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# Littera Scripta

(Economics, Management, Corporate Finance, Finance and Valuation)

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<http://littera-scripta.com>

ISSN 1805-9112 (Online)

Date of issue: December 2019

Periodicity: Twice a year Since 2010

## **The Journal is indexed in:**

- ERIH PLUS (European Reference Index for the Humanities and Social Sciences) – in 2015
- CEJSH (Central European Journal of Social Sciences and Humanities) – in 2015
- EZB (Elektronische Zeitschriftenbibliothek) - in 2017
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# **Selected aspects of risk management in Polish and Slovak SMEs**

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## **Abstract**

The principles of risk management come to the forefront of managers of both large and small enterprises. The trend in risk management consists of a comprehensive approach to risk management that penetrates within all key processes in the enterprise. Although the small and medium sized enterprises (SMEs) become to the important pillars of each economy, the risk management in these entities is elaborated only partially. This is affected mainly by attitudes of SMEs' owners or managers to risks, the lack of knowledge and practical experience in applying risk management. This paper contributes to the wide spreading of knowledge in the area of risk management in SMEs. The main aim of the paper is to compare the selected aspects of risk management between Polish and Slovak SMEs. The compared aspects are: authority to risk management in SMEs, ways of risk identification and risk assessment as well as risk limiting. The research is based on the results of questionnaire survey realized among 150 of Polish and 123 of Slovak SMEs. For the evaluation, the Chi-square test was used.

**Keywords:** small and medium sized enterprise, risk, risk management, organization, responsibility, ways of risk identification.

## **Introduction**

Today, the SMEs are influenced by a number of factors that may fundamentally undermine their business and financial result. The ongoing processes in SMEs are realized under the influence of factors from internal and external business environment. These factors are the source of risks, threats and crises that should be avoided, or their effects should be limited or excluded (Hudáková et al., 2013). SMEs are very sensitive to changes in the

entrepreneurial environment, which after some time are always reflected in the quantitative characteristics of this sector. Today, managers are increasingly faced with the responsibility to take important decisions to ensure prosperity and financial stability under the conditions of uncertainty and risk. More and more businesses, not just large but also small ones, are beginning to realize the need and importance of risk management. New trends in risk management bring idea that it is necessary to pay permanent attention to assess key business risks in business external environment.

Small and medium-sized enterprises represent an important part of the economies in developed countries and the same situation is in Slovakia and Poland. Small and medium-sized entrepreneurs have particularly good conditions for risk management as they are in close proximity to all aspects of individual operations, and they recognize many strengths and vulnerabilities in their businesses.

The knowledge of the key risks and implementation of the risk management in the companies is also an opportunity to increase the performance efficiency or to achieve costs savings. Investments in prevention will bring savings of the financial costs compared with the expenses for solving the subsequences of the negative events. Therefore, it is necessary to improve the awareness and to inform the managers about managing risks in the enterprises worldwide, and in Slovakia as well as Poland. It is important for company managers to be able to identify the most serious risks, to create a space for discussions and to implement the whole risk management system in the companies with an emphasis on preventing the company crises (Hudáková and Masár, 2018). There are currently many companies that must deal with this issue. They obtain useful information and also use the appropriate tools in order to avoid bankruptcy (Weissová, Siekelova and Kramárová, 2017).

The essence of this paper is to compare selected aspects of risk management defined by the SME owners and managers in Slovakia and Poland. The paper is based on the empirical research and using of statistical methods.

## **Literature review**

Small and medium-sized enterprises (SMEs) play an important role in most economies worldwide. For instance, in the European Union, around 99% of the economic activities can be traced back to SMEs, which account for two thirds of all jobs in the private sector. Compared to larger firms, SMEs are usually seen as having simpler internal organization and thus as being more flexible and faster at responding and adapting to change (Caha, 2017). At the same time, SMEs are frequently confronted with major challenges. Compared to larger enterprises, SMEs profit less often from economies of scale and fewer have access to a wide resource base. Due to the usually low equity ratio of SMEs, they are relatively vulnerable to external events compared to larger enterprises. This illustrates that not only larger enterprises face various risks, but also SMEs, whose survival is more

easily threatened due to their smaller set of — both financial and non-financial — resources (Hanulakova and Dano, 2018).

According to Mura and Kljucnikov (2018), risk management process may help SMEs managers to identify significant risks that could jeopardize the success or existence of the company in time to efficiently cope with them. Misjudging or failing to recognize risks can – in the worst case — have disastrous consequences, ranging from customer loss to damaging liability, environmental damage and possibly even bankruptcy. However, many SMEs do not — or not adequately — apply risk management practices, mostly because they cannot afford to rededicate resources due to their constraints (Krajnakova, Navikaite and Navickas, 2015).

According to Lipkova and Braga (2016) over the last ten years, however, corporate risk management (CRM) has expanded well beyond insurance and the hedging of financial exposures to include a variety of other kinds of risk — notably operational risk, reputational risk, and, most recently, strategic risk. In addition, at a large and growing number of companies, the risk management function is directed by a senior executive with the title of chief risk officer (CRO) and overseen by a board of directors charged with monitoring risk measures and setting limits for these measures. Abrhám and Lžičař (2018) argue that a corporation can manage risks in one of two fundamentally different ways: one risk at a time, on a largely compartmentalized and decentralized basis; or all risks viewed together within a coordinated and strategic framework. Jenicek (2016) states that companies that succeed in creating an effective corporate risk management have a long-run competitive advantage over those that manage and monitor risks individually

By reducing risk, a company can reduce the amount of expensive equity capital needed to support its operating risks. In this sense, risk management can be viewed as a substitute for equity capital, and an important part of the job of the CRO and top management is to evaluate the tradeoff between more active risk management and holding a larger buffer stock of cash and equity. For companies without a large buffer of excess equity, a sharp drop in cash flow and value can lead to financial distress and a further (permanent) loss of value from underinvestment (Nocco and Stulz, 2016). What management can accomplish through an CRM program, then, is not to minimize or eliminate, but rather to limit, the probability of distress to a level that management and the board agrees is likely to maximize firm value (Lipkova and Hovorkova, 2018). Minimizing the probability of distress, which could be achieved by investing most of the firm's capital in Treasury bills, is clearly not in the interests of shareholders. Management's job is rather to optimize the firm's risk portfolio by trading off the probability of large shortfalls and the associated costs with the expected gains from taking or retaining risks (Boukalova, Kolarova and Lostak, 2016).

Hudáková and Dvorský (2018) highlight the positive influences of the risk management on making decisions in the environment of the risks, on the quality of the information provided, on increasing the company value, on ensuring its competitiveness, on achieving

constant improvements and on the prevention in the framework of ensuring a continuous operation of the enterprise. Significant global investors have a similar opinion, and say they have no aversion against the risk, but they feel aversion towards surprises and, therefore, require a larger transparency of the companies concerning the risk management. According to Helisek (2015) the companies worldwide attempt to implement the risk management to the planning and decision-making process, i.e. they systematically consider the possible risks when making decisions. They link the risk strategy with the company strategic planning and inform the top management about the most serious risks.

Muller (2006) argues that the risk is qualitative and quantitative expression of threat, the level and degree of threat, and probability of its occurrence as a specified phenomenon and its consequences. The risk arises as an uncertainty in the fulfilment of objectives. Nowadays, risk management becomes an integral part of strategic management. Risk Management Department has given priority at the top level of corporate risk management. Risk managers identify the risks, opportunities, analyze, evaluate risks and control the course of its management (Lipkova, Gress and Poncarova, 2017).

