani-Ferry emphasize the importance of coordination of monetary and fiscal policies exemplifying the Eurozone. They claim that in reality a national fiscal policy and structural policy influence an average level of inflation in a given country and thus the decisions of fiscal authorities of the member states may affect the decision of a central bank related to common monetary policy in the euro area.⁹ It should be stressed that the liberty of national authorities at conducting fiscal policy was limited by the rules of the Maastricht Treaty. Hence it seems that desirable coordination of fiscal and monetary policy is not easy achievable in the process of pursuing financial stability.¹⁰

I. Woroniecka – Leciejewicz conducted an analysis of balance in the monetary-fiscal game emphasizing priorities of the central bank and government in conducting macroeconomic policy. It has been assumed that central bank strives to minimize inflation, whereas government wants to maximize a real economic growth while taking into consideration an impact of budget deficit on GDP growth. These studies indicated that economic authorities try to implement their dominant strategies i.e. to choose a restrictive monetary policy and expansive fiscal policy or both restrictive policies.¹¹

Woroniecka –Leciejewicz expanded the research by studying the interactions between the decisions of the monetary and fiscal authorities and their mutual conditioning using a simulation study based on a fiscal-monetary game, in which fiscal and monetary policy strategies varied regarding restrictiveness and expansionism. The game was carried out assuming that an increasing interest rate slows down, *ceteris paribus*, the rate of economic growth and reduces inflation, and that an expanding budget deficit pushes, *ceteris paribus*, inflation upwards. It was also assumed that an expanding budget deficit improves, *ceteris paribus*, the rate of GDP growth. Two cases were considered, in one of which the monetary authorities sought to minimize inflation and the fiscal authorities maximize GDP growth, and in the other the monetary and fiscal authorities pursued their own goals defined, respectively, by the inflation target and the GDP growth rate. A logistic function used to determine how economic growth and inflation were related to the fiscal and monetary policy instruments showed an increasingly restrictive monetary policy to have a limited potential for reducing inflation, likewise increasingly expansionary fiscal policy for stimulating economic growth. The study showed that the contribution of a fiscal instrument (budget deficit) to a higher rate of GDP growth represented by an increasing logarithmic function grows until the instrument reaches a certain level. Like an increasingly expansionary fiscal policy has a dampening effect on the simulation of economic growth, an increasingly restrictive fiscal policy has limited potential for improving the production growth rate. A similar situation is observed regarding the impact of the budget deficit on inflation. Moreover, as the interest rate increases the rate of GDP growth decreases from maximal when the monetary policy is extremely expansionary to minimal when

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¹⁰ SKRZYPCZYŃSKA J.: Koordynacja ..., op. cit.

¹¹ WORONIECKA – LECIEJEWICZ I.: Analiza policy-mix z uwzględnieniem interakcji decyzyjnych między bankiem centralnym a rządem i ich priorytetów, Zeszyty Naukowe Wydziału Informatycznych Technik Zarządzania Wyższej Szkoły Informatyki Stosowanej i Zarządzania „Współczesne Problemy Zarządzania” No. 1, 2011, 39 – 60 pp.

the interest rate becomes extremely high. Analogously, as the interest rate increases, inflation falls from extremely high when the monetary policy is extremely expansionary to extremely low when the policy becomes extremely restrictive.¹²

In the euro area policy-mix is based on the common monetary policy for all members of the Monetary and Economic Union (EMU) and national fiscal policies. Here, we should refer to the results of analyses conducted by C. Badarau and G. Leveuige who concentrated on studies of policy-mix suitable to the monetary union in a context of financial heterogeneity. Using dynamic, stochastic general equilibrium model (DSGE), they came to several conclusions. First of all, they have ascertained that centralized monetary policy was more advantageous for the monetary union than alternative national monetary policies. Also, they have found that national budget policies can mitigate cyclical divergences. Nevertheless, the analysis of various cases of policy-mix shows the certain advantage of the common budget and it allows better stability of price divergence in EMU.¹³

In the case when the economic authorities are unwilling to cooperate with each other, the Nash equation generates higher levels of inflation and lower levels of production compared with the best solution achievable under the given circumstances (but still not optimal, because of the disturbances caused by the fiscal policy). The reason for this is a mismatch between the central bank seeking to reduce production and inflation below levels set by the government and the government pursuing a fiscal policy increasing inflation and production above levels defined by the central bank. This is a case of an inflationary fiscal policy partly offset by the monetary policy.¹⁴

A fiscal policy may influence inflation (based on the Fiscal Theory of the Price Level (FTPL) developed by Woodford¹⁵ and modified by other authors), because when the debt is high a temptation arises to reduce its real value by increasing inflation rather than taxes. In the case of the aforementioned 'fiscal domination', a disparity between the monetary and fiscal policy goals may significantly weaken the central bank's position thus leading to higher inflation.¹⁶

From the perspective of the monetary and fiscal game, inflation and economic growth are the lowest in an environment characterized by a combination of extremely restrictive monetary and fiscal policies. A monetary policy that is becoming more and more expansionary (successive cuts in interest rates) increases inflation and the rate of GDP growth. On the other hand, an increasingly expansionary fiscal policy (expanding the budget deficit) pushes up inflation and the rate of GDP growth. The highest rates of inflation and GDP growth are observed in countries the economic authorities of which have chosen extremely expansionary monetary and fiscal policies. I. Woroniecka-Leciejewicz noted that the restrictiveness of a monetary policy depends on the government's fiscal policy. To prevent inflation from rising too high, the central bank tightens up monetary policy as the government makes its fiscal policy more expansionary. On the other hand, the central bank's monetary policy has influence on how restrictive or expansionary policy will be pursued by the fiscal authorities. An increasingly restrictive monetary policy leads to a more expansionary fiscal policy, because a higher interest rate

environment requires a more pro-growth fiscal policy to boost economic growth, which usually increases the budget deficit.¹⁷

In considering the issue of coordination between monetary policy and fiscal policy, or a lack of it, one has to take account of the so-called zero lower bound on nominal interest rates, also known as a zero-bound (ZLB) problem. The problem basically is that nominal interest rates cannot drop below zero. Many economists argue that a near-zero interest rate encourages fiscal stimulation that certainly has influence on the type of decisions made by the central bank.

In an economy with zero-bound interest rates, the monetary policy effectiveness can be blunted by the liquidity trap, which emerges when the monetary policy is unable to stimulate demand because interest rates cannot be reduced any lower.¹⁸ Studies on fiscal policy effectiveness under zero-bound interest rates conducted in many countries show that the zero-lower bound interest rates make fiscal expansion more effective, particularly in economies pursuing an accommodative monetary policy (maintaining low interest rates). A. Szymańska argues that fiscal policy is more effective during recession than in a period of stable growth, because recession tends to be accompanied by low interest rates.¹⁹ According to L.H. Summers, the main reason why fiscal policy outperforms monetary policy during a crisis is that its instruments stimulate the economy faster and more efficiently.²⁰ The most recent crisis of 2008 caused many national governments to relax fiscal discipline, as the monetary policy they had pursued so far failed to deliver the desired results in a low-interest rate environment. The discretionary fiscal policies they formulated to handle the crisis impacts included fiscal packages, which were designed to rebalance financial systems and increase total demand in the economy.²¹

A.Rzońca has stated that a zero-bound interest rate is supportive of fiscal stimulation²², because it creates conditions for the government to run a substantial budget deficit by reducing the cost of borrowing, etc.²³ He also argues that a zero-bound interest rate policy can make production factors less productive and reduce total demand. Low interest rates have a negative effect on the rate of productivity growth in the long term, mainly because they contribute to a lower rate of economic restructuring and limit borrowing opportunities available to new organizations and new projects. The financial sector's uncertainty as to the likely course of events in an economy operating zero-bound interest rates also reduces total demand, discouraging the use of some entities' savings to fund the expenditures of others. A low rate of growth usually leads to problems with reducing the general government deficit, which frequently follows a financial crisis. In most cases, a zero-bound interest rate contributes to a larger deficit, because it makes the central bank appear not to be able to stimulate total demand and eliminates the risk of a crowding-out effect.²⁴ According to P. Cizkowicz and A. Rzońca, a financial crisis lessens the influence of interest rate reduction on total demand, because it involves a falling natural interest rate and stronger frictions in financial markets. The authors also maintain that in the aftermath of the burst of the

¹² WORONIECKA – LECIEJEWICZ I.: Problem wyboru polityki – mix w grze fiskalno-monetarnej z zastosowaniem funkcji logistycznej, „Studia i Materiały Informatyki Stosowanej”, Vol. 4, No. 8, 2013, 29 – 38 pp.

¹³ BADARAU C., LEVEUIGE G.: Which policy-mix to mitigate the effects of financial heterogeneity in a monetary union?, “LAREFI Working Paper” No. CR11-EFI/09, 2011, 2 – 3 pp.

¹⁴ DIXIT A., LAMBERTINI L.: Interactions of Commitment and Discretion in Monetary and Fiscal Policies, Princeton University, 2003; KUTTNER K. N.: Kombinacja (policy mix) polityki pieniężnej i fiskalnej z perspektywy amerykańskiej, XXII Konferencja Naukowa NBP, Reformy strukturalne a polityka pieniężna” Falenty 2002.

¹⁵ WOODFORD M.: Fiscal Requirements for Price Stability, *Journal of Money, credit and Banking*, Vol. 33, 2001, 669-728 pp.

¹⁶ SARGENT T., WALLACE N.: Some Unpleasant Monetarist Arithmetic, *Federal Reserve Bank of Minneapolis Quarterly Review*, Vol. 5, 1981, 1-17 pp.

¹⁷ WORONIECKA – LECIEJEWICZ I.: Problem op.cit.

¹⁸ WOJTYNA A.: Skuteczność polityki pieniężnej w warunkach niskiej inflacji: problem zerowej granicy nominalnych stóp procentowych, „Bank i Kredyt” No. 7, 2001.

¹⁹ SZYMAŃSKA A.: Efekty polityki fiskalnej w warunkach niskich stóp procentowych – przegląd literatury, „Studia Prawno-Ekonomiczne”, Vol. XCIII, 2014, 347 p.

²⁰ SUMMERS L.H.: Fiscal Stimulus Issues, Testimony before the House Budget Committee, Washington, 2008: http://larrysummers.com/wp-content/uploads/2012/10/1-16-08_Fiscal_Stimulus_Issues.pdf, (access: 26.11.2017).

²¹ SPILIMBERGO A., SYMANSKY S., BLANCHARD O., COTTARELLI C.: Fiscal Policy for the Crisis, IMF Staff Position Note, 2008/1, 2 p. <https://www.imf.org/external/pubs/ft/spn/2008/spn0801.pdf>, (access: 26.11.2017).

²² RZONCA A.: Kryzys banków centralnych. Skutki stopy procentowej bliższej zera, C.H. Beck, Warsaw, 2014.

²³ ARELLANO C., CONESA J. C., KEHOE T. J.: Chronic Sovereign Debt Crisis in the Eurozone, 2010-2012, “Federal Reserve Bank of Minneapolis Economic Policy Paper”, No. 4., 2012; CONESA J.C., KEHOE T.: Gambling for redemption and self – fulfilling debt crises, Staff Report from Federal Reserve Bank of Minneapolis, no. 614, 2012.

²⁴ RZONCA A.: Kryzys, op.cit.

asset bubble that triggered the financial crisis of 2008 central banks took no account of the zero-bound interest rates' influence on the natural interest rate.²⁵

The recent financial crisis showed many countries' preference to seek solutions to their problems in traditional Keynesian solutions designed to stimulate economies. Interestingly, despite the long-standing promotion of monetarist thought and new classical macroeconomics many governments still find interventionist tools, such as an expansionary fiscal policy, to be useful.²⁶ P. Krugman argues that a fiscal stimulus spurring the economy helps create new jobs and that the reduction of the budget deficit slows down economic growth in the short term. He also concludes that in the face of a financial crisis a government in charge of an economy with near-zero interest rates should increase public expenditures (to illustrate his point, P. Krugman refers to the Great Depression that was defused in the US by rapidly increasing government spending).²⁷

According to J. Działo, a restrictive fiscal policy seems a better option, as it gives the monetary authorities more freedom in carrying out a loose monetary policy. In some cases, however, such as an economic crisis, an expansionary fiscal policy can prove useful. The discretionary, anti-cyclical measures of the fiscal authorities have the potential for mitigating the negative impacts of recession, such as mass bankruptcies and fast-rising unemployment (usually at the cost of higher public deficits and debts).²⁸

3 Analysis of dependencies between instruments of policy mix and real economy

This part presents statistical data concerning instruments of monetary and fiscal policy e.g. the ECB official interest rate, a rate of inflation, money supply M3 in the euro area as well as deficit and debt of general government sector (GG) and GDP growth. Moreover, the results of regression between such variables as interest rate, inflation, GG deficit, GDP growth or a real GDP value were presented.

Table 1 shows the levels of the main (official) interest rates set by the central bank in the euro area (the main refinancing operation rate), between 1999 and 2016. Because the rates were frequently changed over a year, the table presents their annual arithmetic means. Moreover, table 1 shows HICP inflation rate as an annual average rate of change (2015=100) as well as Broad Money (M3) Index (2010=100) in the euro area between 1999-2016.

Table 1 Main interest rate of ECB, inflation (HICP) and Broad money index (M3) in euro area

Year	Main refinancing operation rate ECB (%)	Inflation (HICP) in euro area (%)	Money supply Index (M3) in euro area
1999	2,90	1,1	48,7
2000	4,04	2,1	51,5
2001	3,94	2,3	55,7
2002	2,75	2,2	59,7
2003	2,25	2,1	64,3
2004	2,00	2,1	68
2005	2,25	2,2	73,1
2006	3,00	2,2	79,4
2007	3,88	2,1	88,2
2008	3,44	3,3	97,4
2009	1,44	0,3	101,1
2010	1,00	1,6	100
2011	1,25	2,7	101
2012	0,75	2,5	103,7
2013	0,38	1,4	105,7
2014	0,10	0,4	107,5
2015	0,05	0	114
2016	0,00	0,2	119,6

Source: based on [Eurostat, OECD].

In the analysed period the ECB main interest rate was at a relatively low level. It increased only in more than 3% between 2000-2001 as well as 2007-2008, which mostly reflected an economic slowdown and the last financial crisis that also influenced a level of inflation. Inflation in the euro area between 1999-2016 only in 2008 exceeded 3.3%, whereas in other years a rate of inflation oscillated around 2% (inflation target in euro area is below 2%). It was observed that between 1999-2016 money supply M3 in the euro area was rising steadily (the lowest growth was noted between 2009-2011).

Table 2 shows the 1999-2016 real GDP growth rate for the euro area (as percentage change on previous year), General Government (GG) deficit (as percentage of GDP) and debt (government consolidated gross debt percentage of GDP) in euro area.

Table 2 GDP growth, GG deficit and debt in Euro Area in the 1999-2016

Year	GDP growth rate in Eurozone	GG deficit in euro area (% GDP)	GG debt in euro area (% GDP)
1999	3	-1,5	70,6
2000	3,8	-0,3	68,1
2001	2,1	-2	67
2002	0,9	-2,7	66,9
2003	0,6	-3,2	68,1
2004	2,3	-3	68,4
2005	1,6	-2,6	69,2
2006	3,2	-1,5	67,3
2007	2,9	-0,6	64,9
2008	0,4	-2,2	68,6
2009	-4,4	-6,3	78,4
2010	2,1	-6,2	83,8
2011	1,6	-4,2	86,1
2012	-0,9	-3,6	89,4
2013	-0,3	-3	91,3
2014	1,3	-2,6	91,8
2015	2,1	-2,1	89,9
2016	1,8	-1,5	88,9

Source: based on [Eurostat, OECD].

Between 1999-2016 GDP in the euro area dropped significantly during the last financial crisis of 2008-2009 as well as in the period of so-called public debt crisis. As a result of the last financial crisis GG deficit and GG debt also increased, which affected GDP in the euro area.

Below, a regression analysis of the selected variables is presented. It aimed to find out which dependencies between instruments of policy mix and real economy indicators in euro area were statistically significant in the years 1999-2016 by testing a null hypothesis H_0 (the variables' parameters are not significant) and an alternative hypothesis H_1 (the parameters are significant). The variables were checked for stationarity with the use of the ADF test (the Dickey-Fuller test). Variables that were non-stationary at their levels were transformed into first differences, yielding stationary series. The necessary data were obtained from the Eurostat and OECD.²⁹

Table 3 contains the regression results for the euro area. The independent variables were the nominal main ECB interest rate [IR_ECB] and the nominal main ECB interest rate lagged by one year [IR_ECB_1]; the dependent variable was the first differences of the inflation rate (HICP) in the euro area [d_INF_EUR].

Table 3 The dependent variable (Y): d_INF_EUR; independent variables (X) – IR_ECB and IR_ECB_1

Variable name	Coefficient	Standard error	t-Student	p-value
Const	-0,123662	0,401645	-0,3079	0,7627
IR_ECB	0,827430	0,301489	2,744	0,0158 **
IR_ECB_1	-0,725742	0,317381	-2,287	0,0383 **

Selected regression statistics and analysis of variance; n=17 observations from 2000-2016

²⁵ CIŻKOWICZ P., RZOŃCA A.: Interest rates close to zero, post-crisis restructuring and natural interest rate, "Prague Economic Papers", No.3, 2014.

²⁶ KRYŃSKA E., KWIATKOWSKI E.: Polityka państwa wobec rynku pracy. Idee ekonomiczne i rzeczywistość, „Polityka Społeczna” No. 5-6/2010, 2010, 6 p.

²⁷ KRUGMAN P.: End the depression now!, 2012 [in:] <http://natemat.pl/20625,nobl-ista-paul-krugman-wzywa-zakonczenie-ten-kryzys-teraz> (access: 19.11.2017).

²⁸ DZIAŁO J.: Dlaczego trudno jest prowadzić „dobrą” politykę fiskalną?, „Gospodarka Narodowa” No. 1 – 2, 2012, 36 p.

²⁹ <http://ec.europa.eu/eurostat/web/national-accounts/data/main-tables>; <http://stats.oecd.org/index.aspx?querytype=view&queryname=170#> (access: 10.11.2017).

SD of the dependent variable 1,025377; Standard error of residuals = 0,883530
R-square = 0,350343
F(2, 14) = 3,774922 p-value for F test = 0,048841

Source: own elaboration based on [Eurostat, OECD].

The data in the table 3 point out that the nominal main ECB interest rate and the nominal main ECB interest rate lagged by one year had a statistically significant effect on the first differences of the inflation rate (HICP) in the euro area in the sampled years. The t-Student statistics of 2.744 and -2,287 at p-values of 0.0158 ($p < 0.05$) and 0,0383 ($p < 0.05$) indicate that there is a 95% probability that in that period the first differences of the rate of inflation (HICP) was statistically significantly determined by the nominal main ECB interest rate and the nominal main ECB interest rate lagged by one year.

The value of the coefficient for variable IR_ECB_1 in table 3 is negative (-0.725742), meaning that the influence of ECB interest rates lagged by one year on the first differences of the inflation rate HICP in euro area is consistent with economic theory. Further, the coefficient for the nominal main ECB interest rate is positive (0.827430), indicating that the first differences in inflation rate in the euro area increase as the ECB raises the nominal main ECB interest rate. The last dependency could be a result of financial crisis and a very low inflation in spite of low interest rates. Na tę ostatnią zależność mógł mieć wpływ kryzys finansowy oraz bardzo niska inflacja pomimo niskich stóp procentowych.

In the table 4 the independent variables in the analysis were the real GG deficit in the euro area [DEF_real], real GG deficit in euro area lagged by one year [DEF_real_1] and the nominal ECB's main interest rate [IR_ECB]; the dependent variable was the first differences of the inflation rate (HICP) in the euro area [d_INF_EUR].

Table 4 The dependent variable (Y): d_INF_EUR; independent variables (X) – DEF_real, DEF_real_1 and IR_ECB

Variable name	Coefficient	Standard error	t-Student	p-value
Const	-1,30473	0,744109	-1,753	0,1031
DEF_real	3,64503e-06	1,62790e-06	2,239	0,0433**
DEF_real_1	-5,35224e-06	1,76779e-06	-3,028	0,0097***
IR_ECB	0,407635	0,176935	2,304	0,0384 **

Selected regression statistics and analysis of variance; n=17 observations from 2000-2016

SD of the dependent variable 1,025377; Standard error of residuals = 0,812285
R-square 0,490114
F(3, 13) 4,165297 p-value for F test 0,028451

Source: own elaboration based on [Eurostat, OECD].

The above data indicate that independent variables – real GG deficit and real GG deficit lagged by one year and nominal ECB's main interest rate statistically significantly influenced the first differences of the real inflation rate in the euro area in the analysed period. The t-Student statistics of 2,239, -3,028 and 2,304 at p-values of 0,0433 ($p < 0.05$), 0,0097 ($p < 0.05$) and 0,0384 ($p < 0.05$), respectively, indicate that there is a 95% probability that in that period the first differences of the inflation rate was statistically significantly determined by the real GG deficit, real GG deficit lagged by one year and ECB's main interest rate in the euro area.

The value of the coefficient for variable DEF_real in table 4 is positive (3,64503e-06), meaning that the influence of real GG deficit on the first differences of the inflation rate HICP in euro area is consistent with economic theory. Further, the coefficient for the real GG deficit lagged by one year in euro area is negative (-5,35224e-06), indicating that the first differences in inflation rate in the euro area increase as the governments raise the real GG deficits (variable lagged by one year). The last dependency could have been affected by impact of turbulences in financial markets connected with the last financial crisis.

Table 5 shows the regression results for the euro area. In this case, the independent variables were the ECB's main refinancing operation rate [IR_ECB] and the ECB's main refinancing operation rate lagged by one year [IR_ECB_1]; the dependent variable was the first differences of the real GDP in the euro area [d_GDP_real].

Table 5 The dependent variable (Y): d_GDP_real; independent variables (X) – IR_ECB and IR_ECB_1

Variable name	Coefficient	Standard error	t-Student	p-value
Const	155466	66944,3	2,322	0,0358 **
IR_ECB	199173	50250,8	3,964	0,0014 ***
IR_ECB_1	-206394	52899,6	-3,902	0,0016 ***

Selected regression statistics and analysis of variance; n=17 observations from 2000-2016

SD of the dependent variable 203853,9; Standard error of residuals = 147262,7
R-square 0,543379
F(2, 14) 8,330016 p-value for F test 0,004139

Source: own elaboration based on [Eurostat, OECD].

An analysis of the data in table 5 leads to a conclusion that the ECB's nominal interest rate and the nominal ECB interest rate lagged by one year had a statistically significant influence on the first differences of the real GDP in the euro area. In this case, the t-Student statistics are 3,964 and -3,902 at p-values of 0.0014 ($p < 0.05$) and 0,0016 ($p < 0.05$), respectively, meaning that in the period under consideration the ECB's nominal interest rate and the nominal ECB interest rate lagged by one year rate had a statistically significant influence on the first differences of the real GDP. The numbers also indicate a probability of 95% that the ECB's nominal interest rate and ECB's nominal rate lagged by one year had a statistically significant influence on the first differences of the real GDP in euro area in 1999 – 2016.

As in the previous case, in table 5 the coefficient is negative (-206394) only for the ECB's main rate lagged by one year, implying, again, that the effect of ECB interest rates lagged by one year on the first differences in real GDP in Poland was consistent with economic theory. The positive value of the coefficient for the ECB's nominal interest rate (199173) indicates that the raising of interest rates by the ECB stimulates growth of the first differences of the real GDP, which could be related to financial crisis, low interest rates and, first of all, to inflation expectations of market participants.

Table 6 also contains the regression results for the euro area. The independent variables were the nominal main ECB interest rate lagged by one year [IR_ECB_1] and the real GG deficit in the euro area [DEF_real]; the dependent variable was the first differences of the real GDP in the euro area [d_GDP_real].

Table 6 The dependent variable (Y): d_GDP_real; independent variables (X) – IR_ECB_1 and DEF_real

Variable name	Coefficient	Standard error	t-Student	p-value
Const	435728	94829,6	4,5949	0,0004***
IR_ECB_1	-36674,8	27008,1	-1,3579	0,1960
DEF_real	0,896843	0,221996	4,0399	0,0012***

Selected regression statistics and analysis of variance; n=17 observations from 2000-2016

SD of the dependent variable 203853,9; Standard error of residuals = 145771,3
R-square 0,552581
F(2, 14) 8,645304 p-value for F test 0,003589

Source: own elaboration based on [Eurostat, OECD].

An analysis of the data in table 6 leads to a conclusion that the real GG deficit had a statistically significant influence on the first differences of the real GDP in the euro area. In this case, the t-Student statistic is 4,0399 at p-value of 0,0012 ($p < 0.05$), meaning that in the period under consideration the real GG deficit in euro area had a statistically significant influence on the first differences of the real GDP. The numbers also indicate a

probability of 95% that the real GG deficit had a statistically significantly influence on the first differences of the real GDP in euro area in 1999 – 2016.

In the table 7 the independent variables in the analysis were the ECB's main interest rate [IR_ECB] and the nominal ECB main interest rate lagged by one year [IR_ECB_1]; the dependent variable was the GDP growth in the euro area [GDP_growth].

Table 7 The dependent variable (Y): GDP_growth; independent variables (X) – IR_ECB and IR_ECB_1

Variable name	Coefficient	Standard error	t-Student	p-value
Const	1.49188	0.472299	3.1588	0,0070***
IR_ECB	2,20163	0,354524	6,2101	<0,0001***
IR_ECB_1	-2,13887	0,373212	-5,7310	<0,0001***

Selected regression statistics and analysis of variance; n=17 observations from 2000-2016

SD of the dependent variable 1,894109; Standard error of residuals = 1,038952

R-square 0,736737

F(2, 14) 19,58939 p-value for F test 0,000088

Source: own elaboration based on [Eurostat, OECD].

An analysis of the data in table 7 leads to a conclusion that the ECB's nominal interest rate and the nominal ECB interest rate lagged by one year had a statistically significant influence on the GDP growth in the euro area. In this case, the t-Student statistics are 6,2101 and -5,7310 at the same p-values of 0.0001 (<p=0.05), meaning that in the period under consideration the ECB's nominal main interest rate and the ECB nominal main interest rate lagged by one year rate had a statistically significant influence on the GDP growth. The numbers also indicate a probability of 95% that the ECB's nominal interest rate and ECB's nominal rate lagged by one year had a statistically significantly influence on the GDP growth in euro area in 1999 – 2016.

The coefficient for the ECB nominal main interest rate is positive (2,20163), meaning that the Polish GDP increased following rises in the euro area's main nominal interest rate, which could have been affected by crisis phenomena and inflation expectations in the analysed period. The negative value of the coefficient (-2,13887) for the first rate indicates that the relationship between nominal interest rate of ECB lagged by one year and GDP growth was consistent with economic theory.

The results of the analysis indicate that in the sampled years instruments of monetary policy of the central bank and instruments of fiscal policy of governments in the euro area had a statistically significant impact on basic macroeconomic variables in the euro area such as inflation, real GDP or GDP growth. As monetary policy and fiscal policy play a significant role in economies of euro area countries, the European Central Bank and governments of euro area countries need to be watched carefully for changes in their instruments.

4 Conclusions

The nominal main interest rates (as instrument of monetary policy) that in the years 1999-2016 were already relatively low in the euro area, after 2008, in the wake of the crisis, moved much closer to the zero bound (between 2009 and 2014 the main refinancing operation rate in the euro area decreased from 1.44% to 0.10%). Fiscal policy became more expansionary in that period, expanding GG deficit and debt (as instruments of fiscal policy). It seems that because of financial crisis an expansionary monetary policy was accompanied by an expansionary fiscal policy and that the economists may be right that fiscal expansion is greater during a crisis.

The analysis of interactions between the monetary authority and the fiscal authority performed in the context of low interest rates shows that the crisis caused the ECB to cut interest rates more frequently (i.e. to adopt an expansionary monetary policy) and the governments of many euro-area countries chose to stimulate

total demand using an expansionary fiscal policy that increased public deficit and debt (Stawska, 2017). The maintenance of near-zero nominal interest rates frequently prevents the use of measures counteracting deflationary shocks that affect price levels and production.

In conclusion, the objective of the article i.e. to examine the dependencies between policy mix instruments and selected economic variables in the euro area economy with regard to low interest rates, was accomplished. Furthermore, the hypothesis stating that policy mix instruments had a statistically significant impact on the euro area economy between 1999-2016, has been verified positively. The analyses confirmed that the ECB main refinancing rate (as an instrument of monetary policy) significantly statistically affected the inflation, real GDP and GDP growth in the euro area in the analysed period. In turn, real GDP deficit (as an instrument of fiscal policy) had a statistically significant impact on inflation as well as on the real GDP in the euro area between 1999-2016.

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Primary Paper Section: A

Secondary Paper Section: AH

THE POLICY MIX IN THE CONTEXT OF THE COMPETITIVENESS OF THE POLISH ECONOMY

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Acknowledgement: This work was supported by the Polish Ministry of Science and Higher Education through research project for Young Researchers under the contract no. B1711200001674.02.

Abstract: The aim of the article is to characterise selected macroeconomic indicators from the policy mix area in the context of the competitiveness of the Polish economy. In order to achieve this aim, the following research methods are used: a review of the literature and statistical analysis method. The study includes an analysis of macroeconomic data for the years 2000-2016 on the policy mix and the competitiveness of the Polish economy. The results of the conducted analysis indicate that in the discussed period there was a statistically significant correlation between monetary and fiscal policy indicators in the background of improving indicators measuring the competitiveness of the Polish economy.

Keywords: policy mix, competitiveness of economy, Polish economy

1. Introduction

Monetary policy and fiscal policy have instruments to adjust the market mechanism. This combination is called policy mix.¹ Coordination of monetary policy and fiscal policy has special importance in emergency (crisis) conditions, although it is equally important in a stable economic situation of the country. Policy mix is also a common topic of many works on state strategies used to stimulate or stabilize² the economy and thus "create" competitive conditions for economic development. As Kuttner emphasizes, the combination in the IS-LM model is less crucial, but the overall level of aggregate demand is important and it can be shaped by fiscal policy, monetary policy or a combination of both policies, monetary and fiscal ones.³ Proper monetary and fiscal policy conditions can have a significant positive impact on the country's economic development, as it is possible to stabilize and "improve" macroeconomic indicators. These indicators can influence the competitiveness of a given economy as a result of coordination of monetary and fiscal policy. The coordination of both policies contributes to greater stability of the financial system. Hence, the purpose of this article is to characterize selected macroeconomic indicators from the policy mix in the context of the competitiveness of the Polish economy.

1.1 The competitiveness of economy

The term of competitiveness of economy is not an unambiguous concept in the literature.⁴ For Organization for Economic Cooperation and Development (OECD) "competitiveness of the country is its ability to cope with international competition as well as to ensure a high rate of return on applied production factors and a high level of employment".⁵ B. Jedliński describes this concept in two senses, emphasizing the ability of a given economy to compete in international markets:⁶ • as the country's ability to produce and sell products or services as attractive in terms of price and quality when compared to the same products or services of another country (narrower approach); • as an ability to gain benefits from the commercial cooperation with the countries abroad (broader approach).

Both approaches emphasize the ability to prolong long-term and effective growth and create a proportionately greater wealth of the country than competitors in the world market. The greater the competitiveness of the country's economy is, the bigger the chance for the development of the economy and in a direct way - the citizens (the reinforcement of the economy results from the growth of the citizens' income).⁷ The opposite situation (the lack of the competitiveness) may mean the exclusion from the market, subjection and domination of the stronger economies. Poland's competitiveness can be measured by the presence of Poland in world competitiveness rankings.⁸ Over recent years, Poland's position in international comparisons and rankings of competitiveness has been steadily improving.⁹ The institutions preparing rankings analyzed the various criteria from areas of the policy mix (e.g. national income per capita, unemployment, economic performance, fiscal policy and monetary policy). Hence, profitable macroeconomic parameters and economic policy are often considered factors contributing to the competitiveness of a given country.¹⁰ For example, the World Economic Forum publishes a ranking of global competitiveness - The Global Competitiveness Index (GCI), which measures the overall competitiveness of economy. This index is calculated on the basis of 100 indicators such as: macroeconomic environment, innovations, a degree of business development, labour market effectiveness, development of financial markets or higher education. In turn, International Institute for Management Development (IMD) prepares World Competitiveness Yearbook evaluating 55 countries based on 300 detailed criteria. The IMD Report takes into account the following factors: economic growth, employment, foreign trade results, price level, fiscal policy, company efficiency or infrastructure.¹¹ Table 1 presents the position of Poland in two selected rankings (GCI and IMD) within the years 2000 - 2016.

Table 1. The ranking according to the Global Competitiveness Index and International Institute for Management Development

Ranking according to Global Competitiveness Index (GCI)		International Institute for Management (IMD) - World Competitiveness Yearbook	
Years	Position in the ranking GCI	Year	Position in the ranking IMD
2000-2001	35	2000	40
2001-2002	41	2001	47
2002-2003	51	2002	45
2003-2004	45	2003	47
2004-2005	60	2004	48
2005-2006	51	2005	48
2006-2007	48	2006	50
2007-2008	51	2007	52
2008-2009	53	2008	44
2009-2010	46	2009	44
2010-2011	39	2010	32
2011-2012	41	2011	34
2012-2013	41	2012	34
2013-2014	42	2013	33
2014-2015	43	2014	36
2015-2016	41	2015	33
2016-2017	39	2016	33

Source: Own study based on: World Economic Forum, Global Competitiveness Reports for the periods 2000-2017 and World Competitiveness Yearbook for the periods 2000-2016.

¹ Flanagan K., Uyerra E., Laranja M.: Reconceptualising the 'policy mix' for innovation, "Research Policy", 2011, no. 40, p. 703.

² Kuta K., Rudnicki K.: Funkcjonowanie gospodarki otwartej - Model Mundella-Fleminga, „Finanse i Prawo Finansowe”, 2015, no 3, p. 61.

³ Kuttner K.N.: The Monetary - Fiscal Policy Mix: perspectives from the U.S., „Bank i Kredyt”, 2002, no. 11-12, pp. 208-209.

⁴ Falkus M.: Korean Business: Internal and External Industrialization, „Business History”, 2000, no. 42 (1), pp. 141-142.

⁵ Misztal P.: Zdolność konkurencyjna Polskiej gospodarki w okresie 1998 - 2007 w świetle rankingów konkurencyjności międzynarodowej [in:] Kwaśnik Z., Żukow W. (Eds.), Aktualne wyzwania ekonomii. Radom University, Radom, 2009, p. 55.

⁶ Jedliński B.: Polityka handlu zagranicznego, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk, 2002, p. 72.

⁷ Szamrej-Baran I.: Konkurencyjność gospodarki Polski na tle wybranych gospodarek Unii Europejskiej, „Zeszyty Naukowe Uniwersytetu Szczecińskiego. Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania”, 2012, no. 25, p. 125.

⁸ The reports that are considered the most well-known reports about the competitiveness of the economy include: The World Bank Annual Report, Doing Business, Report, Ernst & Young Europe Investment Attractiveness Report, Global Competitiveness Ranking by the World Economic Forum, Global Competitiveness Journal, Big Mac Index, International Institute for Management Development Report (International Institute for Management Development), Bertelsmann Annual Report. The analysis of Polish competitiveness position in some of above mentioned reports may be found in Report of Ministry of Economic Development „Entrepreneurship in Poland”, October 2016, Warsaw, pp. 108-111.

⁹ Poland 2015. Report Economy, Warsaw 2015, Ministry of Economy, p. 9.

¹⁰ Piasecki R.: Rozwój gospodarczy a globalizacja, PWE, Warsaw, 2003, pp. 69-71.

¹¹ Stawska J.: Konkurencyjność polskiej gospodarki w kontekście ostatniego kryzysu finansowego, „Przedsiębiorczość i Zarządzanie”, Tom XV, Zeszyt 10, 2014, p. 376-377.

The position of Poland in selected rankings (excluding very high positions in 2000 in both rankings) shows a positive trend (despite the decline in some years).

2. Policy mix and its instruments and economy

Fiscal and monetary authorities have different goals and preferences. The central bank is striving mainly to maintain a stable price level, whereas the government - to maximize real economic growth, taking into account the impact of the budget deficit on GDP growth and budgetary constraints.¹² The difference in the goals and preferences of the central bank and government makes stabilization of the economy in the short terms difficult. Reconciliation is the right choice for both authorities, because a conflict between monetary and fiscal policy can lead to an increase in the interest rate and budget deficit.

The effect of dual power results in autonomous decisions by monetary authorities and fiscal authorities¹³ defined as policy mix and understood as a combination of decisions by monetary and fiscal authorities. The premise of this combination is to stimulate and maximize the development of the economy while minimizing unemployment¹⁴ and ensuring price stability. Consequently, the coordination of both policies contributes to greater stability of the financial system.

The optimal situation for the economy takes place when there is mutual complementation and support of the government and the central bank. Choosing the policy mix as the most appropriate combination of fiscal and monetary policy, taking into account the adopted criteria, takes into account the characteristics of both policies, although it should be remembered that even the most appropriate choice does not necessarily have the desired effect.¹⁵ The key problem of coordination of monetary and fiscal policies is also the problem of concern for the entity that would be responsible for such coordination. S. Owsiak emphasizes that the issue of the person responsible for coordinating these policies is still not resolved on the basis of theory or practice. Hence, this problem requires further theoretical research and the search for systemic solutions to develop the institutional basis for policy mix coordination.¹⁶

Despite the complementary character of fiscal and monetary policies, there are significant differences between them. Each policy is conducted by independent authorities, which results in different objectives, met by using various instruments.

Fiscal policy is one of the basic forms of stimulating economic development. Governments have at their disposal various fiscal and legal instruments to stabilize the current state of affairs (taxes and other public levies, expenditures, public deficits, public debt, guarantees and loan guarantees to economic entities influencing the state budget to achieve specific fiscal and non-fiscal objectives).

It is not easy to conduct a good fiscal policy¹⁷, mainly due to fiscal regulations (fiscal rules).¹⁸ Fiscal policy is largely

influenced by political factors. Financing the health care system, pension insurance, combating unemployment or pro-family policy is bound to require budget spending. Rising costs outweigh the state budget and make the tax revenues not sufficient and as a consequence, the public deficit is increasing, leading eventually to excessively high public debt. Both monetary policy and fiscal policy are an essential part of the state's economic policy and they use the money supply for the pursuit of general economic objectives by shaping it to adapt to the needs of the economy. Monetary policy, inter alia through interest rate policy, affects internal demand, economic stability, and availability of credit for businesses and individuals. The central bank's actions focus mainly on maintaining a low inflation rate. According *Monetary Policy Strategy beyond 2003* „(...) the monetary policy is targeted to attain a stable inflation rate of 2.5% after year 2003 with a permissible volatility band of ± 1 percentage point either side of this target.”¹⁹

The appropriate policy mix is an opportunity to minimize the effects of the crisis. Similarly, for example, between 2007 and 2012 (including the period during which the international financial crisis emerged), when the coordination of monetary and fiscal policy to a certain extent aroused the investment activity of companies, so that the effects of the crisis were not so severe.²⁰ Furthermore, some analyses indicate that, without the application of coordinated monetary and fiscal policy, the effects of the financial crisis could be more severe.²¹ It was particularly during the crisis that challenges for the policy mix emerged.²² As a result, an increase in coordination of the policy mix was observed in the years 2007-2013.²³

Policy mix seems to be a relatively popular research topic in literature. The policy mix is examined inter alia from the point of view of the central bank's decision-making interactions with the government and their priorities²⁴, assessment the impact of monetary and fiscal policy on the level of investment²⁵, the state of public finances of a given country against the background of the European Union, the OECD or other world economies, including the context of the debt crisis²⁶.

3. Research method

Authors assessing the competitiveness of the Polish economy in the context of the policy mix used the annual statistical data presented by the Central Statistical Office (GUS) for the years 2000 - 2016. These years include the economic slowdown 2001-2002 and the recent financial crisis and post-crisis years. In order to conduct the analysis, the authors selected the following macroeconomic indicators: a) from the area of monetary policy: interest rates, money supply, inflation rate and exchange rate, b) from the area of fiscal policy: public debt and deficit ratios in relation to GDP, unemployment level and GDP dynamics.

The correlation between selected variables from the monetary and fiscal policy area was calculated to examine the existence of a statistically significant correlation in the policy mix in the economy. Competitiveness has been measured by such

¹² Kuttner K. N.: *The Monetary ...*, op. cit., p. 208-209.

¹³ Owsiak O.: O instytucjonalnych przesłankach trudności w koordynacji polityki monetarnej z polityką fiskalną. „Zeszyty Naukowe PTE”, no. 12, Polskie Towarzystwo Ekonomiczne, Cracow, 2012, 48 p.

¹⁴ Stawska J.: Wpływ policy-mix na wzrost gospodarczy i poziom bezrobocia w Polsce. „Zeszyty Naukowe. Finanse, Rynki finansowe, Ubezpieczenia” no. 67, 2014, pp. 667 - 677.

¹⁵ Wernik A.: Problemy polityki fiskalnej w kreowaniu policy mix, „XXII konferencja naukowa NBP - NBP: reformy strukturalne a polityka pieniężna, Falenty 2002.

¹⁶ Owsiak O.: O instytucjonalnych... op. cit., 48 p.

¹⁷ The reason why it is not easy to conduct a good fiscal policy explains among others, [in:] Działo J.: Dlaczego trudno jest prowadzić „dobrą” politykę fiskalną?, „Gospodarka Narodowa”, no. 1/2, 2012; O. Issing O.: The role of fiscal and monetary policies in the stabilization of the economic cycle, 2005 <https://www.ecb.europa.eu/press/key/date/2005/html/sp051114.en.html> (access 10 December 2017).

¹⁸ income rules – their aim is to maintain stable taxes and limitation of rapid changes in their rates; cost rules – total budget costs could rise at a rate of not higher than inflation + 1 p.p.; public debt rules – limit for total public debt level expressed as a relation of debt to GDP cannot exceed 60%; public deficit rules – in a given period of time (fiscal period) budget deficit should not exceed 3% of GDP [in:] Działo J., Urbanek P.: Wpływ reguł fiskalnych na konkurencyjność gospodarek w nowych i starych krajach członkowskich UE. Wnioski z badań empirycznych, [in:] Grynia A. (ed.), Wybrane

aspekty rozwoju i konkurencyjności nowych krajów członkowskich Unii Europejskiej, Faculty of Economics- Informatics, Białystok University, 2015.