Risk management may help SMEs managers to identify significant risks. Haviernikova, Okreglicka and Klučka (2016) state that risk management is one of the tools that enable increase of security by various processes and specific activities. Risk management represents large complex of problems for businesses. An important role is played by prevention which reduces the consequences of wrong decisions and represents a planned and targeted action, set by rules that aim to minimize the possibility of erroneous decision. To achieve effective risk management, the authors such as Caha (2018); Jiroudkova and Rovna (2015); Machkova and Sato (2017); Sejkora (2014) describe the basic conditions as precisely defined strategy of business entity against its main objectives, including risk strategy, further functioning comprehensive process of risk management supported by appropriate information system, a sufficient emphasis on risk management and those responsible for risk management. An important condition is also functioning of internal corporate culture and ability to advance and adapt to new risk challenges. The risk management according to Sira, Kravcakova Vozarova and Radvanska (2016) involves:

- identification of risk, risk processes and factors (see also Taušer and Čajka, 2014);
- ensuring staff resources;
- use of communication on purposes and the results of the measures implemented (see also in Ivanová and Masárová, 2018);
- constant search for opportunities and improvement of processes (see also in Zadrazilova, 2016);
- focus on the real causes of process failures;
- providing information to interested parties about the risk;
- planning of preventive and corrective measures;
- focusing of prevention on the reliability of the human factor;

- focus on prevention of systemic changes;
- reduce the incidence and consequences of failures, misfits, reducing quality defects etc. (see also in Jirankova and Hnat, 2012);
- continuous and comprehensive evaluation of the effectiveness of risk prevention in terms of the effectiveness of corrective and preventive measures – their overall impact;
- application of the principles of project management and change management.

## Methods and Data

The questionnaire surveys were realized within the project VEGA No 1/0918/16 Risk management of SMEs in the context of clusters' involvement activities in the Slovak Republic. The representative sample was addressed in accordance with the conditions defined in the literature. According to Borrego et al., (2009) and Caha and Šulistová (2016) the aim of qualitative research that is targeting on smaller groups is to examine in detail the specific context. The aim is not to provide a broad, generalizable description that is representative of most situations, but rather to describe a particular situation in sufficient depth to make the full meaning of what is happening clear. The structure of research sample presents table 1.

Tab. 1: The structure of respondents

	<b>Poland</b>	<b>Slovakia</b>	<b>Total</b>
Less than 10	74	84	158
10 - 49	58	27	85
50 - 249	18	12	30
<b>Total</b>	<b>150</b>	<b>123</b>	<b>273</b>

Source: Own research.

The most SMEs belonged to category of microenterprises (less than 10 employees), 49.33% in case of Poland and 38.76% in Slovakia.

For this research, four working hypotheses were stated. First two hypotheses contain null hypothesis (H0) and alternative hypothesis (HA), which were evaluated by Pearson chi-square test:

H1: H0 — There is no statistically significant dependence between the Polish and Slovak entities directly authorized to risk management in SMEs. HA — There is statistically significant dependence between the Polish and Slovak entities directly authorized to risk management in SMEs.

H2: H0 — There is no statistically significant dependence between the Polish and Slovak SMEs' ways of risk identification. HA — There is statistically significant dependence between the Polish and Slovak SMEs' ways of risk identification.

H3: The methods used for risk identification and assessment differ in Polish and Slovak SMEs.

H4: The ways of risk limiting differ in Polish and Slovak SMEs.

For the evaluation of respondents' answers, we used basic descriptive statistics and mathematical and statistical methods (Pearson Chi-square test). The hypotheses are evaluated on confidence level 0.05 according results of p-value. If the calculated p-value is lower than the test level ( $p < 0.05$ ), we reject the null hypothesis ( $H_0$ ) and accept the alternative ( $H_A$ ).

## Results and Discussion

The responsibility for risk management in SMEs is naturally associated with the owner of enterprise or top management. This statement confirmed also the results of our research between Polish and Slovak SMEs. In Poland, in 86.67% of cases, the responsibility for risk management lies on owners, in Slovakia it is in 81.30% of cases.

Tab. 2: Authorization to risk management within SMEs

Responsible person	Poland	Slovakia	Total
owner	130	100	230
risk manager	3	11	14
board members	8	3	11
supervisory board members	1	3	4
external staff	1	5	6
nobody	5	1	5
others	2	0	3
<b>Total</b>	<b>150</b>	<b>123</b>	<b>273</b>
<b>Chi-Sq. = 17.256; p = 0.188</b>			

Source: Own research.

The results of p-value of Chi-square test for H1 showed that we accept the null hypothesis. It means that there is no statistically significant dependence in entities authorized to risk management within SMEs, if the respondent comes from Poland or Slovakia.

If we compared the sized category of respondents in both countries, we can observe differences among their responses. The results showed table 3. Due to the results of Chi-square statistic in Poland as well as in Slovakia (the calculated p-values are less than 0.05), we can conclude that in this case, there is an association between enterprise size described by number of employees and categories of respondents due to the authorization to risk management in SMEs.

Tab. 3: Authorization to risk management within SMEs versus enterprise size by number of employees (%)

Responsible person	Poland				Slovakia			
	ME	SE	MDE	Total	ME	SE	MDE	Total
owner	46.00	32.00	8.67	<b>86.67</b>	63.41	13.82	4.07	<b>81.30</b>
risk manager	0.00	1.33	0.67	<b>2.00</b>	2.44	3.25	3.25	<b>8.94</b>
board members	0.67	3.33	1.33	<b>5.33</b>	0.00	1.63	0.81	<b>2.44</b>
supervisory board members	0.00	0.67	0.00	<b>0.67</b>	0.81	0.81	0.81	<b>2.44</b>
external staff	0.00	0.00	0.67	<b>0.67</b>	1.63	1.63	0.81	<b>4.07</b>
nobody	2.67	0.67	0.00	<b>3.33</b>	0.00	0.00	0.00	<b>0.00</b>
others	0.00	0.67	0.67	<b>1.33</b>	0.00	0.81	0.00	<b>0.81</b>
<b>Total</b>	<b>49.33</b>	<b>38.67</b>	<b>12.00</b>	<b>100</b>	<b>68.29</b>	<b>21.95</b>	<b>9.76</b>	<b>100</b>
	Pearson chi-sq.= 23.016; df=12; p=0.028				Pearson chi-sq.= 30.884; df=10. p=0.001			

Source: Own research.

Important part of risk management is the way, how the risks are identified. The respondents were allowed to select one of the following possibilities:

1. we do not deal with any risk,
2. risks are identified only by person responsible for risk management who is dealing with a risk,
3. risks are identified by an internal audit,
4. risks are identified by responsible person in co-operation with other employees who is dealing with a risk,
5. risks are identified in other way.

Table 4 presents the results of respondents' answers toward hypothesis H2. In the most Polish SMEs (40.00%), the risks are identified only by person responsible for risk management who is dealing with a risk. In Slovakia, in 40.65% of cases, for the risk identification is responsible person, who co-operates with other employees who is dealing with risk. Due to the results of tested statistic Chi-square, the answers about risk identification ways are dependent on countries from which SME comes.

Tab. 4 The ways of risk identification in Poland and Slovakia

Possibility	Poland	Slovakia	Total
1.	48	18	<b>66</b>
2.	60	28	<b>88</b>
3.	7	19	<b>26</b>
4.	29	50	<b>79</b>
5.	6	8	<b>14</b>
<b>Total</b>	<b>150</b>	<b>123</b>	<b>273</b>
	Chi-Sq.= 34.345; df = 9; p = 0.000		

Source: Own research.

The comparison of the SMEs' answers according their sized category about the risk identification presents table 5. Accordingly, 18.67% of micro enterprises in Poland don't deal with any risk and in the same amount of entities risks are identified only by person responsible for risk management who is dealing with a risk. In Slovakia, in this category, the most respondents (26.83%), the risks are identified by responsible person in co-operation with other employees who is dealing with a risk. In category of small enterprises, in Poland the most respondents (15.33%) identify risk by person responsible for risk management who is dealing with a risk. In Slovakia, 26.83% of respondents identify risks by responsible person in co-operation with other employees who is dealing with a risk. In small enterprises, in both countries the most respondents signed the possibility 4. If we compare situation in medium sized enterprises, in Poland the most respondents signed possibility 2 (6.00%). In Slovakia, in three case 3.25% of respondents the risks identify by ways 2, 3 and 4.

The results of p-value in Poland (0.246) and Slovakia (0p=0.06) showed that there is not statistical dependence among ways of risk identification among observed sized categories of SMEs. It means that way by which respondents identify risks does not depend on size category, to which respondent belonged.

Tab. 5: The ways of risk identification in Poland and Slovakia according size category of respondents (%)

Responsible person	Poland				Slovakia			
	ME	SE	MDE	Total	ME	SE	MDE	Total
1.	18.67	12.67	0.67	<b>32.00</b>	14.63	0.00	0.00	<b>14.63</b>
2.	18.67	15.33	6.00	<b>40.00</b>	14.63	4.88	3.25	<b>22.76</b>
3.	2.00	2.00	0.67	<b>4.67</b>	7.32	4.88	3.25	<b>15.45</b>
4.	9.33	6.00	4.00	<b>19.33</b>	26.83	10.57	3.25	<b>40.65</b>
5.	0.67	2.67	0.67	<b>4.00</b>	4.88	1.63	0.00	<b>6.50</b>
Total	49.33	38.67	12.00	<b>100.00</b>	68.29	21.95	9.76	<b>100.00</b>
	<b>Pearson Chi-Sq.: 10.284; df=8. p=0.246</b>				<b>Pearson Chi-Sq.: 14.958; df=8. p=0.060</b>			

Source: Own research. ME — micro enterprises. SE — small enterprises. MDE — medium enterprises.

Risk identification represents the process of finding, recognizing and description of risk. The approaches to risk identification and risk assessment in the company depend on the attitude of the executive person or person who is responsible of risk management (Haviernikova et al., 2016). For identification and assessment of risk various methods are used: appraisalment, quality management, Balance Scorecard, interviews with staff and SWOT analysis. The respondents were asked, which kind of methods they use in risk identification and risks assessment. They marked their perception on the scale with values from 1 — always, 2 — very often, 3 — rarely, 4 — never. The descriptive statistics present table 6 and respondents' perception in table 6.

Tab. 6 The descriptive statistics of SMEs' perception of methods used for risk identification and assessment

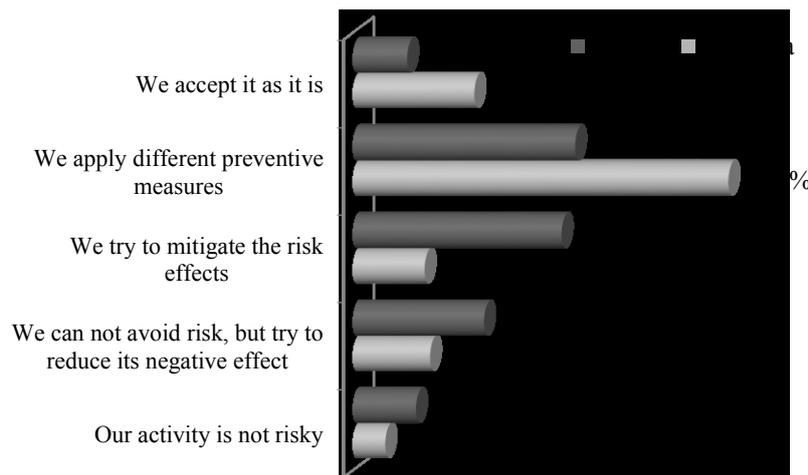
Method	Poland		Slovakia	
	Mean	Standard deviation	Mean	Standard deviation
Appraisalment	2.37	0.89	2.24	0.97
Quality Management	2.46	0.91	2.44	1.13
Balance Scorecard	3.20	0.88	3.11	1.19
SWOT Analysis	3.18	0.88	2.75	1.21
Brainstorming	2.86	0.97	2.77	1.28

Source: Own research.

The most frequently used methods for risk identification and assessment is the Balance Scorecard (Poland:  $3.20 \pm 0.88$ , Slovakia:  $3.11 \pm 1.19$ ). We confirmed hypothesis H3.

The company identifies and reduces potential loss and liability by conduction prevention and risk reduction activities. In literature we can find several ways how the SMEs could do the risk prevention. In our research, we asked SMEs about five possibilities for risk prevention. As follows from Figure 1, the most respondents in Poland, as well as Slovakia apply different preventive measures as a way how to prevent the risk. For Polish entrepreneurs the common way of risk treatment is trying to limit the risk negative effects. Only 4.80% of Slovak respondents answered that their activity is not risky and 8.00% of Polish respondents answered, that they accept the risk as it is. We confirmed the hypothesis H4.

Figure 1. The ways of risk limiting in SMEs in Poland and Slovakia



Source: Own research.

## Conclusion

Based on literature, the general understanding of risk management in SMEs is not univocal and the researches on implementations, methods and practice are limited

(Verbano and Venturini, 2013). The possibility of implementing and sustaining risk management in SMEs is discussed in the literature especially regarding the creating of a holistic approach.

Many enterprises from the SME sector lack knowledge, resources, tools and management skills for proper risk management application (Brustbauer, 2016). The tools and developed solutions by large companies are usually not suitable to SMEs because of their high costs and complexity (Pereira et al., 2015), and, from this point of view, the SME managers consider those guidelines inapplicable because of the specific characteristics of their firms. It is commonly underlined, that resources to support risk management application are beyond capability and affordability of SMEs (de Araújo Lima, Chiara and Verbano, 2019). On the other hand, SMEs are more vulnerable to different kinds of risk than corporations, so they should be more engaged into risk management (Blanc Alquier and Lagasse Tignol, 2006). Despite this, SMEs are far from adopting a proactive risk management approach.

Risk management in practice means to cover the defined framework and steps supporting proactive culture, institutional structure, communication and incorporating risk management into enterprise management strategy. The crucial are suitable reactions to risks and application of these risks' solution to fulfil strategic objectives. The organization of risk management consists of several aspects that are necessary for risk management implementation in SME. This paper is focused on three main aspects of risk organization: responsibility of risk management, risk identification and risk treatment. This research showed the results of these aspects perception by Polish and Slovak SMEs.

In both countries, in over 80% of SMEs the risk management is realized by the owner. It is one of the main reasons of insufficient and inadequate risk management in these enterprises. As Jayathilake (2012) stated, risk management can be influenced by the experience, limited risk knowledge, beliefs and attitudes of the entrepreneurs, and from this point of view, can be not entirely professional. The research showed that, however, there is a multitude of risk models, which identifies all significant risks and analyses, prioritizes and manages those risks (Di Serio, et al., 2011), both Polish and Slovak SMEs use only limited number of those methods, and in limited scope.

The novelty of the paper is visible by exploring and comparing the selected aspects of enterprise risk management in two different countries. After the analysis, it was clearly verified that the research results vary, sometimes significantly, from country to country. This study contributes to the international resources of economic knowledge and could be the basis for preparing the recommendation for risk management improvements in SMEs.

This paper is not free of limitations. Main limitation of present research is the unrepresentative research sample, as well as managerial approach, which may distort the survey responses, the business owner treats emotionally with the company he/she created, and at the same time trying to put the firm in a the best possible light.

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# **Capabilities for smart services in manufacturing companies**

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## **Abstract**

A lot of manufacturing companies supply their tangible products accompanied with suitable services to their customers. Currently also smart services are being added to their service offerings. Applying the change toward smart services is not easy, especially in SMEs where many of businesses fight with lack of money, insufficient digital technologies or unskilled employees. The aim of the paper is focused on significant capabilities of SMEs, which are crucial for smart service provision in manufacturing companies. To fulfil the research aim, a qualitative multi-case study was conducted among seven Czech electrotechnical SMEs, which have already started with smart service development. The findings show that respondents consider wide range of possible capabilities, which could be divided into three main categories, such as technical equipment, internal readiness and knowledge and involvement of customers.

**Keywords:** capabilities, servitization, smart services, SMEs, electrotechnical manufacturers.

## **Introduction**

During last years more and more manufacturers try to transform their pure product offering to offering focused more on services. They add services to their product offering to be able to satisfy their customers with better complexity. Moreover, services included in product offering can help to gain and held their position on the markets. Many manufactures perceive service provision as a significant competitive advantage. Therefore, services are not seen only as add-ons to the product, but become the center of the total offering, with products as add-ons to the services (Gebauer, Gustafsson and

Witell, 2011). Service differentiation in manufacturing takes advantage of the strategic, financial and marketing opportunities.

Servitization means a transformation of manufacturers to solution providers by adding value to core products through services (Baines et al., 2017; Wise and Baumgartner, 1999) and was first mentioned by Vandermerwe and Rada (1988). Due to servitization, the focus shifts more from a product-centered focus towards the service component (Brax and Jonsson, 2009). Services and integrated solution can also support to gain new sources of competitive advantage and value generation (e. g. Brax and Jonsson, 2009; Oliva and Kallenberg, 2003; Wise and Baumgartner, 1999).