¹⁹ *Monetary Policy Strategy beyond 2003*, NBP, Warsaw, February 2003, 12 p.

²⁰ Stawska J.: Znaczenie policy-mix dla działalności inwestycyjnej przedsiębiorstw w kontekście zrównoważonego rozwoju. [in:] Borys G., Dziawgo D., Dziawgo L., Patrzyńska L. (eds.) „Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu no. 330, Finanse i rachunkowość na rzecz zrównoważonego rozwoju. Gospodarka - etyka – środowisko”, Wrocław, 2014, 397 – 405 pp.

²¹ Stawska J.: Wpływ ..., op. cit., 667 – 677 pp.

²² Stawska J., Grzebiak L.: Challenges for policy mix in the context of the financial crisis. The case of Poland, „Journal of Finance and Financial Law” no. 4/2014, Lodz, pp. 139.

²³ Stawska J.: Wpływ ..., op. cit., 667 – 677 pp.

²⁴ Woroniecka-Leciejewicz I.: Analiza policy-mix z uwzględnieniem interakcji decyzyjnych między bankiem centralnym a rządem i ich priorytetów, „Zeszyty Naukowe Wydziału Informatycznych Technik Zarządzania Wyższej Szkoły Informatyki Stosowanej i Zarządzania. Współczesne Problemy Zarządzania”, no. 1/2011.

²⁵ Stawska J.: Znaczenie ..., op. cit., 397 – 405 pp.

²⁶ Stawska J.: Koszty obsługi długu publicznego w Polsce w kontekście kryzysu finansowego w Unii Europejskiej, „Acta Universitatis Lodzensis, Folia Oeconomica no 279”, Lodz University Press, Lodz, 2013, 41 – 56 pp.

indicators as: GDP dynamics, inflation rate, budget deficit ratio, public debt ratio and exchange.

4. Analysis of monetary and fiscal policy measures against the competitiveness of the Polish economy

Below is presented an analysis of selected measures describing monetary and fiscal policy in Poland in the context of the competitiveness of the Polish economy. The analysis started with the inflation index as the monetary policy measure. The most common inflation measure is *consumer price index* (CPI). Its popularity results from the fact that it refers to consumption prices, which is the category of the largest part of GDP.

Inflation in Poland in the analyzed period remains at a low level (creeping inflation) with the exception of year 2000 when inflation amounted to 8.5%, otherwise it is generally within the inflation target (2.5% +/- 1p.p.), with some exceptions (such as 2004 - inflation of 4.4% - when Poland joined the European Union). The years 2007 - 2008 are a period of intensifying disturbances on global financial markets, hence inflation in 2007 was 4.0% and exceeded the inflation target.

Significant signs of price declines were observed in the second half of 2014. Deflation lasted until 2015, mainly due to the fall in oil prices (which reduced production costs and increased corporate profits). In the last two years of analysis (2015-2016), deflation initially remained and 2016 saw low inflation. The latest GUS report indicates that inflation in the first quarter of 2017 increased by 1.1% compared to the previous quarter and by 2% compared to the first quarter of 2016.²⁷ Inflation was accelerating at the beginning of 2017, which was mainly influenced by external factors.²⁸ The NBP's projection (March 2017) for the annual inflation rate YOY terms is 2.00%, which means that it continues to be in the inflation target.²⁹ Apart from inflation, the central bank may also to some extent influence the money supply, summarized in Table 2.

Table 2. Total money supply, consumer price and service indices in the period between 2000-2016

Year	Total money supply (in bln PLN)	Total money supply (as M3) Data in % of GDP	Price-inflation ratio – a month ending the period (December of the previous year = 100)	Reference rate (%) at the end of the year
2000	300 757,3	40,3	8,5	19,00
2001	329 704,7	42,3	3,6	11,50
2002	326 124,9	40,2	0,8	6,75
2003	345 144,8	40,8	1,7	5,25
2004	377 534,5	40,5	4,4	6,50
2005	427 125,4	43,1	0,7	4,50
2006	495 309,5	46,3	1,4	4,00
2007	561 623,8	47,3	4,0	5,00
2008	666 231,3	51,8	3,3	5,00
2009	720 232,5	52,5	3,5	3,50
2010	783 648,5	54,2	3,1	3,50
2011	881 496,3	56,3	4,6	4,50
2012	921 412,5	56,5	2,4	4,25
2013	978 908,2	59,1	0,7	2,50
2014	1 059 015,3	61,6	-1	2,00
2015	1 154 992,6	64,2	-0,5	1,50
2016	1 265 675,2	68,4	0,8	1,50

Source: Own study based on: statistical data of GUS available at <http://stat.gov.pl/wskazniki-makroekonomiczne> (access 18 November 2017).

Money supply in Poland measured by the broadest aggregate - M3 - in the analyzed period is systematically increasing³⁰. In Poland, the central bank uses a policy of low interest rates (compared to historical data) which should favor the economy (though not always). Currently (December 2017) the main interest rates of NBP have been not changed since March 2015 (Table 2).

In Poland, the exchange rate has been floating since 2000, which means that it is shaped by the balancing of supply and demand for currencies. Table 3 shows the exchange rates of USD, EUR and CHF in PLN.

Table 3. NBP official exchange rates (annual average) in the period between 2000-2016

Years	100 USD (in PLN)	100 EUR (in PLN)	100 CHF (in PLN)
2000	434,64	401,10	257,47
2001	409,39	366,85	243,10
2002	407,95	385,57	262,70
2003	388,89	439,78	289,05
2004	365,40	453,40	293,58
2005	323,48	402,54	259,99
2006	310,25	389,51	247,61
2007	276,67	378,29	230,35
2008	240,92	351,66	222,02
2009	311,62	432,73	286,58
2010	301,57	399,46	289,51
2011	296,34	411,98	334,84
2012	325,70	418,50	347,21
2013	316,08	419,75	341,00
2014	315,51	418,52	351,23
2015	377,01	418,39	392,00
2016	394,31	436,25	400,21

Source: Own study based on statistical data of GUS available at <http://stat.gov.pl/wskazniki-makroekonomiczne/> (access 18 November 2017).

Observing the exchange rate data, we note that the PLN exchange rate strengthened significantly against the USD in 2007-2008, while against the EUR and the CHF it was observed in 2001-2002 and 2007-2008, which was probably influenced by the economic slowdown of 2001-2002 and the 2007-2008 financial crisis.

Next, statistical data from the area of fiscal policy are presented below. The analysis began with the most commonly used measure of economic growth, which is the dynamics of GDP, GDP in current prices, GDP per capita (table 4) This pace determines how fast the economy is developing.

Table 4. GDP Dynamics, GDP in current prices and GDP per capita expressed in the Purchasing Power Standard (PPS) in years 2000-2016

Years	GDP growth in %	GDP in billion PLN current prices	GDP per capita in PPS (UE 28 = 100) according to GUS
2000	4,60	747 032	47
2001	1,20	779 975	46
2002	2,00	810 617	47
2003	3,60	845 930	48
2004	5,10	933 062	49
2005	3,50	990 468	50
2006	6,20	1 069 824	51
2007	7,00	1 187 605	53
2008	4,20	1 286 069	55
2009	2,80	1 372 208	60
2010	3,60	1 445 298	62
2011	5,00	1 566 824	65
2012	1,60	1 629 425	67
2013	1,40	1 656 895	67
2014	3,30	1 719 769	68
2015	3,80	1 799 392	69
2016	2,90	1 858 637	69

Source: Own study based on statistical data of GUS available at <http://stat.gov.pl/wskazniki-makroekonomiczne/> (access 18 November 2017).

GDP growth in Poland declined considerably at the beginning of the analyzed period, i.e. in the years 2001-2002, which was related to the overall economic slowdown. Then, after a period of relatively high GDP growth in 2004, 2006-2007, this dynamics significantly decreased. Clear pace started to slow down in 2008-2009 and in 2012 - 2013 (although the growth was positive). In the first period, this could have been the result of the global financial crisis; in the second, the deceleration of public investment after Euro 2012 and the attempt to consolidate public finances (i.e. the reduction of public expenditure to stabilize the General Government sector).

The analysis of GDP per capita eliminates an impact of absolute population size facilitating comparisons between countries because it reflects purchasing power of each currency. GDP

²⁷ Statistical data of GUS available at <http://stat.gov.pl/wskazniki-makroekonomiczne/>.

²⁸ Monetary Policy Council, Inflation Report, March 2017, NBP, 15 p.

²⁹ Official page of NBP, www.nbp.pl, access 10 December 2017.

³⁰ Ibidem.

growth ratio per capita in PPS was presented in relation to the average for EU-28 (determined at the level of 100) In the analyzed period, GDP per capita in Poland is lower than the EU average. GDP per capita, expressed according to purchasing power standards, systematically increased in the analyzed period, and in 2015 reached the level of 69% of the EU average.

Accelerating the pace of economic growth may cause a reduction in the unemployment rate, but it may also trigger inflationary pressure and a tendency to increase foreign debt. The drop in unemployment contributes to the growth of real disposable income and is certainly a positive phenomenon in the economy. The unemployment rate in Poland in 2016 is the lowest in the discussed period 2000 - 2016 (Table 5).

Maintaining the stability of the financial sector is crucial for the economy. The indicators presented in Table 5 define the state of the general government sector (General Government - GG) in Poland.

Table 5. Government debt in relation to GDP and unemployment in the period between 2000-2016

Year	Deficit/surplus of government debt in % of GDP	Government debt in % of GDP	Unemployment rate in %	Unemployment rate in thous.
2000	-3,00	36,50	15,1	2 702,6
2001	-4,80	37,30	17,5	3 115,1
2002	-4,80	41,80	20	3 217,0
2003	-6,10	46,60	20	3 175,7
2004	-5,10	45,00	19	2 999,6
2005	-4,00	46,40	17,6	2 773,0
2006	-3,60	46,90	14,8	2 309,4
2007	-1,90	44,20	11,2	1 746,6
2008	-3,60	46,30	9,5	1 473,8
2009	-7,30	49,40	12,1	1 892,7
2010	-7,50	53,10	12,4	1 954,7
2011	-4,90	54,10	12,5	1 982,7
2012	-3,70	53,70	13,4	2 136,8
2013	-4,00	55,70	13,4	2 157,9
2014	-3,30	50,20	11,5	1 825,2
2015	-2,6	51,1	9,7	1 563,3
2016	-2,4	54,4	8,3	1 335,2

Source: Own study based on statistical data of GUS available at <http://stat.gov.pl/wskazniki-makroekonomiczne/> (access 18 November 2017).

The presented data shows that the indicators of the public finance deficit and public debt clearly deteriorated in 2001-2005 (which probably resulted from economic deterioration). The process of economic deterioration obviously accelerated in 2008-2011, which probably resulted from the financial crisis. Due to the fact that in 2009-2010 the border of 3% the relation between public deficit and GDP (Maastricht criteria) was explicitly exceeded, excessive deficit procedure was initiated. It was abolished by the Council in June 2015³¹, which was certainly helped by the pension reform. Higher budget revenues were provided mainly from taxes and fees. From January 2011 VAT rates were increased by 1 percentage point - from 22% to 23%, and excise duty increased several times. From this moment, the state of public finances has not deteriorated.

The above analyses of statistical data of variables related to monetary and fiscal policy were supplemented with an analysis of the correlation ratio between selected variables in the policy mix in Poland in the years 2000 - 2016. Table 6 shows the Pearson's correlation coefficients between variables related to monetary policy like: nominal reference interest rates of NBP (%) - [IR_NOM], inflation rate (CPI) in the Poland - month ending the period (December of the previous year = 100) - [INF], Money Supply as Broad Money M3- in million PLN - [M3_REAL], and the selected economic variables related to fiscal policy like: nominal GDP in current prices in PLN, adjusted by the CPI- [GDP_REAL]; GG deficit as % of GDP - [DEF%]; GG debt as % of GDP [DEB%]; GG Debt in million PLN adjusted by CPI [DEB_REAL] and the level of unemployment - as at the end of the year [in thous.] -

[UNEMP]. Time series [GDP_REAL] and [M3_REAL], [DEB_REAL] are in real terms using CPI index ($I_1 = 2000 = 100$). For each correlation, the p-value was estimated (assuming that a p-value greater than $\alpha = 0.05$ or $\alpha = 0.1$ was indicative of a statistically insignificant correlation). Prior to correlation analysis, variables were tested for stationarity with the ADF test (Dickey-Fuller test). Variables were transformed into first differences (if it was necessary), yielding stationary. To perform the analysis, data spanning the years 2000-2016 were sourced from the website of the Central Statistical Office of Poland.

Table 6 Pearson's correlation coefficients for the selected variables for Poland, 2000-2016

Variables	Pearson's correlation for Polish economy
IR_NOM v. d_GDP_REAL	-0.5708 (p-value= 0.0209)
d_M3_REAL v. d_GDP_REAL	0.678 (p-value= 0.0039)
IR_NOM v. DEB%	-0.8511 (p-value = 0.000)
d_M3_REAL v. DEB_REAL	0.599 (p-value= 0.0143)
d_M3_REAL v. DEF%	0.539 (p-value= 0.0314)
INF v. DEB%	-0.486 (p-value= 0.048)
UNEMP v. IR_NOM	-0.608 (p-value = 0.009)
UNEMP v. d_M3_REAL	-0.797 (p-value= 0.0002)

Source: Own study prepared in GRETL program.

Analyzing directions and strengths of correlation between macro and micro-economic variables concerning the course of monetary and fiscal policy in Poland in the years 2000-2016 it must be noted that there are dependencies between these variables and significance of these interdependencies for the policy mix of the government and central bank. In the period between 2000-2016 a moderate negative correlation between a nominal NBP reference rate and first differences for the real GDP [-0,570] was observed. What was particularly important was a correlation between first differences for the real money supply M3 and first differences for the real GDP [0,678]. Then, a nominal NBP reference rate to a great extent is negatively correlated with public debt [-0,851]. Moderate correlations were observed between first differences for the real money supply M3 and appropriately real GG government deficit [0,599] and GG government deficit in % of GDP [0,539].

Moderate negative correlation is observed between inflation ratio and government debt as % of GDP in Poland [-0,486]. Conducted correlations also indicate that the level of unemployment is significantly correlated with a NBP nominal reference rate [-0,608], which suggests crucial interdependencies between one of fiscal authorities objectives (as the lowest unemployment rate) and interest rate as an instrument of monetary power. Unemployment was also correlated to a great extent with the first differences for the real money supply M3 [-0,797]. These dependencies indicate a significant connection of tools and variables from monetary policy with key macroeconomic variables for government fiscal policy. It can suggest that in the analyzed period there were crucial correlations between variables from policy mix area in Poland.

5. Conclusions

The issue of competitiveness of the economy is the result of decisions taken by the economy policy agents (central bank and the government) of a given country. Polish economy still expands steadily which was confirmed in this article by conducting the analysis of indicators and the research by the European Commission.³² General economic perspectives are still positive, although the internal risk appears, related e.g. to unfavourable demographic perspectives.

In the analysed period the deterioration of the macroeconomic indicators resulted from the economic slowdown in 2001-2002 and the last financial crisis, which very quickly moved to the economies of the individual countries. This deterioration resulted in the setback of the standing of public finance, higher

³¹ In Poland, the excessive deficit procedure has been initiated since 2009.

³² Commission Staff Working Document. National Report - Poland 2016. http://ec.europa.eu/europe2020/pdf/csr2016/cr2016_poland_pl.pdf (access 18 June 2017).

unemployment which definitely also adversely affected competitiveness of the economy. In the relationship of the threats for economy (as financial crisis), central bank and government decided to take anti-crisis activities. By characterisation of the given indicators about policy mix, the authors conducted the correlation analysis between indicators from policy mix. Results of the analysis point out at statistically significant correlation between measures from monetary and fiscal policy against improving measures of competitiveness of the Polish economy, which may prove that mutual relevant impact of policy mix indicators positively affects the competitiveness of the economy.

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Primary Paper Section: A

Secondary Paper Section: AH

JOURNALISM ON SOCIAL MEDIA: HOW TO TELL STORIES AND NEWS TO YOUNG PEOPLE

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Abstract: Digitization in media industry and in the other segments has brought many challenges for journalists. First of all, it is lower rate of attention on the side of consumers. Secondly, it is multitasking which goes hand in hand with using of social networks like Facebook or Instagram. These two problems are mostly related with young people, especially children and teenagers who were born as digital natives. This paper will analyze ephemeral images, so called Stories, which media use to tell stories to promote their web content mainly for young people using this kind of platform. We will try to figure out why this is an appropriate way of informing young generation called generation Z.

Keywords: digitization, ephemeral journalism, Instagram, Snapchat, social network, visualization

1 Communication on social networks

Social networks initially served only as a tool for citizen journalism. Nowadays, they are very good helpers for both media and individual journalists. In journalism, they serve several purposes:

- Website content propagation which is related with expansion of readership.
- Getting tips about various topics that can be processed as journalistic content. Social networks are one of the primary sources of information from different areas.
- Feedback from audience not only in the form of comments but also through private messages, sharing, or other interactive elements (likes, Facebook responses, etc.).
- Journalist can communicate with readers by informing about their articles, or work, or colleagues' articles on their private accounts.
- Social networks offer an area for citizen journalism, smaller media and blogging.
- Creating specific content for specific social networks.

This very last point has created a need for the production of original content designed primarily for social media delivery. These contents are especially characteristic by the viral potential, which means content should be shared as much as possible, without much effort, for example without the need for sponsorship it should reach as many people as possible. This means, in particular, that social network content is brief and visually attractive using especially videos or photographic content and images. Above all, this means that social networks are responsible for the trend of content visualization. Social media and the presence of media on this platform have redefined the way the public is informed about up-to-date "hot" information and news, as they often appear first on the social network, later on the media, depending on the type of event. Another feature of journalism on social networks is their connection to mobile phones, which represent the fastest way to process news or feedback. The number of smartphone owners is steadily increasing as well as fast internet coverage and speed. Social networks are therefore the fastest medium.

We can say that social networks together with the Internet are new media. Their main advantage is that users use them continuously, although often only in the background and on the other hand recipients do not open individual posts very often even though special content for social networks is linked to the web site, or refers to the web in the description.

It is not anything new that Twitter, Facebook, Instagram and Snapchat, they work mainly on the visual side. Users primarily share content like photos and videos, and the main device is a mobile phone or tablet. At the beginning, it should be said that the existence of media on these social networks is a necessity, though it is not compulsory to exist at all of them. For example, Snapchat is not open to all media and chooses who can

contribute to Discover. The Instagram and Snapchat are primarily for young generation. Thanks to the regular content on these two visual social networks, the media can engage new potential younger readers and also increase brand awareness.

Audiovisual content, especially on Facebook and Instagram is very important to produce. It has even a greater impact on the audience. Video on the social network (especially Instagram) should be 1:1 and should contain subtitles. Additionally, the visual elements shared on social networks are infographics, journalistic photos. There are also so called semantic graphics. Again, it is a 1: 1 format containing text and picture. The most common are quotes, science and technology facts, showbiz, and so on. It is combination of the media graphic identity and logo. Semantic graphic should be comprehensible without the accompanying text (status) to be easily shared. The last one new type of social media content is so called ephemeral images, known as Stories, which originally come from Snapchat and later this concept was taken by Instagram and Facebook. We will study their functions and influence upon audience in the following chapters.

2 Methodology

Ephemeral images are quite new digital content for newsrooms and media at all. Even though almost all of most popular social networks use "story mode", we can say that Snapchat invented it. For that reason, we decided to analyze mainly Snapchat's Discover with seventeen media involved in this project. For example, there are such brands like Daily Mail, Mashable, People, IGN, MTV, BuzzFeed, National Geographic and many more which represent the biggest progress in digitization and convergence of journalism. On the other hand, named media are leaders in their field of journalism worldwide. We chose content analysis of already mentioned Snapchat channels with consideration of Instagram Stories. The main goal is to find out most frequent ways of communicating news by ephemeral images, known as Stories. We also would like to generalize this specific type of communication to bring new theory on the field of mass media communication and describe new journalistic genre.

3 Spreading news with ephemeral images

The media that managed to publish content on Snapchat or Instagram use the broad functionality of these social networks, especially the visual possibilities offered by them which border on infotainment, tabloidization and citizen journalism.

The way of content creation and publication is dependent on the video / photo length which is 10 / 15 seconds. After 24 hours content disappears. It is also possible to swipe down and read full article on the website of media. The purpose of publishing on Snapchat and Instagram is not just to promote and refer to existing content, such as articles on the web, but Discover and Stories also have a place to strengthen the media brand for the target group of teenagers. In the following lines, we'll give examples of how the media is communicating on Snapchat and Instagram focusing on the target group: Generation Z, people born after 2000 who have not experienced life without cutting-edge technology. Generation Z is not willing to act or make moves, even if it is in its personal interest. For example, meet and talk to friends? Generation Z would rather stay in the comfort of home on the Internet because everything is solved by modern technologies. Their armor is the distance from the outside world which separates them from everything that does not concern them directly.¹

¹ Generácia Z sú maximálne digitálni ľudia. [online]. [2016-11-6]. Available: <<http://strategie.hnonline.sk/spravy/782335-generacia-z-su-maximalne-digitalni-ludia>>

We have divided Snapchat and also Instagram publishing into five groups based on content and way of telling stories.

Hard news

Even though we have infotainment elements in serious news, content creators have to consider the character of information. Content mostly consists of one bigger photo and the text is also dominant. Regarding the text part, the authors mostly choose a short caption – title and a short introduction containing one maximum of two sentences. Creators do not even avoid tables or charts. It is also important to be able to broadcast events directly in real time, such as elections, protests, and so on. Live events should be main part of publishing on Instagram or Snapchat.



Hard news on Snapchat (Daily Mail, CNN and MTV).

Tabloid content

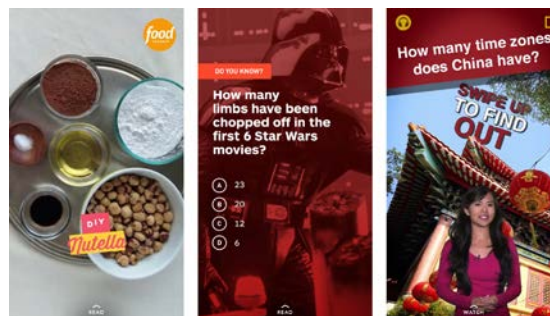
Authors are more likely to use Snapchat's graphical capabilities, including collage of photos with moving pictures or videos and animations. Similar to the print press, the Snapchat and Instagram content is typical for its colorful content and using of photographs. Typical is irony or humor, especially celebrity themes. Content creators also use moderators to report or offer various polls.



Soft news on Snapchat (Daily Male, Food).

Entertainment

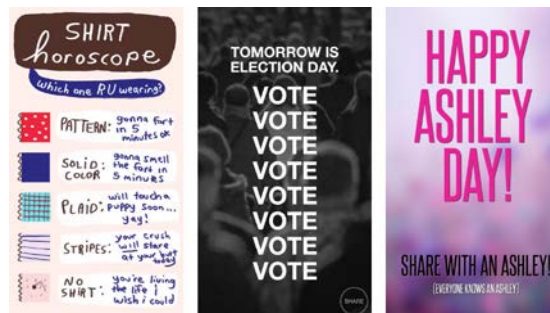
The content prepared to amuse people promoted by Snapchat or Instagram is, in most cases, educational or popular and educational at the same time. Among other things, they are devoted to culinary themes, techniques, sports, or various interests in politics, culture and everyday life. Speaking about visual elements, the processing is similar to both tabloid and hard news. Creators use animations, videos, music, or text, as well as other elements that have hybridized into news. These are various tests, quizzes, recipes or preparation procedures, as well as stories to continue or snippets of interviews or humorously sketched sketches. It is important to note that creators can give a true point of their stories in ten / fifteen seconds or with the help of few Stories or Snaps going in the right order in a row which is similar to listicle articles.



Entertainment information on Snapchat (Food and National Geographic).

Interaction

Although Snapchat has a lower level of interaction, since it is not possible to comment, share or share in the form we are used to, there is some possibility of interacting with the content. Among those that determine the success of the content from a marketing point of view is, in particular, the number of screenings and the number of screen shots. These options have also been used by the media to promote their content. There is also possibility to edit particular post and share it or send it to friends. Instagram also offers live poll feature. Users can choose from two possibilities, yes or no most frequently. They can also know results.



Way of interaction on Snapchat (People, BuzzFeed, Cosmopolitan).

Citizen journalism

Snapchat has changed the nature of citizen journalism. Although he didn't come with the live video first, Snapchat has made the most of its potential. Snapchat has developed a system of geolocation labels that work similarly to hashtags. This means that if a user is in a certain location or on a certain event with its own geolocation label, they can pin it to their shared content. For example, if a geolocation sticker has a hockey match; Snapchat can aggregate all the videos or photos with this sticker and offer a live Snapchat transfer from that location. This makes it more authentic than Facebook, as one event is streamed to an unlimited number of users, making it more attractive. On the other hand, Instagram has similar feature but it collects Stories from similar geographical places.

3.1 Ephemeral images: characteristics

The specific features of Snapchat, Instagram, and Facebook (the inventor of which is Snapchat) have suggested formation of other journalistic products on social networks. They are so-called stories, but terminology varies according to the social network. In the next lines, we'll introduce the features and ways of publishing through this platform, which are really creative and offer unlimited publishing capabilities with functionality of promoting content. We are talking about huge multimedia potential as no other social networks' content. So called Stories are not periodic, don't have an archive and content is very primitive and ephemeral exactly as an informal personal communication. Content we're talking about can be very vigorous, interactive and intelligent in few seconds. This chapter

will describe elementary characteristics of new type of communication defined mostly by Snapchat.

1. Video length: For Instagram it's 15 seconds, Snapchat has 10-second videos or photos that only last for 24 hours. We talk about ephemeral communication that is not periodical; they do not have a public archive.
2. Individual photos or videos can create a longer story.
3. Another feature is filming or shooting with a mobile device in height, which denies all shooting rules.
4. In essence, these contents are primitive and volatile as normal communication.
5. Visualization of data and information. These are shared by either static or dynamic images. This visualization is typical for Z generation but also for all online journalism. The contents are authentic and brief, using humor and often game elements.
6. Users focus on shared content more than on any other platform. It is certainly a positive change for newsrooms. Each type of content lasts only 10-15 seconds and it is followed by another, or it is cyclically repeated, users pay much more attention to watched videos or photos with text. This is a great deal of scarcity nowadays, because we live in a time when young people, surrounded by information overpressure, do not pay full attention to media content. In addition, Snapchat repeat one post cyclically, while Instagram cuts post after 15 seconds.
7. Contribution to citizen journalism. Snapchat has popularized aggregation of user's created content into one channel using geolocation tags. It has created a completely new kind of citizen journalism that can bring interesting, atypical information from various events, protests, sport matches and many others. We are talking about the next level of automation of journalism. The first social network that introduced such a procedure was Periscope.
8. Return to old media. First, there is a comeback of print magazines, because users mostly scroll from left to right or they simply tapping on that part of the screen of the device. In addition, there can also be a return to the traditional 50's when the viewer's only watched programs running behind each other. Similarly, Discover or Stories works on Snapchat, Instagram, where users just follow posts in a row without the ability to manipulate this content. They can just switch channel.
9. The purpose of publishing with this platform is not just to promote and refer to existing content, such as articles on the web, but it also has its place in the context of strengthening the media brand.
10. The target group of young people is undisputed advantage and main reason of using Snapchat Discover or Instagram Stories as a media channel. The young people who have found their place at Snapchat or Instagram have developed a certain language of communication or slang and media producers should understand it and use it in communication of news. Of course, young people will stay on Snapchat because there is a small probability of meeting their parents there who primarily use Facebook, less Instagram. The media have a unique chance to capture a target group of teenagers to create a future audience.
11. The easy form of information spread, which is closely related to the use of infotainment elements, is another advantage of using Snapchat as a communication channel. Young people can receive serious mediated in an inconvenient and fun way.
12. Since Snapchat content remains visible for 24 hours, users are used to share content of very low standards. We find a similar situation in content shared by media channels, although there is rather a larger tendency to tabloidization of information. The problem is also the preparation of Snapchat content itself. Mostly we meet professionally prepared animations or videos that require at least two editors (graphic, journalist). Therefore, there is a need to employ new content-editors for preparing ephemeral content, which also means an intervention in the publisher budget that not every media house can afford.

13. The existence of Snapchat has sparked a number of issues related to privacy and trustworthiness. Is the content of thousands daily users really deleted? In addition, there is also a problem affecting personality rights. If a medium or a private person shares Snap or Story with untrue information about another person, group of people or company and this information will disappear, how could a violation of the law be made when the court does not require screen shot videos or photos to be real evidence?

4 Conclusion

What we should learn from spreading news by Discover or "Stories?" First of all, the most important fragment is the platform. We are talking about mobile devices which are portable and generation Z use them constantly same as social networks (Instagram, Snapchat) which have become a virtual community where they can talk freely and in their own virtual visualized language. It is generally known that nowadays it is very difficult to concentrate for many children and teenagers. Stories offer very useful way of spreading news and telling stories. They are brief and short and users have to remember them because they will disappear forever. The way of telling information is very flexible, funny and comprehensible for generation of digital natives. Media often use gifs, memes and videos. We can say that they visualize communication which is very important for children and teenagers who do not read so much as generation before. We would like to recommend ephemeral images to educational institutions. They could use them as an educational tool which is inconspicuous, interactive and much more effective than traditional way of teaching.

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Primary Paper Section: A

Secondary Paper Section: AJ

EVALUATION OF EMPLOYEES' PERFORMANCE – IDENTIFICATION OF PROBLEMS AND PROPOSALS FOR THEIR ELIMINATION

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The paper is a part of submitted VEGA project No. 1/0348/17 „The impact of the coexistence of different generations of employees on the sustainable performance of organisations“.

Abstract: Employee performance assessment is an important element of human resource management. In a modern business performance assessment is considered as an important starting point for improving its performance. Performance evaluation and management is generally structured with the process of routinely setting goals, communicating and awarding prizes, respectively draw consequences. Managers and the staff also need to understand that there is no perfect rating system. All evaluation systems have their own mistakes, but all of them are an effective tool for correcting performance problems and, ultimately, a tool to increase business productivity and thus competitiveness. The paper presents the results of a survey carried out in select enterprises in the Slovak Republic, focusing on the evaluation of employees' performance; problem identification and pointing to the appropriate tools to remove or, elimination of identified problems.

Keywords: human resource management, work performance, problems of evaluation

1 Introduction

The current economic and social environment is characterized by turbulent changes in all areas of social life and creates completely new conditions for the operation of different types of organizations. As described by other authors, it is mainly about changes in economic relations, political systems, technology development, simulation in production processes (Trebuňa, Popovič & Klos, 2014; Trebuňa et al., 2014), alternation of generations of X and Y staff members (Krahn & Galambos, 2014, Kocian, 2015), and also the rapid development of communication technologies (Prajová et al., 2016). The significance / importance of Corporate Social Responsibility is rising (Vartiak, 2016). There is a need to take into account sustainable development, QMS, EMS (Rusko et al., 2016; Paulová, Kučerová & Mlčka, 2009) including the environmental aspects of entrepreneurship. We believe that there exists contingency perspective on the effect of corporate social responsibility performance on corporate financial performance and it is contextual in respect to three different dimensions of CSR being – Environmental, Social and Governance. We can also assume that if CSR has a positive effect on corporate performance that each dimension of CSR activities might also have a positive impact (Daszynska-Zygadlo, Slonski & Zawadzki, 2016). There is a significant increase in contacts of cultures of different values, which put different demands on people (Durišová & Čambál, 2015). These changes have to be monitored and tailored by companies, but mainly utilized by the opportunities provided by the new global business environment. In order to ensure competitiveness, the quality of human resources, their management and the related monitoring of employee performance are at the forefront of the interest in business entities.

Success of any company depends nowadays on the extent to which it capitalizes on its competitive advantage, and that is when sustainable development comes to the fore. (Kocmanová, Šimanaviciene & Dočekalova, 2015). One of the decisive factors of the company's competitiveness is becoming employees and their potential. This creates a need to detect / measure their contribution to achieving corporate success. Finding the right tools for assessing the employee performance and potential, identifying issues that can affect it, and finding optimal solutions are an important part of Human resource management.

The aim of the paper is to present the results of the VEGA survey with a focus on employee evaluation. We tried to identify issues arising in the evaluation of various categories of

employees and then find the appropriate tools for their removal resp. elimination. To achieve our goal, we used the following research methods: comparative analysis of literary sources, questionnaire survey, and statistical evaluation of results and interpretation of results obtained from surveys in industrial enterprises in Slovakia.

2 Theoretical background

2.1 Human resource management and work performance

Human resource management is the core of enterprise management because human resources are for the company the most valuable and often the most expensive resource which decide the company competitiveness. Also human resources represent the largest wealth of enterprise and their management decides whether the business will be successful or not. Human resources are considered the driving motor which set in motion other sources and makes use of them (Koltnerová, Chlpeková, & Samáková, 2013).

The views of the authors (Čambál, Cagaňová & Šujanová, 2012; Gyurák B., Kučerová & Homokyová, 2015; Kachaňáková, 2007), who deal with human resources management and performance are not quite unified and in theoretical works we find several definitions and approaches to understanding basic concepts power and performance.

In economic theory and in practice, work performance is considered as a measure of a person's work activity. Work performance is defined by the authors differently. As a rule, however, they focus either on performance in behavior or performance in the form of results (fulfillment of quantitative indicators) (Posoldová, 2014).

In general, work performance can be understood as an expression of the amount and quality of work that a worker performs under the given working conditions for a given time unit. The ability of an individual to perform a certain (maximum) work performance is called performance. Power is understood to be its actual expression, which is determined, in contrast to performance, by a more permanent set of dispositions and the ability of an employee (Szarková, 2004).

Work performance can be defined as a result, linked to the organization's strategic objectives, customer satisfaction and contributing to economic results. In a modern company, people's management is based on rewarding their benefits and targeted development of potential. The fulfillment of demanding goals is a constant monitoring and evaluation of work results, removal of undesirable deviations, direct remuneration and education of people (Trebuňa, 2011).

People tend to do what their performance is measured and they continue to do what they are rewarded for. Tell people what you want and reward them when they do it and punish when they do not. In this sense, people are not very different from laboratory animals that continue to behave when they receive granules and pay attention to the behaviors they are receiving for electric shocks. In reality, however, organizational performance and remuneration systems usually do not work so straightforward, but they contain multiple goals, and measures that do not always reflect real behavior and incentives that are not always tied to measures or goals. The result is a confusing and counterproductive practice, which can be termed "reward A, although we require B" (Ashkenas, 2010, str. 159).

People in the organization do what is expected of them because they are rewarding if they do well (if they work with the organization to help achieve the goals within the frame of a wider strategy). Sometimes the remuneration is a form of salary increase, credentials by, new more interesting, respectively more

challenging tasks or job promotion. In other cases, it is just a praise or an interesting opportunity. Instead, many organizations do not rely on effective performance under clearly defined success criteria, or their criteria are too narrow and have unexpected consequences for the organization and its key partners (Mouvius & Susskind, 2010, str. 88).

Invaluable performance review can be a great opportunity for managers to learn about new things in an innovation process that could be used for the entire organization (Mouvius & Susskind, 2010, str. 91).

2.2 Assessment and measurement of employee performance

Employee assessment is of great importance for the functioning of businesses or different institutions. In practice, employee appraisal and performance in an enterprise means determining how the employee performs his / her work, tasks and requirements that are related to his / her job content and also his / her work behavior towards other colleagues (Vetráková et al., 2007, s. 51).

Working performance evaluation represents a process in which organization evaluates performance as well as competence and working behavior of employees. If this evaluation is well prepared and conducted its results can mean impact for individual employees, managers and whole organization (Stachová, 2012).

"When you cannot measure it, you cannot even control it." The performance measurement system has a very strong impact on the behavior of people inside and outside of the business. In order to survive and thrive businesses in the information age, they must use management and measurement systems based on their strategy and capabilities. Many businesses formulate strategies for their customer relationships, key competencies, and in-house capabilities, but employees are only motivated by financial indicators, and their performance is also being evaluated in this way (Kaplan & Norton, 2005 str. 29).

The normative part of the organization's assessment asks not only to identify the nature of the issues we want to eliminate but also to specify what steps to do for remedial action - including coaching, clear benchmarks, motivational incentives, individual success factors. They must agree on clear rules. It is important to build a rating to highlight the critical need to improve the business strategy, the steps to be taken to build the organization's ability to respond to change and achieve the expected successes (Mouvius & Susskind, 2010).

In the view of several authors (Woolliscroft et al., 2013; Saniuk et al., 2015), performance indicators should be chosen to be understandable to all groups of employees at all levels of management. It is important to familiarize them with the employees and to analyze whether there are barriers eliminating the increase in employee performance.

An enterprise should define performance standards that are tied to enterprise Key Performance Indicators. This should correspond to the individual goal metrics consistent with business strategy and business goals. Employee Performance Management and Employee Performance Management System can build enterprise culture in a precise and long-term manner. Corporate culture consists of "values", "beliefs" and "standards" effecting thoughts and behavior of people in enterprises. They are key factors used to describe corporate culture. The corporate culture determines how employees describe where they work, how they understand the business, and how they see themselves as a part of the organization. Culture is also a driver of decisions, actions, and ultimately the overall performance of the organization, whether it is private or public sector (Hitka et al., 2015). It depends on employee's involvement into designing of assessment system, domination of feedback type in organization and dominating of stimulation system (Papsiene & Vaitkevicius, 2014).

At present, it is necessary to identify and define the key parameters of Sustainable Business Performance. An open question remains the way of measuring performance, individual indicators that would allow comparisons, or in time, between departments, respectively businesses to each other.

The total potential of employees can be used for benefit of the organization through shared values, by fostering mutual trust and facilitating initiatives. Staff involvement and communication with them enables using their skills to benefit the organization. (ISO 9004.2009)

The organization should motivate people to understand the significance and importance of their responsibilities and activities in relation to the creation and provision of value for the customers and other interested parties. (ISO 9004.2009)

2.3 Current trends in employee performance evaluation

Employee assessment, which in essence represents a qualitative assessment of the performance and personal benefits of employees, can serve as a tool for identifying the level of competence. The extent to which the outcome reveals the level of fulfillment of the individual competencies is determined by setting the criteria of which evaluation system (Vaňová, Gyurák Báběřová, 2011).

The basis for assessing work behavior is often the so-called competence model, based on corporate values and expressing the profile of an ideal employee. Competency model is a complex of measurable personality traits, abilities and working habits that enable the employee to perform at the position.

Employee development within the specific needs and requirements of the business is becoming more and more important. For this reason, the evaluation process concentrates more and more on the potential of employees, the level of their own thinking and thinking. The potential of employees for their strategic value for an enterprise becomes more important than the currently measured performance capability. Therefore, the evaluation is relevant not only for the present (or past) performance of the employee but for his / her development potential.

360-degree rating: The tool itself, promising just a comprehensive evaluation and integration of different viewing angles, is a 360-degree rating. In practice, this gains increasing importance. In it, they express the opinions of superiors, colleagues, co-workers and clients. This exemplar model is promoted in practice according to cultural and organizational assumptions in various variations. Most often, a supervisor's view is completed only with a request from co-workers (180 degrees) or a client opinion selected (270). By marking "360 degrees", it is to be emphasized that self-image in terms of self-evaluation / self-assessment is the basis and assumption of others.

Assessment Center (AC) and Development Center (DC) – Evaluation and Development Programs: AC and DC means in practice diagnostic or evaluation centers, which are required to assess the performance of managers, as well as specialists, rather than normal workers in production. This type of assessment is conducted through in-depth, detailed interviews, psychological testing, and simulations of various work activities or actions. The biggest drawbacks in this type of assessment are mainly financial and time-consuming, and the fact that information about an employee in a so-called fictitious or simulated environment may not be in line with his real work performance at a real workplace (Kachaňáková, 2007).

Managerial competencies are recommended to evaluate in the Development Center or through psychological and personality tests. DC is a moderated meeting, where participants-assessments engage in group and individual assignments and are led by a structured personality interview. In DC, unlike AC, all the competences displayed and all their levels, not just required

for a particular job, are monitored. Feedback evaluators and interpreters should be trained by LL staff and external consultants for staffing and training agencies. Psychological and personality tests should only be evaluated by psychologists. DC is demanding both for the preparation and for the content and time-based implementation, and therefore it is, used mainly by the employees involved in the career planning.

The various tools used to assess the performance and potential of employees are often deployed in companies in parallel. There is no absolute trust in individual human resources management, more efforts are being made for balanced employee observation and a combination of different evaluation tools. This may relativize the subjectivity of the superiors, the personal engagement of colleagues and the laboratory effect assessment processes. The endeavor is to compose the individual view angles into the overall image of the scorer. A reliable statement about the potential and performance capabilities of an employee is required, which implies the basic direction for the next individual development.

3 Methodology

The aim of the submitted contribution is to summarize the acquired knowledge, to identify problems in the field of measurement and evaluation of the employees' performance and to propose suitable starting points on the basis of previous own surveys, as well as the use of secondary research (study of existing available publications in the given field).

Data obtained from questionnaires were processed and evaluated using mathematic and statistics to express frequency and percentage of answers. Analysis and synthesis were used for obtained information and various aspects of research problems solutions discussing, so these methods were used to sort and summarize identified data. Synthesis was used to ensure the logical and idea entity of partial research results devoted by

analysis. Finally, the reached data from organizations were compared.

4 Results

Within the research project "Identification key parameters of sustainable performance of industrial enterprises in terms of multicultural environment", we used a questionnaire survey focused on the issue of enterprise performance. In addition, we conducted secondary research of existing studies available to the area and we used the study of the available literature sources.

We conducted the questionnaire survey amongst industrial enterprises in Slovakia, it was completed by 169 enterprises (5,3 % microenterprises; 12,4 % of small enterprises; 37,3 % of medium-sized enterprises and 45 % of large enterprises).