Allmendinger and Lombreglia (2005) state that “Soon, it will not be enough for a company to offer services; it will have to provide ‘smart services’. Smart services as often seen as one of the enablers of servitization (e.g. Grubic and Peppard, 2016; Neu and Brown, 2008; Oliva and Kallenberg, 2003). “Smart services are technologically-mediated services actively delivered by the provider through accessing a remote asset and exchanging data through built-in control and/or feedback devices” (Klein (2017). Smart service is the application of specialized competences, through deeds, processes, and performances that are enabled by smart products (Beverungen, Matzner and Janiesch, 2017).

A lot of opposing definitions and terminologies are used for smart services (Klein, 2017), such as ‘teleservice’ (Borgmeier, 2002; Küssel, Liestmann, Spiess and Stich, 2000), ‘telemaintenance’ (Garcia, Guyennet, Lapayre and Zerhouni, 2004), ‘telematics’ (Chatterjee, Greenberg, Jones, Kaas and Wojcik, 2001), ‘e-service’ (Rowley, 2006), ‘e-maintenance’ (Levrat, Iung and Crespo Marquez, 2008) or some variations, combinations or adaptations using the term ‘remote’, such as ‘RRDM (Remote Repair, Diagnostics and Maintenance)’ (Biehl, Prater and McIntyre, 2004). According to Klein (2017), the term ‘smart service’ has gained popularity more recently. For this paper, the term ‘smart service’ is used.

Many benefits could be obtained from smart services offering for manufacturers as service providers and also for their customers. Smart services are more competitive, offer new sources of revenue, higher margins, and considerable cost savings (Küssel et al., 2000). Not only monetary benefits could be use from smart services, but also variety of non-monetary benefits, such as the opportunity to learn from customers, establishing a basis for research and development, sales or marketing activities (Laine, Paranko and Suomala, 2010). Consequently, companies can also profit from a significant strategic position in B2B and B2C contexts (Wunderlich et al., 2015). Porter and Heppelmann (2014) recapitulate the position of smart services: “[They] offer exponentially expanding opportunities for new functionality, far greater reliability, much higher product utilization, and capabilities that cut across and transcend traditional product boundaries”. Benchmarks show that companies, which deliver smart services, get more than 50% of revenue and 60% of margins from services than from product sales (Allmendinger and Lombreglia, 2005).

Customers can benefit from smart services in the meaning that “the value of smart services is in removing unpleasant surprises from their lives” (Allmendinger and

Lombreglia, 2005). The profits could be gathered in reduction of machine downtimes, optimized scheduling of maintenance, more safety, improved information flow and transparency as well as a reduction of labor costs and creation of a better work environment (Lee, Kao and Yang, 2014).

An organization's overall portfolio of capabilities can be seen in two levels (Winter, 2003). Operational and other ordinary capabilities are at the base level, such as routine activities, administration, and basic governance. The level of dynamic capabilities is above the base level. Dynamic capabilities can be split into "microfoundations" and "higher-order capabilities" (Teece, 2007). Microfoundations contain the adjustment and recombination of a firm's existing ordinary capabilities and also contain the development of new capabilities. They are second-order dynamic capabilities that involve new product development, expansion into new sales territories, the assignment of product mandates across divisions in the big corporations, and other activities that establish smart managerial decision making under uncertainty. The high-order dynamic capabilities by which management, supported by processes in company, senses possible ways for future, formulates business models to seize new or changed opportunities, and the best structures for the company based on its existing for and the new strategies for the future (Teece, 2018). Top management is (or should be) most focused on the high-order dynamic capabilities, because they are most appropriate for the innovation and selection of business models that address problems and opportunities the company is attempting to solve or exploit (Teece, 2018).

Marquardt (2017) considers the main challenge for businesses in competitive markets in the following areas:

- flexibility,
- progressiveness,
- be a visionary,
- be at the height of evolution.

The factors that enable the benefits of smart services to be realized are these:

- skills, experience and knowledge,
- support from customers and from other complementary data sources, processes and structures,
- operating centers,
- historical data,
- the presence of internal knowledge and skills (Grubic and Peppard, 2016).

According to the report “Manufacturing 2020” (Manufacturer, 2018), it is necessary for the company to be able to look to 2020. It is useful to be, at the same time, able to ensure effective business in the future. Furthermore, the report recommends that the customer should always be at the center of the digital strategy. It is also ideal to minimize internal barriers as much as possible to provide customized products and services to the customer.

It is also necessary to identify new opportunities for maintaining and expanding the business and to uncover possible rapid challenges (e.g. according to Table 1) that are associated with market competition. In the case of smart services, big data, smart platforms and their management are often mentioned as a future competitive advantage.

Tab. 1: Challenges for smart services

Challenges	Prerequisites
Lack of standards and cooperation	Intelligent data collection platforms
Data ownership, security and privacy concerns	Big data, smart data
Large investments and uncertain return on investment (ROI)	IT infrastructure
Technology and data analytics deficits	Sensors and business intelligence for collection and data processing
Lack of experienced staff and knowledge	Data analytics, data mining skills
Lack of courage management to change	Visionary leadership, descriptive approach
Missing vision and business models	Determining possible sales strategies

Source: Marquardt (2017).

The aim of the paper is to find out significant capabilities of SMEs, which are crucial for smart service provision in the manufacturing companies.

## Methods and Data

Smart services based on smart products discussed in the paper are a very innovative topic, which is quite new in the research field and still open to new investigations. To find out more about smart services provided by manufacturers, a qualitative research was conducted as a multi-case study among seven SMEs electrotechnical companies, South Moravian Region. The research explored how smart services are provided by current manufacturing SMEs. The in-depth interviews investigated following aspects: type of smart products and smart services, the length and way of smart service provision, customer perception of smart services, the reasons for starting with smart service provision, the capabilities for smart service provision, the benefits gained from smart services, barriers connected to smart service provision, gathering and using the data gained from smart services, specifics of Czech industrial market, collaboration with other

firms and “learnings” for other firms which want to start with smart services. The in-depth interviews were important to learn more about the current situation of smart service offering in electrotechnical companies and understand to complex situation of smart service provision.

The multi-case approach delivered analytical benefits by enabling comparison and contrast of the results to get the distinction of case specific findings as well as some general phenomena. The part of the study focusing on capabilities for smart service provision was used for the purpose of this paper.

The qualitative research concluded only electrotechnical SMEs, where producers are often very familiar with smart service provision. Their products enable to include smart services to their total offering and are often one of the key characteristics of them. All respondents operate in the same industry, as was mentioned before, but they offer a wide scope of products and services to their customers with varying degrees of service orientation. The different level and wide range of smart services provides valuable insights into smart services in SMEs in different contexts. The following smart services are provided remote monitoring, control and diagnostics, remote repairs, preventive and predictive maintenance.

The case companies for qualitative research were selected based on purposive sampling (Eisenhardt and Graebner, 2007). The details of the case companies are described in Table 1. Three companies were found as the members of Electrotechnical Association of the Czech Republic (<https://www.electroindustry.cz/>). Four companies providing smart services were detected from the previous research, which was held in sixty electrotechnical SMEs companies in the Czech Republic, South Moravian Region (CZ-NACE 26 and CZ-NACE 27). The respondents participating in the research were directors or managers of companies producing electrical engineering equipment in the Czech Republic.

The data were collected from February to November 2014. Each interview lasted from 50 to 100 minutes and was performed on site, which gave a chance to tour each company and get a sense of the work environment. All interviews were recorded and transcribed. After selecting the case companies, semi-structured interviews with predefined themes were conducted. The interview consisted of open-ended questions, which were based on the literature review. All interviews were conducted face-to-face. Open coding was used to organize the data and convert them to discrete thematic blocks.

Table 2 shows main information about case companies. For this paper only basic information was chosen.

Tab. 2: Case company description

<b>Firm</b>	<b>Respondents</b>	<b>Number of employees</b>	<b>Company history</b>	<b>The length of smart service provision in years</b>
A	Owner	15	more than 5 years	1
B	Product manager	50	more than 5 years	1
C	Owner	10	more than 5 years	2
D	Owner	4	less than 2 years	2
E	Owner	25	less than 2 years	2
F	Owner	148	more than 5 years	2
G	Product Manager	170	more than 5 years	More than 2

Source: Author.

The respondents from electrotechnical companies were mostly owners who were very keen on to develop smart services more deeply. Companies were mostly established more than five years ago, and they have started with smart service provision mostly two years ago. All of them agreed that smart services are the future of manufacturing.

## Results

The research question (RQ) was formulated in the following statement: RQ: Which capabilities are important for smart service provision in electrotechnical companies?

The question for respondents during in-depth interviews was stated as „Which capabilities are important for smart service provision in your company? “ and obtained broad range of answers. Respondents answered in terms of technical equipment (technology, interconnection, communication protocols), in terms of internal readiness (such as innovation, knowledge, financial resources, active employees) and also with regard to the importance of knowledge and customer involvement (more in Table 3 and Picture 1). The most topical response is from company G, where the respondent stated that their multidisciplinary allows them to provide smart services.

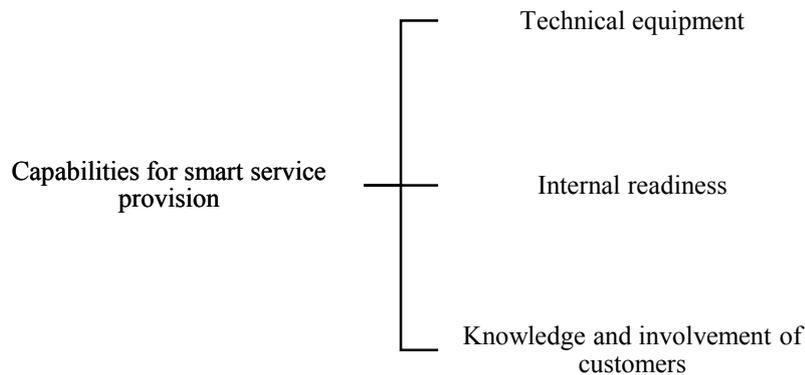
Tab. 3: Capabilities for smart service provision according to case companies

Firm	Capabilities for smart service provision
A	Ability for innovations, technical knowledge and equipment, proactive management and free financial resources.
B	Sufficient knowledge and storage capacity.
C	Good knowledge of technology and customer needs.
D	Have customers, store and market information. Be enthusiastic. Have education in electrotechnics.
E	Enthusiastic employees (co-partners), involvement of customers.
F	Connection using public IP addresses, supported communication protocols.
G	Multidisciplinarity.

Source: Author.

Picture 1 shows capabilities for smart service provision divided into three main categories, which were mentioned during interviews by respondents. The categories were created by grouping similar answers together to gain a list of main fields based on respondent responses, that are listed in the Table 3.

Figure. 1: Capabilities for smart service provision



Source: Author.

Three main categories of capabilities for smart service provision according to respondents are: technical equipment, internal readiness and knowledge and involvement of customers. The most often mentioned was category related to technical equipment. During interviews was heard often that technical equipment is the first and most important capabilities for starting with smart service provision. However, the limited number of cases discourages a consistent generalization of the findings achieved so far, that will have to be confirmed by further investigations.

## **Discussion**

The aim of this paper has been an investigation of capabilities for smart service provision in manufacturing companies. The qualitative research was held among seven electrotechnical companies in the Czech Republic, South Moravian Region. A research question was formulated in this paper to understand which capabilities are important for smart service provision in electrotechnical companies.

### **Theoretical Implications**

According to the research mentioned in this paper, respondents consider wide range of possible capabilities, which are significant for smart service provision. These capabilities were then divided into three main categories, such as technical equipment, internal readiness and knowledge and involvement of customers. As was mentioned by Winter (2003) that portfolio of capabilities can be seen in two levels, the base level and above the base level, it is possible to admit that capabilities mentioned by respondents are mostly from above the base level category, it means level of dynamic capabilities described by Teece (2018). These capabilities lead to innovation of company offering and are not routine at all. Especially internal readiness and knowledge and involvement of customers and ability to adopt new approaches through company offering is often hard to fulfil.

The category of capabilities focused on technical equipment is mentioned by Marquardt (2017) as one prerequisite for smart services. Many challenges for smart services are perceived in the area, such as lack of technology, data analytics and knowledge or experienced staff.

The findings from the interviews are very similar to findings of Grubic and Peppards (2016), where factors enable the benefits of smart service provision are firstly operating centers and support from complementary data sources, process and structures, secondly skills, experience and knowledge and thirdly support from customers.

### **Managerial Implications**

The findings illustrate the main capabilities for smart service provision seen by respondents from electrotechnical companies. During interviews was heard often that technical equipment is the first and most important capabilities for starting with smart service provision. However, internal readiness is still the crucial. As many of respondents (mostly owners of companies) mentioned that for beginning with smart services, their enthusiasm for smart service provision was very essential and smart service provision could not begin.

Technical equipment and also knowledge and involvement of customers are seen as important capabilities for smart service provision, but without internal readiness in companies, mainly in top management, they are not sufficient.

Therefore, the list of recommendations for companies, which want to start with smart service provision was created and already discussed in some electrotechnical companies which already have adopted smart services. For this paper only part focused on important conditions for internal recommendations was chosen. Conditions for internal recommendations are the following ones:

- enthusiasm of management,
- management belief in this area, future vision and benefits,
- management must be active, persistent and resilient, not discouraged,
- think smart services seriously and strategically (this is a long way),
- have an R&D department that will take care of the development (external sources can also be used),
- subsequently training the staff on the benefits (especially sales representative), applications and smart services implementation,
- ensuring safety,
- providing appropriate infrastructure and tools (e.g. cloud rental) to develop smart services.

## **Conclusion**

Smart services based on smart product are very topical for researchers and also for manufacturers. Therefore, it is crucial to wide discuss this area. The paper describes capabilities for smart service provision from theoretical view and also from the view of manufacturers. It analyses which capabilities are significant for smart service provision and tries to divide them in some categories. To address the research objective, a qualitative multi-case study was conducted among seven Czech electrotechnical SMEs, which have already started providing smart service development.

The findings revealed that respondents mentioned wide range of possible capabilities, which could be divided into three main categories, such as technical equipment, internal readiness and knowledge and involvement of customers. These findings are also in line with above mentioned theory and the first theoretical and managerial implications were prepared. However other investigation is necessary because of the limited number of cases, where it is impossible to generalize the findings.

Future quantitative research in small and medium manufacturers is already in the progress. The aim is to verify the findings from the qualitative research described also in this paper.

## **Acknowledgement**

Eva Tomaskova contributed in the research, which was held in sixty electrotechnical SMEs companies in the Czech Republic, South Moravian Region in 2014.

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# **International technology transfer as a mechanism of activating the innovative development of a country**

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## **Abstract**

The article deals with the theoretical, methodological and analytical issues of the development of international technology transfer that are becoming of increasing importance in the development of innovation processes in different countries. Identification of the content characteristics of the main forms of international technology transfer allows outlining the methodological approach for analysing their effectiveness. In accordance with the existing methodological provisions the authors suggest systematize a set of indicators for analysing the effectiveness of international trade in high-tech goods and in high-tech services, international trade in intellectual property, foreign direct investment and international migration of highly skilled workforce and students. The paper investigates the effectiveness of international technology transfer in different countries regarding the innovation processes context.

**Keywords:** technology, international transfer, innovation policy, technological level, gap, resource capacity, intellectual property, R&D.

## **Introduction**

In modern conditions, the advanced technologies, the possession of which allows the country's economy to develop more efficiently and dynamically than others, have been gaining their importance.

That is why the development of its own scientific potential, ensuring its effective use is the basis of the government innovation policies of the most developed countries of the world. Even countries with created innovative systems are trying to develop their capacity to produce new knowledge and to create new technologies.

Nevertheless, not all modern innovative world leaders have always been in the forefront of science and technology development. Such countries as Japan, South Korea, Israel and others have been able to demonstrate high rate of innovating in activities and to build effective models of technological breakthroughs. The international technology transfer has also played an important role in these processes that is even more important for reducing the technology gap, for example, of the developing countries.

Considering the dynamics of scientific advancement in certain industries and the limited ability of even developed countries to evolve several areas of science and technology at the same time, the development of the various forms of technological cooperation takes place in the world that is advisable to consider from the standpoint of the large-scale and complex process of the international technology transfer. The gained knowledge, information and technological secrets become the basis for launching new directions of scientific development and production processes in an importing country. Further deepening of knowledge, its adaptation and improvement creates conditions for the design and development of new technology, however, provided the development of the "technological capability" of the importing country.