Based on answers from respondents, 85.1% of the organizations surveyed perform a regular performance evaluation of employees. The group of respondents did not rank the results according to the size of the organization, as the evaluation and measurement of the performance of their employees is not carried out in micro-enterprises and in most small enterprises. Middle and large businesses are evaluating employee performance, and differences have not been found between them. In their responses to the other questions in the questionnaire, the respondents addressed the problems they encountered in the field.

In the questionnaire was surveyed the frequency of measuring and evaluating employee performance. The answers to this question are related to the number of respondents who said they were evaluating the performance of their employees. As respondents had the opportunity to report multiple responses (e.g. irregularly + annual, monthly + yearly), the question was evaluated in absolute terms. As can be seen in FIG. 1, the majority of respondents realize annual, respectively monthly evaluation.

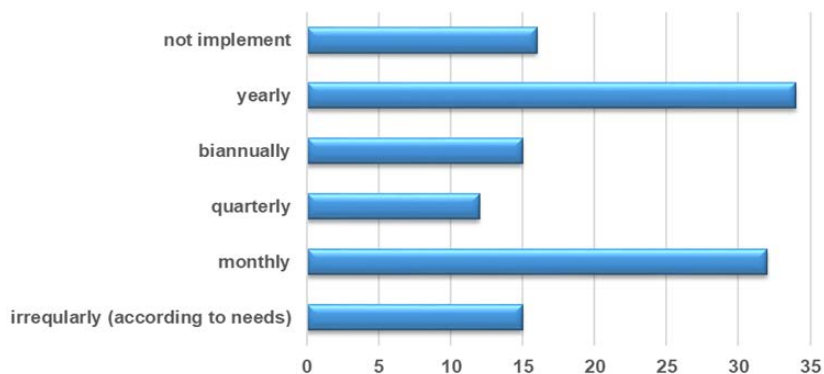


Figure 1. Survey of employee measurement and evaluation frequency.

Source: own processing

Then we focused on finding out what they consider the organization as the biggest problem in the evaluation of employees broken down by category, i. e. production staff (operators, etc.), Technical and administrative staff and managers.

The graphical representation of the survey results is shown in Fig. 2, which suggests that respondents in all three categories consider the evaluator's subjectivity as the biggest problem. In the other criteria, different categories of employees are different.

The production staff is considered a problem of lack of time to conduct interviews and assessment is considered unnecessary formality which does not help. In the case of technical and administrative staff, another criterion was the non-linking of the evaluation results to remuneration and career growth. For managers, the other criteria were setting measurable results and short time for conducting interviews.

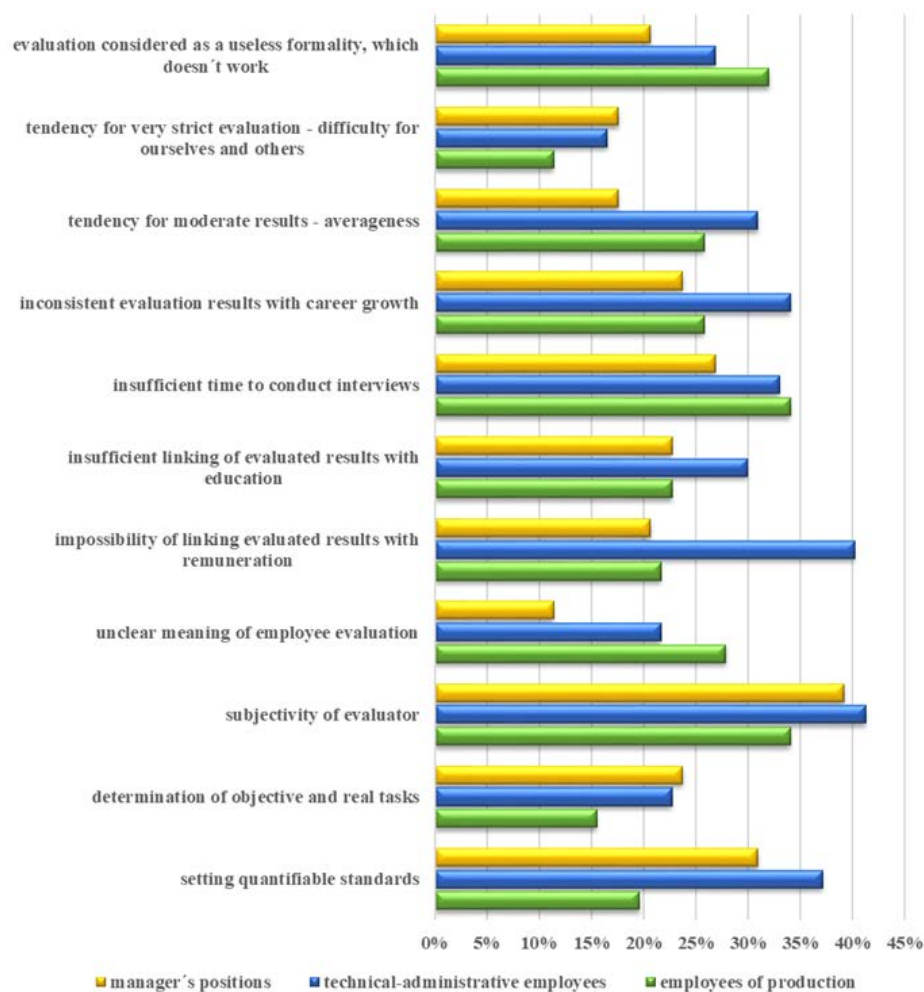


Figure 2. Troubleshooting for staff performance ratings by category
Source: own processing

Respondents were asked to comment on which criteria they did not consider to be a problem. As can be seen from Tab 1, the following considerations are not considered to be the problem: the most responses. The smallest problem is the tendency to a very rigorous assessment – the difficulty of ourselves and others.

Although the respondents are reporting a problem as a problem with the assessment criterion considered unnecessary formality that does not help, in the overall assessment this criterion does not turn out to be problematic.

Tab. 1 Survey of perceptions / not understanding of staff performance appraisal (Source: own processing)

Number	Characteristic no-problem	Percentage
1	setting quantifiable standards	31,69
2	determination of objective and real tasks	35,05
3	subjectivity of evaluator	28,87
4	unclear meaning of employee evaluation	34,02
5	impossibility of linking evaluated results with remuneration	35,05
6	insufficient linking of evaluated results with education	35,05
7	insufficient time to conduct interviews	27,84
8	inconsistent evaluation results with career growth	24,74
9	tendency for moderate results - averageness	31,96
10	tendency for very strict evaluation - difficulty for ourselves and others	44,33
11	evaluation considered as a useless formality, which doesn't work	41,24

5 Discussion and suggestions for solution

Employee performance is the basis for the company's overall performance. If employees do not have feedback as their performance is assessed, as the employer is satisfied with their activities, they are unlikely to change their actions. If the company wants to manage employee performance, they need to know clearly what is expected of them (set goals), create conditions for work, and give feedback to employees, as satisfied with their previous work and see the potential of their further development.

A simpler and more manageable measure is to measure the organization's quantitative goals. The measurement of qualitative indicators is more difficult and more complicated.

Performance indicators should be chosen in such a way that they are understandable to all groups of employees at all levels of management. It is important to familiarize them with the employees and to analyze whether there are barriers eliminating the increase in employee performance. On the basis of the results obtained and the trend of the development of these indicators, the performance of the employee and his potential should be assessed.

In the survey, we outlined the important aspects that we want to focus on in the future and can be addressed by further research.

Based on the results of the survey, which found that the subjectivity of ratings for all categories of staff appears to be the most significant issue. The question remains how to solve this problem? Can we deal with all categories in the same way or do different approaches be chosen? One of the options is the more rigorous preparation and training of the assessors, respectively. Expanding the number of evaluators for non-interested persons (eg personnel, employee representatives, etc.). As a further option, it appears to increase the use of the 360 ° employee rating method.

Another identified shortcoming in the category of technical and administrative staff is that staff evaluation results are not linked to other subsystems, that is to the remuneration system and career growth of employees. In this context, questions about the importance of staff evaluation are taken into consideration - is evaluation worthwhile without further follow-up? What does the career development system of employees depend on?

Survey results also point to the problem of setting measurable criteria for the category of managers and technical and administrative staff. The question is: What indicators do businesses focus on when assessing these groups of employees? Is it sufficient to measure performance to evaluate only financial indicators? The solution can be to use MBO, MBC, KPI, and BSC performance evaluation systems, which are mainly described in the RLZ theory, but their practice has not yet fully implemented.

To shape behavior, it is necessary to introduce an effective evaluation of employees who will not assess their behavior from the past, by denouncing what was wrong (past we will not change), but focusing on the future, learning from the errors and evaluating the potential of the employee and the possibilities of his development, by agreeing, for example, the motivation objectives to be achieved by the employee in the next period, discussing the support he needs from the supervisor.

In the past, staff ratings lacked standardization, leading to a high degree of subjectivism. At present, human resource assessment is becoming a means to help drive the MBO goals. It becomes an integral part of managing people and joins with other levels of HRM. It serves as a basis for the formation of remuneration as a starting point for development as well as a tool for maintaining (securing) the individual effort (motivation) of the employee, or for the inclusion of the employee in the program of career development and succession planning.

6 Conclusion

The Performance Management System ensures not only consistency and goal communication, but also employee performance appraisal, commitment to motivation and development with expected performance, and feedback on the effectiveness of the entire system.

The main goal of Employee Performance Assessment should be to create a comprehensive image of the employee, his strengths and weaknesses, the possibilities for further development as well as the results of his work and his future perspectives in the organization. It should form the basis for the development of an employee's career, conditional on specific activities, especially in the field of education, or to create a forum for discussion about moving to another job position that would correspond more to the employee's duties. In case of a negative evaluation, inform and talk to the employee about the consequences. The outcome of the evaluation should be linked to other motivational tools.

Regular assessment of staff performance and positive approach to management and employees should be part of building and maintaining corporate culture. Corporate culture as a basis for all actions and decisions must be transformed into everyday

business process and operations (Vaňová & Gyurák Báběřová, 2014).

Employee performance increase, will be not succeed if there is wrong corporate culture, in the business, if (Team of authors, 2009):

- we do not have clearly defined corporate objectives and strategy,
- we frequently change corporate strategy and objectives,
- we do not have clearly discussed strategy and objectives of the enterprise also with employees,
- we have implemented multistage and confusing organizational structure,
- we have a tenuous flow of relevant information,
- we have applied only authoritative control that commands and shows only the failures of employees, we have in the enterprise groups and individuals who do not respect generally accepted rules and standards.

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Primary Paper Section: A

Secondary Paper Section: AE

ADOLESCENT'S PERSONALITY THROUGH BIG FIVE MODEL: THE RELATION WITH PARENTING STYLES

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Paper is published within the frame of the project Vega 1/0122/17 Risk behavior and attachment of the adolescents aged from 10 to 15

Abstract: The paper deals with the parenting styles and their influence on the personality dimensions of the adolescent. Certain parenting and certain educational practices enhance the personality characteristics of the child at different levels. Personality dimensions were examined using the Big Five model, specifically the NEO FFI questionnaire. The parenting styles were examined using a DZSVR questionnaire which identifies four basic educational styles: autocratic, liberal, integrative and indifferent, based on level of component of requirements and freedom. On a sample of 402 adolescents, we found that there is a strong correlation between parenting styles and adolescents personality dimensions, and we found differences in personality dimension between research groups (parenting styles). An integrative and liberal parenting styles support the personality dimensions as the consciousness, extraversion and openness, while autocratic and indifferent parenting styles support the neuroticism.

Keywords: parenting styles, personality traits, liberal, autocratic, democratic, indifferent, NEO FFI

1 Introduction

The influence of the family environment on personality development is often topic of discussion in psychological, pedagogical and biological sciences. The most common problem is the identification of the impact of external and internal factors on the personality development. As some researches have shown (Johnson, A. M., Vernon, P. A., Feiler, A. R. et al. 2008), internal determinants are important factors in the personality development and its characteristics, but the prevalence of internal factors is being questioned because children tend to copy and mimic the behavior of their parents. The family is the most important external factor in personality development. Parenting styles influences the formation of personality to a significant extent. As has been shown in various analyses (for example Lasoya, S. H. et al., 1997; Prinzie, P. et al., 2009), negative control, strictness, and lack of emotionality in the family form a trait of neuroticism and poorly develops agreeableness and openness to experience. While supportive parenting styles and emotionality rich family environment support development of these personality dimensions, and individuals are more emotionally stable. Based on these assertions, we assume that the quality of the attachment among the adolescent and his/her parents represented by the parenting style has the influence on the personality dimensions quality. We will try to confirm the assumptions and identify the association between the parenting styles and personality dimensions using the Big Five construct. Consequently, we will try to found differences in the personality dimensions of adolescents who have been raised with different parenting styles.

1.1 Theoretical background: defining the basic concepts

The concept of personality is defined in many ways. However, most often, personality is defined as a person with all the social, psychological and biological features that include the psychic processes, conditions and properties of a person. Every person is unique in his/her interests, opinions, thoughts or qualities. The notion of personality includes the needs of person, drives, interests, talents, values, character and temperament. All these elements form personality. Its component is also the primary and secondary characteristics of the personality. These primary ones are qualities that are innate and based on the naturalness of each person, for example temperament. The secondary characteristics of a personality are those that one's acquire during life, such as personality traits (Řičan P., 2010; Bělková, P., 2013).

Personality development and its improvement over the life is the result of various influences and education, and is also conditioned by inherited attributes. The process of personality shaping starts before birth of child, but the most intense is in the period of adolescence. Improvement and personality development continues throughout life, but this progress is considerably smaller compared to childhood and adolescence. There are a lot of factors that determine the personality development and have influence on this process, but the most significant are hereditary, society and family environment, also mentioned as internal and external determinants.

Internal determinants are defined as the hereditary features of the personality, specifically the heritage of previous generations and the factors that influenced the development of individual during prenatal and perinatal period (Strejček, J., 2009). M. Nakonečný (1995) states that the term inheritance means the tendency of the organism to preserve and pass on the traits and characteristics of the ancestor to descendent through genes (hereditary information). Into category of inherited personality features we also include the inherited assumptions, signs and characteristics that arose in the prenatal period, as we mention before. But, inheritance does not create integral and unchangeable features of personality, but only assumptions that are of certain quality, as they develop, depend on other external influences (Končeková, L., 2005).

Another important determinant of the personality of the child is the school and the individual's own activity, because child lives a significant part of his childhood, puberty and adolescence, in this environment. The school enters into the child's educational process, along with family and community. The school significantly supports the complex development of individuals' personality and prepares them for their personal, working and civic life. The school's greatest importance in shaping the personality of the individual is the influence on the formation of ethical and moral values (in addition, the school also significantly influences the development of the individual's body, skill development, talent, etc.).

Greater influence on personality formation has the material and social environment of the individual. Material environment means environmental quality (climatic conditions, natural environment, environmental changes, etc.), while the social environment is the environment in which a person grows (most often a family and a school; Strejček, J., 2009). According to I. Šnýdrová (2008) family is the most important factor, which influences the formation and maturation of the personality. Parents and other members of the family becomes the target of observation and unintentional imitation from the lowest age of the child. As stated I. Šnýdrová (2008), personality shaping is a direct reflection of the quality of the family. Lack of childcare and educational patterns shapes adverse personality traits. Parentally neglected are mainly children of uncultivated parents, but also paradoxically children in families with a high socio-economic status, where parents do not have time for children, where the child is unwelcome or is in the background in a number of other parental values. These and other disorders of the family atmosphere misinterpret the development of the personality of the child, because children take and consolidate mainly unfavorable patterns of behavior (Šnýdrová, I., 2008).

The individual in the family environment gains first views of life and the world, shaping the basic characters of the personality because he/she spends in family environment a considerable part of their lives. The roots of raising problems can be found in several aspects of parenting caused by parental behavior: perfectionism, parental indifference, unilateralism, inadequacy of parenting tools, inappropriate parenting practices for the age of the child, inappropriate parenting practices to the child's abilities, overworking neglect etc. (Šturák, P., 2005). Among the basic conditions of positive education are mainly: love from

parents, positive emotional relationships, parental authority, harmonious relationships among family members, realistic parenting attitudes towards children and proper parental roles in parenting activity, positive example of parents and siblings, order of family life and appropriate requirements for behavior of the child (Havran, J., 1998).

The family can be the source of happiness, satisfaction and love, but also the source of dissatisfaction, conflict and suffering which lead to the risk behavior production. In risk families, children with parents and siblings have negative relationships. The result is anxiety, negative personality traits and other pathological phenomena. According to J. Čáp (1996), on the basis of research, he found that stricter parenting style leads the child to be introvert person, less confident and unhappy. According to the empirical findings and theoretical assumptions of some authors (Clark, L. A. et al., 2000; Čáp, J., Boshek, P., 1996; Fontana, D., 1997; Lasoya, S. H. et al., 1997; Šturák, P., 2005) different parenting style shapes different types of personality, with different characteristics of the child's personality. In the following text we will describe the most reported types of parenting styles and their reflection on the personality of the child, the future adult individual (these constructs are only of theoretical basis, concrete empirical evidence is given in the next section):

- The integrative parenting style (also known as democratic): parent requires from child to behave reasonably and socially at a level appropriate to his or her age and abilities (Šturák, P., 2005, p. 5). Parents are trusted, caring and curious about the views and feelings of their child. The parent reasonably justifies their decisions. The integrative parenting style is considered the most appropriate, which also positively influence the behavior of the child. One does tend to be independent, self-confident, friendly, satisfied, striving for the best performance and success.
- The autocratic parenting style (also known as authoritarian), as well as most of parenting styles, have its positives (the authority necessary to overcome the Electra and Oedipus complex) and its negatives (Tomšik, R., 2015) – feats are enforced and two-way communication is lacking. Parents require obedience, respect for authority, the traditions and hard work. Such parenting behavior results into following personality traits of the children: they tend to social isolation, loneliness, lack of spontaneity; girls often tend to be depended and without effort for good performance, boys tend to be aggressive.
- Liberal parenting style (also known as leaning): parents demand little from the child. They are receptive, responsive and child-oriented. This parenting style results in a positive emotional affinity for the child, but he/she is immature, does not control impulses, have lack of social responsibility, and cannot rely on self. There is also a tendency towards aggressive behavior (Fontana, D., 1997).
- When parents raise up the child by neglecting parenting style (also known as indifferent or uninvolved) we can characterize them as too busy, not involved in the lives of children, without interest in what they are dealing with. Among these members there is a lack of two-way communication or parents tend to avoid communication with child, the parents tend to ignore the opinions and feelings of his children. This parenting style gives the child various distractions in behavior. Individuals tend to have mood swing. They often cannot control their feelings, impulses, and do not care about schooling and school-related activities. They are often tend to school truancy and use drugs and other addictive substances which are the basic forms of the risk behavior of the adolescents (Šturák, P., 2005).

1.2 Influence of parenting styles on personality dimensions: empirical evidence and research objectives

The correlation between the parenting styles and the personality dimensions of the child has been addressed in the research field by, for example, S. H. Lasoya et al. (1997), R. M. Huver et al. (2010), E. F. Sleddens et al. (2014), M.E. Maddahi et al. (2012) and P. Prinzie et al. (2009). Researches have revealed some

patterns and evidence that there are significant relationships between these variables. The problem arises when comparing the results of the research, since the same research methods for mapping parenting styles were not used. Nevertheless, we have tried to compare the findings of the researches. The most common model of parenting methods was detected using the Support, Control, Negative control, and Negative affect variables – support and control as elements of the integrative parenting style and negative, strict control and lack of emotionality as elements of indifferent parenting style. The results of the studies are given in Table 1 and described in further text:

- Extraversion is related to the parenting style that is characterized by a high level of support and control – authoritarian (integrative), liberal and autocratic parenting style. In some cases (for example Sleddens, F. C. et al., 2009, Prinzie, P. et al., 2009) negative relationship of extraversion and negative control was also found.
- In all cases, consciousness is correlated with a higher level of parental support and control, and negative control (S. H. Lasoya et al., 1997; P. Prinzie et al., 2009).
- Agreeableness in all research is positively correlated with a higher level of parental support and control, and negatively with negative control and negative affects (Lasoya, S. H. et al., 1997) – the highest level of statistical correlation compared to other dimensions.
- The personality dimension neuroticism, contrary to emotional stability, received the greatest attention in scientific research, probably because the correlation between neuroticism and parenting style is quite predictive. Neurotic parents are considered less competent for rising up. S. H. Lasoya et al. (1997) found that neuroticism is related to the absence of family "heat" and was in significant correlated with negative affects. In all previous studies, decreased emotional stability was also associated with strictness and negative control. The same level of correlation between neuroticism and autocratic parenting style was also found in research by M. E. Maddahi (2012). The direct impact of autocratic parenting style on the personality dimension neuroticism ($R^2 = 0.380$) was found by J. A. D. Datu (2012) using linear regression analysis
- Openness, like extraversion, correlated with integrative style. In research by Lasoya, S. H. et al. (1997; $r = -0.180$) and F.C. Sleddens et al. (2014) with positive support, and with negative control ($r = -0.110$) in research by P. Prinzie et al. (2009).

Table 1: Overview of studies measuring correlation between NEO FFI personality dimensions and family parenting styles.

Authorship		Support	Control	Negative control	Negative affect
S.H. Lasoya et al., (1997); n=313	N	-0.28	0.17	0.34	0.31
	E	0.34	ns	ns	ns
	O	0.47	0.30	ns	ns
	P	0.38	0.26	-0.29	-0.17
E. F. C. Sleddens et al., (2014); n=821	S	0.29	0.15	-0.15	ns
	N	-0.20	ns	0.32	-
	E	0.27	0.08	-0.17	-
	O	0.29	ns	-0.18	-
R.M.E. Huver et al., (2010); n=688	P	0.42	0.14	-0.21	-
	S	0.14	0.18	ns	-
	N	ns	-	0.11	-
	E	0.24	-	ns	-
P. Prinzie et al., (2009); n=3778	O	0.15	-	ns	-
	P	0.37	-	-0.13	-
	S	0.12	-	ns	-
	N	-0.17	-	0.14	-
P. Prinzie et al., (2009); n=3778	E	0.14	-	-0.10	-
	O	0.16	-	-0.11	-
	P	0.19	-	-0.10	-
	S	0.11	-	-0.10	-

*Note: n– number; N– neuroticism; E– extraversion; O– openness; P– agreeableness; S– consciousness; ns– correlation is not significant.

The results of research by authors such as J. Belsky, S. R. Jaffee (2006), G. Kochanska, N. Aksan, K. E. Nichols (2003), C. L. Smith et al. (2007) who used Eysenck Personality Questionnaires, the Multidimensional Personality Questionnaire and the NEO PI, found the same results or very similar results. Some of the research also found the relationship between these variables (Huver, R. M. E. et al., 2010; Clarke, T. L., 2006). Their comparison is challenging due to the different settings of the research samples and the research objectives themselves. R. M. Huver et al. (2010) found that negative control is a good predictor of neuroticism ($\beta = 0.100$) and that support is a good predictor of extraversion ($\beta = 0.130$) and agreeableness ($\beta = 0.220$). T. L. Clarke (2006) identified the significant impact of support on the personality dimensions agreeableness and conscientiousness ($\beta = 0.108$) and the impact of inconsistent/indifferent parenting style on the personality dimension neuroticism ($\beta = 0.374$) using linear regression analysis.

Based on previous research, we formulate the following predictions (hypothesis) on the differences between the levels of personality dimensions of individuals raised up with different parenting styles:

- *We assume that individuals who are raised up by the autocratic and indifferent parenting style will achieve a higher level of neuroticism compared to individuals who have been raised up with liberal and integrative parenting style (H_1);*
- *We assume that individuals who are raised up with the autocratic and indifferent parenting style will achieve a lower level of extraversion compared to individuals who have been raised up with liberal and integrative parenting style (H_2);*
- *We assume that individuals who are raised up with the liberal, autocratic and integrative parenting style will achieve a lower level of conscientiousness, agreeableness and openness compared to individuals who have been raised up with integrative parenting style (H_3).*

2 Research sample

The research sample consists of university adolescents from Slovak universities from the following regions: Nitra, Bratislava, Banská Bystrica, Prešov, Trenčín, Trnava and Žilina. In total 402 adolescents of the first year of bachelor studies were involved in the research. In the academic year 2014/2015 was admitted to the first years around 3300 adolescents. According to the approximation of D. W. Morgan and R. V. Krejcie (1970; In: Tomšík, R., 2016), at least 346 respondents must be included in the set, with a percentage distribution corresponding to the size of the basic set in each region. This criterion is fulfilled. A research sample consists of 119 male and 266 female respondents (17 uncategorized), with an average age of $M = 20.5$ years. During research 500 questionnaires were distributed, which means that the return of the questionnaires was 80.4 %.

2.1 Methods

Standardized research tools were chosen for the valid results of the study, whose internal consistency and reliability is not disrupted. The standardized questionnaire DZSVR (Questionnaire for detecting of parenting styles in family, originally in Slovak: Dotazník na zisťovanie štýlov výchovy v rodine hereinafter DZSVR) for detecting parenting styles and for measurement personality traits we choose standardized NEO FFI Personality Inventory.

The authors of the DZSVR questionnaire are J. Čáp and P. Boschek (1994). In this questionnaire adolescents denounce the behavior of their parents, mother and father in particular, in the most common situations. From the beginning of the seventies, the questionnaire was gradually modified on the basis of the results on various researches. In its current form, the questionnaires consist of 40 items, ten for each of the four parenting components. The questionnaire contains a positive and

negative component of the relationship between parents and adolescent, a component of requirements and freedom that corresponds to parental attitudes (based on Schludermann's and Schaefer's CRPBI questionnaire): positive, hostile, directive and autonomous. The items are administered separately for the mother and father and the answers are recorded on the three-point scale (yes, partially, no). By combining the individual components of education, it is possible to identify the emotional relationship of parents to the adolescent, educational styles in the family and then the overall way of family education (parenting styles). The scale is composed of nine components and with their combination we find the following information:

- Emotional relationship of each parent is generated by the synthesis of the positive and negative component of parenting.
- The style of parental control is generated by the synthesis of components of requirements and freedom.
- By synthesizing the emotional relationship of father and mother we generate an emotional relationship in the family as a whole.
- By synthesizing the control style of father and mother, we will achieve parenting control in the family as a whole.
- And by synthesizing the emotional relationship and the parenting control in the family as a whole, we will reach the parenting style in the family as a whole.

On the basis of these analyzes it is possible to identify four parenting styles: integrative, indifferent, liberal and autocratic. Cronbach's alpha of subclass ranges from 0.59 to 0.82 (Čáp, J., Boschek, P., 1994; Mayerová, K., 2013).

NEO Five Factor (NEO FFI) is a personality inventory that examines a person's Big Five personality traits (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism). The authors of the NEO FFI questionnaire are R. R. McCrae and P. T. Costa (Slovak version by I. Ruisel and P. Halama, 2007). Cronbach's alpha of questionnaire is 0.87 (Hřebíčková, M., 2004). Questionnaire consists of 60 items (Likert type), twelve for each personality dimension:

- Openness to experience: (inventive/curious vs. consistent/cautious). Openness reflects the degree of intellectual curiosity,
- Conscientiousness: (efficient/organized vs. easy-going/careless). A tendency to be organized and dependable, show self-discipline, act dutifully, aim for achievement, and prefer planned rather than spontaneous behavior.
- Extraversion: (outgoing/energetic vs. solitary/reserved). Energy, positive emotions, surgency, assertiveness, sociability and the tendency to seek stimulation in the company of others, and talkativeness.
- Agreeableness: (friendly/compassionate vs. challenging/detached). A tendency to be compassionate and cooperative rather than suspicious and antagonistic towards others.
- Neuroticism: (sensitive/nervous vs. secure/confident). The tendency to experience unpleasant emotions easily, such as anger, anxiety, depression, and vulnerability.

2.2 Data analysis

For the description of the research data, for detecting associations between variables and for detecting differences between research groups were used statistical programs SPSS (Statistical Package for Social Science ver. 20) and STATA 13 for Microsoft Windows. MCAR test (Little's Missing Completely at Random) was used to verify the missing data. After assuring that the data in the file is missing randomly, the Missing Value Analysis (Expectation-Maximization) method was applied to replace the missing data. To verify the normality of the research data the Kolmogorov-Smirnov and Shapiro-Wilk tests were used. To determine the correlation and magnitude of the effect between parenting styles and personality dimensions of NEO FFI, we used the Eta coefficient, while we used Kruskal-Wallis test and LSD analysis to find differences in personality dimensions between research groups (Tomšík, R., 2016).

3 Results

In research, before statistical analyses, we determine the normality of the distribution of research data using Skewness, Kurtosis, Kolmogorov-Smirnov KS test with Lilliefors correction and Shapiro-Wilk test. Although the skewness and kurtosis of the majority of variables were given within -1 to 1, the Kolmogorov-Smirnov test and the Shapiro-Wilk test indicate that the variables do not fulfill the criteria of normality. Based on these results, we chose non-parametric tests for further statistical analyses.

Table 2 presents findings of the representation of individual parenting styles in the research sample. Of the total number of respondents (N = 402), the largest part of respondents were raised up with indifferent parenting style 58.7% (n = 236). With autocratic parenting style were raised up 15.9% (n = 64) of respondents, 13.2% (n = 53) of respondents were raised up with the liberal parenting style, while the 12.2% (n = 49) of respondents were raised up with integrative parenting style.

Table 2: Distribution of parenting styles in research sample.

Parenting style	N	%	% ^V	% ^C
Autocratic	64	15.9	15.9	15.9
Liberal	53	13.2	13.2	29.1
Integrative	49	12.2	12.2	41.3
Indifferent	236	58.7	58.7	100
Total	402	100	100	

*Note: N- number; %^V- valid %; %^C- cumulative %.

Compared to the norms, determined by J. Čáp and P. Boschek (1994) in the handbook, the distribution of individuals according to the parenting style was similar to distribution in our research sample (age category – over 17 years). The authors report that individuals raised up with autocratic parenting style were 18.5%, liberal 14.0%, integrative 24.0% and indifferent 44.0%. Compared to the norms, we detect significantly in research sample larger number of individuals raised up with indifferent parenting style. The proportion of adolescents who were raised up with autocratic and liberal parenting style is comparable to norms, while the proportion of adolescents who were raised up with integrative parenting style is significantly smaller.

Table 3 presents descriptive statistics of personality dimensions of research sample. Observing only the average score, we find that the adolescents have reached the highest average score in the personality dimension consciousness (M = 31.82). Approximately one-and-a-half points below were scaled personality dimensions extraversion (M = 30.14) and agreeableness (M = 30.07). The lowest average scores were achieved in personality dimension openness (M = 27.99) and neuroticism (M = 22.28). Compared to the standards presented by I. Ruisel and P. Halama (2007) in the handbook, we do not notice significant differences compared to the scores that were measured on our sample. For the age group of individuals aged 15-24, the authors report the following average scores for individual personality dimensions: neuroticism M = 21.87; extraversion M = 30.05; openness M = 29.45; agreeableness M = 29.69 and consciousness M = 29.45. The biggest differences are in personality dimensions openness and consciousness, where adolescents of our research sample have reached about one point higher scores compared to norms. Other scores are comparable.

Table 3: Descriptive statistics of personality dimensions among adolescents.

NEO FFI	N	MIN	MAX	M	SEM	SD	S	C
Neuroticism	402	0	43	22.28	0.403	8.077	0.000	-0.120
Extraversion	402	5	45	30.14	0.326	6.538	-0.297	0.103
Openness	402	4	46	27.99	0.303	6.070	0.246	0.137
Agreeableness	402	16	46	30.07	0.320	6.421	0.235	-0.742
Conscientiousness	402	13	48	31.82	0.336	6.736	0.109	-0.217

*Note: N- number; M- mean; MIN- minimum score; MAX- maximum score; SEM- standard error of the mean; SD- standard deviation; S- skewness; C- kurtosis.

Our intention was to analysis the association between the parenting styles and the individual personality dimensions measured by the NEO FFI questionnaire, based on the theoretical and empirical evidence of previous research. Using eta η coefficient, we have found a statistically significant association between parenting styles and all personality dimensions, namely: neuroticism ($\eta = 0.444$), extraversion ($\eta = 0.317$), openness ($\eta = 0.399$), agreeableness ($\eta = 0.392$) and

conscientiousness ($\eta = 0.285$). The most prominent effect was parenting styles and personality dimensions neuroticism ($\eta^2 = 0.197$), openness ($\eta^2 = 0.159$), and agreeableness ($\eta^2 = 0.153$). While the effect between parenting styles and personality dimensions extraversion ($\eta^2 = 0.101$) and conscientiousness ($\eta^2 = 0.081$) was lower (small effect). The results of the analysis are given in Table 4.

Table 4: Relationship between parenting styles and the personality dimensions NEO FFI.

Model	NEO FFI	N	M	SEM	df	η	η^2
DZSVR Parenting styles	Neuroticism		22.28	0.403		0.444	0.197
	Extraversion		30.14	0.326		0.317	0.101
	Openness	402	27.99	0.303	401	0.399	0.159
	Agreeableness		30.07	0.320		0.392	0.153
	Conscientiousness		31.82	0.336		0.285	0.081

* Note: N- number; df- degrees of freedom; η - Eta coefficient; η^2 - variability.

In the following part of the research we will focus on identifying the differences in the individual personality dimensions among research groups (based in parenting styles). Based on previous

data distribution normality tests, we chose nonparametric tests for further analyses, specifically the Kruskal-Wallis H test. Significant difference between the research groups was found at

the level of all personality dimensions of the NEO FFI questionnaire at the level of statistical significance 0.001. The

results of the analysis are given in Table 5 and Figure 1.

Table 5: Comparison of personality dimensions (NEO FFI) between research groups based on parenting styles.

NEO FFI	DZSVR Parenting style	N	M	SD	SEM	df	H	p
Neuroticism	Autocratic	64	22.48	9.77	1.221	3	28.107	0.001
	Liberal	53	17.85	8.245	1.133			
	Integrative	49	19.59	8.261	1.18			
	Indifferent	236	23.78	6.968	0.454			
Extraversion	Autocratic	64	28.45	8.19	1.024	3	33.134	0.001
	Liberal	53	33.77	5.37	0.738			
	Integrative	49	32.39	5.287	0.755			
	Indifferent	236	29.32	6.114	0.398			
Openness	Autocratic	64	29.27	7.17	0.896	3	16.18	0.001
	Liberal	53	29.04	5.939	0.816			
	Integrative	49	29.69	7.687	1.098			
	Indifferent	236	27.06	5.201	0.339			
Agreeableness	Autocratic	64	29.92	7.251	0.906	3	56.541	0.001
	Liberal	53	35.57	4.167	0.572			
	Integrative	49	31.59	6.304	0.901			
	Indifferent	236	28.56	5.891	0.383			
Conscientiousness	Autocratic	64	31.47	7.067	0.883	3	22.783	0.001
	Liberal	53	35.28	7.026	0.965			
	Integrative	49	33.31	5.467	0.781			
	Indifferent	236	30.83	6.544	0.426			

*Note: N– number; M– mean; SD– standard deviations; SEM– standard error of the mean; df– degrees of freedom; H– Kruskal-Wallis H test; p– level of statistical significance.

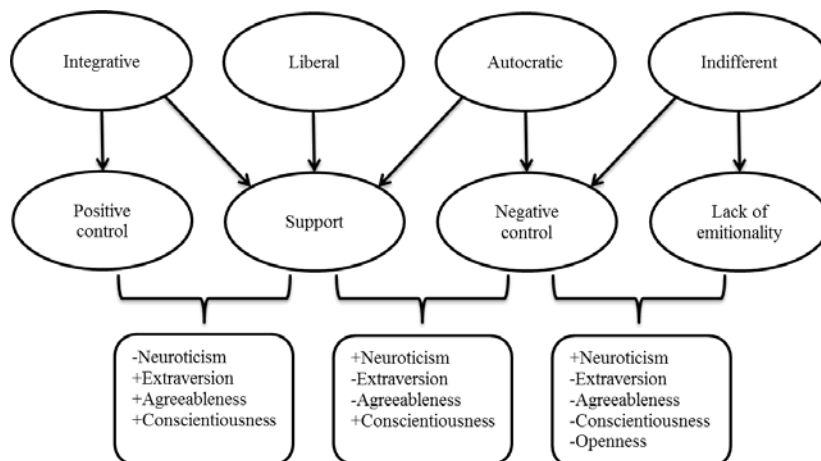


Figure 1: Moderate model of influence of style of education on personality dimensions.

Using LSD analysis, we found the following differences between research groups in personality dimension extraversion. We found a statistically significant difference between adolescents who were raised up with integrative parenting style and adolescents who were raised up with indifferent ($p = 0.002$) and autocratic parenting style ($p = 0.001$), where adolescents who were raised up with integrative parenting style obtained significantly higher score (Mean Difference hereinafter MD = 3.066; MD = 3.935). Similarly, as with integrative parenting style, we also found a statistically significant difference in extraversion among adolescents who were raised up with liberal and indifferent ($p = 0.001$) and the autocratic parenting style ($p = 0.001$), where adolescents who were raised up with liberal parenting style obtain a significantly higher average score (MD = 4.452; MD = 5.320).

We found statistically significant difference in neuroticism between adolescents who were raised up with integrative parenting style and adolescents who were raised up with indifferent (MD = -4.184; $p = 0.001$) and autocratic parenting style (MD = 2.893; $p = 0.049$), where adolescents who were raised up with indifferent and autocratic parenting style obtain lower scores. Similarly, we found statistically significant difference in neuroticism between adolescents who were raised up with liberal parenting style and adolescents who were raised up with indifferent (MD = -4.635; $p = 0.001$) and autocratic parenting style (MD = 5.925; $p = 0.049$), where adolescents who were raised up with indifferent and autocratic parenting style obtain lower scores.

In variable openness, adolescents who were raised up with indifferent parenting style obtain significantly lower scores

compared to those who were raised up with integrative parenting style (MD = -2.639; $p = 0.005$), liberal (MD = -1.983; $p = 0.030$) and autocratic parenting style (MD = -2.211; $p = 0.009$).

In personality dimension agreeableness, adolescents raised up with liberal parenting style obtain significantly higher score, compared to adolescents who were raised up with autocratic (MD = 5.644), indifferent (MD = 3.974) and integrative parenting style (MD = 7.007) at the level of statistical significance of 0.001.

In the personality dimension consciousness, the highest average score was obtained adolescents who were raised up with liberal and integrative parenting style. A statistically significant difference was found between adolescents raised up with liberal parenting style and integrative (MD = 4.448; $p = 0.001$) and autocratic parenting style (MD = 3.814, $p = 0.002$). A significant difference in consciousness was also found among adolescents who were raised up with integrative parenting style and adolescents who were parenting style by indifferent parenting style (MD = 2.471; $p = 0.017$).

4 Discussion and conclusion

Adolescents raised up with integrative and liberal parenting style are characterized by higher emotional stability (or lower neuroticism). They are more sensuous, friendly and extraverted. However, it should be noted that the adolescents raised up with liberal style parenting style have achieved a slightly higher score in all variables (personality dimensions), compared with those who have been raised up with the integrative parenting style. These two parenting styles are generally considered to be the most appropriate and desirable for the development of positive personality traits. Parents require from child to keep up with the standards, reasonable and at a level corresponding to their age. Such parents are usually helpful, responsive and child-oriented. For these parenting styles are characteristic partner-equivalent parent-child relationships, which support the development of positive personality characteristics such as agreeableness, consciousness and stability. These results correspond to the results with E. F. C. Sladdens et al. (2014), who found that positive parental control and support stimulate curiosity, friendliness and stability. Openness was not related to these parenting styles.

The second model describes the impact of indifferent parenting style on the personality dimensions. The results of the analyzes were confirmed predictions, however, the effect of indifferent parenting is not the same as the effect of autocratic parenting, the differences between them will be described in the following model. The problem of indifferent parenting is a drastic disagreement between parenting practices (eg, autocratic vs. liberal education). Highly misbalanced parenting practices result in the creation of emotional instability (neuroticism) in the individual, because the individual perceives one parent as a refusing one, while the other may then be in the coalition (Čáp, J., Boschek, P., 2000). Neuroticism also influences other personality components. As we have found in research, individuals raised up with indifferent parenting style are characterized by a lower level of all other personality dimensions, including the openness to experience that is in all other research groups (liberal, integrative, autocratic) within the norms. We can confirm that indifferent education has the most adverse influence on the personality development and personality characteristics. However, it is a puzzling fact that this research group accounted for up to 59% of individuals in the research sample, which is up to 15% higher comparing to norms. As theoretical and empirical bases state, individuals raised up with autocratic parenting style are distinguished by reduced emotional stability, which corresponds to the results of our research. Strong neuroticism is formed in individuals raised under the strong parental control, which causes stressful situations, frequent admissions, and forms neurotic traits in the adolescent personality. However, this claim is only partially proven in research. Even though the individuals raised with

autocratic parenting style have higher degree of neuroticism, other personality dimensions are within the norms (except extraversion). Autocratic parenting style "limits" the personality, in the sense that it diminishes extraversion and emotional stability but increases consciousness and agreeableness. This leads to a highly introverted personality.

The results of the analyses confirmed several hypotheses based on previous researches (for example Belsky, J., Barends, N., 2002; Clarke, L. A., 2000; Čáp, J., Boschek, P., 2000; Losoya, S. H., 1997). By the study, we confirmed the significant relationship between the parenting styles and the personality dimensions. On the basis of these results, we can assert that the moderate model, based on the theoretical and empirical findings, is functional.

Résumé: There exists the relation between quality of the parental style and the quality of the personality. The parental styles characterized through the negative emotions and problematic control are in the relation with negative personality dimensions as low emotional stability, low openness to experience, low agreeableness, low conscientiousness. This result can open the problem of the risk behavior product and the relation with the personality dispositions. It is possible to assume, in accord with Čerešník, M. (2016), that mentioned personality qualities can contribute to the higher risk behavior production in the population of the adolescents

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Primary Paper Section: A

Secondary Paper Section: AN, AM, AO

FORMATION OF COMPLEX COMPANY EVALUATION METHOD THROUGH NEURAL NETWORKS BASED ON THE EXAMPLE OF CONSTRUCTION COMPANIES' COLLECTION

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Abstract: The main goal of this contribution is to create a model through the use of neural networks, which will be able to predict the company's ability to survive a prospective financial crisis. Artificial neural networks are able to conduct non-linear statistical modelling and offer a completely suitable alternative to individual financial indicators within complex methods of evaluation. The contribution examines the basic data on companies coming from the Albertina database. The collection includes both financial and non-financial indicators of all construction companies in the Czech Republic within the period of 2008 to 2014. The object is to find an artificial neural network, which can classify each company based on the input data. Three neural networks are given and described, proving positive results. The best results are achieved by MLP 15:15-54-66-4:1. Through this network the Czech construction companies' ability to survive a possible distress is consequently evaluated.

Keywords: complex company evaluation, artificial neural networks, construction company, company bankruptcy, financial and non-financial indicators, predictive model

1 Introduction

In all companies, the meaning of enterprise evaluation keeps growing within today's constantly changing economic environment (Fotr and Kislingerova, 2009). Enterprise evaluation is the basic element for understanding the sources of company competition and at the same time, it is a source for company's strategy implementation support. It is obvious that the knowledge of a company's financial position is necessary. Reverse information is able to discover areas in which the enterprise was successful and how or where it has fulfilled the expectations and its aims. They may also point to situations not expected or managed by the enterprise and to situations, which may occur in the closest future (Vochozka et al., 2017). According to Wang, Stockton and Baguley (2010), success of the enterprise is even directly dependent on an exact prediction of future development.

The process of a complex enterprise evaluation represents an objective, just and exact evaluation of enterprise function using mathematical statistics and operative research principles (Zhang and Zhong, 2015, p. 178). A correct enterprise evaluation may be ensured only by relevant methods. The last fifty years have brought a varied consideration range of approaches, methods, and tools of its measurements (Wagner, 2011, p. 776). According to Vlachy (2009, p. 147) traditional methods of financial analysis are insufficient. For instance, ratio analysis, using balance sheet and profit and loss statement data is still a widely used method, which may thus easily interpret the enterprise's financial situation (Savvidis and Ginoglou, 2013). But not even this enterprise evaluation based on the analysis of financial data is sufficient (Smeureanu et al., 2011). Modern enterprises produce huge amounts of data, and traditional analytical tools and methods are no longer able to process such amounts of information collectively (Yan, Wang and Liu, 2012, p. 275). Enterprise evaluation should use both financial and non-financial indicators. (Hsiang et al. 2013). The truth is that information nowadays may represent relatively precious company wealth. A huge amount of data may also fundamentally influence complex enterprise evaluation (Machek and Hnilica, 2012). The ability to analyse and use massive amounts of information still keeps lagging behind the ability to collect and keep them (Wang, Rees and Liao, 2002).

Complex enterprise evaluation methods are a specific group of tools used for suitable enterprise evaluation – mainly multidimensional models working with several criteria assigned specific weight (importance). The enterprise's situation is then collectively expressed by one number, which evaluates the level of the enterprise's financial health (Vochozka, 2010, p. 675). Artificial neural networks are able to carry out non-linear

statistical modelling in these models, and thus provide a suitable alternative for simple financial indicators including a frequently-used logistical regression or discrimination analysis (García, Giménez and Guijarro, 2013). These collective indexes serve according to Vochozka (2010) mainly investors and owners of the enterprise to determine the performance of the given enterprise from the perspective of value creation, or serve creditors in predicting whether the enterprise is not reaching bankruptcy in the nearest future.

The issue of artificial neural networks related to enterprise evaluation belongs among rather young subjects. Their development and especially wide application expansion is being observed since 1980's (Du Jardin, 2010). Nowadays, still new types of networks keep appearing, as well as massive development of information technologies and computing technologies for their implementation (Synek, Hoffmann and Mackenzie, 2013). Neural networks belong, together with fuzzy sets, expert systems, gnostic theory in uncertain data or genetic algorithms, etc., among non-static higher methods of financial analysis (Vochozka et al., 2016). Most simple indicators, but also mathematical-statistical or non-statistical methods prove shortcomings that implement a certain level of inaccuracy into the result. They often do not take into account specific differences – for instance, the level of inflation or tax policy. They also have difficulties capturing causes of problems and are not able to work with intangible assets, know-how for instance (Kuzey, Uyar and Delen, 2014). Modern methods try to get rid of these shortcomings. So-called higher methods of financial analysis demand high-quality software equipment and knowledge of mathematical statistics. Data availability and ability to provide the model with information wanted are also necessary. Neural networks require a certain set of data to refine the network outcome, that is why they are not able to evaluate enterprise performance correctly without model data (Amusan et al., 2013). Savvidis and Ginoglou (2013) state that the performance of artificial neural networks and of complete company evaluation depends mainly on data. If there is enough data it is possible to claim that artificial neural network is the correct choice for enterprise evaluation (Ghodsi, Zakerinia and Jokar, 2011).

The main advantage predicting artificial neural networks for application in economy is, according to Vesely (2011) the ability to work with non-linear data, too. In complex enterprise evaluation, there are countless non-linear relations or structures (Ciobanu and Vasilescu, 2013). A non-linear enterprise evaluation model assembled on the basis of neural networks may stimulate economic phenomena better, and its results are objective, relatively exact and have a practical referential value (Zhang and Zhong, 2015, p. 178). This advantage of artificial neural networks is confirmed also by Wu et al. (2011) claiming that networks are able to learn, and having learned, they are able to capture the hidden, and even strongly non-linear dependencies. They use distributed parallel processing of information and reach high speed processing of large data volumes. According to Mostafa (2009), artificial neural network models have a great potential in classifying the relative enterprise performance thanks to their robustness and algorithm modelling flexibility.

A model based on artificial neural networks, evaluating enterprise performance may be set in many ways. Input data is often represented by significant items which are usually a part of a balance sheet or profit and loss statement. Shi, Bian and Zhang (2010) for instance, classify the value of total enterprise assets, the amount of workers, main enterprise costs, net fixed assets, net profit, main enterprise income, total asset turnover indicator and income per share among input information. Zhang and Zhong (2015) use up to 20 enterprise financial indicators for the purposes of education and testing of back propagation type neural network samples. They include, for instance, net income

per share, main enterprise costs, total costs of annual wages, main entrepreneurship income, net profit after tax, return on total assets, or profitability on equity (Zhang and Zhong, 2015, p. 179). The output is represented by a value copying the course of economic indicator by which the network was determined – a whole range of economic indicators may be used, while the most suitable are difficult to be set and complex or testifying (Galushkin, 2012). Different types of artificial neural networks may create the network architecture – according to what the neuron transmission function is, how neurons are interconnected mutually, how many input neurons, hidden layers there are, etc. (García, Giménez and Guijarro, 2013). Similarly, the amount of layers depends on the given model's author's consideration. If there are not so many in the neural networks, they learn quicker. If there are bigger numbers of layers, they are able to generalize better (Elsawy, Hosny and Razeq, 2011).

The disadvantage is that we never know how the network makes its decisions, and why it has decided the way. It is thus impossible to know the inner structure of this system. That is why neural networks are also termed as 'black boxes' (Tzeng and Ma, 2005). The networks are very comfortable and practical, but the way they evaluate the enterprise exactly, is not always very clear (Shi, Bian and Zhang, 2010, p. 640). We also always operate with the probability that the response will be, in certain percentage, wrong. This fact considerably limits its use in areas with one-hundred-percent-flawlessness (Slavici, Mnerie and Kosutic, 2012). While evaluating an enterprise, networks are also sensitive to organization and preparation of data, but also to the whole configuration. To apply them, a high computing power is needed, and their processing takes a long time (Kim, An and Kang, 2004).

Advantages in using artificial neural networks during a complex enterprise evaluation are the following (Ciobanu and Vasilescu, 2013):

- Simple implementation,
- Possibility of parallel processing,
- Learning and generalization ability,
- Adaptation ability,
- Distributed representation and calculation.

Nevertheless, there is a range of disadvantages while using artificial neural networks while evaluating an enterprise in a complex manner (Knez-Riedl and Mulej, 2014):

They work with a so-called 'black-box approach' - their inner functionality is not directly known,
 At the training stage they are computing-power consuming,
 Their processing often takes a long time,
 Networks are unable to solve other, similar problems other than those they are trained to solve,
 Networks are an approximation of the required solution – it is necessary to always count on certain error rate,
 Networks are prone to be over-trained.

Only a few authors dedicate their work to applying neural networks in order to evaluate an enterprise in a complex manner. The reasons are probably reasonably significant disadvantages of artificial neural networks, and the existence of many complex, and often simpler models for enterprise evaluation. Zhang and Zhong (2015) have suggested a model based on artificial neural networks, which has a high prediction accuracy and its results are objective and exact. A similar model is presented by Makeeva and Bakurova (2012). The background for its creation is profitability, liquidity, indebtedness and return indicators. Al-Shayea and El-Refae (2012) have created a model for insolvency prediction based on less used types of neural networks – GMDH¹, Counter Propagation and fuzzy ARTMAP² networks. The most influencing factors when evaluating, are, according to them, net profit, total equity, costs on sale, sales, cash flow, and credits. Net profit, annual volume of work and work capital are

the main indicators of financial performance of any building company (Mohamad et al., 2014). It was Mohamad et al. (2014) who have developed a hybrid model (an artificial neural network technique + genetic algorithm) with the aim to predict, based on the previously published data on financial statements, the amount of the three main given indicators of building companies' financial performance. Complex enterprise evaluation methods created via artificial neural networks are often used by banks when considering credit requests – credit risk evaluation in a given enterprise (Mansouri and Dastoori, 2013). A complex enterprise evaluation's aim in this case is to minimize credit risk and improve decision-making process while establishing business relationships in economic, legal and social sphere (Yongli et al., 2013). A model based on GRNN³ neural network, designed by Zhu et al. (2015) may serve as an example. It may evaluate credit risk efficiently.

Complex enterprise evaluation methods are nowadays created by modern analytical models using computers and sophisticated mathematical models (Gholizadeh et al., 2011). Neural network imperfections, however, point to the fact that this technology still undergoes the process of development and improvement. Even so, they may be used as a complex enterprise evaluation indicator, while complemented and combined with other models very often. Many authors have proven that complementation by other models improves the calculation, and raises the efficiency and accuracy of the result (Ciobanu and Vasilescu, 2013, p. 448). The obtained model outputs may be further compared to the other enterprises' results or to the results of best enterprises working in the same branch (Rosillon and Alejandra, 2009). The aim of this contribution is to create a model, using neural networks, which will be able to predict the enterprise's ability to survive possible financial distress.

2 Data and Methods

Basic data about enterprises, which is going to be analysed and examined comes from the Albertina database. These are enterprises classified among building enterprises by the Czech Statistical Office. These enterprises fall among the classification F-sectional in CZ-NACE (economic activity classification). The resulting file includes exactly 65 536 data lines. Each line consists of a hundred characteristics. Specifically, they are financial parameters and non-financial indicators.

Financial parameters include all data from financial statements i. e. balance sheets, profit and loss statements, cash flow statements. Further, earnings before interest and tax (EBIT) is included. Non-financial indicators include enterprise identification (name and identification number), enterprise business district, number of employees and the enterprise auditor's statement.

It is common to start the paper with input data analysis from the perspective of their objective interpretation. Data analysis has been carried out, but only on the level of variable classification, not from the perspective of 'economic fundamentals'. In case some available data is excluded already at the stage of data file preparation, we could reach a situation of excluding a variable, which, although refused by current economic theory, may significantly influence the result. Thus, we are facing a dilemma whether to include a greater amount of variables (some even against the sense of current knowledge) and obtain a result, which may be economically difficult to interpret, or whether the amount of variables should be decreased to values possible to be relatively easy interpreted today. I have chosen the first option. The economic environment has changed so much as we can not describe it using the same variables as we had done several decades ago.

To prepare a data file MS Excel will be utilized. The data file will be imported into the DELL Statistica software in version No 12 and version No 7 (result visualization). Subsequently it will

¹Group Method of Data Handling – Networks with inductive modelling.

²Adaptive Resonance Theory MAP – neural network hybrid architecture.

³Generalized Regression Neural Network.

be processed via 'Automated neural networks' tool. The result, if its validity is improved (it will prove a higher level of accuracy), it will be subsequently varied on the level of vector weights among neurons.

We are looking for an artificial neural structure, which will be able to classify each enterprise, based on the input data, into one of four groups:

The enterprise is not going bankrupt (a creditworthy enterprise),
Bankruptcy in the given year,
Bankruptcy in two years,
Bankruptcy in the future (in a period longer than two years).

First, we will establish the properties of individual characteristics of the enterprise. It is necessary to define the output categorical quantity. In this case, it is obvious that this will be a value within a column in the MS Excel notebook marked as 'resulting situation'. At the same time, we need to know the results for at least the periods of 2008 to 2014. Further, we will establish the categorical input quantities. In case of neural structures, categorical quantities are transferred into a binary code, i.e. into the form of 'YES' (1) or 'NO' (0). In case of, for instance, placing the enterprise within a given region, we are counting on 14 regions. The code will state that the enterprise does not reside in thirteen regions, and it does reside in the fourteenth region – the numeric code thus contains 14 numerals (0 or 1). These are non-financial indicators (e.g. the place of the enterprise residence, the region respectively). All the stated items of financial statements and numbers of employees will belong among continuous quantities.

Subsequently, the file will be randomly divided (sampled) into three groups of enterprises – i.e. a training file (neural networks are trained on this one to reach the best results possible), a testing file (this file tests the success of trained artificial neural structures classification), and a validation file (used for the second validation of the result obtained). The data will be divided in the following ratio among the training, testing and validation file: 70:15:15. The choice will be random. Thus, the ratio of individual enterprise groups is not preserved (the enterprise is not going bankrupt, bankruptcy in two years, bankruptcy in the future) in individual data files. If we keep the ratio, we might distort the result. Equally, the sub-sampling⁴ will be done randomly. A maximum of two sub-samples will be created. The seed (for a random number choice) for sub-sampling will be stated at a value of 10.

Subsequently, 10,000 random artificial neural structures⁵ will be generated, out of which, ten of the best results will be preserved. To create the model, we will use multiple perceptron networks (MLP) and linear neural networks, probabilistic neural networks (PNN), generalized regression neural networks (GRNN), radial basic-function neural networks (RBF), three-layer perceptron networks (TLP), and four-layer perceptron networks (FLP).

In case of radial basic-function neural networks, we will use 1 up to 40 hidden neurons. The second layer of the three-layer perceptron network will contain 1 to 10 hidden neurons. The second and third layer of the four-layer perceptron network will contain always 1 to 10 hidden neurons. Perceptron networks will classify individual enterprises based on cross entropy. That works with multinomial division of frequency (unlike e.g. smallest squares sum, which presumes a normal division of frequency). The analysis thus can be stopped, if the value of cross entropy draws near the value of 0 and if it does not improve any longer. The threshold of classification is assigned based on the highest trust. Hidden layers as well as output neurons of identical functions will be utilized as activation functions for neurons, and they are presented in Table No. 1.

Table 1: Activation Functions in Neurons' Hidden and Output Layers

Function	Definition	Extension
Identical	x	$(-\infty, +\infty)$
Logistical	$\frac{1}{1 + e^{-x}}$	(0, +1)
Hyperbolic	$\frac{e^x - e^{-x}}{e^x + e^{-x}}$	(-1, +1)
Exponential	e^{-x}	$(0, +\infty)$
Sinus	$\sin x$	[0, +1]

Source: Author

Weight decomposition will be carried out with a one-hundredth accuracy for both hidden and output layers⁶. Initialization will not be used.

The result of the calculation will be:

An overview of the best 10 generated and preserved networks (including a complete result description in an xml file) from the previously generated 10,000. Confusion matrices via which we will determine classification (prediction) success of a possible enterprise bankruptcy, respectively the correctness and incorrectness of estimates in individual cases.

Sensitivity analysis, which will confirm in every generated neural network which input quantities are necessary for the given neural structure, and the weight of the specific input quantity included. The scheme of preserved neural structures.

3 Results

The overview of individual generated and preserved networks is the object of Table No. 2⁷ (Inserted in Attachment number 1).

BP value in the table indicates using the Back Propagation algorithm. It is one of the so-far mostly used algorithms, which has been published independently by several authors: Rumelhart, Hinton and Williams (1986), Werbos (1974) and Parker (1985). Its advantage is that it requires less memory than most of other algorithms, and it usually reaches an acceptable amount of error quite fast. Moreover, it is useful for most neural networks. The abbreviation 'CG' represents the Conjugate gradient descent algorithm (Bishop, 1995; Shepherd, 1997). It is an advanced method of training of a multilayer perceptron network. Usually, it proves significantly better results than Back propagation. Equally, it can be used to solve the same tasks as Back propagation. Its use is recommended for any networks with a greater amount of weights, and a multiple outcome. PI, i.e. Pseudo-Inverse Algorithm represents the optimization technique via the method of smallest squares (Kahan, 1965). SS represents a (sub) sample, i.e. sub-sampling. KN represents nearest neighbor deviation assignment. It is an algorithm assigning radial unit deviations via RMS (an efficient value) distance from K units closest towards each unit in the form of standard deviation. Each unit thus has its own, independently calculated deviation based on the density of points clustered near each other.

The most valuable network is the one, which proves the highest reliability values for the training, testing and evaluating data file. At the same time, ideally an identical or at least similar value is required in all three sets. In case of obtained results, it may be observed that this condition has been met in nine out of ten preserved networks. The only exception is Network No. 2, MLP 2:7-88-63-4:1, proving minimal values. At the same time, we are looking for a network, which proves minimal error, again relatively identical for all, training, testing and verifying data

⁴By sub-sampling, in this case, clustering of data lines is meant to be based on reported similar characteristics.

⁵If the improvement of individual trained networks is not significant, training of neural networks can be shortened.

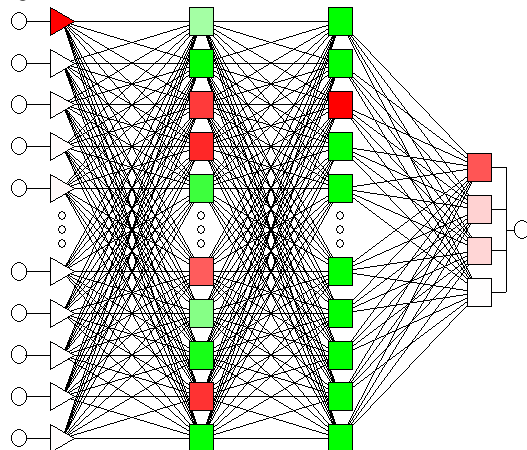
⁶Weight decomposition is determined based on iteration in the software. Iteration accuracy of each weight was determined to be equal to 0.01 for the analysis' purpose.

⁷It is suitable to add that results may slightly differ for repeatedly carried-out analyses. This is given by the fact that neural network algorithm uses slightly different generators meant for variable initiation weights. This helps reach a slightly different local minimum in a function. The result is not significantly influenced by this fact.

sets. In our case the lowest error is optically proved by the RBF networks. All reach a value lower than 0.16. Optically we will be looking for a result in the form of one of RBF networks.

Nonetheless, to be able to determine whether this or other neural network is useful in practice, i.e. whether its results are economically reliably interpretable, and whether they prove acceptable accuracy, a confusing matrix has to be set. In fact, it is a confusion matrix made of several partial matrices. It is a 10x4 matrix (10 neural structures, 4 possible results) always for three data sets (training, testing and validation). It is necessary for us to find one, which will be able to predict all assumed results, i.e. the enterprise is not going bankrupt, it will go bankrupt in the given year, it will go bankrupt in two years, and it will go bankrupt in the future. Moreover, it is important for the neural structure not to be mistaken in its predictions. Relatively interesting results are presented by neural networks No. 3, 4, and 5 (i.e. MLP 15:15-54-66-4:1, Linear 84:86-4:1 a Linear 90:98-4:1). Network No. 3 is a multiple perceptron network with two hidden layers. It works with 15 input variables, which are processed by 54 neurons in the first hidden layer, and 66 neurons in the second hidden layer. The output layer is represented by four neurons (i.e. four possible results) out of which the only option is being opted for. With regard to the fact that we are using 15 input variables, and at the same time the network contains 15 neurons in the input layer, the network uses only continuous quantities input variables. The network model is the object of Figure No. 1.

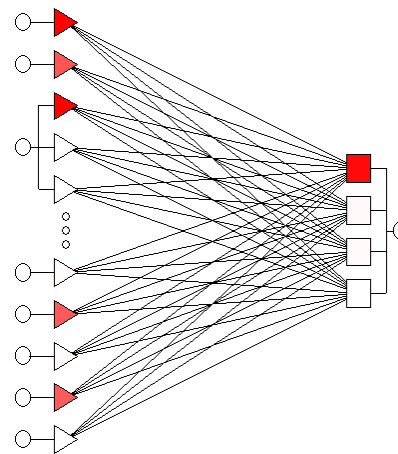
Figure 1: MLP 15:15-54-66-4:1 neural network model



Source: Author

The obtained linear networks work with both continuous and discrete quantities. The first one, Linear 84:86-4:1 assumes 84 input variables. The network model is the object of Figure No. 2.

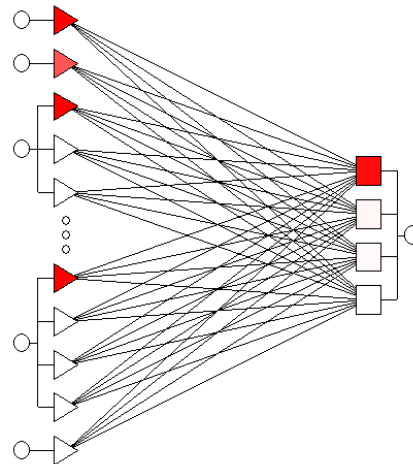
Figure 2: Linear 84:86-4:2 neural network model



Source: Author

The second linear neural network called 'Linear 90:98-4:1 works with 90 input quantities. The neural network model is captured in Figure No. 3.

Figure 3: Linear 90:98-4:1 neural network model



Source: Author

Figures No. 1-3 are best able to interpret the network structure. The figure always shows clearly which input variable is meant (categorical, continuous), and the neuron function (signal amplification and weakening). Also, it is clear in what manner the signal is further modified. Unfortunately, detailed modification is unclear (the input variable in hidden neuron functions and in output layer neurons). Finally, even the output of the neural function is noticeable. The description of individual model components in weight decomposition is available in the xml form at the following link http://www.vstecb.cz/data/1487593732162SANN_PMML_Code_rozcleneni-souboru-214-podniku-do-5-skupin.rar (the length of each of them significantly exceeds the size of this contribution itself that is why they are not included standardly in the contribution appendix).

The implemented sensitivity analysis evaluates the meaning of individual input variables for preserved neural networks. However, the range of this contribution does not allow interpreting the complete executed analysis. Nevertheless, even so we are able to identify the most significant variables to determine the prediction model. They are the following:

- The year of establishing the company,
- Business contact receivables,
- Short-term financial property in thousands CZK,
- Other current assets,
- Other short-term obligations,
- Revenues for sale of goods in thousands CZK,
- Return interest in thousands CZK.

At the same time, it is suitable to submit the result to the modification of vector weights between individual vectors. The aim is an increase in the efficiency of the obtained model. With regard to the amount of variables, this is rather an attempt. In this case, a significant increase in classification (prediction) accuracy has not occurred, not in one of the three most suitable neural structures (MLP 15:15-54-66-4:1, Linear 84:86-4:1, and Linear 90:98-4:1).

4 Conclusion

When processing this paper, three neural structures were determined and described, showing similar positive results (MLP 15:15-54-66-4:1, Linear 84:86-4:1 a Linear 90:98-4:1), respectively the best results from the 10 preserved neural structures. Based on the reached reliability values, it is impossible to unambiguously determine the one neural structure with the best parameters. If we focus on the calculated error, preferring both linear networks, while, during a detailed testing the Linear 90:98-4:1 network will be preferred. On the other hand, the other tool, confusing matrix, pretends a completely different result. All four situations, i.e. that the enterprise is not going bankrupt, it is going bankrupt in two years and it is going bankrupt in the future, are best predicted by the multilayer perceptron MLP 15:15-54-66-4:1 network.

With regard to the usability of the model and minimal deviations from the other two models which were being taken into account we may judge that the best results are shown by the MLP 15:15-54-66-4:1. Thanks to its parameters, we may claim that the result is applicable in practice. Via MLP 15:15-54-66-4:1 we will judge the ability of a building enterprise in the CZ to survive possible financial distress.

A comparison of the obtained model to already renowned and used bankruptcy models (such as Altman indexes, the Neumaier IN indexes, and Taffler index) occurs. A range of expert papers has dealt with their predictive value, such as Vochozka (2010). Generally, it may be concluded that they show the following shortcomings (Vochozka, 2010):

- Assumption of bipolar dependent variables,
- Data choice method in model enterprises,
- Assumption of data stationarity and instability,
- Choice of independent variables,
- The use of annual financial statements,
- Time dimension.

In case of individual variables, it is clear that their absolute size is in question. Nevertheless, we must understand the result not as individual variables, but as a file of variables within which the individual variables interact. To make it clearer, we are only indicating the most significant variables. But also among them there are quantities characterizing the enterprise size – e.g. ‘revenues for sales of goods in thousands CZK’. Less significant variables, such as numbers of employees or total assets are not mentioned.

Suggested Solution: the neural structure shows some shortcomings, as well as models constructed via multiple discrimination analysis do. Some are eliminated, specifically the assumption of bipolar dependent variables (the model works with four values), the choice of independent variables (the model has allowed using all available variables – it was not necessary to eliminate some), and the time dimension (the enterprise’s neural networks, respectively recording lines do classify. Thus, it is possible to work with the history of individual enterprises).

Regarding the specific comparison, we may refer to Vochozka (2010), Delina and Packova (2013), Kubenka and Slavicek (2014) or Mertlova (2015). The suggested neural structure shows significantly better values of prediction, 15-20% higher accuracy on the average.

Interesting results have been brought by sensitivity analysis. Based on their results we may arrive to these partial conclusions: The year of the enterprise’s establishment tells us that an enterprise with a longer history has gained greater experience, and thus will be probably able to survive possible financial distress.

An enterprise, which generates greater business-contact receivables will, with a greater c, be able to survive possible financial distress. This claim is relatively courageous, as we are unable to analyse claim structure out of financial statements. They may be expired claims, or even impregnable claims. Business-contact claims may be a false positive indicator.

A higher value of short-term financial property expressed in thousands CZK indicates the enterprise’s ability to survive probable financial distress.

An enterprise that creates other higher current assets will probably survive possible financial distress.

A higher value of short-term obligations means a higher ability of the enterprise to survive possible financial distress. Optically, it may seem to be a false positive indicator. But, if we look at the result through money supply creation, the indicator makes sense. The enterprise, thanks to a longer due date of its obligations, accumulates short-term financial property. The indicator thus complements point No. 3 more than appropriately.

Higher revenues for sale of goods in thousands CZK create an assumption that the enterprise will probably survive possible financial distress. It is interesting that the overview also includes sale revenues in the building industry section. It might be assumed revenues for own products and services will be calculated with a greater probability. Nevertheless, the indicator is certainly not false positive.

A higher value of return interest in thousands CZK means a higher ability of the enterprise to survive possible financial distress. Even in this case it may be a matter of a rather negligible item in profit and loss statement within a building enterprise. But, the value again is certainly not false positive.

The determined aim to create, via neural networks, a model, which will be able to predict a building-enterprise’s ability to survive possible financial distress, has been fulfilled.

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Primary Paper Section: A

Secondary Paper Section: AE, AH

Attachment number 1.

Table 1: An Overview of Preserved neural networks

	Profile	Train Perf.	Select Perf.	Test Perf.	Train Error	Select Error	Test Error	Training/Members	Inputs	Hidden (1)	Hidden (2)
1	MLP 1:4-33-61-4:1	0.94359	0.94524	0.94487	1.43022	1.54192	1.45348	BP10, CG20, CG0b	1	33	61
2	MLP 2:7-88-63-4:1	0.03850	0.03760	0.03832	1.02620	1.04046	1.01426	BP10, CG20, CG0b	2	88	63
3	MLP 15:15-54-66-4:1	0.94318	0.94505	0.94443	0.58611	0.59107	0.5835	BP10, CG20, CG0b	15	54	66
4	Linear 84:86-4:1	0.94443	0.94549	0.94487	0.16093	0.16396	0.16088	PI	84	0	0
5	Linear 90:98-4:1	0.94431	0.94549	0.94462	0.16085	0.16203	0.16074	PI	90	0	0
6	PNN 88:93-31997-4:1	0.94425	0.94605	0.94543	0.16236	0.16034	0.16066		88	31997	0
7	PNN 87:92-31997-4:1	0.94425	0.94605	0.94543	0.16237	0.16034	0.16066		87	31997	0
8	RBF 61:69-328-4:1	0.94387	0.94549	0.94480	0.15962	0.15862	0.15909	SS,KN,PI	61	328	0
9	RBF 61:69-359-4:1	0.94371	0.94512	0.94480	0.15964	0.15861	0.15993	SS,KN,PI	61	359	0
10	RBF 61:69-360-4:1	0.94387	0.94543	0.94505	0.15932	0.15859	0.15909	SS,KN,PI	61	360	0

Source: Author



C CHEMISTRY

CA	INORGANIC CHEMISTRY
CB	ANALYTICAL CHEMISTRY, SEPARATION
CC	ORGANIC CHEMISTRY
CD	MACROMOLECULAR CHEMISTRY
CE	BIOCHEMISTRY
CF	PHYSICAL CHEMISTRY AND THEORETICAL CHEMISTRY
CG	ELECTROCHEMISTRY
CH	NUCLEAR AND QUANTUM CHEMISTRY, PHOTO CHEMISTRY
CI	INDUSTRIAL CHEMISTRY AND CHEMICAL ENGINEERING

DESIGN AND COMPARISON OF PURE HYDROGEN PRODUCTION SYSTEM VIA STEAM METHANE REFORMING COUPLED WITH PSA PROCESS

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Abstract: Steam Methane Reforming (SMR) coupled with Pressure Swing Adsorption (PSA) is the most common process to produce pure hydrogen. This paper presents a simulation and energy evaluation of hydrogen production system. In this simulation, the energy released in exothermic adsorption reaction, is recovered to increase the latent and sensible heat of water. Required energy for desorption reaction is provided from recovered heat of SMR process. Since the rate of the saved energy is not significant enough, the temperature of the reformer is being increased. The simulation results are compared to conventional and heat integrated hydrogen production system. Generally, the modified design reduces the total energy consumption in 66.2% compared to conventional process and 14.32% compared to heat integrated process.

Keywords: Steam Reforming, PSA, Hydrogen Production, Energy consumption.

1 Introduction

Hydrogen is a clean and environmental friendly fuel which can be considered as an alternative for future. Although it is newly getting started in the market as a transportation fuel, the industry is working toward clean, economical, and safe hydrogen production. Hydrogen can be supplied from two sources: renewable (biomass and water) and non-renewable (natural gas and heavy hydrocarbons) (Holladay et al. (2009), Kapdan et al. (2006)).

The most common technology to produce hydrogen in large scale is steam reforming, which almost 50% of hydrogen production is via steam methane reforming (SMR) (R. Soltani et al. (2014), Metz et al. (2005)). SMR consists of two stages: reforming and water gas shift (WGS) reactions (Park et al. (2008), Martínez et al. (2014)). Reforming reaction happens in high temperature (700°C to 900°C) in order to produce syngas. While, WGS reaction takes place in two stages to have a higher hydrogen yield. The first WGS stage works at high temperature (350°C–510°C) and the second one works at lower temperature (180°C - 310°C). In addition, it is more economically beneficial to perform SMR process at high pressure (1500 Kpa-3000 Kpa), despite of its negative effects on the rate of methane conversion (Rostrup-Nielsen et al. (2002), Johnsena (2006)). Since there is a need for pure hydrogen in the industry, CO₂ in the syngas needs to be removed completely. The most common technologies used to separate impurities from hydrogen with high purity degree, are membrane and pressure swing adsorption (PSA) (Steven F. Rice, Ding (2002)). In the PSA process used in this study, there are different sorbents available to adsorb carbon dioxide (Fausto Gallucci et al. (2013), Liu et al. (2010)). Calcium oxide (CaO) is the most used CO₂ sorbent available in nature. CaO has broadly attracted the attention due to low cost as well as high capacity of CO₂ adsorption (Barelli et al. (2008), Yancheshmeh (2016)).

Although the SMR coupled with PSA process is the best way to produce hydrogen, it is not an efficient process due to high energy consumption (Boyano et al. (2011)). Various studies were performed on different aspects of SMR process to make it more efficient. For instance, in 2012, Hajjaji et al. performed an analysis on energy consumption in hydrogen production based on SMR process, in which heat exchangers were used to recover the waste heat so as to enhance the thermal efficiency. Wu et al. in 2013 dealt with improvement of heat regeneration using a heat exchanger network for the hybrid process of steam methane and dry reforming.

In 2015, Lin Zhu et al. worked on Calcium based sorption enhanced steam methane reforming (SE-SMR) to reduce the energy penalty for capturing CO₂ from combustion flue gas. They were able to increase exergy efficiency by 14.39%.

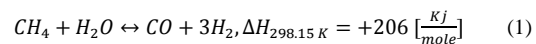
Furthermore, Guoqing Li et al. (2016) proposed a new design of SMR process which recovers heat and pressure energy via a gas turbine at the outlet of the reforming furnace. The energy consumption in this design was reduced by 2.5%.

In this work, both processes are studied to determine the possibility of reducing the energy consumption further. The simulation of this process is done via PRO/II v9.4 simulator. In the simulation, a network of heat exchangers are used to recover the waste heat of both processes. Also, temperature of reformer is being increased to obtain better results in energy recovery and hydrogen production rate. At the end, the energy consumption of the design will be compared to the design of Chunfeng Song et al. (2015).

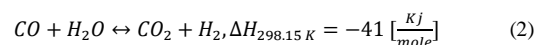
2 The governing equation

Hydrogen production system consists of the following reactions:

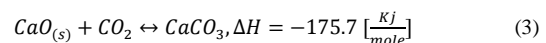
1. Steam Methane Reforming reaction :



2. Water Gas Shift (WGS) reaction:



3. CO₂ adsorption and desorption reaction:



Considering the exothermic reaction 1 and endothermic reaction 2, the above processes require a source of energy supply (Liu et al. (2010)). Reaction rate constants have been proposed by Xu & Froment and are used to determine the kinetics of these two equations. Equations 4 to 6 are the Rate equations for reactions 1 and 2 which are based on LHHW (Langmuir–Hinshelwood–Hougen–Watson Rate Equations) expression.

Rate equation of steam methane reforming reaction:

$$r_1 = \frac{k_1 \left(p_{CH_4} p_{H_2O} - \frac{p_{H_2}^3 p_{CO}}{K_{eq,I}} \right)}{DEN^2} \left[\frac{K mole}{Kg_{cat}.h} \right] \quad (4)$$

Rate equation of water gas shift reaction:

$$r_2 = \frac{k_{II} \left(p_{CO} p_{H_2O} - \frac{p_{H_2} p_{CO_2}}{K_{eq,II}} \right)}{DEN^2} \left[\frac{K mole}{Kg_{cat}.h} \right] \quad (5)$$

DEN term is defined as below:

$$DEN = 1 + K_{CO} p_{CO} + K_{H_2} p_{H_2} + K_{CH_4} p_{CH_4} + \frac{K_{H_2O} p_{H_2O}}{p_{H_2}} \quad (6)$$

Where, r_i are the reaction rates i ($i = 1, 2$), respectively; k_i are the reaction rate constants i , respectively; K_i are the adsorption constant of chemical species i ($i = CH_4, CO, H_2$), respectively; p_i is the partial pressure of the chemical species i in the shell side (reaction part) ($i = CH_4, H_2O, H_2, CO, CO_2$) (Silva J.D et al. (2016), Sánchez et al. (2012), Baek et al. (2014)).

In rate equations, pressure unit is in bars, energy unit in rate constant equations is in Kj/mole and temperature unit is in Kelvins. Equilibrium, rate, and adsorption constants are all included in equations 7 to 14 (Baek et al. (2014)).

$$k_I = 4.23 \times 10^{15} \times \exp\left(\frac{-240}{RT}\right) \tag{7}$$

$$k_{II} = 2.00 \times 10^6 \times \exp\left(\frac{-67.1}{RT}\right) \tag{8}$$

$$K_{EQ,I} = \exp\left(\frac{-26830}{T+30.114}\right) \tag{9}$$

$$K_{EQ,II} = \exp\left(\frac{4400}{T-4.036}\right) \tag{10}$$

$$K_{CH_4} = 6.65 \times 10^{-4} \times \exp\left(\frac{38.28}{RT}\right) \tag{11}$$

$$K_{H_2O} = 1.77 \times 10^5 \times \exp\left(\frac{-88.68}{RT}\right) \tag{12}$$

$$K_{H_2} = 6.12 \times 10^{-9} \times \exp\left(\frac{82.90}{RT}\right) \tag{13}$$

$$K_{CO} = 8.23 \times 10^{-5} \times \exp\left(\frac{70.65}{RT}\right) \tag{14}$$

3 Process description

3.1 Hydrogen production process

Generally, hydrogen production includes two major processes: steam methane reforming (SMR) and pressure swing adsorption (PSA). SMR and PSA processes can be categorized into six stages which are shown in Fig1.

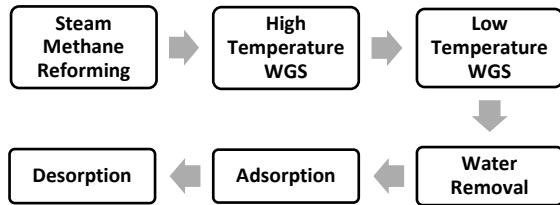


Figure 1: Overall scheme of hydrogen production system

In Figure 2, the hydrogen production system, which includes SMR and PSA processes, is shown. After the temperature and pressure of S1 and S13 increased to 700°C and 1010 Kpa, the feed mixture enters the reformer which the reaction 1 takes place. Then, in order to have a higher hydrogen production rate, the syngas (S6) is transferred to water gas shift process (WGS). It includes the high and low temperature reactors (1010 Kpa, 350°C and 200°C). In water removal stage, the S11 is cooled down to condensate the water. The water is separated from syngas in three stages.

In the next step, syngas (S35) is transferred to the PSA process for purification which the reaction 3 takes place. In the PSA process, Calcium Oxide (CaO) sorbent is utilized to adsorb CO2. Therefore, pure hydrogen is separated in the flash tank. Finally, CO2-enriched sorbent is sent to desorption column. Heat exchangers 09 and 10 are used to calculate the heat of adsorption and desorption reactions.

3.2 Simulation model

The SMR process is simulated using the commercial simulator software PRO/II v9.4. In this simulation, Peng-Robinson equation of state is used as the thermodynamic method for fluid properties computations. Reformer and WGS reactors are assumed as conversion reactors in which the rate of conversion is determined via Equations 4 to 6. Heat exchangers are counter-current type, and formulated using the pinch analysis and specified minimum temperature approach. It is also assumed that there is no heat loss within the heat exchangers. Minimum temperature difference in all heat exchangers is set at 10° C. The isentropic efficiency of the pump and compressor are set at 85%.

In addition, pressure drop in the adsorption and desorption columns is neglected. Since PSA columns operate at near-adiabatic conditions, they are assumed as a single column for simplification. In this section, conversion reactors are used instead of adsorption columns; hence, additional heater and cooler are used for computing the adsorption and desorption heats during the process.

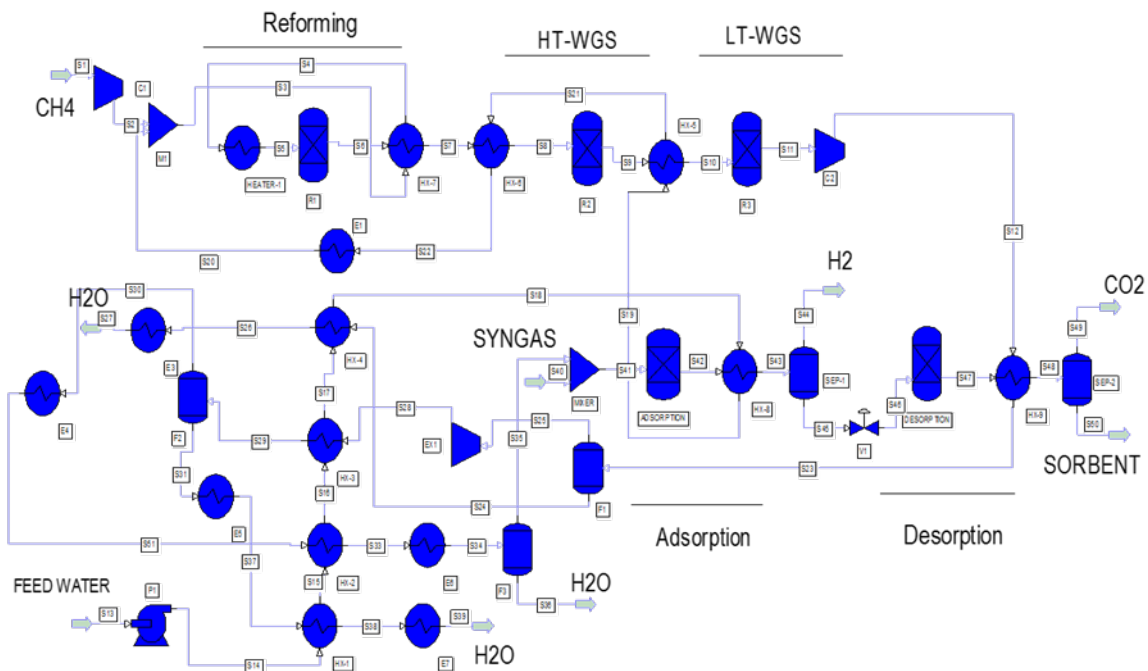


Figure 2: Steam methane reforming coupled with pressure swing adsorption process

4 Results and discussion

A modified design of hydrogen production system is studied and compared to the design of the Chunfeng Song et al. (2015) that used heat integration technology to reduce the energy consumption. In the original design eight heat exchangers were used in the SMR process to recover energy and evaporate water feedstock. Also, the outlet stream of LT-WGS reactor was compressed to establish an optimal heat pairing between the cold and hot streams. To optimize the PSA process, a heat pump was used to recover the heat released from adsorption column and reused it for sorbent regeneration.