That is why the international technology transfer issue is relevant and needs a comprehensive research in the context of determining the content of the state policy regarding its transformation into a significant development factor, which is important for developing countries, especially to overcome the gap with technologically advanced countries.

Scientists and analysts of the international agencies are actively considering the issues of international technology transfer, since forming a comprehensive vision of the main factors and forms of the international transfer is important for many countries and enterprises. The main directions focusing of the efforts of the scientists include characteristics of the main forms, determining the content of the state policy on ITT, studying the experience of innovative leaders, etc.

Shugurova (2015) describes the international transfer of technologies (ITT) and the related processes of the protection of intellectual property rights. The issue of evaluating the technology transfer scale in the implementation of the various forms of international cooperation is presented in Roszkowskai (2013) and Mansfield (1994). The content of the government policies regarding ITT across countries group is presented directly in Hoekman, Maskus and Saggi (2005). The authors note that the content of the government policies regarding ITT varies widely in different groups of countries, and therefore needs to be substantiated. Keller (2004) has systemically studied the nature of the technology diffusion processes.

The studies devoted to summarizing the experience of developing countries occupy quite prominent place in science, the success of which is a real example for other countries focused on the innovative system formation. In this context, the works of Dahlman (2007, 2010), Xiaolan, Pietrobelli and Soete (2011) are particularly significant. Herewith, Xiaolan, Pietrobelli and Soete (2011) emphasize the importance not only of an attracting

the technology in foreign markets, but also of creating their own indigenous ones for the developing countries.

The development prospects of the international technology transfer processes in the 21<sup>st</sup> century are outlined by Butler and Gibson (2011).

Since the processes of international technology transfer are characterized by the complexity and dynamism, the research of their basic forms in the context of evaluating the scope and impact on innovative development are always relevant and require clarification from the standpoints of both methodology and analysis.

## **Methods and Data**

The purpose of the article is to research the theoretical and methodological provisions of monitoring the scope of the international technology transfer in its various forms in the context of identifying the major trends of innovative development of the technological leaders in order to summarize the positive experience, the use of which will be the basis of the strategy of overcoming the technological backwardness, especially for the developing countries.

To achieve this goal it is necessary: to summarize the achievements of the leading scientists who have researched various forms of international technology transfer and the nature of its impact on innovation processes, to form methodological provisions to study the forms of the international technology transfer, to evaluate the scale and to set the main trends in the development of the international technology transfer processes; to summarize the best practices of the governments of the technological leaders on the content of the public policy in this area.

The evaluation of the scope of international technology transfer should be considered in the overall system of the research of the level of national economy innovativeness (Bruno (2013), Dahlman (2010), Vochozka (2017)), the methodology of which is more developed. Both integrated and fragmented indicators are used to evaluate the innovation levels of selected countries.

The methodology for defining the Global Innovation Index has gained the greatest distribution.

The Global Innovation Index is a composite indicator that summarizes not only the country's resource capacity for innovative activity but also the performance of this area.

There are several most common approaches including:

the Global Innovation Index calculation methodology, developed at the first in 2007 by Dutt (2016), is based on the appliance of the innovation model and reflects the complex nature of the innovation process;

the methodology of calculating the Innovation Index of the European Innovation Scoreboard, developed in 2000 by Hoddander (2011), was created to measure the effectiveness of the national researching and innovation systems in EU countries.

The Global Innovation Index is also calculated by various international think tanks, such as WIPO, Bloomberg, and Forbes. The annual Bloomberg Innovation Index, in its seventh year, analyses dozens of criteria using seven metrics, including research and development spending, manufacturing capability and concentration of high-tech public companies.

A common feature of these techniques is the innovation process investigation through the links between two components: inputs — the resources and conditions that are key to system innovation and outputs — the totality of the results of the innovation system's function. However, the advantages of the existing methodological approaches are the grouping of indicators based on different criteria, the use of which makes it possible to identify both sectoral conditions and direct factors of innovation activity. The measurement of innovative drivers and results remains difficult from a practical point of view, so a great emphasis is placed on investigating the climate and the infrastructure for innovation.

The situation with the methodology of analysing the scope of international technology transfer is more sophisticated, since it is quite difficult to distinguish and to value all operations that contribute to the technology diffusion.

Scientific works of academics, in particular Bulter (2011), Haytera and Rooksby (2016), James (2010), Kasych (2011), Mansfield (1975), Massey (1997), Seaton (1993) propose the methodological approaches for the study of the various forms of international transfer. Accordingly, it is necessary to justify the main stages and to summarize quantitative and qualitative indicators that can directly or indirectly represent key process characteristics in order to carry out a comprehensive and multifaceted analysis of the international technology transfer.

Considering the fact that technology transfer research should be conducted in the framework of analysing the innovation processes in the economy, the following basic stages of the analysis are suggested:

- the analysis of the level of innovation of the national economy;
- the analysis of the impact of the international transfer on the economic development of the country;
- the study of indicators characterizing the forms of the international technology transfer;
- the analysis of the host country's potential for technology adsorption.

The study of its impact on the economic development of selected countries is the most important in the process of exploring the nature of the international technology transfer. This analysis allows us to evaluate the scale of the various forms of the international technology transfer and to define the causal relationships between the knowledge gained and the ability of the economic systems to ensure the technologies diffusion and their transformation into economic growth. Since international transfer of technologies is often an accompanying process in the realization of various forms of international economic

interaction, basic methodological provisions should be formed and the statistical data collection should be organized for the appropriate analysis (Table 1).

Table 1. Indicators characterizing the scale of the international technology transfer

Forms ITT	Indicators
International trade in high-tech goods (Embodied Technology Transfer)	<ul style="list-style-type: none"> <li>- share of high-tech products in the country's export / import structure;</li> <li>- share of information and communication equipment in export / import structure;</li> <li>- share of mechanical engineering products (equipment) in export / import structure.</li> </ul>
International trade in high-tech services	<ul style="list-style-type: none"> <li>- share of engineering services in the structure of export / import of services;</li> <li>- share of consulting services in the structure of export / import of services.</li> </ul>
International trade in intellectual property	<ul style="list-style-type: none"> <li>- patents (purchases, sales);</li> <li>- licenses for patents;</li> <li>- know-how (not patented);</li> <li>- models and designs;</li> <li>- trademarks (including franchising);</li> <li>- technical services;</li> <li>- financing of industrial R&amp;D outside the national territory.</li> </ul>
Foreign direct investment	<ul style="list-style-type: none"> <li>- total volume of direct investment exports / imports and their dynamics;</li> <li>- value and dynamics of FDI per capita per year,</li> <li>- cost of M&amp;A transactions.</li> </ul>
International migration of highly skilled workforce and students	<ul style="list-style-type: none"> <li>- share of highly qualified personnel in total labor migration from country to country;</li> <li>- share of young people who travel abroad (to travel abroad) to study;</li> <li>- the average annual growth rate of young people leaving for study.</li> </ul>

Source: Systematized by the author.