In this study, the energy required for desorption column is obtained by SMR process. Moreover, the energy released in the adsorption column is used to increase the latent and the sensible heat of the water feedstock in the SMR process. The S1 and S13 are pressurized up to 1010 Kpa which is done via compressor (0.241 MW) and pump (1.61 KW). Similar to Chunfeng Song et al. (2015) simulation, heat exchangers of 1 and 4 (0.16 MW and 0.003 MW) use the energy of extracted H₂O from syngas to increase water feed temperature. The HX-2 (0.341 MW), HX-3 (0.113 MW), HX-5 (0.81 MW) and HX-6 (0.94 MW) are recovering the syngas heat to increase the latent and sensible heat of water feed stream. The mixture of vapor and methane is preheated to reach the right temperature for the reforming reaction. Therefore, HX-7 recovers 0.97 MW from the reformers outlet flow and heater-1 consumes 1.52 MW to heat S4 up to 700°C.

While the heat pump is omitted in the new design of the PSA process, adsorption heat is recovered via a heat exchanger (HX-8) to prevent the heat loss in the conventional PSA process. Therefore, HX-8 transfers the heat of adsorption to S18 to increase the sensible and the latent heat of the water. The recovered heat is around 0.98 MW. The saved energy used by heat pump in the heat integrated PSA process in the Chunfeng Song et al. (2015) design, is 0.36 MW. However, a small difference in the amount of the recovered heat can be observed between the HX-8 in this design and the HX-5 in the Chunfeng Song et al. (2015) design. The difference causes an increase in the total consumed energy of Heater 1 and 2. It rises from 2 MW to 2.23 MW. Moreover, S12 provides the energy demands of the desorption column, which HX-9 transfers 0.98 MW energy from S12 to S47.

The percentage of the saved energy in the new design, does not meet the eye. Thus, to have a more energy efficient process, temperature of reformer in the SMR process is increased from 700°C to 750°C. The temperature rise effects not only conversion of methane in reformer but also heat recovery of HX-7. While the HX-7 recovers more energy to preheat the feed for reformer, the energy load for the Heaters 1 and 2 decreases. Meaning, Heaters 1 and 2 consume less energy (1.32 MW, 0.5 MW).

Figure 3 shows the minimum temperature difference in the heat-integrated SMR process. It can be seen that the hot and cold stream lines are almost parallel which indicates that there is hot and cold streams are well paired. Also, there is a curve in the lines that shows the minimum temperature difference between the hot and cold streams. Figure 4 illustrates the pairing of the hot and cold streams in the new hydrogen production process.

Generally, it can be observed that there is no energy loss or consumption in proposed PSA process. Whereas in conventional PSA process (9.71 KJ/mole H₂) and heat integrated PSA process (3.7 KJ/mole H₂) more energy were wasted or consumed. Furthermore, the energy consumption of the new SMR process is 34.55 KJ/mole H₂, while in the conventional process and heat integrated process was 92.4 KJ/mole H₂ and 36.63 KJ/mole H₂, respectively.

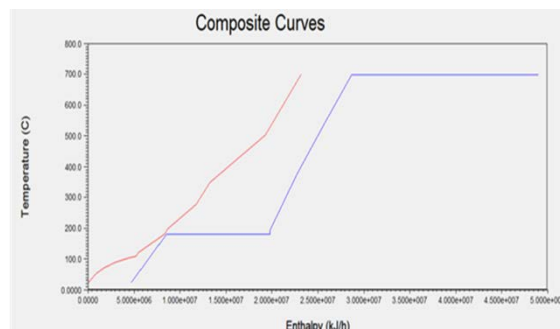


Figure 3: Temperature – enthalpy diagram for the heat exchangers of proposed process

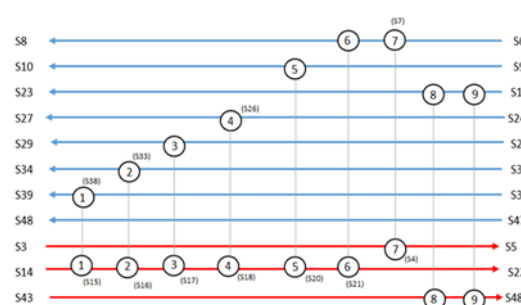


Figure 4: Schematic diagram of cold and hot streams in proposed process

4 Sensitivity analysis

Reaction conditions are regarded as the key factors since their effect on the process performance is significant. The most relevant parameters are temperature and Steam/Carbon ratio (S/C) which crucially affect the process.

Figure 5.A shows the variation of the hydrogen composition versus temperature. It can be observed that the composition of the outlet hydrogen stream increases while the temperature rises. Since steam methane reforming reaction is endothermic, a rise in temperature causes the reaction to move toward producing more hydrogen.

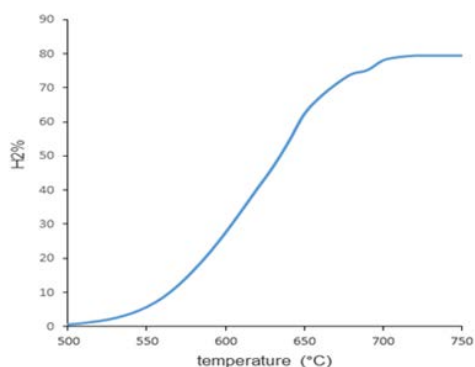


Figure 5

A) Diagram of hydrogen composition-temperature in heat-integrated SMR process where the temperature of the H-WGS and L-WGS reactors are constant at 350°C and 200°C, respectively, S/C ratio is constant at 3 and pressure (1010 Kpa) is constant through the whole process.

In Figure 5.B, the effects of the steam to carbon (S/C) ratio are analyzed. Based on the stoichiometry of the SMR and WGS reactions, increasing the steam will cause the reaction 1 to move further to the right side. Also, it causes methane in reaction 1

and CO in reaction 2 to convert further. Nonetheless, generation of large amount of steam at high pressure for reaching to the level of complete conversion of methane and CO requires a great deal of energy. In addition, it decreases the process efficiency drastically and increases the total energy demand. However, moderate steam-to-carbon ratio is used to optimize the process.

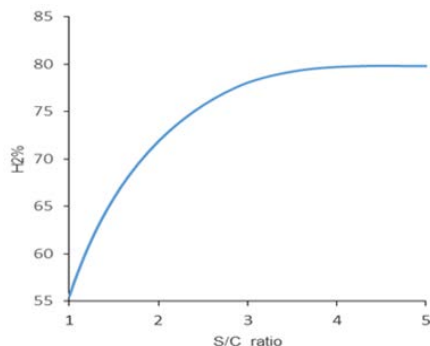


Figure 5

B) Diagram of hydrogen composition-S/C ratio in heat-integrated SMR process where the temperature of the H-WGS and L-WGS reactors are constant at 350°C and 200°C, respectively, temperature is constant at 700°C and pressure (1010 Kpa) is constant through the whole process.

5 Conclusions

In this study, a simulation of hydrogen production system via SMR and PSA processes was discussed and compared with previous works. In proposed process, a network of nine heat exchangers was used to reduce energy consumption. Eight heat exchangers recovered the heat loss of SMR process and one heat exchanger recovered the heat loss of PSA process. A part of the recovered heat in the SMR process was used to provide energy for endothermic desorption reaction. Similarly, heat of exothermic adsorption reaction was used to increase the sensible and latent heat of water feed stream. In addition, to reduce energy consumption and energy recovery, the temperature of reformer was increased. Compared to Chunfeng Song et al. (2015) design, the energy consumption was reduced to zero in the proposed PSA process, while in the conventional process 9.71 KJ/mole H₂ and in the heat integrated PSA process 3.7 KJ/mole H₂ energy was consumed, respectively. On the other hand, in the SMR process, the energy consumption of the new design was less than conventional and heat integrated process which is 34.55 KJ/mole H₂, whereas the amount of energy consumption in conventional and heat integrated SMR process was 92.4 KJ/mole H₂ and 36.63 KJ/mole H₂, respectively. In conclusion, the total energy consumption in the proposed design was reduced by 66.2% compared to conventional hydrogen production system and 14.32% in comparison to heat integrated hydrogen production system.

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Primary Paper Section: C

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WHEN LEFT IS RIGHT: THE PREFERENCE FOR THE LEFT SIDE OF THE FACE IN ATTRACTIVENESS AND EVALUATION RATINGS

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This work was supported by the grant KEGA 004TTU-4/2015.

Abstract: The dominance of the right hemisphere in facial perception emerges as a presumption of a preference for the left part of visual field over the right. The outcomes of several studies are not consistent in verifying this hypothesis. This research tested the preference for the left visual field using male and female mirror images of the right half of the face and the left half of the face in two tasks – an attractiveness assessment and in a specialized facial-evaluation task – by both male and female evaluators. Subjects (N = 2,267) were Slovak females (N = 1,356; 59.8%) and males with a mean age of 24.01 years. The Chi-Square Test showed a strong, statistically significant (sig. = 0.000) preference for the perception of the left half of a human face in both tasks; in both males and female evaluators. This tendency was the most prevalent in the female face composites and in the attractiveness assessment.

Keywords: Visual field, dominance, face perception, hemisphere.

1 Introduction

Facial perception is considered to be a special type of visual perception for various reasons. Facial perception, unlike the perception of other “non-facial” objects, shows the signs of an inborn characteristic (Maguinness and Newell, 2014), the processing style used for recognizing faces is unique, as it is not present when we perceive other objects and, from numerous studies, it also seems, that there are face-specific neural representations of facial perception (McKone and Robbins, 2014).

Within the uniqueness of the process of facial perception, several brain regions involved in this activity have been identified. The first cases that stressed the specificity of facial perception were connected with prosopagnostic patients, who did not show any sign of damage within visual perception, except in face recognition. One of the first well documented cases comes from 1947 by Bodamer (Ellis and Florence, 1990) and turns attention towards the fusiform gyrus region. Further studies revealed that the most specific forms of prosopagnosia are due to lesions of the right posterior network including the fusiform face area and the occipital face area, whereas face identification defects are mainly observed within left temporal-occipital lesions (Gainotti and Marra, 2011).

Except for wide research that considered the areas of the brain specifically involved in facial perception – e.g. occipital face area – OFA (Pitcher, Walsh, and Duchaine, 2011), fusiform face area – FFA (Fairhill and Ishai, 2007), superior temporal sulcus – STS (Pitcher, Walsh, and Duchaine, 2014), intraparietal sulcus – IPS (Hoffman and Haxby, 2000), auditory cortex (Campbell, 2014), limbic system and amygdala (Williams and Mattingley, 2004; Pitcher, Shrutí, Rauth, and Ungerleider, 2017), or anterior temporal lobe (Kriegeskorte, Formisano, Soger, and Goebe, 2007) studies opened the question of lateralization of functions connected with facial perception. Generally, there is a tendency to stress the importance of the right hemisphere (De Renzi, Perani, Carlesimo, Silveri, and Fazio, 1994; Burt and Perrett, 1997; Yovel, Tambini, and Brandman, 2008). From brain trauma case studies it has emerged that the consequences of lesions were more evident if the right hemisphere was damaged (De Renzi, Perani, Carlesimo, Silveri, and Fazio, 1994) affecting e.g. specific processes of configural features perception (Abbott, Wijerante, Hughes, Perre, and Lindell, 2014). This has been followed by studies in which the importance of the left and right visual fields were compared (Franklin and Adams, 2010) or studies on left-left vs. right-right facial symmetry (Nicholls, Wolfgang, Clode, and Lindell, 2002; Chen, Liu, and Fu, 2007).

During facial perception, each hemisphere processes the information that is presented in the contralateral visual field. That means that information from the left visual field is sent to the right hemisphere, whereas information from the right visual field is sent initially to the left hemisphere (Jung et al., 2017). The outcomes of the studies mentioned are not consistent with the initial presumption, that the left visual field and right hemisphere are generally more important for facial perception than the right visual field and left hemisphere. E.g. faces rated in a sexual context gave a better prediction of attractiveness rating for faces shown in the left rather than the right visual field, whereas faces rated in a nonsexual context gave a better prediction of attractiveness of faces shown in the right rather than the left visual field (Franklin and Adams, 2010). Different results favouring the right or left hemisphere also emerged from the study by Zhai and colleagues, where they found that the perception of a father’s face involves the left inferior parietal lobule and left middle frontal gyrus/right middle frontal gyrus/right inferior frontal gyrus, whereas the perception of a mother’s face involves the right inferior parietal lobe and frontal network (Zhai, Yu, Zhang, Chen, and Jia, 2016).

Another type of study emerged from interest in the perfect symmetry of the face. From an evolutionary point of view, facial symmetry (as well as symmetry of the overall organism) is considered an indicator of developmental stability (Simmons, Rhodes, Peters, and Koehlerb, 2004). Symmetry deviations are then the result of the failure of an organism to cope with various adverse environmental (e.g. climate, pollution, malnutrition, parasitism) or genetic (inbreeding, mutation, etc.) factors (Moller and Anders, 1997). Since these qualities may be hereditary, a preference for symmetry in human faces may have been favoured by natural selection (Penton-Voak and Perrett, 2000) and has been proven to be considered as attractive (Scheib, Gangestad, and Thornhill, 1999; Jones, DeBruine, and Little, 2007; Little, Jones, DeBruine, and Feinberg, 2008). As a consequence, the more symmetrical a face the higher the attractiveness rating should be.

An attempt to verify this presumption brought a new research area focused on the judgement of the attractiveness of faces which have been made using mirror images of the left or right face sections and thus considered to be perfectly symmetrical. From the point of view of symmetry and thus the level of attractiveness, there should be no difference in judgements for left-left or right-right facial composites as they are both perfectly symmetrical. However, results show, that the attractiveness ratings differ according to the section (left, or right) from which the mirror image was made (Butler and Harvey, 2005; Parente and Tommasi, 2008) with a preference for the left side of the face. Again, these findings are not universal; there are also different results depending on the specifics of the judgements – e.g. in the observation of emotions, the left-left facial composite over the right-right composite was assigned with greater importance (Nicholls, Wolfgang, Clode, and Lindell, 2002; Chen, Liu, and Fu, 2007). On the other hand, Zaidel and Cohen (2005) did not reveal any significant differences between left-left and right-right composites in attractiveness assessments. In another study Zaidel with colleagues, found that subjects significantly rated right-right composites of ordinary women’s faces as being more attractive than left-left, whereas men’s right-right versus left-left was not significantly different (Zaidel, Chen, and German, 1995).

2 Problem

From the mentioned results and numerous other studies, it seems that the preference for right hemisphere and left visual field in facial perception is not uniform in all cases. First of all, the results may vary according to the type of evaluation task connected to facial perception (e.g. attractiveness evaluation vs. emotional expressiveness). Also, they could differ according to

the familiarity of the face (mother vs. father vs. unknown person), situational context in which the face is presented (sexual vs. nonsexual context), and on the sex of the observer (man vs. woman) as well as the sex of the facial composite (female vs. male). Therefore, we designed research on a large sample (over 2.5 thousand) of men and women, which required various evaluations of male and female facial composites using the right of left part of the face in order to determine whether:

- the subjects prefer the left or right half of the face as represented by mirrored face symmetrical composites made from either the left (left-face symmetrical composite) or right half of the face (right-face symmetrical composite) in attractiveness rating;
- there is any difference in the preference for left- or right-face symmetrical composites according to the sex of the facial composite and the sex of the evaluator in attractiveness rating;
- the subjects prefer the left or right half of the face in the evaluation task;
- the subjects that rely on the left half of the face in the evaluation task also prefer the left-face symmetrical composite within the attractiveness rating (and vice versa: subjects that rely on the right half of the face in evaluation task also prefer the right-face symmetrical composite within the attractiveness rating).

3 Procedure and Methods

The participants took part in the research voluntarily. After a short exposition of the main ideas of the research and after granting oral consent they continued by completing a battery of questionnaires, tests and sets of questions and tasks. Only the main area of research was disclosed to the participants, otherwise they were blind to the aims of the specific tasks and questions.

3.1 Preference for Left- or Right-Face Symmetrical Composites in the Rating of Attractiveness

To determine the preference for either left- or right-face symmetry in the attractiveness rating, four facial composites were used – two female faces and two male faces (Fig. 1 and 2).

Fig. 1: Female face composites made as a mirror picture from the left half of the photograph of the original female face (left picture) and the right half of the original face (right picture) (Jebreil, 2015).

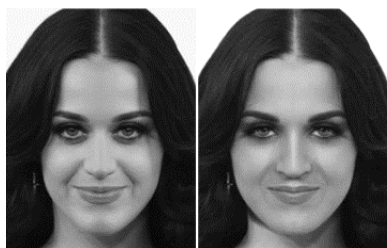


Fig. 2: Male face composites made as a mirror picture from the right half of the photograph of the original male face (left picture) and the left half of the original face (right picture) (Beaird, 2009).



Two female face composites were made with mirror images of the left or right face sections of the original face. The left section is the left half of the picture, as seen by the observer (the right half of the face of person who has been photographed). The original face was not included in the battery. Similarly, two male composites were made and were presented in the opposite order as the female facial composites. Whereas the first of the two female pictures represented the left-left face composite and the second the right-right face composite, in males the first picture referred to the right-right mirror face composite and the second to the left-left. The aim was to avoid the “same-choice” effect, which could affect the results. The subjects were asked to choose the most attractive female and male face composite.

3.2 Preference for Left or Right Half of the Face in the Evaluation Task

Along with the task of choosing which, in their opinion, was the more attractive of the two pictures, other facial composites were added into the test battery (Fig. 3).

Fig. 3: Face composites blended from male and female halves of the face (Perrett, 2010)



Subjects were asked to judge, which of the faces in Fig. 3 was the more feminine. In reality, each face is half woman and half man. The halves are subtly blended across the midline so that the observer does not notice the join. The first (left) face composite is blended from the left male and right female half of the face, whereas the second (right) face composite is made from the left female and right male half of the faces. The two facial composites are therefore the same except that they are mirror reflections (Perrett, 2010). This task reveals which half of the face the subject preferred for when making decisions on human faces.

3.3 Age and Sex of Evaluators

Data on age and sex were entered into the test battery by participants. Age was stated in years. Participants had to choose between the options: “male”/“female”.

4 Subjects

Subjects enrolled in the research on a voluntary basis. Out of 2,512 participants, 245 (9.75%) were excluded from further evaluation due to incomplete or incorrectly completed questionnaires. The final sample (N = 2,267) consisted of Slovak females (N = 1,356; 59.8%) and males. The mean age of the sample was 24.01 years with a minimum of 17 and a maximum of 72.

5 Results

5.1 General Preference for Left- or Right-Face Symmetrical Composites in the Rating of Attractiveness

Generally, our sample preferred the left-face symmetrical composite over the right-face symmetrical composite when rating attractiveness. When assessing the female face composite, 1,907 subjects (84.1 %) preferred the left-face symmetrical composite over the right-face symmetrical composite (N = 360). Similar results were gained for the male face assessment: 1,612 (71.1%) of subjects preferred the left-face symmetrical composite over the right-face symmetrical composite (N = 655;

28.9%). These preferences are statistically significant in both cases; a Chi-Square Test for the equality of distributions of choice for left- and right-face symmetrical composites showed, that there are statistically significant differences in these distributions in both the female (sig. = 0.000) and male facial composites (sig = 0.000) favouring the left-face symmetrical composite (Table 1).

Tab. 1: Chi-Square Test For Attractiveness Rating (All Participants)

Symmetric. composite	Observed N	Expected N	Residual	Chi-sq.	Sig.
♀ Left	1,907	1,133.5	773.5	1055.68	0.000
♀ Right	360	1,133.5	-773.5		
♂ Left	1,612	1,133.5	478.5	403.99	0.000
♂ Right	655	1,133.5	-478.5		

5.1 Sex Differences in the Preference for Left- or Right-Face Symmetrical Composite in the Rating of Attractiveness

When attention was placed on the differences in facial attractiveness preference for left- or right-face symmetrical composites according to the sex of the observer (evaluator), the results showed that both sexes – male and female – evaluated the attractiveness of the left- and right-face symmetrical composites similarly. Male (Table 2) and also female (Table 3) observers, to a statistically significantly degree, preferred the left-face symmetrical composite to the right-face symmetrical composite in female facial composites as well as in male facial composites.

Tab. 2: Chi-Square Test For Attractiveness Rating (Male Participants)

Symmetric. composite	Observed N	Expected N	Residual	Chi-sq.	Sig.
♀ Left	762	455.5	306.5	412.48	0.000
♀ Right	149	455.5	-306.5		
♂ Left	672	455.5	171.5	129.14	0.000
♂ Right	284	455.5	-171.5		

Tab. 3: Chi-Square Test For Attractiveness Rating (Female Participants)

Symmetric. composite	Observed N	Expected N	Residual	Chi-sq.	Sig.
♀ Left	1,145	678.0	467.0	643.33	0.000
♀ Right	211	678.0	467.0		
♂ Left	985	678.0	307.0	278.02	0.000
♂ Right	371	678.0	-307.0		

5.2 General Preference for the Left or Right Half of the Face in the Evaluation Task

The next task which required an assignment of which face from two facial composites was more feminine, in reality detected, whether the subjects use the left or right half of the face composite for the evaluation process (in this case the evaluation of the presence of sexually dimorphic features in the face). Similar to the rating of attractiveness, subjects relied on the left half of the facial composite significantly more than on the right half (Table 4).

Tab. 4: Chi-Square Test For Evaluation Task (All Participants)

Evaluation according to the:	Observed N	Expected N	Residual	Chi-sq.	Sig.
Left half	1,333	1,133.5	199.5	70.225	0.000
Right half	934	1,133.5	-199.5		

The tendency to prefer the left half of the face in the evaluation task is not as strong as in the rating of attractiveness; however it is still statistically dominant. It applies to the whole sample of tested participants as well to both women and men individually. The Chi-Square Test for the equality of distribution of choice for the left and right half of the face calculated for female

participants showed a statistically significant (sig. = 0.000; Chi. sq. = 62.879) preference for the left half of the face (N = 824) over the right half (N = 532). Similar results were also gained in the Chi-Square Test for male participants – they also preferred the left half of the face (N = 509) over the right half (N = 402). Even though the preference for the left half of the face in the evaluation task was not so prevalent in the male participants as the female, it was statistically significant (sig. = 0.000, Chi-sq. = 12.568).

5.3 Consistency in the Rating of Attractiveness and the Evaluation Tasks

Another question is, whether the subjects who rely on the left half of the face in the evaluation task also prefer the left-face symmetrical composite within the attractiveness rating (and vice versa: subjects that rely on the right half of the face in the evaluation task also prefer the right-face symmetrical composite within the attractiveness rating). Table 5 shows, that the majority (N = 962) of participants who rely on the left half of the face in the evaluation task also considered the male left-face symmetrical composite more attractive. The rest (N = 371) found the male right-face symmetrical composite more attractive.

Tab. 5: Frequency of Choices in the Attractiveness Rating and the Evaluation Task (All Participants)

The preference of symmetrical face composite in attractiveness rating according to left-/right side symmetry	The choice of the half of the face in the evaluation task	
	Left half	Right half
Female composites	Left Right	1,119 788
Male composites	Left Right	214 146
		962 650
		371 284

On the contrary, from those participants who rely on the right half of the face in the valuation task only 284 also considered the right-face male symmetrical composite as more attractive. The majority (N = 650) assigned the left-face male symmetrical composite as the more attractive. It therefore seems, that the tendency to evaluate the left-face male symmetrical composite as more attractive than the right-face male symmetrical composite is stronger than the preference for the left half of the face in the evaluation task. However, both tendencies – in the rating of attractiveness and the evaluation task – favour the left half of the face over the right half. These tendencies are even stronger with the female face symmetrical composites. From 1,333 participants who rely on the left half of the face in the evaluation task 1,119 participants considered the left-face female symmetrical composite as more attractive and only 214, the left-face female symmetrical composite. Again, a large portion (N = 788) of participants who rely on the right half of the face in the evaluation task, considered the left-face female symmetrical composite to be more attractive.

6 Discussion

The research showed a strong, statistically significant preference for the left half over the right half of human face in the rating of attractiveness as well as in the specialized evaluation task. These results correspond with research that has proved the superiority of the left visual field (Jung et al., 2017) and right brain hemisphere (Burt and Perrett, 1997; Yovel, Tambini, and Brandman, 2008) in the perception of faces. However, further intensive research focused on various tasks connected with facial perception could clarify the problem more precisely. Neuroscientists stress the fact that the process of facial perception is complicated and varies according to the task. E.g. face recognition of familiar faces and face identification differ from the process of facial perception focused on extracting the meaning of facial expressions as well as from the process of eye gaze perception (Haxby and Gobbini, 2014).

The preference for the left half of the face within facial perception was strongest in the attractiveness rating and in the rating of the female face symmetrical composite. An attractiveness rating is based on an evolutionary derived set of

criteria that provide the best choice of mate. Therefore, we consider our results consistent with the findings of Franklin and Adams (2010), who proved, that faces rated in a sexual context better predicted the attractiveness ratings of faces shown in the left than the right visual field. The reason for the stronger left face preference in female face composites compared to male face composites might be seen in the evolutionary importance of beauty that is detected in facial features. Whereas a female may follow various mating strategies (e.g. long-term mating, short-term opportunistic copulations, extra-pair copulations or serial mating (Gangestad and Simpson, 2000; Greiling and Buss, 2000; Buss, 2006) and therefore their preference for the presence of male attractiveness may not be their primary criteria, males predominantly prefer attractive (and thus healthy – Thornhill and Grammer, 1999) female faces. In this area, we suggest further research leading to an investigation of the possible influence of actual mating strategies on left or right half face preference in ratings.

However, the tendency to choose the left part of the face in the attractiveness rating was also proven to be statistically significant for male faces. Even though it was not as strong as for female faces, it was still statistically significant. This also applies to both female and male participants (evaluators). Therefore, we can evaluate the preference for the left half of the face in attractiveness ratings as universal. Except for the monitoring of the effect of the sex of the evaluator/evaluated face on the preference for the right or left part of the face, the handedness of the face also seems to be a factor, which can also determine choices. According to the results of previous research (e.g., Perrett, 2010; Frässle, Krach, Paulus, and Jansen, 2016) we suggest this area of investigation is very important.

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Primary Paper Section: A, E

Secondary Paper Section: AN, AA, EB

I INFORMATICS

IN INFORMATICS

CONCEPT PROPOSAL FOR INTERACTIVE COLLECTIVE DECISION MAKING INTEGRATED BY MOBILE ICT

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This work was supported by the Faculty of Management, Comenius University in Bratislava, Slovakia. This publication is the result of the project implementation BiDaC: Big Data Industrial Research and Development Center project, ITMS2014 + [project number 313011B814] supported by the Operational Programme Research and Innovation funded by the ERDF.

Abstract: Through the affordability, huge usability and ubiquitous connectivity, information and communication technology (ICT) tools spread among population across the planet and became omnipresent. Smart phones allow unexploited possibilities and new innovative activities to enhance educational process practiced by academic institutions. This paper proposes a simple interactive concept model using ICT that provides benefits to soft skills development of participating users. It focuses on a greater participation of students in assessment of their peers and decision-making in a chosen lecture course during their academic study and exemplifies the use of it in a model situation in a course class. The proposed concept can be used analogically in decision-making during team discussions and negotiations in a business company too.

Keywords: mobile information and communication technology, group decision-making, management study, innovating educational processes, smart technology in education, student centered university, interactive education, learning.

1 Introduction

With the emergence of digital technology, the information and communication technology (ICT) was developed that irreversibly revolutionized our lives (Dávideková & Greguš, 2016) by allowing real-time communication and collaboration across any distance (Dávideková & Hvorecký, 2017). It changed every facet of our lives: the way people work, communicate, learn, spend time, and interact (Jorgenson & Wu, 2016). No other former technology has had such an immense global impact on our lives as ICT (Al-Rodhan, 2011). It has allowed increasing the output per worker through enabling to quickly find and distribute information (Ogbomo & Ogbomo, 2008) and immense processing speed and so it has relatively a high contributory power on long-term sustainable economic growth (Kumar, Stauvermann and Samitas, 2015).

In 1909 Nicola Tesla developed the first concept of a device combining the technology of computing and telephony (Lim, 2010) nowadays called smart phone. Since then a combination of many technological advances has made modern smart phones the enormous success they are today (Mallinson, 2015). It integrates several technologies into one small device that can accompany us everywhere thanks to its tiny dimensions and lightweight (Dávideková & Greguš, 2016). Through the enormous established and well-developed infrastructure of mobile wireless technology, the connectivity to the Internet became ubiquitous enabling more and more functionalities to be bundled into small mobile devices.

Smart phones represent flexible mobile phone technologies that provide possibilities and constraints for our lives (Wellman & Rainie, 2013). Through their flexibility, small dimensions, versatile usability and omnipresent connectivity smart phones gained popularity all over the world (Lee, Ahn, Choi & Choi, 2014). These powerful devices can be used in many innovative ways (Guenaga et al., 2012) and their versatility found many applications in several activities of our everyday life (Wang, Xiang & Fesenmaier, 2014). They are considered handheld computers rather than traditional phones (Ahn, Wijaya & Esmero, 2014) as they allow far more processing possibilities and not only telephony. Yet if compared with computers, smartphones are far smaller and by integrating, many individual appliances including GPS and two cameras smart phones allow far more versatile and sophisticated utilization than a notebook or a desktop computer. In contrast to computers, smart phones

are more user friendly through their more intuitive usability provided by touch screen and simple operation that is accessible also for younger and older generations.

Smart phones spread among students and young generations by an immense speed. If compared to traditional telephony where Alexander Graham Bell constructed the first telephone in 1875 (Coe, 1995) and its spread to 81% coverage of UK households in 1985 took more than a century (Statista, 2014), the smart phone firstly constructed by IBM in 1994 (Buxton, 2011) achieved a spread of 66% coverage of UK households in 2015 (Ofcom, 2015) where the cell phone coverage of households achieved 80% of UK households already in 2006 (Statista, 2016).

A smart phone provides the comfort of being online anywhere at any time (Agger, 2011) and becomes an integral part of students' life (Hurlen, 2013) on that way. Students are using it to communicate with their peers, taking photos, recording audio and video records, for calculations, as e-book readers etc. Smart phones alternated the way we used to stay connected with friends and share our experiences on instant through video, audio, pictures, location and/or text.

This paper proposes an innovative integration of smart phones into educational process during academic lectures and classes studied at university. This concept is based on the belief, that the widespread ICTs will improve the quality of life, as well as active participation (Veselý, Karovič & Karovič, 2016) of students on educational process and may enrich their professional development and education. It aims to increase the interactivity through innovative use of omnipresent ICT means, to enhance the quality of academic study by active participation of students in assessment process during their education and to equip future managers with valuable experiences through the training and development of their soft skills that are essential for professionals in managerial positions in business organizations. As the availability of skills has become the key to achieving innovation (Volná et al., 2015) and assurance of sustainable successful existence of business entities, this concept proposal focuses on development, deepening and training of expertise and skills of future managers already at time of their studies to allow their future employers' further fruitful exploitation and utilization.

This paper is organized as follows: Section 2 provides a brief description of proposed concept model for collective decision making that can be implemented by means of mobile ICT. This particular section demonstrates its use through a possible scenario of a standard use case during the managerial academic study at the same time. The conclusion summarizes the motivation of the proposal as well as opportunities offered by the integration of presented concept model that may provide a benefit in form of priceless valuable experiences to students that may foster their professional development.

2 Concept Proposal

For the convenience of the reader, this section provides a visual presentation of proposed concept with a description of the process depicted in it. It also describes a scenario of a use case.

The purpose of presented proposal is to enable interactive collective participation in decision making with instant evaluation allowed by means of available mobile ICT. It combines affordable and available technology into a system that allows group decision making in real time. The proposed concept model will be described in terms of uses in a university lecture of a study subject in a managerial study program as such a use represents the main targeted utilization in this paper. IT represents an innovative enhancement for management and business oriented studies that is possible to implement in lecture courses and that provides added value for students. It may lead

to deeper skills development and exploitation through participation.

However, there are no limitations avoiding its use in other situations like brainstorming meetings or other discussions requiring the same or analogue functionality supplied by the proposed concept.

It intends to foster the collecting of experiences in decision making that represents a significant activity in managerial positions in any type of an organization. It aims to enhance the collecting of necessary experiences already during the academic studies of any business specialization with sufficient room for internalization through several iterations, analysis of conducted practical exercises to gain knowledge from lessons learnt and facilitating the development of soft skills by a guidance of lecturing experts.

2.1 Architecture

The proposed concept is based on combining available and affordable technology into an intrinsic system that provides required functionality with versatile usability. Required functionality includes real time receiving and processing of requests and providing responses. In other words, students can build a connection, submit their assessment and send it. The system receives assessments and processes them in a queue by combining all assessments into one: the results. The results are the output of the iteration and can be analyzed in the class under the supervision of the lecturer.

The system consists of following necessary parts that are further described in subsequent subsections:

- Entry point
- Database with user data
- Processing system
- Database with object data
- Presentation system

2.1.1 Entry point

Entry point may denote a Mobile Application for smart phones, tablets or other mobile devices enabling the access to the processing system set up on an online server over the Internet. A mobile app is easy to be shared and installed on devices of participants and the smart phone is wide spread among university students. The proposed concept model utilizes the powerful equipment that every student brings along with himself/herself.

Another recommendable option for integrating the entry point denotes an access through a web page portal optimized for computer internet browsers. Based on the omnipresence of smart phones and connectivity as well as considering the targeted use, a mobile application for smart phones will denote the standard entry point further in this paper. An end user would access the system via the mobile app by providing his/her user credentials and remain signed for a limited or even unlimited period of time depending on the actual implementation of proposed concept.

The integration of entry point optimized for computer internet browsers is highly recommended as it may represent a more comfortable and convenient access for setting up of new objects where various settings can be placed on one page without excessive scrolling. Next aspect to consider is also the comfort of lecturers who might be more proficient with working on a computer and therefore prefer this entry point.

2.1.2 User Data Database

The credentials are to be verified against a database containing all user accounts allowed to access the application. This may be represented by a separate database where those user accounts are set up e.g. manually by an administrator or in another database of given institute and accessed through an application programming interface (API). APIs allow composing flexible

and business specific applications (Molnár, Kryvinska & Greguš, 2014). In the analyzed utilization case, a management faculty of a university represents the institution and users denote students attending academic lectures. It is possible to communicate with university information system via designed API for accessing those relevant data with no need of additional separate database. The authors will further consider an API for communicating with university information system.

2.1.3 Processing System

Next necessary item of proposed conceptual architecture is represented by the processing system. A recommended implementation denotes the integration in form of a web application running on an online server accessible via Internet that collects data of sent requests and processes those in a query by providing resulting responds. The system counts the votes for a specific object and processes those according to set up rules. This is possible to implement also with several various checks for example: only one vote per user ID for a particular object, to determine how many users of all voted, how many times a user voted and with which answer etc. The system stores all the information in an appropriate database.

2.1.4 Object Data Database

A separate database for object data stores data assigned to each voting event. Those data may include but are not limited to: a list of users that voted, optionally list of users not allowed to vote, occurrences of various voting options, the number of all users authorized to vote, date and time, name of the user creating given object, title of given object, categorizing attributes for later listing options etc. It is also possible to differentiate various indicators or aspects that end-user shall assess.

2.1.5 Presentation System

Last part of proposed concept model denotes a presentation system. This could be the same mobile application that denotes also the entry point. However, as the concept is designated to serve in an academic lecture class attended by students, it is recommendable to implement also a web interface accessible through an internet browser that would display the results of occurred voting in a window easily projectable through a projector on a wall or plane. This may increase the collective visibility to everyone and simplify the post analysis of results as well as possible defense of submitted voting of a participant (described later).

2.1.6 Concept Visualization

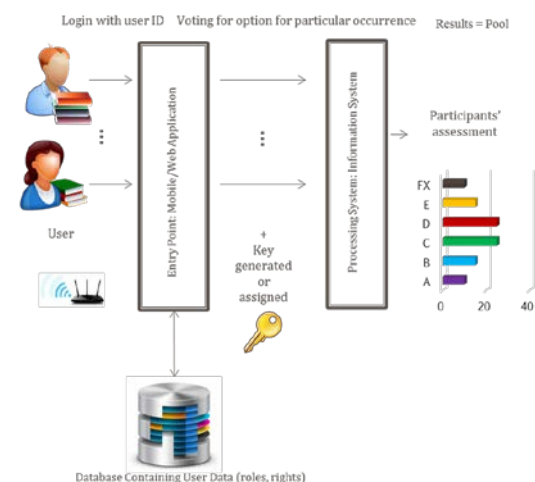


Figure 1: Simple concept for voting integrated by ICT means
Source: own elaboration

The described architecture is shown in fig. 1.

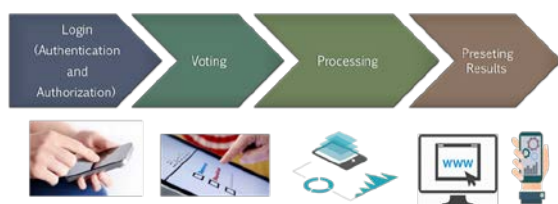


Figure 2: Process flow of proposed concept
Source: own elaboration

It is recommendable to search for possible involvement of any existing scalable voting mobile applications to implement a finished solution instead of own in-house software development or even contracting of external software company. In-house software development may take long time. It is important to consider how an integration of an existing app with its constraints may affect its utilization for targeted purpose described in following subchapter.

The concept depicted in fig. 1 demonstrates the high-level architecture of proposed concept. Here it is necessary to consider the security of user credentials and data, the possibility of limiting the number of voters and how the group of users entitled to vote may be populated, how the connection on internal databases shall be ensured, how data from conducted voting shall be preserved, how the proposed model can be made scalable to needed level for various utilization cases, etc.

2.2 Use Case Scenario

This subsection demonstrates a typical use case that was targeted to be solved by provided concept proposal.

University students are often assigned to elaborate various projects that shall be presented in front of the whole group and the lecturer assesses the conducted work with a note, eventually by a number of points or other corresponding evaluation. This represents a typical assessment and decision-making process. Such a situation offers the opportunity of including students into decision-making where they can collect experience in assessment and through comparing other students among themselves. They can develop their soft skills in various fields, e.g. giving and receiving constructive feedback, defending their decision and viewpoint with arguments, making fast valid decisions based on relevant aspects.

In typical use case scenario, the lecturer determines and distributes assignments to students or students groups that are to be elaborated until a given specified deadline. After the deadline, students are presenting the results of their work in front of their peers.

The lecturer sets up a new object or item in the system through an entry point by providing some description and optionally some attributes for later categorizing that may be used for later data mining analysis like which study subject etc. The setting up could already include using of a preset template that may foster easy and fast set up. The system would generate an ID. There are several options how to generate such an ID. It could be also a combination of an arbitrary word entered by the lecturer combined with a consecutive number referring to the number of occurrences of given key word. Alternatively, it may consist purely of a sequential number of given created object. Although there are several ways, the authors of this paper recommend a combination of an arbitrary entered word by the lecturer and a consecutive number, as the setting up is considered comfortable for lecturers.

The system would further automatically populate some fields like date and time, faculty, subject, optionally name of the lecturer etc. This data is possible to be automatically populated based on user accounts data. It may simplify the setting up for lecturers and become a user-friendly environment.

After the setting up is closed, the object may become available for users to send requests, in other words, for students to vote. After any presentation students, representing the audience may send their votes in points or by selecting an option from provided offered choices and evaluate the performance of their peer on that way.

The lecturer would open the object for viewing results in appropriate presentation system and the processing system would update the results by any new received vote. The lecturer may discuss the voting results with students and draw their attention to not considered aspects, mistakes done etc. There is also room for further analysis and discussion of various aspects by students at time of their voting about their reasoning like why they chose conducted option for a given result. On this way, students may be more motivated and animated to listen to contributions of their peers as they are requested to assess their work and have to explain their decisions. At the same time, students may get motivated for giving a better performance as they will be evaluated objectively by a broader group of evaluators: a whole group of their peers and not only subjectively by one lecturer.

The exemplified application of presented concept denotes only a very simple use case of various possibilities. It is also possible to use such voting style also for discussion events, analyzing historical events by asking how students would behave (decide to act on different ways based on projected situation), or even giving comparisons of voting results of performances of various students.

2.3 Possible Misuses, Extensions or Further Applications

In order to achieve the goal of an objective assessment, it is important to prevent students voting always in superlatives for all their peers by desiring only good notes for all or only for particular peers. Therefore, the voting itself is not determining the resulting note of a student, but the lecturer does. It is only an opportunity to collect the opinion of every one student within a very short time and to combine him or her contribution into one collective decision. It represents a way of gathering experience in making objective decision based on prescribed assessing aspects and opens the possibility of training in giving constructive critical feedback towards given performance.

In case the application stores the whole voting of each user separately, it is possible to choose some of the assessing users (one or more) to explain the assessment they gave and eventually to let them confront each other against their assessments. This proposes a new opportunity to vote for assessment and evaluation of given performance that is represented by giving explanations to given voting and taken position. If an end user is forced to objectively explain his/her decision, the motivation to participate is higher than by an anonymous voting. At the same time, it may enhance the whole process with the aspect of giving constructive and critical evaluation when the end user is forced to defend his/her opinion against an opinion of someone else with relevant arguments and explaining them to everyone in the group. The ability to defend a standpoint or conducted decision represents a skill that is significantly important and essential for managerial positions and management professionals.

The selection of "assessment defendants" could be implemented by random choice or by a pseudorandom selection from a group that fulfills some criteria (e.g. users who were mostly negative, positive or neutral or even including the aspect whether the user already absolved the defending of his/her assessment already in the past), based on some statistical evaluation e.g. whose voting is outside the median or conducted manually.

It is also possible to use such a voting application for other purposes: collective decision making among lecturers about any topic during their meetings, brainstorming within a team in a business company, decision making in any big group analogue to using color cards for vote expression used by agile project management processes, etc.

A great extension to proposed concept model shall be represented by the opportunity to ask questions that would be visible on the pane and the presenter could answer those at appropriate time. These questions would be collected also through such an online system in real time providing a smooth processing without any delays caused through the collecting step.