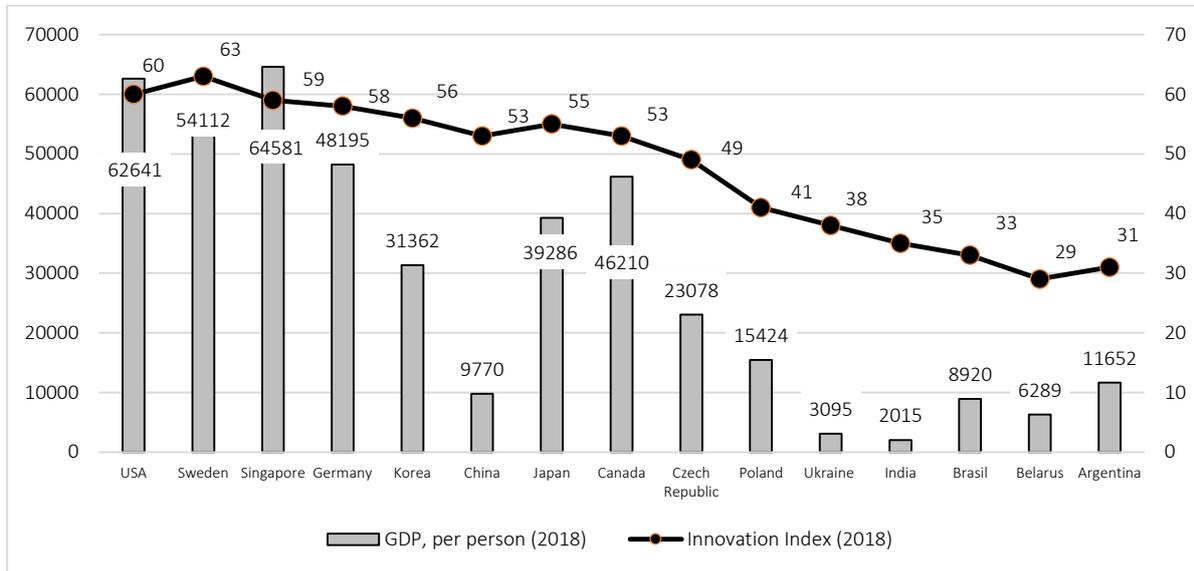
The indicators presented allow us to analyze not only the role of the selected forms of the international transfer, but also to create a comprehensive understanding of the studied processes. The results of the analysis should show, on the one hand, the importance of international technology transfer for the development of the country, and on the other hand, the role of the country (active or passive) in the international flows of the technology transfer.

## Results

The acceleration of the national economy growth is increasingly based on innovation, and the innovation process is more frequently viewed as a systemic phenomenon. The wide recognition of the importance of innovation for economic and social development leads to the increase of the interest in evaluating the policies and practices of shaping innovation systems in different countries of the world. In the "knowledge economy", the winner is the one who skilfully exploits that knowledge and turns it into income. That is why the attention to innovation processes and forms of their activation is growing in an increasing number of countries and requires a comprehensive policy to promote innovation. However, innovation processes are still characterized by a high level of regional differentiation, which is clearly monitored based on the innovation development

index, which should be presented in conjunction GDP per capita Fig. 1, Table 2, Appendix A.

Figure 1. The Global Innovation Index 2018 and GDP, per person



Source: Formed by the authors according to Official sites of The World Bank and Official sites of WIPO.

Table 2. Innovation leaders by income group

High income (above \$12,236)	Upper-middle income (\$3,956–12,235)	Lower-middle income (\$1,006–3,955)	Low income (under \$1,005)
Switzerland ....68.40	China .....53.06	Ukraine .....38.52	Tanzania.....28.07
Netherlands.....63.32	Malaysia.....43.16	Viet Nam.....37.94	Rwanda.....26.54
Sweden .....63.08	Bulgaria.....42.65	Moldova.....37.63	Senegal.....26.53

Source: Formed by the authors according to Official sites of WIPO.

The following basic regularities were tracked based on the presented data:

**1. Innovation leaders of the world economy are mainly highly developed countries,** in particular, Switzerland, Sweden, the USA, the Netherlands, Great Britain, etc. The GDP per capita of the top ten innovators is from \$ 50,000 (Finland) up to \$ 114,000 (Luxembourg). The achieved level of the economic growth is the result of the functioning of the developed innovative systems, which provide the developed countries with the ability to create innovations independently and to determine the directions for the development of science and technology of entire industries. In spite of the fact that some EU countries are leaders in the ranking, in general the EU region is only trying to catch up with the United States. The EU at the global level is less innovative compared to Australia and Canada, South Korea and Japan, which are actively developing the capacity for innovative development. In the context of enhancing innovation development in the European Union, the EU Innovation Scoreboard is used, which allows to continuously monitor the changes in the performance and development factors of the national innovation systems of individual countries. The countries based on the research results are divided into four

groups: innovators-leaders; active innovators, moderate innovators and modest innovators.

## ***2. The development of economy's resource capacity is the basis of government policy in the innovative area.***

The important and illustrative indicators of resource support for innovation include such indicators as Research and development expenditure (% of GDP), Research and development expenditure per person, Researchers in R&D (per million people), Technicians in R&D (per million people), which allow to compare the ability of individual countries to provide the science sector with adequate resources and to set target indicators that can be adopted in the process of the innovation strategy development.

Thus, the innovation leaders direct from 1.7 to 4.6% of GDP to the research, and the overall trend that is a characteristic of the most innovation-oriented countries is the increase in this indicator, which reflects the content of state policy regarding the GDP redistribution towards increasing the level of investment in innovation (R&D). EU countries have defined a quantitative benchmark for innovation policy (investment in R&D), at least 2% of GDP, since the early 1900s. Israel and South Korea direct the largest share of GDP for this purpose, i.e. over 4%.

The use of the expenditure on research per capita is quite informational, since it most accurately allows estimating the real volume of science funding. Developed countries finance \$ 1200-1850 per capita on expenditure on research. Israel and the USA are the absolute leaders on this indicator, while the indicators of other developed countries, such as Sweden, Germany, and Japan are lower.

Thus, the basis of the high level of the innovativeness of the country's economy is the achieved overall level of the economic development (GDP) and the content of state policy to increase the level of the investment in innovation (R&D).

## ***3. An increasing number of countries provide a multi-level focus on innovation development targets.***

In today's environment, the capacity of the countries to provide the economic growth on an ongoing basis depends on their ability to produce innovation. That is why the vast majority of the developing countries, despite the significant lag from leaders, focus on overcoming the gap.

Examples of several developing countries are illustrative, including South Korea and Singapore that have been able to focus their economies on innovative goals. A well-chosen strategy, initially through international technology transfer and then the development of its own high-tech production, provided for these countries not only an overcoming of a gap from the group of the developed countries, but also formed strong competitive positions in the markets of modern products and relatively stable economic growth.

Such countries as Singapore and South Korea have reached the level of the indicators of developed countries that proves the ability of the developing countries to reach the level

of the developed countries according to the quantitative terms and to become an active player in the international technology market. A number of other developing and transformational countries are also trying to provide for the innovation orientation of investment, as evidenced by the share of these expenditures in GDP, but in absolute terms, the distance from the developed countries remains rather significant.

China is also developing in the same way. The active international technology transfer and the attempt to ensure the full development of the country's scientific potential have already given some positive results. China's GDP has actually reached \$ 10,000 per capita. However, in order to ensure high GDP growth in the long term, China needs a reorientation from capital-dependent development and the active involvement of technology to development, which will be ensured by the growth of overall factor productivity, that is by the ability to create modern technologies independently.

The vast majority of the developing and transformational countries are characterized by the medium level of innovation activity, as they have fragmented opportunities to develop a set of technologies. The international technology transfer is also an important factor in securing innovative economic growth for this group of countries.

The current economic development model reflects the prioritized importance of the influence of such production factor as technology, and therefore the economic growth dynamics is determined by the country's ability to provide the technological development. However, a rather limited number of countries provides the development of technology through their own efforts, and managing the international technology transfer has become the priority for others. Moreover, if the state policy for promoting international technology transfer has become clear and systematic in some countries, then the issue of international transfer is not properly assessed in other countries.

*International technology transfer* is the international referral process, the distribution of technology-intensive objects, which creates the conditions to overcome the technological backlog in a particular field of science and production or the economy as a whole.

There are two ways to ensure technological development of the country's economy.

1. Assuring development of technologies on its own. However, the economy has to have all the necessary resources (investments, personnel and logistics) and technological development experience for this to happen.
2. Receiving the technology from the outside by: acquiring technology in a related form (technology-intensive product or service); acquisition (receipt) of technology in "pure" form (based on licensing agreements, know-how transfer agreements, participation in scientific conferences, etc.); obtaining technology in any form by attracting FDI. The main forms of the international technology transfer are presented in fig. 1.

The technology transfer should be seen as an attempt to get ahead of the consistent process of the science and technology development in the countries with lower levels of development and which against a background of expectations of gradual evolutionary

development of science may remain outside the modern processes of economic globalization for a rather long period.

*International trade in technology-intensive products* plays a significant role in the technology diffusion, as it becomes a source of ideas and knowledge that allows the importing country to gradually start producing similar products and to reduce the gap to the technologically advanced countries. The import of mechanical engineering products and, first of all equipment, is especially important, since this process allows to ensure the improvement of the technological processes in other fields.