The analysis of applications provided by given studied academic institution showed only one application provided in app stores of mobile app providers. This application represents only a very limited read access to very few information of academic information system not allowing interaction similar to proposed concept. Therefore, the authors of this paper intent do highlight the innovative ways for the utilization of the omnipresent affordable technology to provide more student focused interactive study with greater room for skills development as the availability of skills nowadays represents the key in achieving innovation (Volná et al., 2015) and success in contemporary business environment.

In addition, a search for other applications of academic institutions in Slovakia in the application stores had negative results.

The lecturer who shall intervene in any adverse effects or dangerous situations reduces a possible threat in terms of unhealthy competition among students through the facilitation of whole process. Unhealthy effects of smart phones on physics of people have not been confirmed through scientific research (Hardell et al., 2002).

3 Conclusions

The development of information and communication technology (ICT), in particular the emergence of mobile ICT in form of smart phones, revolutionized our lives by changing the ways of processing and conducting of daily activities. Nowadays, a small tiny device, the smart phone, enables real time communication with another user or even with whole group across any distance. The digital environment created new ways of executing activities by allowing processing of large volumes of data within a very short time as well as their spreading through continuously increasing pace of informational dissemination to a much broader group.

Smart phone - the modern combination with all the high-end technology allows many devices to be integrated in one small device at hand (Dávideková, 2016). It represents a very powerful device that can be used in many innovative ways (Guenaga et al., 2012) through various software mobile applications opening new ways of interaction even in academic institutions. A typical academic institution offers wireless access to its students that represents the core premise for proposed concept. Still, academic institutions are not excessively using the communication channel denoted by smart phones to animate students for interactive participation in lectures and developing their soft skills on this way.

This paper proposed an inventive interactive involving of students into dynamic collective decision making within a lecture class to enhance the academic business oriented studies of future management professionals. It offers the opportunity to collect experience and practice in fast decision-making, assessment of their peers, giving and receiving constructive feedback and defending of their opinion against the opinions of others through formulating arguments.

The proposed conceptual model provides an innovative option for enriching business-oriented lectures with greater interactivity by involving students in voting and creating more room for fruitful discussions targeting professional personal development and training of soft skills including decision making of future managers as those are of significant importance and essential in managerial positions.

The proposed concept was tailored to the needs of provided use case describing a lecture class of business oriented academic management study. However, as aforementioned, there are various opportunities for a possible application of proposed concept model not only limited to utilization by an academic institution, but it can be used also by business organizations in their operation.

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Primary Paper Section: I

Secondary Paper Section: AE, JD

AUTOMATIC HYSTERESIS OF CANNY EDGE DETECTOR FOR LINES DETECTION

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Abstract: The Canny edge detector is a very popular multi-stage algorithm for image edge detection and its output is frequently used as an input for the Hough transform algorithm for identification of lines. Its crucial step is the edge tracking by hysteresis, which selects the final edges by using two thresholds. The assessment of those two values in an unsupervised way is a difficult task, that is usually solved by application of statistical functions to the values of intensity of the input image converted to grayscale. This paper's objective is to experimentally prove, that it is more convenient not to use the input image, but instead the gradient image, which is the output of the Sobel gradient operator. The paper also revealed that with using the 2:1 ratio between the upper and lower threshold and the upper threshold to be set around 55 % of the maximum value of gradient image, the line detection reaches much better results.

Keywords: Canny, Hough, Hysteresis.

1 Introduction

The Canny edge detector is a very popular multi-stage algorithm for image edge detection, which has uses in many applications of computer vision, mainly in image data preprocessing. Its popularity is also indicated by the fact that, unless we don't count the simple gradient operators, it is the only implemented edge detector in the currently most used computer vision and image processing library – OpenCV.

The Canny edge detector algorithm consists of four steps: removing the noise with Gaussian filter, finding the intensity gradient with the Sobel gradient operator, non-maximum suppression and edge tracking by hysteresis (Canny, 1986). The last step, the edge tracking by hysteresis, is crucial, since selects the final edges by using two thresholds. The assessment of those two values in an unsupervised way is a difficult task that is yet to be solved in a satisfactory manner. Therefore, these values are usually set manually based on experiments (Medina-Camicer et al., 2010).

The hysteresis divides all pixels of an image into three groups according to the three intervals set by the thresholds. If a pixel has a value higher than the upper threshold, it is considered an edge. Should its value be below the lower threshold, it is considered an inconsequential edge and it is discarded. And lastly, should the pixel's value be between both thresholds, the pixel is considered an edge only if it lay next to another pixel already considered an edge.

The Canny edge detector output, a binary image, is frequently used as an input for the Hough transform algorithm for identification of miscellaneous geometric shapes in the original image, most frequently lines. This papers's subject is the problematic of automatic determining of the thresholds for hysteresis used in the Canny edge detector. In contrast to the majority of papers dealing with this subject, its focus is not the detection of all the edges in an image, but the detection of those edges which allow to correctly detect lines using the Hough transform algorithm.

For this purpose, the determination of the thresholds, is usually recommended to be based on the results of statistical functions, such as the arithmetic mean or median, applied to the values of intensity of the input image converted to grayscale. Another way leading to the thresholds is to use the fractions of the output of Otsu's method algorithm for automatically performing thresholding of graylevel image (Fang et al., 2009). This paper's objective is to experimentally prove, that it is more convenient not to use the input image, but instead the map of the gradient at each point, which is the output of the Sobel gradient operator, thus pointing the direction for the ensuing research in this field.

2 Materials and Methods

All the programming for the purpose of this paper was done in programming language Python 2.7.8 using the NumPy fundamental package for scientific computing and the aforementioned computer vision library OpenCV in version 3.1.0. This implies that also the implementation of the Canny edge detector comes from the implementation used in this library.

The Gaussian blur with square matrix of order 5 is used for the image noise reduction. To find the gradient magnitudes we used the Sobel gradient operator size 3x3 (1) as a convolution kernel, namely twice, for horizontal (G_x) and vertical (G_y) first derivative approximations.

$$G_x = \begin{bmatrix} -1 & 0 & +1 \\ -2 & 0 & +2 \\ -1 & 0 & +1 \end{bmatrix} * A, G_y = \begin{bmatrix} -1 & -2 & -1 \\ 0 & 0 & 0 \\ +1 & +2 & +1 \end{bmatrix} * A \quad (1)$$

The values of pixels G_x and G_y therefore may reach maximum of 1020 and a minimum of -1020. We can also derive that, if a pixel G_x has its maximum value 1020, pixel G_y highest value is 510 and vice versa, as shown in the examples of an image before the convolution (2), where X is the currently processed pixel. The highest possible sum of both values is therefore 1530.

$$\begin{bmatrix} 0 & 0 & 255 \\ 0 & X & 255 \\ 0 & 255 & 255 \end{bmatrix} G_x = 1020, G_y = 510 \quad (2)$$

$$\begin{bmatrix} 0 & 0 & 0 \\ 0 & X & 255 \\ 255 & 255 & 255 \end{bmatrix} G_x = 510, G_y = 1020$$

For the calculation of the edge gradient in the Canny edge detector from OpenCV in default settings, every pixel is processed by a function (3) using absolute values. A more correct and more accurate method would be to use an another function (4), which is, however, slower because of the use of powers and roots. With the first method, G values range between 0 and the highest possible sum of G_x and G_y , 1530; with the second, which we will be using, G values range between 0 and cca. 1140.395.

$$G = |G_x| + |G_y|, G \in \llbracket 0; 1530 \rrbracket \quad (3)$$

$$G = \sqrt{G_x^2 + G_y^2}, G \in \llbracket 0; 1140.395 \rrbracket \quad (4)$$

On this range, by testing all the options and subsequent evaluation by sensory observation, whereas the ratio between the upper and lower threshold will be tested in two variants: 3:1 and 2:1, we will be doing an experimental search for the best thresholds for the hysteresis. Sensory observation will be performed on the output of the Hough transform for line detection, which will follow directly after the edge detection. The Heath set of images (1997), which is still often used for the comparison of methods of edge detection, will be used as test images. The Hough transform will in all cases be statically set, with the resolution of one pixel and one degree and a minimum number of intersections equal to a hundred in Hough space to line detection.

3 Results

Table 1 shows information about the test images ordered by name in first column (Heath et al., 1997) and the results of the experiments. In columns „maximum“, „mean“ and „median“ are the results of the corresponding functions applied to gradient values. Columns „3:1“ and „2:1“ contain the resulting intervals of the best upper threshold values.

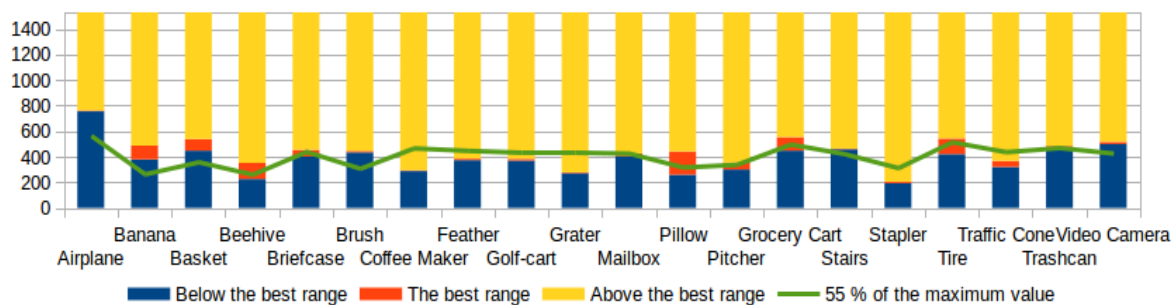


Figure 1: Results of the experiments with 2:1 ratio between the upper and lower threshold. Test images (x-axis) are described by intervals of the best upper thresholds to detect lines in range of possible gradient values (y-axis). Results (green line) are upper thresholds set to 55 % of the maximum value of gradient image.

We can argue that with a different setting of the Hough transform algorithm, the best setting of the Canny edge detector changes as well, but the experiments verified also, that even when the minimum number of intersections in Hough space for line detection is arbitrary, the range of intensity values is not always sufficient for the best result of line detection. The reduction of this minimum number of intersections in an image, where the edge detection was done inefficiently, often leads to poor identification of lines (Mukhopadhyay, Chaudhuri, 2015).

Table 1: Information about the test images and the results of the experiments

Image	Maximum	Mean	Median	3:1	2:1
Airplane	1034.2	61.3	28.0	836–838	756–762
Banana	487.2	25.1	11.7	408–487	380–487
Basket	659.5	100.2	81.0	558–562	448–538
Beehive	481.7	42.5	31.6	276–352	226–352
Briefcase	807.2	53.4	25.6	581–599	401–455
Brush	567.3	37.5	16.0	482–490	434–446
Coffee					
Maker	856.7	42.2	15.2	348–394	288–294
Feather	821.4	80.0	58.1	448–478	374–386
Golf-cart	792.9	62.9	40.5	528–550	370–384
Grater	786.5	39.4	15.6	324–358	272–278
Mailbox	782.3	84.4	61.1	522–526	404–426
Pillow	584.2	44.3	27.8	300–534	260–442
Pitcher	623.8	44.4	14.1	428–520	300–354
Grocery					
Cart	910.8	81.8	55.3	547–593	448–554
Stairs	775.5	79.6	48.8	622–634	459–463
Stapler	575.0	23.4	11.4	288–370	193–205
Tire	943.6	61.1	26.0	631–735	421–543
Traffic					
Cone	802.9	59.5	41.2	350–368	320–368
Trashcan	862.1	67.9	38.9	592–604	468–484
Video					
Camera	782.7	43.5	19.2	500–502	500–518

4 Discussion

As we can see, the best threshold values often go beyond the range of intensity values of the original image. So if we want to apply statistical functions to determine the threshold values, we should work with all the values of the gradient image.

The experiments also revealed that in some cases, the 2:1 ratio allowed a more accurate line detection and in most other cases, where the two tested ratios yielded comparable results, the 2:1 ratio had a greater interval, thus a higher probability of correctly determined hysteresis thresholds. Based on the table I would suggest for line detection to use the 2:1 ratio between the upper and lower threshold for hysteresis of the Canny edge detector. Then, the upper threshold to be set around 55 % of the maximum value of gradient image. With this setting, namely 52 - 56 %, the thresholds scored the best results in seven experiments and provided sufficiently good results in many others (as we can see in figure 1).

Similarly, we could also use the mean, where best results provided the upper threshold equal to approximately seven times the mean value of the gradient image, more precisely 691 - 696 %. I do not recommend, however, to use the median, because good results were quite scattered.

5 Conclusion

Based on the results of this paper, I believe that it is a bad practice to determine the Canny edge detector hysteresis threshold values solely on the basis of the intensity values of the input image. The values of the gradient image after performing the convolution with the Sobel operator and then consequentially calculating the gradient magnitude, provide much better results when used with detection lines using the Hough transform. There is no reason to believe that these values would not provide better results in other cases.

With the repetition of experiments on a larger set of test images, we could find the thresholds that give required results for many images, a sort of a starting point of setting for the Canny edge detector, which can be further modified according to the specific line detection problem.

Resolving this problem would simplify the line detection not only in OpenCV by the Canny edge detector, but also it would be possible to apply the results to other edge detectors based on the hysteresis, more of which appear in literature (Heath et al., 1997). It is likely that the results could also be used with a line detection algorithm other than the Hough transform, for example with the PClines method (Dubská et al., 2011).

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Primary Paper Section: I

Secondary Paper Section: IN

A REVIEW OF HYBRID RECOMMENDER SYSTEMS

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Abstract: Due to the huge amount of information available online, the need of personalization and filtering systems is growing permanently. In today's world recommender systems are increasingly used to make suggestions and provide information about items for users. Also recommendation systems constitute a specific type of information filtering technique that attempt to present items according to the interest expressed by a user. There are many techniques that can be applied for personalization in recommender systems. All these techniques have complementary strengths and weaknesses. A hybrid recommender system combines two or more recommendation techniques to gain better system performance and mitigate the weaknesses of individual ones. In this review paper, we prepared a brief introduction on hybrid recommendation systems, components of recommendation systems, various approaches of recommendation systems such as collaborative approach, content-based approach, hybrid approach and demographic approach.

Keywords: hybrid approach, collaborative approach, content-based approach, demographic approach.

1 Introduction

It is typically necessary to possess a certain sufficient amount of information to make good decisions in any situation. Technologies enable us to easily obtain more information, especially on the Internet. For example, if an individual want to rent a movie online, there are numerous choices available. However, too much information can make decision-making inefficient, leading to information overload. Personalization technologies and recommender systems help to overcome this problem by providing personalized suggestions regarding which information is most relevant to users. [1]

Recommender systems are used in various online applications from e-commerce to search engines. There are a number of techniques used to implement recommender systems, each with its advantages and disadvantages. Hybrid systems intend to combine two or more of these techniques in order to obtain better results. [2]

Recommender systems [3] reached a broad acceptance and attracted public interest during the last decade, also expanding the field for new sales opportunities in e-commerce [4, 5].

Recommender systems are divided into two categories in term of their approach to rating estimation: content-based and collaborative recommender systems. Content-based recommendations [6] based on item similarity of the user preferred to objects in the past. Moreover, collaborative recommendation systems [7] depend on the ratings given by individuals with similar taste and preference. However, both techniques exhibit specific strong and weak points.

Collaborative filtering recommender systems are the most commonly used systems [8]. They involve the use of the information provided by other users to make suggestions to a particular user. This can be compared to what happens in real life when an item is purchased based on the recommendation. Collaborative filtering systems differ in the way they use the information provided by other users to link it to the information available about the user that it needs to make a prediction for. A type of collaborative filtering is the use of association rules.

Development of recommender systems depends on e-commerce but there are also other applications for them such as search results and news portals customization. Different techniques have been used, including the nearest neighbor algorithm [9], association rule mining [10] and neural networks [11].

Hybrid techniques were implemented to overcome some challenges in the above-mentioned techniques. The challenges

include some aspects of performance, trust security and privacy issues.

Hybrid approaches unifying collaborative and content-based filtering less than one single framework, reducing synergetic effects and mitigating inherent challenges of either paradigm. Finally, hybrid recommenders operate on both product rating information and descriptive features. In fact, numerous ways for combining collaborative and content-based aspects are conceivable; [8] lists an entire plethora of hybridization methods. However most widely adopted among these, is the so-called "collaboration via content" paradigm [12], where content-based are built to detect similarities among users.

2 A review on the recommendation systems: approaches and limitations

This section is a review on the basic approaches of recommendation systems. The approaches include content-based, collaborative filtering, demographic, and hybrid approaches. Also there are limitations for the recommendation approaches are described in details.

Today there are different approaches to recommendation systems that are used to serve in different contexts based on system needs. The content-based approach deals with item profiles and user profiles, and it is designed to recommend text-based items. The collaborative filtering approach is widely used in commercial areas. Amazon uses the collaborative filtering approach to recommend books and other products to its customers [13]. Recommendation systems based on collaborative filtering recommend items to a particular user based on the similar items that have been rated by some other users, and the target user and the other users share the same preferences of items or products. The demographic approach recommender systems use demographic information such as the gender, age, and date of birth of respective users in order to recommend items [13].

3 Content-based approach

Content-based approach is one of the most widely used recommendation approaches. One main component of content-based is the user modeling process, because the interests of users are inferred from the items that users interacted with. Items are usually textual, for instance emails or webpages [14]. There are actions that are typically established interaction through downloading, buying, authoring, or tagging an item. Items are showed containing the items' features. Features are typically word-based. Some recommender systems use non-textual features, such as writing style, layout information, and XML tags [15].

In content-based approach, the user rates the items, that mean the recommender system should understand the common characteristics among the items that the user has rated in the past. The system then recommends the items that have a high degree of similarity to the user's preferences and tastes. For example, in a movie recommendation system, a content-based approach tries to understand the common characteristics such as actors, directors, genres, etc. among the movies that the user has given high ratings in the past. Then, the system recommends the movies that have a high degree of similarity to the user's preferences [13].

In a content-based recommendation system, a user profile contains the user's preferences of items. A user profile can be obtained by analyzing the content of all rated items [5]. Specifically, this profile is constructed by using the content (keyword) that has been analyzed using the methods that are mentioned in the item profile section. Each item in the user's profile has a weight that denotes the importance of keyword K_i to the user [5]. This weight can be computed using average

approach through a variety of techniques such as Rocchio algorithm, Bayesian classifier, Winnow algorithm, and cosine similarity measure [5]

In the recommender systems, content-based approach is the important approach among 62 tested approaches, 34 (55%) applied the idea of content-based approach [16]. There is an authorship relationship between users and items [17], having papers in one's personal collection, adding social tags [18], or downloading, reading, and browsing papers [19].

Most of the reviewed approaches use plain words as features, although some use n-grams, topics (words and word combinations that occurred as social tags on CiteULike) and concepts that were inferred from the Anthology Reference Corpus (ACL ARC) via Latent Dirichlet Allocation [20], and assigned to papers through machine learning. A few approaches utilize non-textual features, and if they did then these non-textual features were typically utilized in addition to words.

Giles et al. declared same method as words were used and weighted the citations with the standard TF-IDF measure so-called CC-IDF. Others used the idea of CC-IDF as a baseline. Moreover, Beel recently developed some initial evidence that CC-IDF might not be an ideal weighting scheme [21].

Zarrinkalam and Kahani considered authors as features and determined similarities by the number of authors two items share [22].

Here we can refer to some weakness of content-based approach such as low serendipity and overspecialization, lack of quality and popularity of items. For example, two research papers may be considered by a content-based approach recommender system. This relevance might not always be justified, for example if one paper was written by an authority, while another paper was written by a student. So a recommender system should recommend only the first paper but a content-based approach system would fail to do so.

Another criticism of content-based approach is limited access to the item's features. For research-paper recommendations, usually PDFs must be processed and converted to text, document fields must be identified, and features, such as terms must be extracted. None of these tasks are trivial and they may introduce errors into the recommendations [23].

4 Collaborative filtering approaches

The term collaborative filtering approaches was developed by Goldberg et al (1992), who proposed that "information filtering can be more effective when humans are involved in the filtering process" [24]. The concept of collaborative filtering was introduced two years later by Resnick et al. Their theory was that users like what like-minded users like, where two users were considered like-minded when they rated items alike. Items that one user rated positively were recommended to the other user, and vice versa. [25].

Collaborative filtering approaches are widely used in e-commerce. They have been successful in many e-commerce applications such as Amazon and Netflix. It is a popular approaches used to reduce information overload [9]. Amazon recommends books to their customers using the collaborative filtering approach. A recommendation system based on collaborative filtering recommends items to a particular user based on the similar items that have been rated by some other users. For example, in movie recommendation systems that are based on the collaborative filtering approach, the system finds a group of users that have similar preferences as a query user. Then, the system recommends the movies that they have rated highly in the past by those users to the target user [13].

Collaborative filtering approaches are grouped into two general categories:

- Memory-based approaches: They use the entire collection of the rated items in order to make recommendations or predictions.
- Model-based approaches: They allow systems to learn to recognize patterns in the data sets in order to make recommendations or predictions.

In a memory-based approach, it is important to measure the similarities between users or items. There are many different similarity measures that are used to compute the similarities between users or items [9].

In model-based approaches, classification, clustering, and regression algorithms can be used. For example, the Bayesian classification and K-Means clustering algorithm are used in model based of collaborative filtering approach [8].

There are three advantages to comparison of content-based approach, collaborative filtering approach. First; collaborative filtering approach is content independent, second, because humans do the ratings, collaborative filtering approach considered real quality assessments. Finally, collaborative filtering approach is supposed to provide serendipitous recommendations are not based on item similarity but on user similarity [26].

From the reviewed approaches, only 11 (18%) applied collaborative filtering [27]. Yang et al. intended to let user's rate research papers, but users were "too lazy to provide ratings" [28].

Naak et al. faced the same problem and created artificial ratings for their evaluation [29]. This illustrates one of the main problems that collaborative filtering approach requires user participation, but often the motivation to participate is low. This problem is referred to as the "cold-start" problem. If a new user rates few or no items, the system cannot find like-minded users and therefore cannot provide recommendations. If an item is new in the system and has not been rated yet by at least one user, it cannot be recommended. In a new community, no users have rated items, so no recommendations can be made and as a result, the incentive for users to rate items is low.

A general problem of collaborative filtering in the domain of research-paper recommender systems is sparsity. Vellino compared the implicit ratings on Mendeley (research papers) and Netflix (movies), and found that sparsity on Netflix was three orders of magnitude lower than on Mendeley [30]. This is caused by the different ratio of users and items. In domains like movie recommendations, there are typically few items and many users.

There are further critiques of collaborative filtering approach. Computing time for collaborative filtering approach tends to be higher than for content-based approach. Collaborative filtering approach is generally less scalable and requires more offline data processing than content-based approach.

Torres et al. believed that collaborative filtering approach creates similar users [31] and Sundar et al. observe that collaborative filtering approach dictates opinions [32].

Lops criticized that collaborative filtering approach systems cannot explain why an item is recommended except that other users liked it. Other problem of collaborative filtering approach is manipulation, collaborative filtering approach is based on user opinions, and blackguards might try to manipulate ratings to promote their products so they are recommended more often. [33].

4.1 Limitation of collaborative filtering approaches

- Collaborative filtering has the problem which is new users entering the system. In order to make recommendations to a user, the system needs to know the user's preferences from the ratings that the user makes. Since the user is new

in the system, he has not rated items yet. Thus, the system will not be able to provide accurate recommendations.

- The systems should contain rated items in order to recommend some items to the users. When a new item enters the systems, the item has not rated by users yet. Therefore, the systems will not be able to recommend it to the users.
- Sparsity is a major problem for collaborative filtering approach. The total number of ratings is important in the recommendation systems. In order to provide accurate recommendations by the recommendation systems, sufficient number of ratings should exist in the systems. For example, in movie recommendation systems, there are many movies that have been rated by only a few people. The systems will rarely recommend these movies [13].
- In many practical collaborative filtering recommendation systems, the number of users and items increase rapidly in the system [8]. Therefore, the system needs to provide more and complicated computational process, and this leads the computational resources going beyond the acceptable levels.

5 Demographic approach

A demographic approach recommends items to the user based on the user's demographic information such as gender, age, and date of birth. It puts the users into groups based on their demographic characteristics. The system will put the users who belong to a certain zip code into one group. Also, the users of ages ranging from 18 to 25 years-old will be in one group. The recommendation systems based on demographic approaches assume that the users in the same group or category share the same interests and preferences [13]. The demographic approach tracks the buying or rating behavior of the users within the same group or category. If there is a new user entering the system, the system first will place the user into a particular group based on the user's demographic information. Then, the system will recommend products or items to the user based on the buying or rating behavior of the other users in the group.

The purpose of the system is to recommend books to library visitors based on their personal information that is gathered from them through an interactive dialogue. Another recent example of a recommendation systems based on demographic groups is Lifestyle Finder. The system uses demographic groups from marketing research to recommend a range of products and services, and it gathers the data from users through a short survey. The advantage of the demographic approach is: the system does not require maintaining a history of user ratings like in content based and collaborative filtering approaches [8].

5.1 Limitation of demographic approaches

- The demographic approach suffers from is how to identify the group or category that the user belongs to when the user is new to the system.
- The demographic approach how to identify the interests and preferences of users within the same group.
- The demographic approach is the demographic system works well when the demographic data is available to the system.
- The accuracy of recommendation systems based on demographic data is less than those recommendation systems based on content or collaboration filtering.

6 Hybrid recommendation approach

Since all above-mentioned approaches have complementary strengths and weaknesses, so a hybrid recommender system combines two or more recommendation techniques to gain better system performance and mitigate the weaknesses of individual ones.

However, recommendation approaches previously introduced may be combined in hybrid approaches. Many of the studied approaches have some hybrid characteristics. For instance,

content-based approach uses global relevance attributes to rank the candidates, or graph methods are used to extend or restrict potential recommendation candidates.

Therefore, hybrid recommendation technique used so-called "feature augmentation". It is a weak form of hybrid recommendation technique, since the primary technique is still dominant. In true hybrids, the combined concepts are similarly important, among the approaches reviewed; only TechLens approaches may be considered true hybrid approaches.

TechLens [31] is one of the most influential research-paper recommender systems. TechLens was developed by the GroupLens31 team. Currently the GroupLens team is still active in the development and research of recommender systems in other fields. Between 2002 and 2010, Konstan, Riedel, McNeel, Torres, and several others published six articles related to research-paper recommender systems. Often, McNeel et al.'s article from 2002 is considered to be the original TechLens article [34]. However, the 2002 article introduced some algorithms for recommending citations, which was introduced in 2004 by Torres et al. [31]. Two articles about TechLens followed in 2005 and 2007 with respect to recommendations. In 2006, McNeel et al. analyzed potential pitfalls of recommender systems [35]. In 2010, Ekstrand et al. published another article on the approaches of TechLens [36].

TechLens' algorithms were adopted from Robin Burke [8] and consisted of three content-based approach variations, two collaborative filtering approach variations, and five hybrid approaches.

Pure-content-based approach served as a baseline in the form of standard content-based approach in which a term-based user model was compared with the recommendation candidates. In the case of TechLens, terms from a single input paper were used. In content-based approach -Separated, for each paper being cited by the input paper, similar papers are determined separately and at the end the different recommendation lists are merged and presented to the user. In combined content-based approach, terms of the input paper and terms of all papers being cited by the input paper are combined in the user model. Then the papers most similar to this user model are recommended. [38, 39]

Pure-collaborative filtering approach served as another baseline and represented the collaborative filtering approach from McNeel et al., in which papers were interpreted as users and citations were interpreted as votes [34].

Hybrid: With Pure-CF->CBF Separated, recommendations were first created with Pure- collaborative filtering. These recommendations were then used as input documents for CBF-Separated. Similarly, Pure-CF->CBF Combined, CBF Separated->Pure-CF, and CBF-Combined->Pure-CF were used to generate recommendations. Fusion created recommendations with both CBF and CF independently and then merged the recommendation lists.

The previously discussed filtering techniques can be combined to produce a hybrid filtering [37]. Although any filtering techniques are possible to be combined, we will only focus on combining collaborative filtering approach and content-based approach. There are several ways to combine two filtering techniques [13], as shown in Figure 1:

- Case A: implementing a collaborative filtering approach and a content-based approach separately and combining their recommendations afterwards;

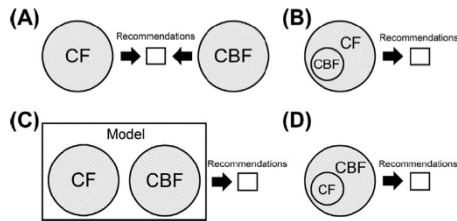


Figure 1: Several models of hybrid filtering, using both collaborative filtering approach and content-based approach [40].

- Case B: incorporating some of the characteristics of the content-based approach into the collaborative filtering approach, e.g. the incorporation of personal information in collaborative filtering approach, to alleviate the problem of introducing a new user to the RS;
- Case C: building a general model that takes into account characteristics from both collaborative filtering approach and content-based approach, therefore combining their results with a machine-learning algorithm (e.g. using Bayes-Networks);
- Case D: incorporating some of the characteristics of the collaborative filtering approach into the content-based approach. For example, using the determined recommendations from the collaborative filtering approach used as an input to the content-based approach algorithm;

7 Discussion and Conclusion

In the 16 years from 1998 to 2013 more than 200 research articles were published in the field of recommender systems. The articles consisted primarily of peer-reviewed conference papers (59%), journal articles (16%), pre-prints (5%), and other documents such as presentations and web pages (15%). The few existing literature surveys in this field cover only a fraction of these articles, which is why we conducted a comprehensive survey of recommender systems. The review revealed the following information [35].

Content-based approach is the predominant recommendation approaches. From 62 reviewed approaches, 34 used content-based approach (55%). From these content-based approach approaches, the majority utilized plain terms contained in the documents. A few approaches also utilized non-textual features, such as citations or authors. [8].

The most popular model to store item representations was the vector space model (VSM). Other approaches modeled their users as graphs, as lists with topics that were assigned through machine learning, or as ACM classification hierarchies. The reviewed approaches extracted text from the title, abstract, header, introduction, foreword, author-provided keywords, bibliography, body text, social tags, and citation context.

According to Yang et al result, it concluded that only eleven approaches applied collaborative filtering approach, and none of them successfully used explicit ratings. Hence, implicit instead of explicit ratings were used. Implicit ratings were inferred from the number of pages the users read, users' interaction with the papers and citations. The main problem of collaborative filtering approach for research papers seems to be scarcity. Vellino compared implicit ratings on Mendeley (research papers) and Netflix (movies), and found that scarcity on Mendeley differs from Netflix by a magnitude of three [30].

As mentioned above, a demographic approach recommends items to the user based on the user's demographic information such as gender, age, and date of birth. Demographic approach puts the users into groups based on their demographic characteristics. Also, the users of ages ranging from 18 to 25 years-old will be in one group. The demographic approaches

assume that the users in the same group or category share the same interests and preferences. The demographic approach tracks the buying or rating behavior of the users within the same group or category. The demographic approach first will place the user into a particular group based on the user's demographic information. Then, the system will recommend products or items to the user based on the buying or rating behavior of the other users in the group.

In this study a novel hybrid approach we proposed to prediction of rating, so collaborative filtering approach and content-based approach were used and finally combined. Although there are several hybrid recommendation systems, so in order to combine collaborative filtering approach and content-based approach, rating and content information are integrated to build a hybrid model. The main advantages of this hybrid model are less parameters and more reasonable prediction.

Since content features have a characteristic such as multiplicity, so this hybrid model has flexibility in size, by what the computational effort increased substantially. In order to reduce the runtime in the system, some dimension of hybrid model by means of singular value decomposition decreased. The hybrid model compared with basic collaborative filtering approach, this hybrid approach performed better in prediction accuracy and runtime. So according to result we can conclude that novel hybrid model is practical to real-life applications.

Since, over the last years, recommender systems have made significant progress, accordingly hybrid recommendation model have been proposed and implemented. This proposed hybrid model mainly focuses on providing justifications for the recommendations. This proposed hybrid model is the integration of content and context data with rating data, and also provides accurate justifications for recommendations.

Moreover, this proposed hybrid model provide an explanation interface that shows the recommendations in a group or a category rather than duplicating the same information which reduces the time for decision making of customers. This proposed hybrid model allows the customer to interact with it to provide feedback on the recommendations and justifications. The results have clearly shown that interact with the customer more effectively and boosts the customer's satisfaction on the recommender system. Interacting with the recommender systems allows the customer to achieve their desired product quicker.

This proposed hybrid model is implemented by a prototype web-based application in the JAVA platform. This proposed hybrid prototype is implemented for movies; however, it can be easily implemented for other products. However, all of these advances with accordance with the current generation of recommender systems still require further improvements to make recommendation methods more effective in a broader range of applications. Specifically, there is lot of work needed in the area of providing effective explanations that will increase the customer's trust on the recommender systems and also boosts the business of the organizations.

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Primary Paper Section: I

Secondary Paper Section: JC, IN, BD



J INDUSTRY

JA	ELECTRONICS AND OPTOELECTRONICS
JB	SENSORS, DETECTING ELEMENTS, MEASUREMENT AND REGULATION
JC	COMPUTER HARDWARE AND SOFTWARE
JD	USE OF COMPUTERS, ROBOTICS AND ITS APPLICATION
JE	NON-NUCLEAR POWER ENGINEERING, ENERGY CONSUMPTION AND UTILIZATION
JF	NUCLEAR ENERGY
JG	METALLURGY, METAL MATERIALS
JH	CERAMICS, FIRE-PROOF MATERIALS AND GLASS
JI	COMPOSITE MATERIALS
JJ	OTHER MATERIALS
JK	CORROSION AND MATERIAL SURFACES
JL	FATIGUE AND FRACTURE MECHANICS
JM	STRUCTURAL ENGINEERING
JN	CIVIL ENGINEERING
JO	LAND TRANSPORT SYSTEMS AND EQUIPMENT
JP	INDUSTRIAL PROCESSES AND PROCESSING
JQ	MACHINERY AND TOOLS
JR	OTHER MACHINERY INDUSTRY
JS	RELIABILITY AND QUALITY MANAGEMENT, INDUSTRIAL TESTING
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JV	COSMIC TECHNOLOGIES
JW	NAVIGATION, CONNECTION, DETECTION AND COUNTERMEASURE
JY	FIREARMS, AMMUNITION, EXPLOSIVES, COMBAT VEHICLES

EMPIRICAL METHODS IN INTERNATIONAL TRADE USING FOR EVALUATION IN LIVESTOCK INDUSTRY, CASE OF SPECIFIC CHOSEN COMMODITY

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Abstract: World trade in livestock products is concentrated globally. V4 integration into the World and EU economy is one of the most important developments affecting the structure and evolution of the global system of the 21st century. These countries have grown, driven primarily by the expansion of modern, industrial and export-oriented sector. This case explores what V4 competitiveness of specific commodity means by using four different measures by using the modification of Balassa's and Vollrath's indices: relative export share, relative import share, relative export advantage and relative import advantage. Each measure has a special meaning and use and the concept and measurement of international competitiveness of nations is a useful tool. This analysis shows that V4 countries overall had a strong comparative advantage and competitiveness in selected industry, taking into account six commodities worldwide, in the period from 2004 to 2013.

Keywords: competitiveness, international trade balance, live-stock industry, comparative advantage.

1 Introduction

World export has an increasing tendency and becomes more important. The live-stock export industry is a valuable state's industry and supports the live hood of many people. With the development of improved communications of all kinds, recent decades have seen rapid growth of international trade.

The expansion of agricultural products has allowed a greater diversity through the world. The trade in live-stock products was largely limited to cross the borders by many exceptions, regulations which were abolished by free trade areas, an example for the first type of this block is the North American Free Trade Agreement (NAFTA) formed in 1994 (NAFTA, 2008). In recent years many of regional integration agreements has rapidly increased, and more than 164 agreements have been notified to GATT/WTO (WTO, 2017). The developments, e.g. refrigerated transportation since 1800s century in U.S. (Briley, 2004), sea- and airfreight, new technologies like mechanization, electrification, internet, automation and data exchange in manufacturing technologies led to the creation of new major trading routes.

The aim of this paper is the measurement and comparison of trade balance through the competitiveness and international comparative advantage of V4 countries in the six chosen commodities of live animals, using statistical data from the Food and Agriculture Organisation of the United Nations (FAO) and International Trade Centre from 2004 to 2013.

Many of live farm animals around the world are transported thousands of kilometres for slaughter, or to places where they will be fattened for slaughter. This trade is a global phenomenon. In North and South America, Australia and Europe, animals often have to endure journeys across vast distances before long sea voyages to reach their final destinations.

According to the data provided by Trading Economics exports of Live Animals in the U.S. averaged USD 64.21 million from 1996 until 2016, reaching an all-time high of USD 265 million in October 2000, and a record low of USD 18 million in April 2004, because of the spread of BSE illness (also called "mad cow disease") in 2003 (TRADING, 2017a). Canada averaged CAD 137.43 million from 1988 until 2016, reaching an all-time high of CAD 294 million in November 2014 and a record low of CAD 35.50 million in April 1988 (TRADING, 2017b). Mexico averaged USD 39 993.17 thousand from 1993 until 2016, reaching an all-time high of USD 121 740 thousand in December 2014, and a record low of USD 1 114 thousand in September 1996 (TRADING, 2017c).

On the basis of the data available from Australian Livestock Exporters' Council (ALEC) in the period 2014-15 Australia exported 1.38 million cattle valued at Australian \$1.35 billion FOB, 2.18 million sheep valued at Australian \$244 million FOB, 90 950 goats valued at Australian \$9.6 million FOB (Online, 2017). Trading data in Australia averaged AUD 1 546.48 million from 1988 until 2016, reaching an all-time high of AUD 3 299 million in May 2015, and a record low of AUD 543 million in January 1989 (TRADING, 2017d).

All V4 countries are since 2004 members of the European Union, which caused several changes in this Live-stock industry. In 2015 Spain, Germany, France United Kingdom and Italy held the largest populations of livestock in the EU-28 (Extra-EU, 2015). Further comparison shows big differences in the V4 countries (Agricultural production-animals, 2017) as follow in the Czech Republic, bovines (1.33 million heads), pigs (1.55 million heads); in Hungary, bovines (0.77 million heads), pigs (2.94 million heads), sheep (1.24 million heads); in Poland, bovines (5.59 million heads), pigs (10.99 million heads); and in Slovakia, bovines (0.47 million heads), pigs (0.64 million heads) (Agriculture, forestry and fishery statistics, 2015).

Until 2011, EU-28 exports of animal products in terms of monetary value were lower than EU-28 imports. In 2011, animal products recorded a EUR 215 million trade surplus which grew over the next two years to EUR 2 862 million in 2013. From 2002 to 2013 animal products exports more than doubled, growing by 109 %. On the other hand, imports increased by 38 % during the same period (Extra-EU trade in agricultural goods, 2015).

Evidently, the livestock export trade is vital for providing options to producers for competition for their livestock. This is an important contributor to agricultural export earnings and to the economics of the State. It is a necessary component of the State's agricultural sector and contributes annual earnings to the economy offering jobs and significant employment opportunities.

2 Methodology

The classic theory of comparative advantage generally understood that trade generates gains for both exporting and importing countries. Various methods of quantification of revealed comparative advantages provide the basis for analysis. The first to have published this index was Balassa in 1965, as follows:

$$B = (x_{ij} / x_{it}) / (x_{nj} / x_{nt})$$

where x means export, i indicates a given country, j is a given product, t represents a group of products and n a group of countries (Balassa, 1965). The concept of revealed comparative advantage pertains to the relative trade performance of individual countries in particular commodities (Ballasa 1965, 1977, 1986). The Balassa Index is criticised because it is seen to neglect the different effects of agricultural policies and asymmetric values (Jambor, 2013).

Vollrath (1991) offered three alternative specifications of revealed comparative advantage, following analyses of international competitiveness in agriculture. The first of these measures is the relative trade advantage (RTA), which accounts for imports as well as exports. It is calculated as the difference between relative export advantage (RXA), which equates to the Balassa Index, and its counterpart, relative import advantage (RMA).

$$RTA = RXA - RMA$$

where RXA and RMA refer to relative export advantage and relative import advantage (Scott and Vollrath, 1992).

One way of judging competitiveness is to ask what the trade record reveals about the country's performance. How well does a country export one item, compared with all other goods? We can first work out the formula for Relative Export (RES) and Import Share (RIS), an intermediate step towards Relative Export (REA) and Import Advantage (RIA). The value of the method becomes more apparent when we compare RES or RIS between various commodities.

In order to identify whether the V4 countries are more competitive, we determined specific live-stock commodity as cattle, chickens, horses, pigs, sheep and turkeys and used the modified indexes because it was decided as the best procedure for this investigation.

In the first step, we defined the Relative Export Share as follows:

$$\text{RES of the V4 country of live animals} = \frac{\frac{\text{V4 country exports of live animals}}{\text{World exports of live animals}}}{\frac{\text{total exports of V4 country}}{\text{World total exports}}} \quad (1)$$

$$\text{RES of the V4 country of commodity} = \frac{\frac{\text{V4 country exports of commodity}}{\text{World exports of commodity}}}{\frac{\text{total exports of V4 country}}{\text{World total exports}}} \quad (2)$$

During the second phase, we determined the Relative Import Share as follows:

$$\text{RIS of the V4 country of live animals} = \frac{\frac{\text{V4 country imports of live animals}}{\text{World imports of live animals}}}{\frac{\text{total imports of V4 country}}{\text{World total imports}}} \quad (3)$$

$$\text{RIS of the V4 country of commodity} = \frac{\frac{\text{V4 country imports of commodity}}{\text{World imports of commodity}}}{\frac{\text{total imports of V4 country}}{\text{World total imports}}} \quad (4)$$

With the completion of these steps, we are now ready to proceed with the Relative Export Advantage which is based on intermediate comparison of market shares of world trade, which we defined in this way:

$$\text{REA of V4 country of live animals} = \frac{\frac{\text{V4 country export share of live animals}}{\text{total exports of V4 country excluding live animals}}}{\frac{\text{World export share of live animals}}{\text{World total export excluding live animals}}} \quad (5)$$

$$\text{REA of V4 country of commodity} = \frac{\frac{\text{V4 country export share of commodities}}{\text{total exports of V4 excluding commodities}}}{\frac{\text{World export share of commodities}}{\text{World total export excluding commodities}}} \quad (6)$$

Relative export advantage makes clear distinctions between a specific commodity and all other commodities, and between a specific country and the rest of the world. The raw indices are converted to natural logarithms.

The last step described the Relative Import Advantage as follows:

$$\text{RIA of V4 country of live animals} = \frac{\frac{\text{V4 country imports share of live animals}}{\text{total imports of V4 excluding live animals}}}{\frac{\text{World imports share of live animals}}{\text{World total imports excluding live animals}}} \quad (7)$$

$$\text{RIA of V4 country of commodity} = \frac{\frac{\text{V4 country imports share of commodity}}{\text{total imports of V4 excluding commodity}}}{\frac{\text{World imports share of commodity}}{\text{World total imports excluding commodity}}} \quad (8)$$

where the raw indices are converted to natural logarithms.

To summarise how well a country's economic sector, such as live animals and the commodities, competes with other economic activities in the international market, both exports and

imports by the country in question are accounted for. We defined the Revealed Competitiveness as follows:

$$\text{RC} = \text{REA} - \text{RIA}$$

where REA refers to the Relative Export Advantage and RIA to the Relative Import Advantage. To arrive at a final index number for Revealed Competitiveness, we subtract the Relative Import Advantage of the sector from its Relative Export Advantage. As in the Relative Export Advantage index, we use natural logarithms to ease comparisons. This adjustment is made because countries have two-way trade in their economic systems.

3 Results

3.1 Relative Export Share of Live Animals and Six Chosen Commodities

The records reveal that from 2004 to 2013, the relative export share of live animals from the Czech Republic was 1.64 times better than the average of all its exports, compared with the world. Hungary's relative export share of live animals was 2.74 times better than the average of all its exports, compared with the world. Poland's results reveal that the relative export share of live animals from the country was 2.09 times better than the average of all its exports, compared to the world. The last country, Slovakia, in that period showed that its relative export share of live animals was 1.93 times better than the average of all its exports, compared with the world.

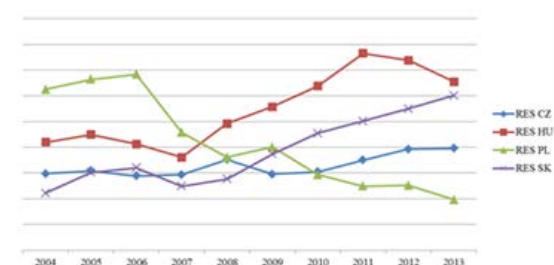
If we examine the single country results over the periods, we can confirm that Poland had a better advantage of the V4 share of exports from 2004 to 2007 and Hungary had the advantage from 2008 to 2013, demonstrated in Table 1 and Figure 1, Slovakia is the only country with the possibility of expanding its share of exports, as can be seen from 2008 by the increase.

TABLE 1: Relative Export Share of Live Animals, 2004-2013

	2004	2005	2006	2007	2008
CZ	1.49	1.54	1.44	1.47	1.76
HU	2.10	2.25	2.06	1.81	2.46
PL	3.13	3.32	3.42	2.29	1.81
SK	1.11	1.51	1.60	1.24	1.38
	2009	2010	2011	2012	2013
CZ	1.48	1.52	1.75	1.97	1.98
HU	2.79	3.19	3.83	3.69	3.27
PL	2.01	1.47	1.24	1.26	0.98
SK	1.87	2.27	2.51	2.75	3.01

Source: author's own calculation based on (FAOSTAT, 2015), (International Trade in Goods - Exports 2001-2016, 2015).

FIGURE 1: Relative Export Share of Live Animals, 2004-2013



Source: author's own calculation based on (FAOSTAT, 2015), (International Trade in Goods - Exports 2001-2016, 2015).

The value of the method becomes more apparent when we compare relative export shares among various commodities in our case: cattle, chickens, horses, pigs, sheep and turkeys as indicated in Figure 2.

We see the highest marked share value of the commodity in the period from 2004 to 2013. The first commodity is cattle, where we see the best share in Poland from 2004 to 2007; the next best

share belongs to Hungary from 2008 to 2013. For the second commodity, chickens, we realise three different countries in different periods: in 2004 and 2007, it was the Czech Republic, from 2005 to 2006 and 2011 and 2012, Slovakia, and the third country, Hungary, from 2008-2010 and in 2013. For the next commodity, horses, we easily recognise the best export share of Poland. Pigs have the best share in Hungary from 2004 to 2010, and Slovakia from 2011 to 2013. For the sheep commodity, it is plainly Hungary. For the last commodity, turkeys, the best share is in Slovakia from 2004 to 2005, the Czech Republic from 2006 to 2008 and in 2011, with Poland having the best share from 2009 to 2010 and from 2012 to 2013.

FIGURE 2: Relative Export Share of Six Commodities, 2004-2013

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Czech Republic	Cattle	7.56	10.24	9.98	8.20	8.76	7.46	7.30	7.75	9.63	8.98	
	Chickens	4.10	3.22	3.65	4.22	4.72	3.93	3.74	3.84	3.24	3.37	
	Horses	0.05	0.09	0.07	0.04	0.04	0.02	0.02	0.02	0.02	0.04	0.02
	Pigs	1.84	1.35	0.99	0.85	0.88	0.45	0.89	1.11	1.19	1.30	
	Sheep	0.03	0.02	0.05	0.02	0.02	0.02	0.01	0.02	0.02	0.02	
	Turkeys	4.17	5.21	7.83	8.35	10.59	4.84	5.59	6.44	8.29	8.09	
Hungary	Cattle	6.09	8.18	9.06	8.48	9.24	10.22	14.29	18.69	14.65	9.19	
	Chickens	1.89	3.25	3.75	3.44	4.76	4.45	3.99	2.99	3.66	4.11	
	Horses	0.57	0.35	0.49	0.38	0.36	0.29	0.37	0.27	0.07	0.08	
	Pigs	5.53	5.58	5.45	3.04	2.11	3.29	5.20	2.82	3.08	2.69	
	Sheep	11.10	10.40	9.09	6.90	7.01	6.38	6.20	6.50	6.62	5.26	
	Turkeys	0.36	0.82	0.67	0.36	0.53	2.49	0.65	1.71	1.29	0.72	
Poland	Cattle	23.77	25.76	25.34	13.98	8.81	9.32	6.82	5.68	5.41	3.22	
	Chickens	1.27	1.71	1.88	1.49	1.21	1.37	1.08	1.05	1.34	1.46	
	Horses	3.10	2.53	2.20	1.78	1.56	1.55	1.46	1.46	1.31	0.99	
	Pigs	1.00	1.69	3.57	2.31	1.87	1.87	1.26	0.65	0.71	0.50	
	Sheep	0.72	0.86	0.70	0.63	0.51	0.43	0.35	0.35	0.29	0.24	
	Turkeys	3.21	2.78	2.85	1.81	3.34	5.67	5.88	5.98	9.28	10.99	
Slovakia	Cattle	9.10	8.16	9.02	5.62	6.60	8.09	9.02	6.86	8.25	6.97	
	Chickens	1.38	5.76	4.23	2.43	3.39	4.24	3.94	4.52	5.28	4.35	
	Horses	0.03	0.03	0.14	0.06	0.23	0.32	0.02	0.01	0.02	0.01	
	Pigs	0.05	0.80	1.80	2.21	1.01	1.45	3.44	4.86	4.79	6.51	
	Sheep	0.69	0.47	0.52	0.27	0.33	0.30	0.24	0.29	0.34	0.27	
	Turkeys	5.81	5.72	5.49	0.30	3.87	2.55	2.31	1.75	1.73	3.94	

Source: author's own calculation based on (FAOSTAT, 2015), (International Trade in Goods - Exports 2001-2016, 2015).

3.2 Relative Import Share of Live Animals and Six Chosen Commodities

The records show that, in the chosen period, the Czech Republic imported more live animals of all its imports than the rest of the V4 countries, compared with the world. The Czech Republic had 1.64 times more than the average, Hungary 1.42 and Poland 1.47 times more imported live animals. Only the Slovak Republic imported less than 1.10 times.

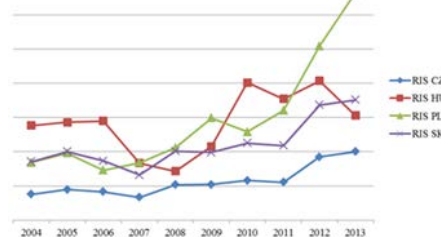
If we examine single country results over the periods, we confirm that Poland had the advantage of the V4 import share from 2007 to 2009 and from 2012 to 2013, and Hungary from 2004 to 2006 and from 2010 to 2011, as shown in Table 2 and Figure 3.

TABLE 2: Relative Import Share of Live Animals, 2004-2013

	2004	2005	2006	2007	2008
CZ	0.38	0.45	0.41	0.33	0.52
HU	1.38	1.43	1.45	0.83	0.71
PL	0.84	0.98	0.73	0.84	1.06
SK	0.85	1.00	0.86	0.66	1.01
	2009	2010	2011	2012	2013
CZ	0.52	0.58	0.55	0.92	1.00
HU	1.08	2.01	1.77	2.04	1.53
PL	1.49	1.29	1.60	2.54	3.32
SK	0.99	1.13	1.09	1.68	1.76

Source: author's own calculation based on (FAOSTAT, 2015), (International trade in goods - imports 2001-2016, 2015).

FIGURE 3: Relative Import Share of Live Animals, 2004-2013



Source: author's own calculation based on (FAOSTAT, 2015), (International trade in goods - imports 2001-2016, 2015).

The value of the method becomes more apparent when we compare relative import shares between various commodities as highlighted in Figure 4. We see the highest bold marked share value of the commodity in the period from 2004 to 2013. The first commodity is cattle, where we see the highest import share in Poland from 2004 to 2007; after that the next highest import share belongs Slovakia from 2008 to 2009 and Hungary from 2010 to 2013. For the second commodity, chickens, we easily realise the highest import share for Slovakia, except in 2004, which refers to Poland. For the next commodity, horses, we easily recognise the highest import share for Poland, except in 2009 for the Czech Republic and, in 2011, for the Slovak Republic. The highest pig share goes to Hungary from 2004 to 2007 and in 2010, and Poland from 2008 to 2009 and 2011 to 2013. For the sheep commodity, Hungary is plainly shown as the best. For the last commodity, turkeys, shows us that Poland had the highest import share for the whole period.

FIGURE 4: Relative Import Share of Six Commodities, 2004-2013

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Czech Republic	Cattle	0.48	0.42	0.25	0.41	0.38	0.28	0.16	0.13	0.18	0.15
	Chickens	1.28	2.49	2.22	1.32	1.49	1.73	1.59	1.46	1.67	1.68
	Horses	0.14	0.11	0.10	0.09	0.10	0.10	0.02	0.04	0.03	0.01
	Pigs	0.09	0.46	0.56	0.62	1.29	1.85	1.86	1.75	2.39	1.80
	Sheep	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Turkeys	3.11	2.85	2.14	1.00	2.07	1.10	1.35	1.05	1.16	1.39
Hungary	Cattle	0.67	1.05	0.79	0.72	0.23	0.29	4.37	6.74	7.65	4.49
	Chickens	1.20	1.28	0.41	0.35	0.74	0.41	1.44	1.69	2.71	1.92
	Horses	0.02	0.02	0.03	0.00	0.00	0.00	0.01	0.01	0.00	0.01
	Pigs	5.32	5.53	5.33	3.16	2.30	3.83	5.99	3.24	3.45	3.05
	Sheep	1.13	0.78	2.91	0.59	0.70	0.59	0.52	0.55	0.48	0.42
	Turkeys	1.69	1.64	1.81	1.83	2.64	4.00	3.65	3.64	6.11	4.63
Poland	Cattle	2.17	2.47	1.70	1.44	0.78	0.55	0.94	1.00	1.56	2.29
	Chickens	2.00	2.22	2.45	2.15	1.76	2.03	2.47	2.53	2.70	3.09
	Horses	0.26	0.12	0.12	0.20	0.18	0.04	0.09	0.09	0.21	0.25
	Pigs	1.07	1.66	0.79	0.90	2.47	4.41	3.63	4.70	8.63	11.06
	Sheep	0.61	0.70	0.58	0.55	0.43	0.43	0.34	0.32	0.28	0.24
	Turkeys	10.72	13.98	15.21	16.28	13.38	10.41	9.46	11.81	10.38	11.93
Slovakia	Cattle	0.04	0.02	0.33	0.37	0.88	0.62	1.89	1.32	1.79	1.75
	Chickens	1.26	5.14	3.95	2.25	3.24	4.42	4.01	4.72	5.58	4.67
	Horses	0.01	0.02	0.06	0.08	0.16	0.05	0.08	0.16	0.12	0.02
	Pigs	1.22	2.79	2.55	1.69	2.00	2.03	2.62	2.43	4.78	5.40
	Sheep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	Turkeys	1.12	1.47	1.60	0.28	1.65	0.77	1.15	0.96	0.66	0.95

Source: author's own calculation based on (FAOSTAT, 2015), (International trade in goods - imports 2001-2016, 2015).

3.3 Relative Export and Import Advantage of Live Animals and Six Chosen Commodities

By examining Tables 3 and 4, Figure 5 and 6, the same results as for the RES and RIS data, which were previously examined, can be confirmed. However, the difference in this calculation is that the raw indices are converted to natural logarithms as we implement the principle of export and import advantage mentioned in the methodology. A positive value of REA and RIA is interpreted as an indication of a country's export or import advantage versus the rival – the world.

TABLE 3: Relative Export Advantage of Live Animals, 2004-2013

	2004	2005	2006	2007	2008
CZ	0.58	0.61	0.52	0.52	0.69
HU	0.74	0.81	0.72	0.59	0.90
PL	1.14	1.20	1.23	0.83	0.59
SK	0.11	0.41	0.47	0.22	0.32

	2009	2010	2011	2012	2013
CZ	0.55	0.56	0.69	0.82	0.83
HU	1.03	1.16	1.35	1.31	1.19
PL	0.70	0.38	0.22	0.23	-0.02
SK	0.63	0.82	0.92	1.01	1.10

Source: author's own calculation based on (FAOSTAT, 2015), (International Trade in Goods - Exports 2001-2016, 2015).

Green marked fields indicate comparative advantage of V4 country in the commodity category versus the world.

FIGURE 5: Relative Export Advantage of Six Commodities, 2004-2013

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Czech Republic	Cattle	0.53	0.79	0.63	0.58	0.80	0.75	0.77	0.77	0.95	0.96
	Chickens	1.41	1.17	1.30	1.44	1.55	1.37	1.32	1.35	1.18	1.22
	Horses	-3.04	-2.46	-2.66	-3.30	-3.11	-3.94	-3.82	-3.73	-3.28	-4.06
	Pigs	0.61	0.30	-0.01	-0.16	-0.13	-0.80	-0.12	0.11	0.17	0.26
	Sheep	-3.40	-3.83	-2.93	-3.98	-4.11	-4.11	-4.45	-3.90	-3.82	-3.75
	Turkeys	1.43	1.65	2.06	2.12	2.36	1.58	1.72	1.86	2.11	2.09
Hungary	Cattle	0.31	0.57	0.53	0.61	0.85	1.07	1.32	1.66	1.37	0.98
	Chickens	0.64	1.18	1.32	1.24	1.56	1.49	1.38	1.09	1.30	1.59
	Horses	-0.56	-1.06	-0.71	-0.97	-1.03	-1.22	-0.99	-1.31	-2.67	-2.51
	Pigs	1.71	1.72	1.70	1.11	0.75	1.19	1.65	1.04	1.13	0.99
	Sheep	2.41	2.34	2.21	1.93	1.95	1.85	1.83	1.87	1.89	1.66
	Turkeys	-1.01	-0.20	-0.40	-1.02	-0.63	0.91	-0.43	0.53	0.25	-0.33
Poland	Cattle	1.68	1.71	1.56	1.11	0.81	0.97	0.58	0.46	0.37	-0.07
	Chickens	0.24	0.54	0.63	0.40	0.19	0.31	0.07	0.05	0.29	0.38
	Horses	1.13	0.93	0.79	0.58	0.44	0.44	0.38	0.38	0.27	-0.01
	Pigs	0.00	0.52	1.27	0.84	0.63	0.62	0.23	-0.42	-0.34	-0.70
	Sheep	-0.33	-0.15	-0.36	-0.47	-0.67	-0.84	-1.04	-1.04	-1.23	-1.42
	Turkeys	1.17	1.02	1.05	0.59	1.21	1.74	1.77	1.79	2.23	2.40
Slovakia	Cattle	0.71	0.56	0.52	0.20	0.52	0.83	0.86	0.65	0.80	0.70
	Chickens	0.32	1.75	1.44	0.89	1.22	1.45	1.37	1.51	1.66	1.47
	Horses	-3.38	-3.50	-1.97	-2.74	-1.47	-1.13	-3.75	-4.27	-3.76	-4.70
	Pigs	-2.93	-0.22	0.59	0.79	0.01	0.37	1.23	1.58	1.57	1.88
	Sheep	-0.37	-0.76	-0.66	-1.33	-1.10	-1.21	-1.43	-1.24	-1.08	-1.30
	Turkeys	1.76	1.74	1.70	-1.19	1.35	0.94	0.84	0.56	0.55	1.37

Source: author's own calculation based on (FAOSTAT, 2015), (International Trade in Goods - Exports 2001-2016, 2015).

TABLE 4: Relative Import Advantage of Live Animals, 2004-2013

	2004	2005	2006	2007	2008
CZ	-0.98	-0.80	-0.88	-1.10	-0.66
HU	0.32	0.36	0.37	-0.18	-0.34
PL	-0.17	-0.02	-0.32	-0.18	0.06
SK	-0.16	0.00	-0.15	-0.42	0.01
	2009	2010	2011	2012	2013
CZ	-0.65	-0.55	-0.59	-0.08	0.00
HU	0.08	0.70	0.57	0.71	0.42
PL	0.40	0.25	0.47	0.94	1.20
SK	-0.01	0.12	0.08	0.52	0.56

Source: author's own calculation based on (FAOSTAT, 2015), (International trade in goods - imports 2001-2016, 2015).

FIGURE 6: Relative Import Advantage of Six Commodities, 2004-2013

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Czech Republic	Cattle	-2.05	-2.25	-2.95	-2.28	-2.27	-2.54	-3.27	-3.40	-3.09	-3.27
	Chickens	0.24	0.91	0.80	0.28	0.40	0.55	0.47	0.38	0.51	0.52
	Horses	-1.98	-2.20	-2.30	-2.37	-2.27	-2.31	-3.96	-3.32	-3.57	-4.24
	Pigs	-2.39	-0.78	-0.57	-0.48	0.26	0.62	0.62	0.56	0.87	0.47
	Sheep	-5.10	0.00	0.00	-6.06	-9.20	-7.55	-6.89	-7.24	0.00	-6.54
	Turkeys	1.13	1.05	0.76	0.00	0.73	0.10	0.30	0.05	0.15	0.33
Hungary	Cattle	-1.72	-1.33	-1.81	-1.71	-2.80	-2.53	0.06	0.57	0.64	0.16
	Chickens	0.18	0.25	-0.90	-1.04	-0.29	-0.89	0.36	0.52	1.00	0.65
	Horses	-4.06	-3.83	-3.64	0.00	0.00	-5.81	-5.07	-4.36	-5.98	-4.43
	Pigs	1.67	1.71	1.67	1.15	0.83	1.34	1.79	1.18	1.24	1.12
	Sheep	0.12	0.00	0.00	-0.52	-0.36	-0.53	-0.65	-0.59	0.00	-0.87
	Turkeys	0.52	0.50	0.59	0.60	0.97	1.39	1.29	1.29	1.81	1.53
Poland	Cattle	-0.55	-0.48	-1.05	-1.02	-1.56	-1.88	-1.48	-1.34	-0.95	-0.51
	Chickens	0.69	0.80	0.90	0.76	0.56	0.71	0.91	0.93	0.99	1.13
	Horses	-1.35	-2.10	-2.11	-1.60	-1.71	-3.12	-2.41	-2.41	-1.56	-1.37
	Pigs	0.06	0.51	-0.24	-0.11	0.90	1.49	1.29	1.55	2.16	2.41
	Sheep	-0.49	0.00	0.00	-0.59	-0.85	-0.85	-1.09	-1.13	0.00	-1.41
	Turkeys	2.37	2.64	2.72	2.79	2.59	2.34	2.25	2.47	2.34	2.48
Slovakia	Cattle	-4.50	-5.23	-2.67	-2.37	-1.44	-1.75	-0.78	-1.06	-0.81	-0.78
	Chickens	0.23	1.64	1.37	0.81	1.18	1.49	1.39	1.55	1.72	1.54
	Horses	-5.24	-3.76	-2.86	-2.50	-1.84	-3.03	-2.57	-1.86	-2.16	-4.13
	Pigs	0.20	1.03	0.94	0.52	0.69	0.71	0.96	0.89	1.57	1.69
	Sheep	-5.36	0.00	0.00	-8.43	-7.43	0.00	-7.24	-8.07	0.00	-7.48
	Turkeys	0.11	0.39	0.47	-1.26	0.50	-0.26	0.14	-0.04	-0.42	-0.05

Source: author's own calculation based on (FAOSTAT, 2015), (International trade in goods - imports 2001-2016, 2015).

3.4 Revealed Competitiveness of Live Animals and Six Chosen Commodities

Revealed Competitiveness is a remarkable measure when trying to gauge a country's overall live animals and its commodities. To arrive at a final index number for revealed competitiveness, we subtract the Relative Export Advantage of the sector from its Relative Import Advantage, using natural logarithms to ease comparisons.

In this section, we describe the Revealed Competitiveness of V4 countries of live animals versus the world trade market. We implement the principle of Relative Competitiveness as mentioned already, where a positive value of RC is interpreted as the indication of V4 comparative advantage versus the world.

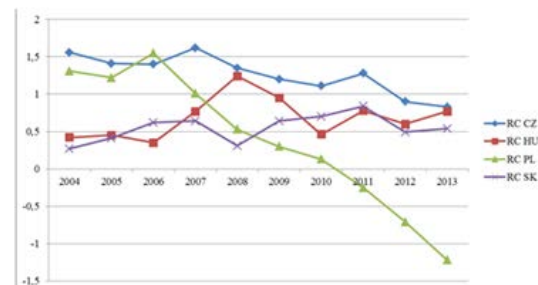
Table 5 shows RC is the highest index in the Czech Republic from 2004 to 2005 and from 2007 to 2013, and in Poland in 2006. Figure 7 better demonstrates the declines of Poland's competitiveness, which is seen as a danger for future growth. On the contrary, very good prospects and tendencies are shown by Hungary and Slovakia, with potential growth. The Czech Republic shows a decreasing trend.

TABLE 5: Revealed Competitiveness of Live Animals, 2004-2013

	2004	2005	2006	2007	2008
CZ	1.56	1.41	1.40	1.62	1.35
HU	0.42	0.45	0.35	0.77	1.24
PL	1.31	1.22	1.55	1.01	0.53
SK	0.27	0.41	0.62	0.64	0.31
	2009	2010	2011	2012	2013
CZ	1.20	1.11	1.28	0.90	0.83
HU	0.95	0.46	0.78	0.60	0.77
PL	0.30	0.13	-0.25	-0.71	-1.22
SK	0.64	0.70	0.84	0.49	0.54

Source: author's own calculation.

FIGURE 7: Revealed Competitiveness of Live Animals, 2004-2013



Source: author's own calculation.

Figure 8 shows a better overview by commodity of the competitiveness of live animals and the advantages on the world market. The first group focused on is Cattle. Slovakia had a big advantage from 2004 and 2005, with a descending trend thereafter. The Czech Republic showed great potential in this commodity from the beginning of 2006 to 2007 and continued to rise from 2010 to 2013. In Hungary, the highest peak is observed from 2008 to 2009, with a downward trend. Poland can be seen as the loser.

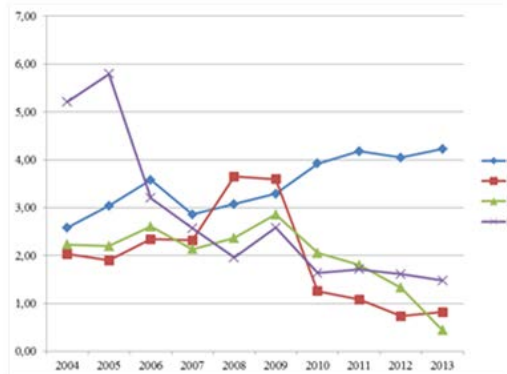
FIGURE 8: Revealed Competitiveness of Six Commodities, 2004-2013

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Czech Republic	Cattle	2.58	3.04	3.58	2.86	3.07	3.29	3.92	4.18	4.04	4.23
	Chickens	1.17	0.26	0.50	1.16	1.16	0.82	0.85	0.97	0.66	0.70
	Horses	-1.06	-0.26	-0.36	-0.93	-0.84	-1.63	0.14	-0.41	-0.29	0.18
	Pigs	3.00	1.08	0.56	0.32	-0.38	-1.42	-0.74	-0.45	-0.70	-0.21
	Sheep	1.70	-3.83	-2.93	2.08	5.10	3.44	2.45	3.34	-3.82	2.79
	Turkeys	0.29	0.60	1.30	2.13	1.63	1.48	1.42	1.81	1.97	1.76
Hungary	Cattle	2.03	1.90	2.34	2.32	3.65	3.60	1.26	1.09	0.73	0.82
	Chickens	0.45	0.93	2.22	2.27	1.85	2.38	1.02	0.57	0.30	0.94
	Horses	3.50	2.77	2.93	-0.97	-1.03	4.58	4.08	3.05	3.32	1.92
	Pigs	0.04	0.01	0.02	-0.04	-0.09	-0.13	-0.14	-0.14	-0.11	-0.13
	Sheep	2.28	2.54	2.21	2.45	2.31	2.38	2.47	2.47	1.89	2.53
	Turkeys	-1.53	-0.70	-0.99	-1.63	-1.60	-0.47	-1.72	-0.76	-1.56	-1.87
Poland	Cattle	2.23	2.20	2.61	2.13	2.37	2.86	2.05	1.80	1.33	0.44
	Chickens	-0.45	-0.26	-0.26	-0.36	-0.37	-0.39	-0.83	-0.87	-0.70	-0.75
	Horses	2.48	3.03	2.90	2.18	2.15	3.56	2.78	2.78	1.83	1.35
	Pigs	-0.07	0.02	1.81	0.94	-0.28	-0.86	-1.06	-1.97	-2.50	-3.11
	Sheep	0.17	-0.15	-0.36	0.13	0.18	0.01	0.05	0.09	-1.23	-0.01
	Turkeys	-1.21	-1.61	-1.68	-2.20	-1.39	-0.61	-0.47	-0.68	-0.11	-0.08
Slovakia	Cattle	5.21	5.79	3.20	2.57	1.96	2.58	1.63	1.71	1.61	1.48
	Chickens	0.09	0.12	0.07	0.07	0.05	-0.04	-0.02	-0.04	-0.06	-0.07
	Horses	1.87	0.26	0.89	-0.24	0.37	1.89	-1.18	-2.41	-1.60	-0.57
	Pigs	-3.13	-1.25	-0.35	0.27	-0.69	-0.33	0.27	0.69	0.00	0.19
	Sheep	5.00	-0.76	-0.66	7.10	6.34	-1.21	5.80	6.82	-1.03	6.19
	Turkeys	1.65	1.36	1.24	0.06	0.83	1.20	0.70	0.60	0.97	1.42

Source: author's own calculation.

See Figure 9 for more detailed results. In the Chicken section, the winner is definitely Hungary, except for the years 2004, 2011 and 2012, where there was stagnation. This was followed by the Czech Republic with the highest peak in 2004, 2011 and 2012. Poland and the Slovak Republic are the losers.

FIGURE 9: Revealed Competitiveness of Cattle, 2004-2013



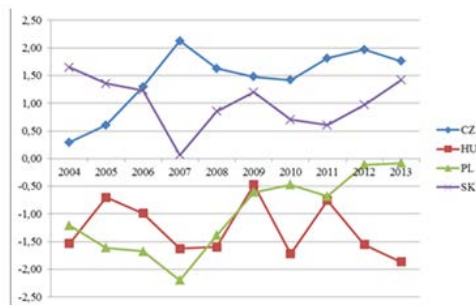
Source: author's own calculation.

The next commodity is Horses, where it can be demonstrated that Hungary in 2004, 2006 and from 2009 to 2013, and Poland in 2005, 2007 and 2008, had better competitiveness than Slovakia and the Czech Republic. Slovakia lost the competing index in this area. In the next commodity, Poland lost its position in 2006 and 2007. From 2008, with a decreasing trend, the same tendency can be shown in the Czech Republic, after the highest index in 2004 and 2005. Slovakia allocated the best potential impulse in this section up to 2010 and until 2013. Hungary remained steady.

The Sheep sector belongs to Slovakia, which is of course very remarkably for this country, with an upward and downward trend, except in 2005 and 2006 which belongs to Hungary, 2009 to the Czech Republic and 2012 again to Hungary. Here we measured the highest index of those six commodities of this V4 country.

The last group is Turkeys, where two sides are revealed: the Czech Republic with a smooth trend from 2006, and Slovakia with the highest peak in 2004 and 2005 on the winning side, with Hungary and Poland on the losing side with a falling trend as shown in Figure 10.

FIGURE 10: Revealed Competitiveness of Turkeys, 2004-2013



Source: author's own calculation.

4 Discussion and Conclusion

We propose further research investigations, with a comparison of the top exporting countries of live animals: U.S, Canada, Mexico, Australia, India, Argentina and Brazil. Research of these countries is very rare, as none of them is an EU member and has raised many questions in need of future examination for validating by a larger sample size. Furthermore, there should be a focus on the V4 country's neighbours. All of these reveal more and less successful performances at the industry-region level. We think that this would improve the understanding of the regional aspect of competitiveness, as a future point of view on the economic development of a region.

It is evident that livestock production is the world's largest user of land, either directly through grazing or indirectly through the consumption of fodder and feed grains. The world food economy is being increasingly driven by the shift of diets towards animal-based products such as meat, milk and dairy and as a result, agriculture is being affected, not only through growth of livestock production, but also through linkages to other sectors (Gennari, 2015).

Globally, livestock production currently accounts for some 40 % of the gross value of agricultural production and in industrial countries this share is more than one half. The total demand for animal products in developing countries is expected to more than double by 2030. By contrast, the demand for animal products in the industrial world has been increasing at low rates, and livestock production in this group of countries is expected to grow only slowly over the projection period (Bruinsma, 2003).

We have presented an analysis of the V4 countries' Revealed Comparative Advantage and Competitiveness by using indices of export and import shares and Export and Import Advantage and Revealed Competitiveness for the period 2004 to 2013.

The results need to be interpreted with care; the indices are less satisfactory as cardinal measures, but are useful in identifying whether or not V4 has a comparative advantage or not in live animals (six chosen commodities) versus the world market.

The evidence from this study suggests that small countries could also conquer the chosen sector versus the large world market. We have obtained satisfactory results demonstrating that the Czech Republic, Slovakia and Hungary have a very good competitive advantage and competitiveness in cattle, Hungary and the Czech Republic in the group of chickens. Hungary and Poland are specialised in horses, Slovakia and the Czech Republic in pigs. The sheep commodity easily belongs to Slovakia, with Hungary and the Czech Republic partly belonging to this group. The last sector (turkeys) belongs to the Czech Republic and Slovakia.

Increasing population, urbanisation and higher incomes are fuelling the strong demand for animal food products. This will have a major impact on the location and organisation of livestock production. Late or wrong changes can significantly influence animal and human health and the environment. The

future holds both opportunities and serious decisions. For this reason, we see a demand for change in the V4 countries from industry to a return to agriculture and livestock production as it was before the fall of the Iron Curtain in 1989. However, without proactive development policies, safety and security, environmental protection and poverty reduction will not be possible.

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Primary Paper Section: J

Secondary Paper Section: AH, BB, GA

DECOMPOSITION OF DRIVING SYSTEMS SPECIFIED FOR REHABILITATION MACHINES

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VEGA 1/0198/15, Innovative approach to processing driving units and construction of transportation and handling facilities, with a view to reducing emissions and increasing level of technical reliability.

Abstract: The rehabilitation engineering deals with a proposal and design of mechanical devices that are helpful to disabled persons during individual phases of the rehabilitation process. The main task of the mechanical support, which is specified for the motoric rehabilitation, is measuring and evaluation of the physical status of the rehabilitants with regard to objective determination of the diagnosis, selection of the suitable therapy and performing of controlled manipulation with the treated motional segment of human body in order to improve physical abilities of the rehabilitant. The assistance devices are using specific driving systems designed for increasing of the loading forces, for keeping of constant speeds and for positioning of patient. An important part of the driving system is the gearing mechanism. This article describes gearing systems applied in design of the rehabilitation machines.

Keywords: Rehabilitation, system drive, backlash-free movement.

1. Introduction

Threat of very serious illnesses that require demanding diagnostics and therapy is always actual in spite of the technical and medical progress reached during development of a mankind. The rehabilitation engineering is a biomedical branch of science, which integrates and applies knowledge obtained from the various scientific disciplines, namely from the medical and technical sciences. The main task of the rehabilitation engineering consists in design proposal of special mechanical systems determined for disabled persons and applied during the individual periods of the rehabilitation process. The driving system is an integrated part of every rehabilitation machine.

2. Drives of rehabilitation machines

Process of development in the rehabilitation area is very dynamic also thanks to a progress, which was made within the framework of the robotic equipment design. Architecture of apparatuses designed for motoric rehabilitation can be characterised by the specific constructional features taking into consideration the anthropometrical, biomechanical and medical aspects, as well as by the safety aspects relating to the man-machine interaction. The rehabilitation equipment can be divided according to the rehabilitated parts of the human body. There are applied special individual rehabilitation devices intended for rehabilitation of the following human body parts:

- head and neck,
- vertebra,
- upper limbs,
- lower limbs.

Another possible classification of the rehabilitation equipment is according to the kind of loading or loading forces acting against the patient's body during application of the given rehabilitation equipment, i.e.:

- rehabilitation devices with loading,
- rehabilitation devices without loading (suitable for the patients just after surgery)
- combined rehabilitation devices.

Design solutions of the rehabilitation machines are as follows:

- pedestal-type,
- bed-type,
- multifunctional.

The mechanically supported motoric rehabilitation allows measuring and evaluation of the rehabilitant's physical status with regard to objective determination of the diagnosis, selection of the suitable therapy and possibility to perform controlled manipulation with the treated motional segment in order to improve physical abilities of the rehabilitant. The rehabilitation supporting devices are equipped with various driving systems intended for increasing of the loading level, for keeping of constant speeds and for positioning of patient.



Fig. 1 Rehabilitation equipment

2. Simulation of situation

The gearing mechanism is an important constructional part for each of the driving systems. There are applied in the medical machines the high-precise gears, whereas they are usually analysed with regard to their constructional adaptability, dimensions and own mass reduction.

Backlash-free mechanisms belong into the group of high-precise gears. These gears are produced at a very high precision level of the functional surfaces. The value of the applied accuracy tolerances is approx. $1\mu\text{m}$ using the pre-stressed assembly and minimal internal friction among the rolling bodies. It is possible in this way to reduce heat generation in the gearbox and consequently there is also reduced dilatation of the internal elements with a positive influence on the gearbox operation accuracy.

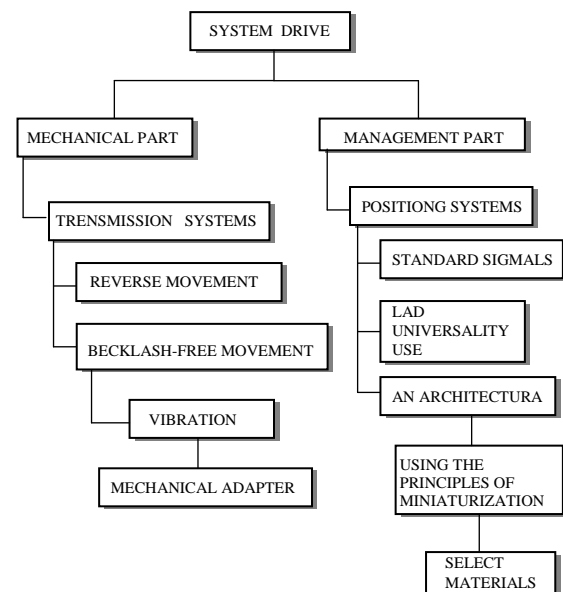


Fig. 2 Drive system - block diagram of hierarchical ties for therapeutic tools

3. Utilization of mini and micro harmonic gear units in medical equipments

The Micro Harmonic Drive gear is now established in the precision machine market as an ideal solution for precise positioning applications. Harmonic gearboxes recently found application in health care. Micro gearboxes are not particularly recent development and micro-gears are available in excellent market for several years. But these products suffer from poor application position in the machine. The above solutions will be done, or only allow very light load. What is needed are micro-gears, which are not only very small size, but also have high repeatability without play, a fairly large reduction and low parts count. These requirements inspired the development of new micro-gearing Micro Harmonic Drive. These transfers for medical technology, the use of high quality materials such as stainless steel alloy that our micro wheels corrosion resistant. This makes them very well suited for use in medicine, because they are made of materials that can be sterilized. Two thousand sterilization cycles in a vacuum steriliser have impressively confirmed this possibility.

4. Types of mini harmonic gearbox

Miniature gear CSF-Mini and PMG is characterized by compact design and high torque transmission. Are either to an output shaft, or a stepper motor. Inlet side can be supplied optionally with shaft or flange.

Board CSF-Mini (Fig. 3) - the mini transmissions are restricted due to component board HFUC, with higher accuracy, higher-transferable torque and higher torsional stiffness. Its benefits are transfer without backlash with high torque transmission, with increased speeds and cut-off corresponds to the torsional rigidity and accuracy, square bearing solid output with the output shaft or flange, various options for input and output elements and very low weight. Further possibilities harmonic gear is in the motors. The external dimension of 13 mm 51.1 mm do, maximum torque of 0.21 Nm to 28 Nm and a gear ratio of 30 - 100.

Council PMG (Fig. 3) - consists of components Council HDUC, Gearbox, output shaft and creates a unit with large compact dimensions. This series provides high precision and compact dimensions. PMG is the advantage of high precision torque, high positional accuracy and repeatability, high torsional stiffness, zero backlash, high efficiency. The outside dimension from 20 mm to 50 mm, maximum torque of 0.55 Nm to 14.70 Nm and a gear ratio of 50 - 110.

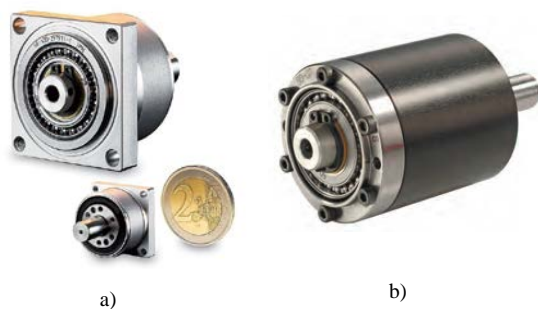


Fig. 3 Mini harmonic gearbox: a) CSF-Mini, b) Gearbox PMG

5. The Micro harmonic drive

Micro gears are not a particularly recent development and micro-spur gears or micro-planetary gears have been available in the market for a number of years. Micro Harmonic Drive - the world's smallest backlash-free precision gearbox.

The Harmonic Drive gear provides a unique combination of precision, torque capacity and power density. These features have made it the preferred solution in a wide range of machines and devices. However, a new market is emerging for ever smaller gears and actuators, for a new generation of compact, lightweight

machines and portable devices that can be manufactured with a minimal use of material and can operate precisely, quickly and efficiently.

Key requirements for innovative microactuators used in positioning applications are not only miniature dimensions and low weight, but above all precise and backlash-free positioning capability.

By combining new microtechnological manufacturing techniques with the unique Harmonic Drive operating principle, a new standard has been set with respect to positioning accuracy, high torque capacity, high reduction ratios, compact dimensions and low weight.

The basic components of the transmission system flat type are wave generator and three gears - flexspline, circular spline and dynamic spline (Fig. 4).

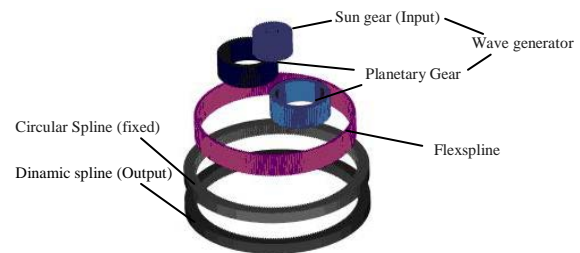


Fig. 4 Micro Harmonic Drive

The Wave Generator deflects the elastically deformable Flexspline elliptically across the major axis. Due to that the teeth of the Flexspline engage simultaneously with the two ring gears - Circular Spline and Dynamic Spline - in two zones at either end of the major elliptical axis. Across the minor axis of the elliptically deflected Flexspline there is no tooth engagement. When the sun wheel of the Wave Generator rotates, the zones of tooth engagement of the Flexspline travel with the angular position of the planet wheels of the Wave Generator.

To enable simple integration in machines or devices Micromotion has developed a new range of micro gearboxes. These can be easily combined directly with common Micromotors or can be provided with an input shaft, allowing the motor to be mounted in parallel. An optional hollow shaft allows a laser beam, optical fibre or air supply to be passed along the central axis of the gearbox (Fig. 5)

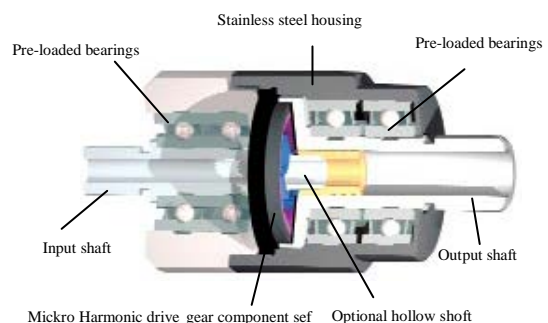


Fig. 5 Micro Harmonic Drive - components

This solution provides the machine designer with numerous advantages:

- Miniature dimensions yet zero backlash - the Harmonic Drive gear stage is backlash-free by nature and the elastically.
- Excellent repeatability for precise positioning - the zero backlash of the Micro Harmonic Drive gear provides a

repeatability in the range of a few seconds of arc. This enables positioning tasks to be carried out with sub- μm accuracy

- c) Very long operating life - the MHD Micro gearboxes have an operating life of 2500 hours at rated operating conditions, that is, at rated input speed and rated output torque.
- d) Very high reliability - the MHD Micro gearboxes have an operating life of 2500 hours at rated operating conditions, that is, at rated input speed and rated output torque. This corresponds to many million operating cycles in practical applications and the operating life of the Micro gearbox is typically equivalent or longer than the expected operating life of the machine in which it is used. The "life-cycle-costs" are therefore considerably lower than for other solutions with a lower initial cost.
- e) High efficiency to avoid power losses - the Micro Harmonic Drive® gear has an efficiency of up to 82% at rated operating conditions.
- f) Hollow shaft capability - the optional hollow shaft can be used to pass laser beams, air / vacuum supply or optical fibres through the centre of the gear or actuator along the central axis of rotation.
- g) Applicable under extreme environmental conditions - the use of high quality materials, such as stainless or high-alloy steels for the gearbox housing, input / output shafts and bearings, provides a high level of corrosion resistance, even for standard MHD Micro gearboxes.

6. Conclusion

The main task of the rehabilitation engineering consists in design proposal of special mechanical systems determined for disabled persons and applied during the individual periods of the rehabilitation process. The driving system is an integrated part of every rehabilitation machine. He presented decomposition therapeutic plant and the subsequent design of the drive system based on the requirements to meet the target and the objective function, in to ensure the quality of the therapeutic process with the comfort of using modern methods of construction and IT technology. The work presents and discusses the application of tool selection offered partial elements of those may be generated by the system.

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Primary Paper Section: J

Secondary Paper Section: JR

STRENGTH CHARACTERISTICS OF LNG TANKS AND THEIR APPLICATION IN INLAND NAVIGATION

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Abstract: EU legislation in the field of transport and energy is focused on the safety of transport and storage of LNG, environmental friendliness, but above all to protect the health of the population. LNG is an important alternative to conventional ship fuel. Under current IMO guidelines and ADN, LNG fuel tanks installed in the vessel must meet the criteria of the LNG tank from a group of "independent types A, B, or C". Specifically, the fuel tanks of inland waterway vessels are the type "C". One method for determining the strength characteristics of the LNG is the tank finite element method (FEM), which is evaluated using the HMH stress hypothesis. The result is a set of the maximum stress characteristics and assessment of the suitability of LNG tanks on inland vessels and floating terminals.

Keywords: LNG, LNG storage, strength characteristics, computation model, stress tests

1 Introduction

Energy security and independence from fossil fuel imports from Russia is one of the most frequent economic - political issues in Central and Eastern Europe. Trade in strategic raw materials is becoming an effective political tool for creating spheres of influence in the regions, and thus a potential source of conflict. One way to prevent this is to diversify sources.

Natural gas is the most used energy source after oil and black coal. It is expected that its consumption will rise in the future. Not only worldwide but also in the European Union. The consumption of the natural gas in the world will drag the emerging economies, mainly Asian countries. In the European Union, it currently leads trend of "green" energy sources and low-carbon fuels.

The most strategic of natural gas is the wide range of applications. In addition to traditional technologies using natural gas as a producer of the electricity and heat nowadays are here new opportunities especially in transport. Increasingly stringent standards aimed at emissions (mainly CO₂, NO_x, SO_x), and particulate matter (PM) from transport are forcing carriers to look for the solutions to eliminate these negative aspects, considering not only environmental but also economic aspects (Tropp et al., 2012). In this regard, some of the most promising solutions offer alternative fuel technology. Compared to conventional fuels, liquefied natural gas (LNG) can reduce NO_x by up to 85-90 %, SO_x and PM by close to 100 % and CO₂ by 15-20 % (GIIGNL).

Road transport companies are faced with this problem for decades. The first European emission standards Euro 1 took into effect in 1993. Compliance with this standard required a substantial change of engine elements such as installation controlled three-way catalytic converter and lambda probe. In comparison with the situation in 1993, currently applicable emission standards Euro 6 have brought the reduction of PM by 99 % and NO_x by 98 % (GIIGNL).

The first European legislative regulation concerning to the emission limits for inland transport appeared in 2004. Directive 2004/26/EC complementing Directive 97/68/EC regulated emissions of new engines installed on inland vessels for the period until the end of 2008. Responding to developments in road transport has brought further adjustments in the adjustment of Directives 2010/26/EU and 2012/46/EU mainly focused on modulating NO_x emissions. The last legislative amendment was approved by the European Parliament in July 2016. Within the "phase V" Directive tightens emission limits for combustion engines of non-road mobile machinery and also inland navigation ships. These measures are accompanied by broader support of the research in the field of alternative fuels. Inland water transport clearly preferred the use of dual fuel systems (diesel - LNG). Wider application of the LNG in transport avoids the need for a functioning market (Barta et al, 2016). This is related to the resolution of the many problems with logistics, not only within the region but also with regard to the production regions and physical properties related to LNG being transported over long distances. It is necessary for solving the many problems with the logistics, not only in the region of the production, but also due to the other participating regions within the logistics chain with respect to the physical properties of LNG related to its transportation over long distances. Currently the legislation applying to the transportation of dangerous goods (ADR) allows using the LNG tankers on the inland waterways. Tankers should be equipped with special containers - tanks for the storage of cryogenic gases. Similar tanks are also possible for use for long-term storage in the central terminal. Although this technology is not new, its application to inland vessels has only just begun. During the designation and location of the containers to an existing vessel the shape of the tank and the amount of stored gas, as well as insulation and strength characteristics must be considered (Sebor et al, 2006).

2 The legislative framework and the safety of transportation and storage of LNG

Legislation in the field of transport, storage and distribution of LNG in the world is different. The main idea is to ensure safety in transportation and storage of LNG, environmental friendliness, but especially health protection. Nowadays, in the boom of implementation of LNG as an alternative fuel in the transport and energy sectors in Europe, it is necessary to implement safety risk assessment according to accepted methodologies. European regulations mainly focus on the outcomes regardless of the ways to achieve required level of safety (GIIGNL).

EC (European Council) Directive 2012/18/ EU (SEVESO III) is aimed at preventing accidents and prevention of conflicts of transport of dangerous substances such as the LNG. The directive was drawn up based on Council Directive 82/501/EEC (SEVESO I) and EC Directive 96/82/EC (SEVESO II). On the revision of SEVESO I and SEVESO II it was based on an assessment of major accidents and analysis of the failure of safety management systems for the transportation of LNG (European Commission - SEVESO III).

European Committee for Standardization (CEN) defines codes and regulations relating to import LNG:

- European Union SEVESO III Directive 2012/18/ EU of 1 June 2012;
- EN 1473: „Installation and equipment for LNG – Design of onshore installations “. Designed for storage capacities over 200 tones. This code is based on a risk assessment approach;
- EN 1160: „Installation and equipment for LNG – General characteristics of LNG “;
- EN 14620: „Design and manufacture of site built, vertical, cylindrical, flat-bottomed steel tanks for the storage of

refrigerated, liquefied gases with the operating temperatures between 0°C and – 165°C;

- EN 1474: „Design and testing of LNG loading/unloading arms“;
- EN 13645: „Design of onshore installations with a storage capacity between 5 tones and 200 tones “(CEN).

According to ADN (European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways) maximum volume of the tank type G1 designed for the transportation of LNG by inland waterways is 380 m³. Due to the expected size of vessel (in case of pushing convoys is a type DE Iib) is the maximum volume at 350 m³ (European Commission – SEVESO III).

3 Research questions and the focus of the study

The paper focuses primarily on the assessment of two research questions: (1) *what are complying with the design parameters of LNG tanks for the transport and storage of LNG for inland vessels and inland LNG terminals?* (2) *What are the basic strength parameters, which must comply with tanks?* Design of suitable reservoirs depends on several factors (purpose, ship size, the parameters of the waterway, LNG terminal capacity etc.).

Therefore, is necessary within the solving of the research questions consider mentioned aspects.

4 The basic design parameters of LNG tanks

Due to the physical properties of LNG, its transport and long-term storage must necessarily bring a wide range of mainly safety and technical issues. A significant role plays here also the economical and the environmental aspects. To solving all these aspects have been expended great resources. It brought a wide range of technical solutions in storage technology useful not only in inland terminals but also for vehicles (Skrucany et al, 2015).

For vessels transporting liquefied natural gas, current legislation allows to use 4 types of tanks:

- membranes tanks,
- independent self-supporting tanks:
 - type A,
 - type B,
 - type C.

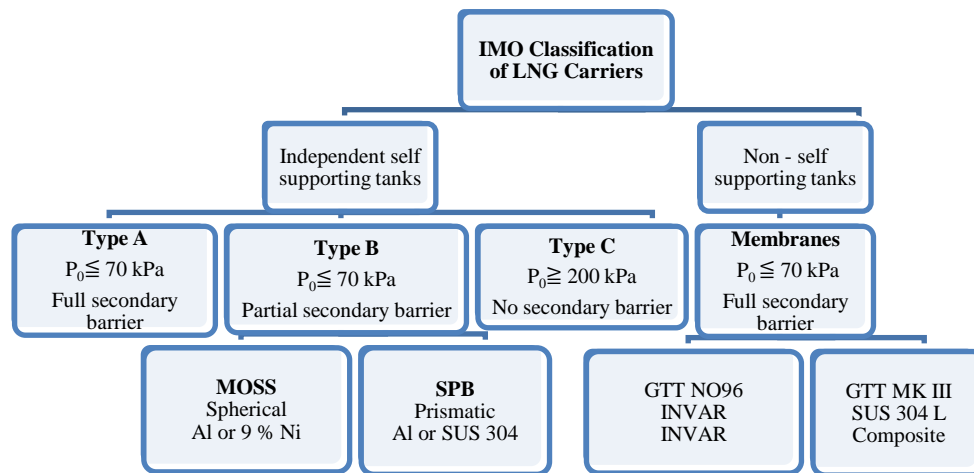


Figure 1 Classification of LNG Carriers according IMO (Source: GIIGNL)

LNG fuel tanks must comply the criteria of Independent self-supporting tanks (type A, B, or C) according to the IMO and ADN legislation (Figure 1). Specifically, the fuel tanks of inland vessels must comply with type C.

From a technical and operational point of view using of reservoirs "C" provides several benefits:

- IGC (The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk) does not required secondary barrier for this type of tank,
- Small and medium sized tanks can be designed with vacuum insulation, which saves insulating material and it increases the efficiency of the insulation,
- Simple installation (for the storage of the tanks are sufficient two suitable shaped supports,
- Ability to design the tanks for high pressure, which is good for long-term storage and solving problems with evaporation.

From a structural point of view these are mostly double-skin pressure tanks cylindrical shape with an arched bottom. The inner tank is made of austenitic stainless steel or 9% nickel steel. The outer container, which acts as a secondary barrier can be made from either stainless steel or carbon steel. The wall thickness of the inner and outer container is at least 3 mm. The space between them is isolated by a combination of Perl / vacuum or Multi-Layer Insulation (MLI) / vacuum. The tank is equipped with fittings for filling, pressure regulators, taking into

LNG heat exchanger, measuring level and pressure (Hoffman, 2016). Standard tanks are designed for the pressure of 1.6 MPa. The real operating pressure depends on the needs of the engine and the injection device fluctuates from 0.3 to 1 MPa (Buil, 2013). LNG technology differs from CNG technology only in tanks and evaporation, other technological elements are in both same. The design must meet the requirements of the IMO IGC "International Code for the Construction and Equipment of Ships designed for liquefied gas" and EN 13458-2 "for cryogenic vessels (IMO).

5 Assessment of strength characteristics of LNG tanks

Solution of strength characteristics of LNG tanks was carried out by finite element method (FEM), which were evaluated using the HMH stress hypothesis, i.e. hypothesis of maximum specific deformation energy required to change shape. This hypothesis gives the most accurate value and is most commonly used. It is used in the computation software where reduced stress by HMH strength hypothesis is called Von Misses stress. It is suitable for ductile materials. The criterion of dangerous condition is maximum specific strain energy required to change shape $\lambda_{t max}$. Strength HMH hypothesis assumes that a dangerous condition occurs when the specific strain energy for changing the shape of the stress state exceeds specific strain energy to change the shape of rectilinear con stress state, which results in failure. Requires the fulfilment of inequality:

$$\lambda_{t max} \leq \lambda_D, \quad (1)$$

where:

$\lambda_{t\ max}$ maximum specific strain energy,
 λ_D maximum allowable strain energy.

Dangerous condition occurs in the specific strain energy for changing the shape:

$$\lambda_D = \frac{1+\mu}{3E} \sigma_D^2, \quad (2)$$

where:

μ poisson ratio,
 E Young's modulus,
 σ_D maximum allowed stress.

Whichever is:

$$\lambda_{t\ max} = \frac{1+\mu}{3E} (\sigma_1^2 + \sigma_2^2 + \sigma_3^2 - \sigma_1 \cdot \sigma_2 - \sigma_1 \cdot \sigma_3 - \sigma_2 \cdot \sigma_3), \quad (3)$$

where:

σ_1 first principal stress,
 σ_2 second principal stress,
 σ_3 third principal stress.

Parameters $\sigma_{1,2,3}$ are principal stresses in each direction. Substituting relations (2) and (3) to (1) and by adjusting receive strength condition according HMH hypothesis for the spatial state of stress:

$$\sigma_{red} = \sqrt{\sigma_1^2 + \sigma_2^2 + \sigma_3^2 - \sigma_1 \cdot \sigma_2 - \sigma_1 \cdot \sigma_3 - \sigma_2 \cdot \sigma_3} \leq \sigma_D, \quad (4)$$

where:

σ_{red} reduced stress according HMH hypothesis.

For planar state of stress is valid relation:

$$\sigma_{red} = \sqrt{\sigma_1^2 + \sigma_2^2 - \sigma_1 \cdot \sigma_2} \leq \sigma_D. \quad (5)$$

For planar state of stress given by the normal and shear stresses τ :

$$\sigma_{red} = \sqrt{\sigma^2 + 3\tau^2} \leq \sigma_D, \quad (6)$$

where:

τ shear stress.

Using HMH strength hypothesis, it is possible to calculate the reduced stress without the knowledge of the principal normal stresses. The reduced stress can be directly calculated for a given state of stress by 6 independent components of the stress:

$$\sigma_{red} = \frac{\sqrt{2}}{2} \cdot \sqrt{(\sigma_x - \sigma_y)^2 + (\sigma_y - \sigma_z)^2 + (\sigma_z - \sigma_x)^2 + 6 \cdot (\tau_x^2 + \tau_y^2 + \tau_z^2)} \leq \sigma_D, \quad (7)$$

where:

σ_x normal stress in directions X,
 σ_y normal stress in directions Y,
 σ_z normal stress in directions Z,

τ_{xy} shear stress in directions X,
 τ_{yz} shear stress in directions Y,
 τ_{xz} shear stress in directions Z.

The maximum allowed stress can be seen from relation:

$$\sigma_D = \frac{Re}{k}, \quad (8)$$

where:

Re yield strength for the material,
 k safety factor (for the chosen material mostly determined by relevant standard),
 σ_D maximum allowed stress.

In the case of LNG tanks, which are the subject of this paper, safety factor is determined by IMO standard. This standard prescribes a safety factor $k = 1.5$ for all load cases specified in this standard (Lisowski et al, 2010).

Computational models of vessels were made based on ideological proposals, where individual dimensions were chosen. Models were modified so that the all parts that do not affect the stress have been removed from ideological models. For stress analysis, it has not been take into account the strength of insulation. Its impact was specified as the mass on the inner shell (Stopka et al, 2016).

5.1 Loading

Maximum allowed working pressure of tanks is prescribed up to 10 bar it was prescribed on inner shell. Vacuum between shells was prescribed like pressure of the value 130 MPa on the internally sides of shell and atmospheric pressure of value 101,325 kPa prescribed on external side of outer shell. Portable tanks and their fastenings should be capable of withstanding separately applied forces, based on:

1. twice the total mass acting in the direction of travel of the tank simultaneous with the weight of the tank;
2. the total mass acting horizontally at right angles to the direction of travel of the tank (where the direction of travel is not clearly determined, the total mass should be used) simultaneous with the weight of the tank;
3. the total mass acting vertically upwards;
4. twice the total mass acting vertically downwards.

Impact of LNG was included in the computation by the hydrostatic pressure as follows according to standard four load cases (Figure 2).

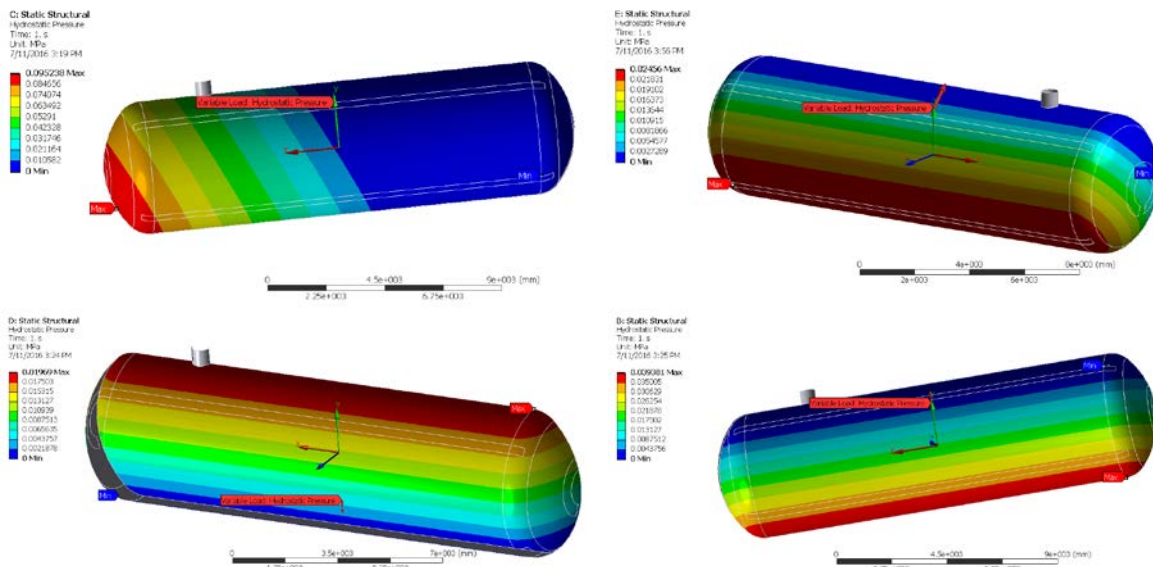


Figure 2 Hydrostatic pressure for all load-cases (Source: authors)

5.2 Boundary conditions

All degrees of freedom in model were taken in site of attachment vessels with a ship decks area marked in blue (Figure 3).

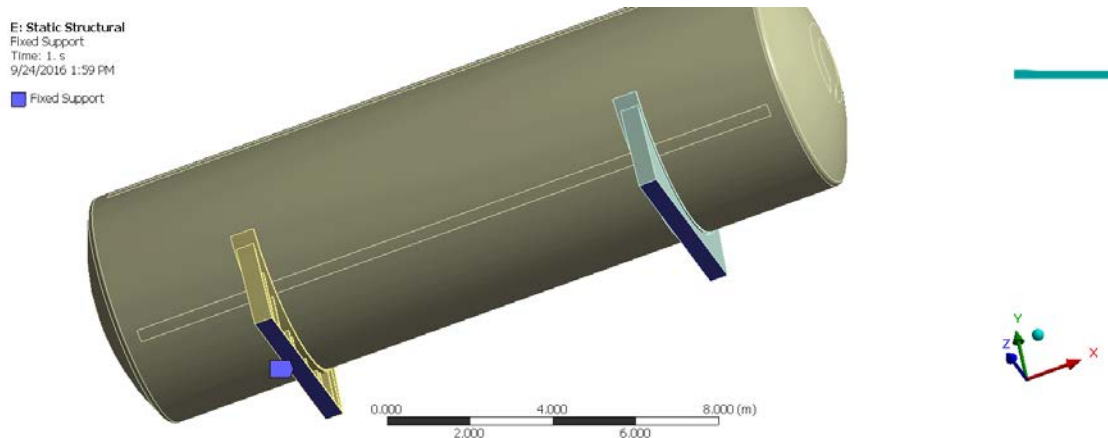


Figure 3 Location of fixed support on model - blue color (Source: authors)

5.3 Material properties

As indicated above, the selected material of the outer and the inner shell is stainless steel AISI 304. For longitudinal support and knobs was selected plastic material polycarbonate for the good ratio between strength and insulating properties. The material properties for the assessment of the strength properties are given in Table 1.

Material	Young's modulus [GPa]	Poisson's ratio
AISI 304	200	0,29
Polycarbonate	2,21	0,37

Table 1 Material properties (Source: GIIGNL)

The material properties are dependent on the operating temperature. As mentioned above, the temperature of LNG is about -160° C and temperature of environment was considered 20° C. The necessary properties such as yield strength and ultimate strength for both materials in given temperatures are indicated in Table 2.

Material	Temperature [°C]	Yield Strength [MPa]	Tensile Strength [MPa]
AISI 304	20°C	205	515
	-160°C	380	1470
Polycarbonate	20°C	70	

Table 2 Tensile properties at varying temperatures (Source: GIIGNL)

5.3.1 FEM mesh

Mesh of elements was created on the geometric model for the purpose of calculation, using FEM. The outer and inner shells were meshed by shell-elements for the remaining items in the assembly (plastic supports longitudinal and knobs, stand under the tank) were used volume elements.

For three loading states half symmetry was used. Model consist of 1 939 766 elements. In this case, it was necessary to calculate the whole model, and the number of elements increased to 3 914 394 from which were created 6 363 429 equations in the computational model (Figure 4 and Figure 5).

In Figure 4 and Figure 5 it is possible see the created FEM mesh for LNG tank. Figure 4 shows the outer shell with the supports and Figure 5 shows the inner shell with plastic longitudinal supports and knobs.

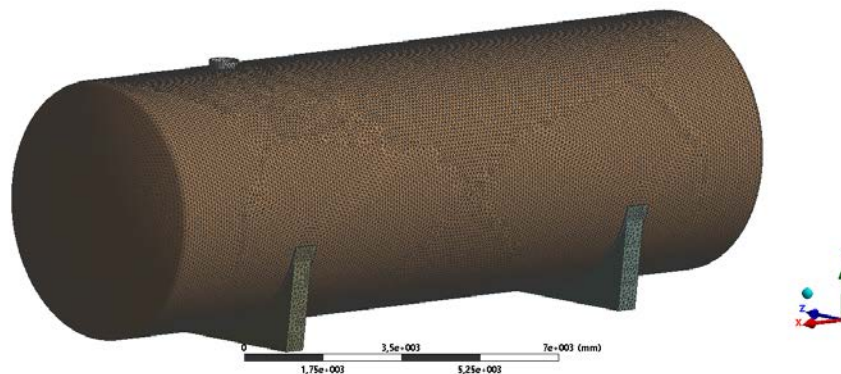


Figure 4 Mesh of outer shell of LNG vessel volume 348,5 m³ (Source: authors)

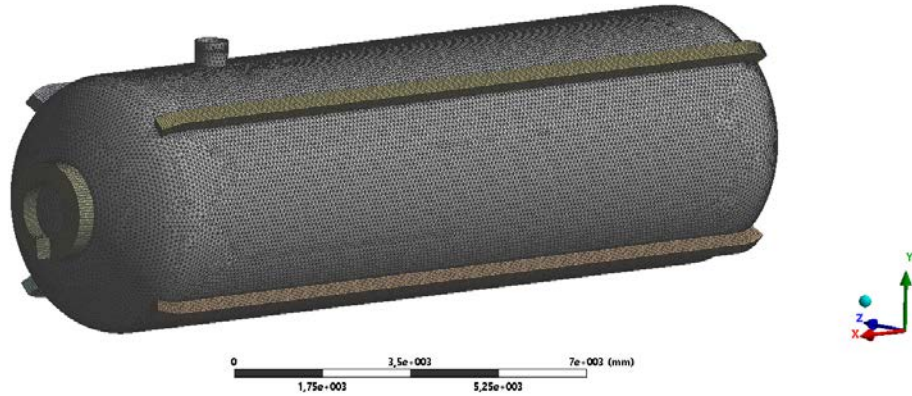


Figure 5 Mesh of inner shell of LNG vessel volume 348,5 m³ (Source: authors)

5.4 Results of computation

As Substituting of all the necessary parameters such as load, boundary conditions and material model, the load cases 1-4 were obtained distribution of stress fields, as shown in Figures 6 – 13. In neither of these cases did not exceed the maximum stress allowable stress which gives the IMO standard. Each analysis was calculated on the computational server. For the calculation were used processors with attribution Intel Xeon E5-v4640 0 2.4GHz with 32 calculation cores, allocated memory for the first three analysis was till 78 GB and for last analysis was this value about 178 GB. Computation time of the first three analyses was around 90 minutes and for the last analysis, it was 282 minutes.

The results of all load cases are stress distribution plotted in two views namely in the case where the stress distribution is shown in outer shell, and in the case where the stress distribution is shown on the inner shell.

5.4.1 Results for load state 1

The stress distribution at the first load cases can be seen in Figure 6 and Figure 7. The maximum value of stress on outer shell is in front part, the position is marked with a red arrow (Figure 6). In the case of the inner shell, the maximum value of stress is around the filler neck and it is also marked with a red arrow (Figure 7).

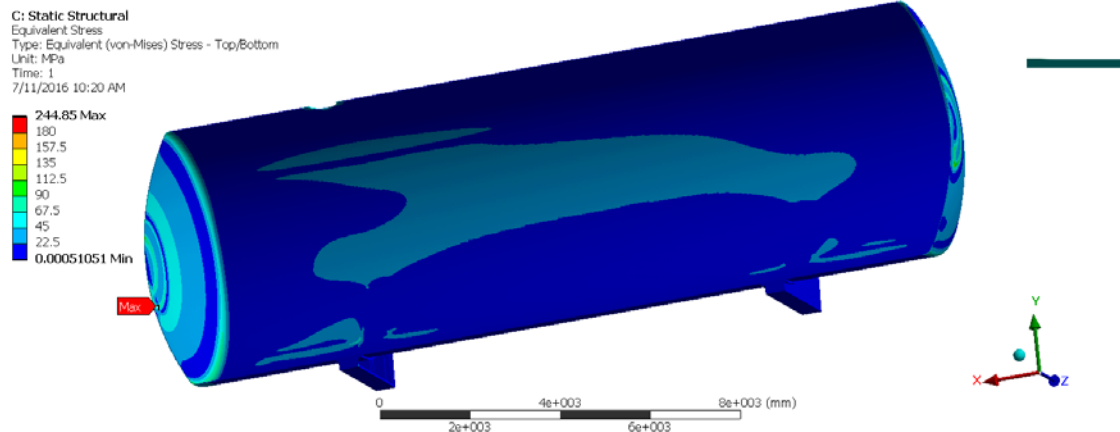


Figure 6 Load case 1 - stress distribution on outer shell (Source: authors)

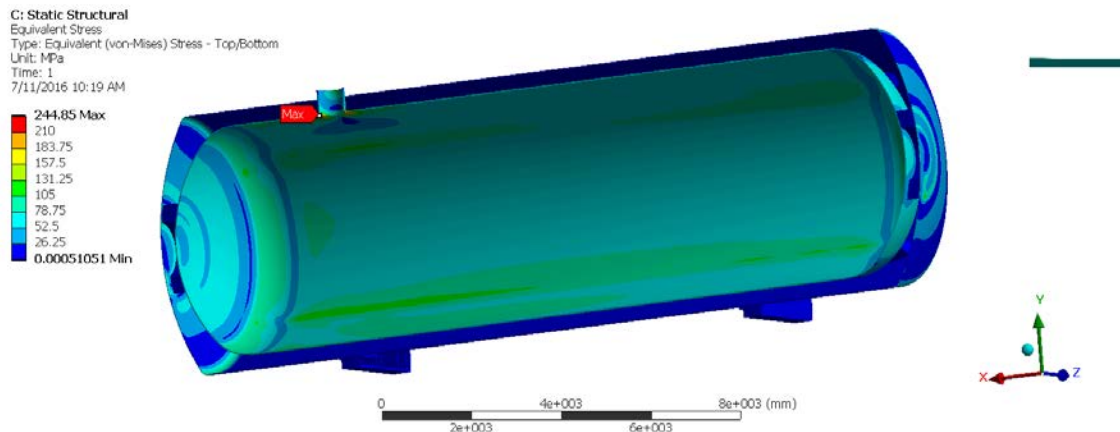


Figure 7 Load case 1 - Longitudinal crosssection stress, distribution on inner shell (Source: authors)

The maximum values of stress are shown in Table 3, which also contains the value of the calculated safety factor. Safety factor does not fall below the permissible value of 1.5 in either load case, so construction can be considered satisfactory for this load state.

Part	Equivalent von Misses stress [MPa]	Safety factor
Inner shell	244,85	1,55
Outer shell	129,99	1,57

Table 3 Load case 1, comparison of calculated values and allowed values (Source: authors)

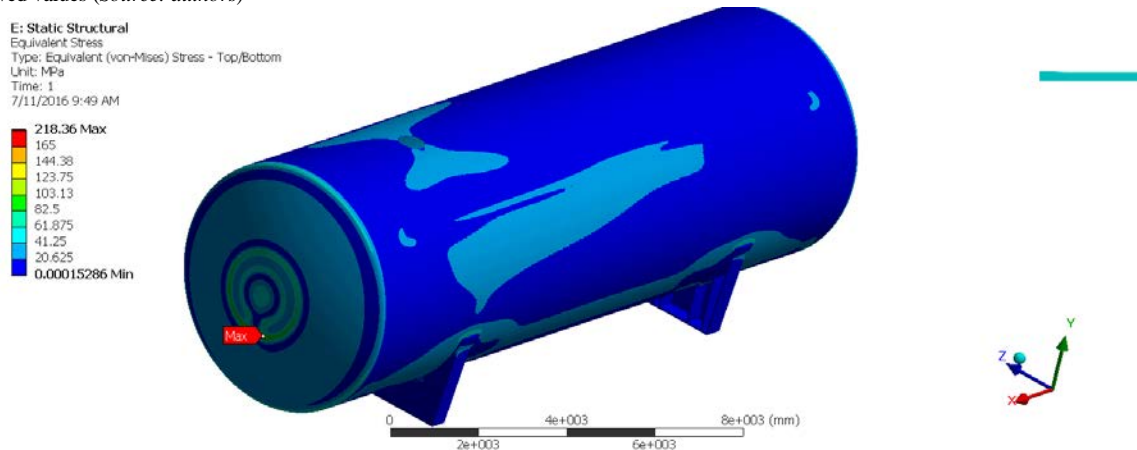


Figure 8 Load case 2 - stress distribution on outer shell (Source: authors)

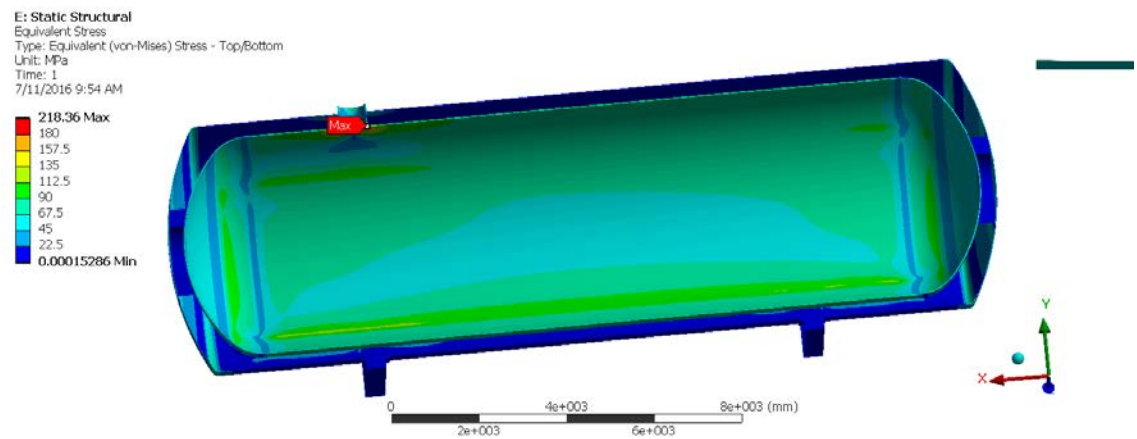


Figure 9 Load case 2 - Longitudinal cross-section stress, distribution on inner shell (Source: authors)

Table 4 shows the maximum stress for inner and outer shell with a factor of safety that exceed the value of 1.7, which means that in this load state in terms of strength it produces some reserve.

Part	Equivalent von Misses stress [MPa]	Safety factor
Inner shell	218,36	1,74
Outer shell	119,06	1,72

Table 4 Load case 2, comparison of calculated values and allowed values (Source: authors)

5.4.2 Results for load state 2

In the second load cases, it was not possible to use half the symmetry due to asymmetrical nature of the load. In computation, the whole model was used. The maximum stress value of the outer shell is in the front part of the shell (Figure 8). The maximum value of stress in inner shell was again in the area of the filler neck (Figure 9).

5.4.3 Results for load state 3

In the third type of load the half symmetry of model was again used. Stress distribution can be observed on the outer and inner shell, the maximum stress occurred again in the front part of the outer shell (Figure 10) and in the area of filler neck in the inner shell (Figure 11).

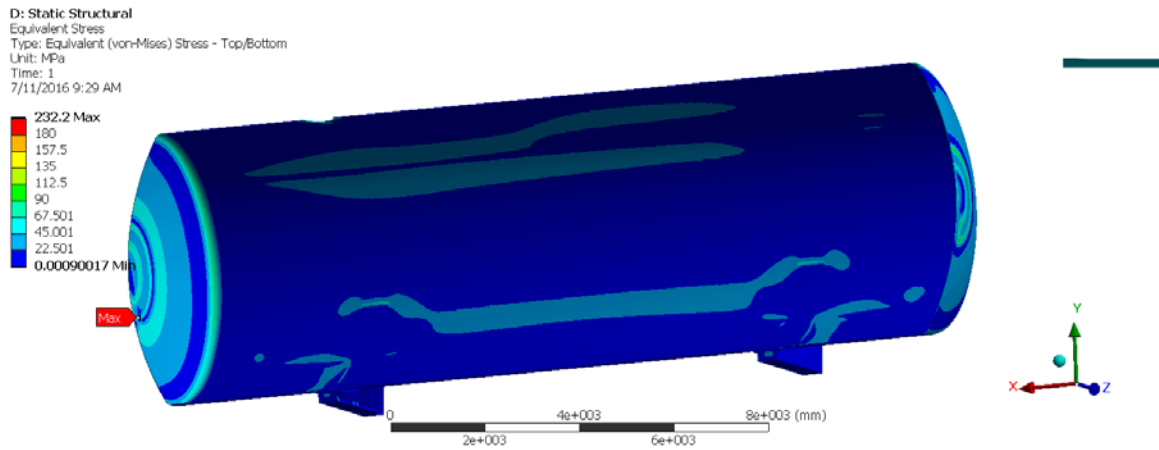


Figure 10 Load case 3 - stress distribution on outer shell (Source: authors)

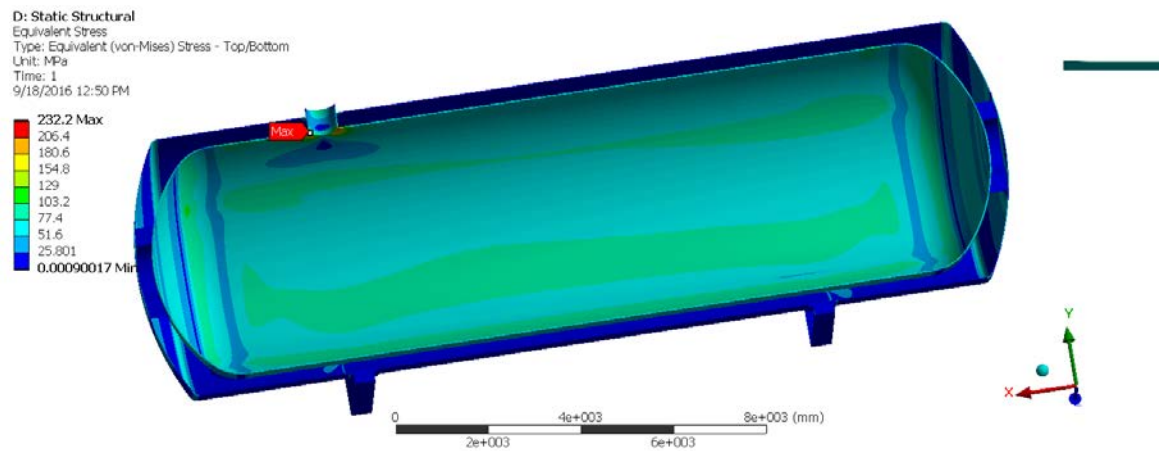


Figure 11 Load case 3 - Longitudinal crosssection stress, distribution on inner shell (Source: authors)

Safety factor has exceeded the limit of 1.5 for this load case (Table 5). However, in dealing with the outer shell it exceeded the value of 2.

Part	Equivalent von Misses stress [MPa]	Safety factor
Inner shell	232,2	1,64
Outer shell	98,43	2,08

Table 5 Load case 3, comparison of calculated values and allowed values (Source: authors)

5.4.4 Results for load state 4

The stress distribution and the position of maximum stress can be seen in Figure 12) for the outer shell of tank and on the Figure 13) for inner shell of tank. For computation half symmetry was used.

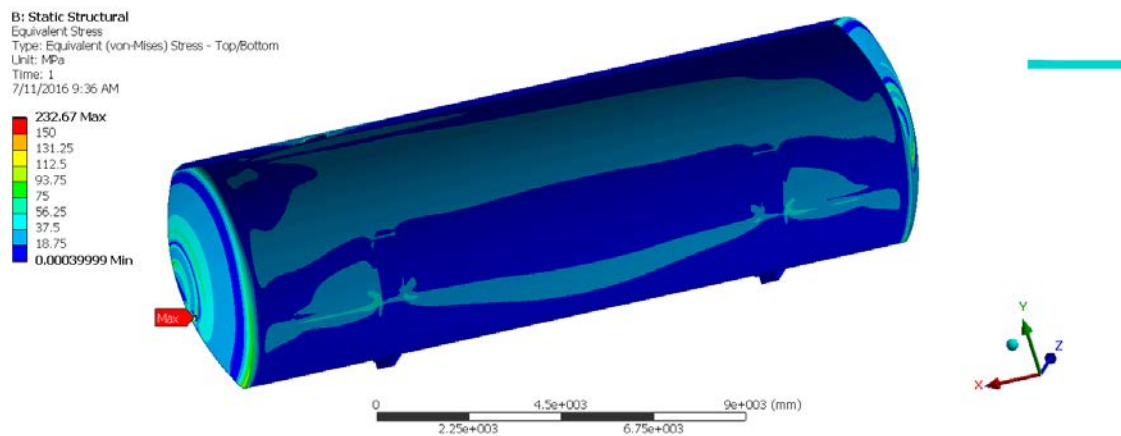


Figure 12 Load case 4 - stress distribution on outer shell (Source: authors)

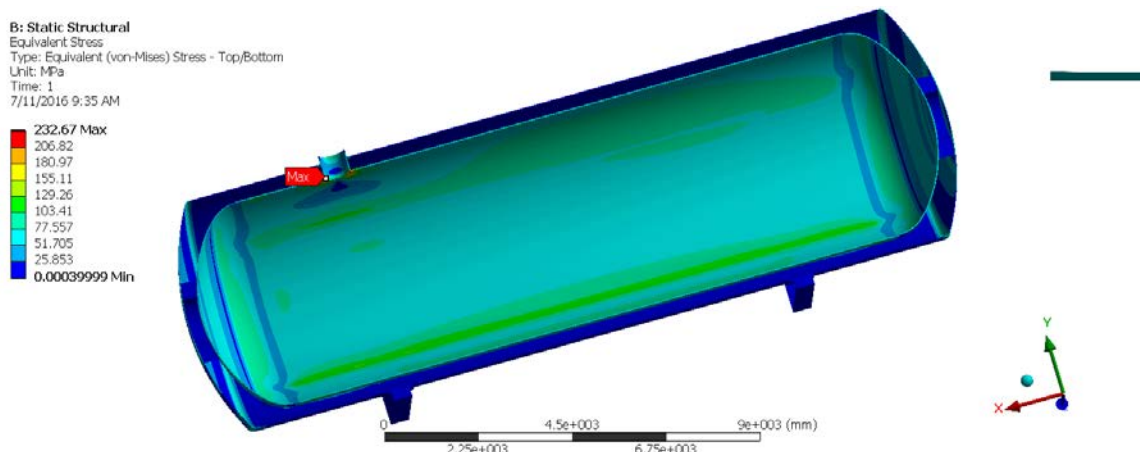


Figure 13 Load case 4 - Longitudinal cross-section stress, distribution on inner shell (Source: authors)

The obtained values of the maximum stress and the calculated safety factor are given in Table 6. Coefficient of safety once again does not fall below the permissible value of 1.5, thus solved state can be considered suitable.

Part	Equivalent von Misses stress [MPa]	Safety factor
Inner shell	232,67	1,63
Outer shell	131,4	1,56

Table 6 Load case 4, comparison of calculated values and allowed values (Source: authors)

6 Conclusion

In all four load states areas with maximum stress were created in identical locations, in the case of outer shell as in the case of inner shell. In the outer shell, it was on the front face; the stress concentrator could be removed using a different type of knob block. Inner shell has stress concentrator always occur in the area of the filler neck. With given dimensions of the LNG tanks is in the construction this area the most loaded part and it is considered as the most critical point. In the future, it would be appropriate to optimize the area of filler neck, which means improved strength conditions while maintaining the smallest possible thermal transmittance. According to IMO: For each load, for portable tanks, the safety coefficient for metals having a clearly defined yield point should be 1.5 in relation to the determined yield stress. Every case of load suits to standard in computation of this volume (Table 3-6).

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