*International trade in services* has generally been characterized by a sufficiently high rate over the last decades, but imports of a number of services may be considered as a part of the international technology transfer processes. Thus, equipment installation, engineering, scientific and technical consulting contribute to the technological development of the developing countries. The role of the international education, which provide foreign students in developed countries with the knowledge that corresponds to the most advanced achievements of science, technology and technology, should be noted separately.

*International trade in intellectual property*, which involves the acquisition of licenses or other property rights for production or distribution, basic technical information or know-how, is important since it is becoming a factor in the growth of the developing countries and it allows access to modern technologies and provides manufacturers with competitive advantages.

Intellectual property, especially when it comes to high-tech, has become a highly productive intangible asset, an important result of the innovation system. This is why the leading companies in developed countries are more active in transferring technology through trading the intellectual property to countries where a stronger legal framework is more powerful to protect them.

*Foreign direct investment (FDI)* in some countries is a real mechanism for structural shifts, as their involvement into strategic industries generates secondary effects and can significantly effect the economic dynamics of the host country. Undoubtedly, in the process of attracting FDI to a developing country, we cannot expect the automatic development of the technological base for R&D, since each foreign enterprise tries to protect and to maintain a monopoly on the own possession of high-tech knowledge and secrets of production. However, FDI is usually carried out by powerful transnational corporations, which, in addition to financial resources, provide for the importation of the up-to-date equipment, the transfer of experience and certain knowledge that is accompanied by the technology transfer. A variety of the organizational forms of FDI through the establishment of joint ventures, mergers and acquisitions contribute to the technology diffusion, and so objectives of state policy regarding FDI should be involved to form the conditions for attracting foreign investors who will provide not only FDI but also the technology transfer. It allows the companies from the developing countries, which attract FDI and get investor as strategic partner, entry the international distribution

systems in future, and thus enables the effective entry into highly competitive markets in the most developed countries, especially into the high-tech markets.

*International movement and labour turnover* in modern conditions is gaining new quantitative and qualitative characteristics and is accompanied by the unconditional transfer of technologies. Free labour migration, intensification of production internationalization processes in FDI framework, the growth of TNCs and other forms of interaction between international companies, the formation of global labour markets, the globalization of the market of educational services provide the transfer of knowledge and experience, which opens wide opportunities for the innovative development of the developing countries.

The international workforce movement will refer to the international transfer of technology in the situation when an employee returns to the country after work or study abroad and becomes the driver of technological change. This question should become the centre of the state policy in the context of providing the international technology transfer through the international labour movement.

The performance indicator of the country's innovation sector and of the international technology transfer scale is the share of high-tech exports in its total value. Using this indicator, we track the following major differences:

Innovation leader-countries have a 15 — 25% rate and a slight downward trend, which is generally indicative of a steady global market demand for technology-based products of this group of countries;

New industrial countries (South Korea, Singapore) and China have the highest indicator at 30 — 53% level of the export value, which testifies to the ability of these countries to use modern technologies in production of their own products and move to the stage of their export;

Transformation countries (Czech Republic, Poland) are also gradually increasing their high-tech exports.

Based on FDI indicators, regional features are not clearly monitored, but there are common trends:

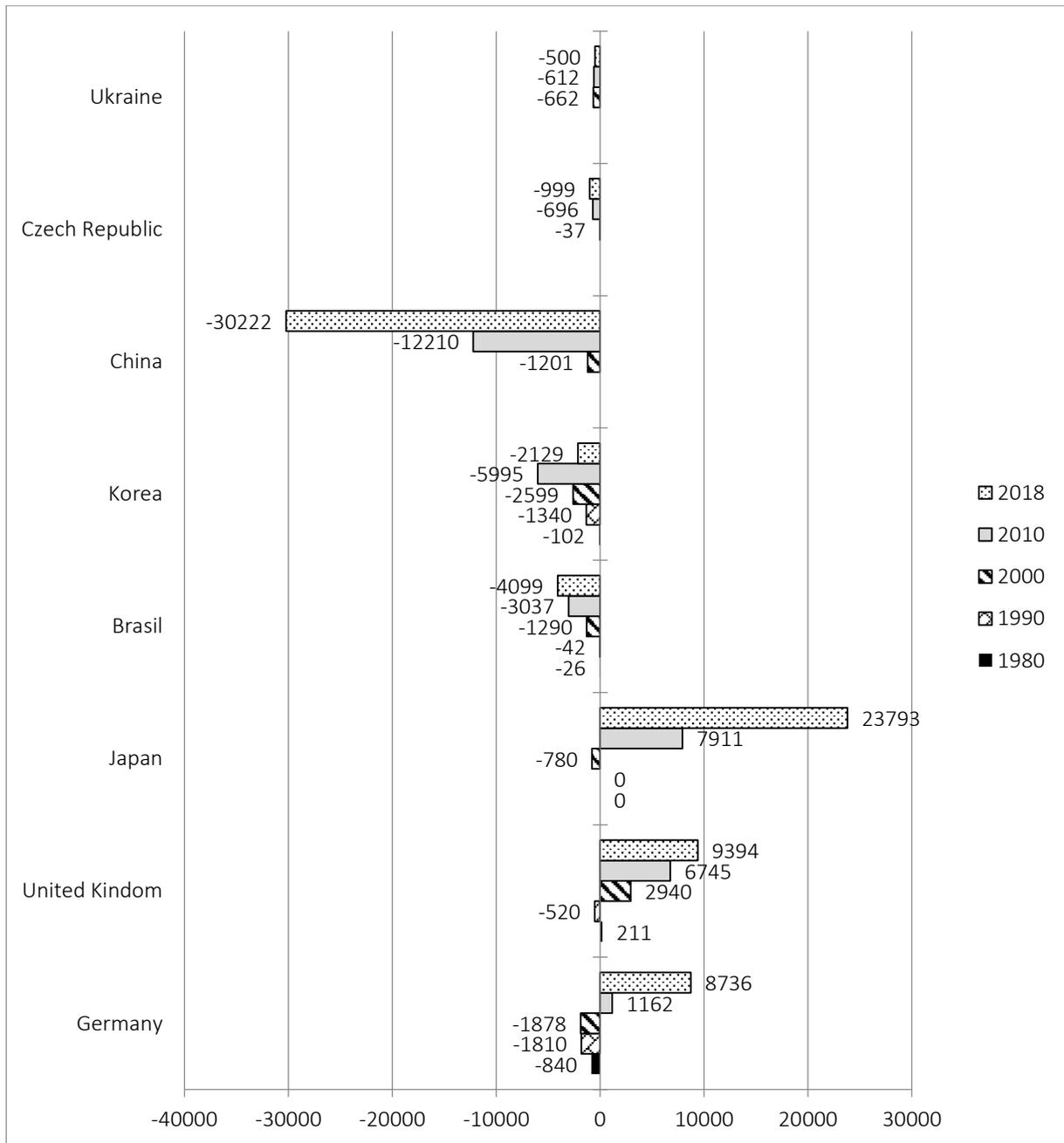
FDI and their share of GDP are gradually increasing, however, with the exception of Singapore and Israel they have not become a significant factor in the economic development of some countries. The greatest impact is the FDI made by high-tech companies that contribute to the technological development of the production in the host country. In this context, the active involvement of such investments is of the strategic importance for the developing countries, which, through FDI-related technologies, are actively beginning to develop their own high-tech industries;

the magnitude of the net FDI inflow is volatile and indicates that the developed countries are both active exporters and importers, although a number of the developing countries

are becoming active exporters. Significantly, the net investment in China has almost reached US level.

The indicators more directly reflect the International technology transfer: charges for the use of intellectual property, payments and receipts, millions and their balance (Fig. 3). The data presented indicate a gradual increase in the value of these transactions for the vast majority of countries, but with a general excess of payments over revenue. Only a few countries have a positive balance between revenues and payments from intellectual property, including the United States, the United Kingdom, Germany, and Japan. Other developed countries, developing countries, as well as transformational economies are actively using the intellectual property of other countries, making net payments abroad. The change in positions in the United Kingdom, Germany and Japan is the most significant, which have received significant net proceeds from the sale of intellectual property abroad over the last decades.

Figure 3. Net charges for the use of intellectual property, millions and their balance

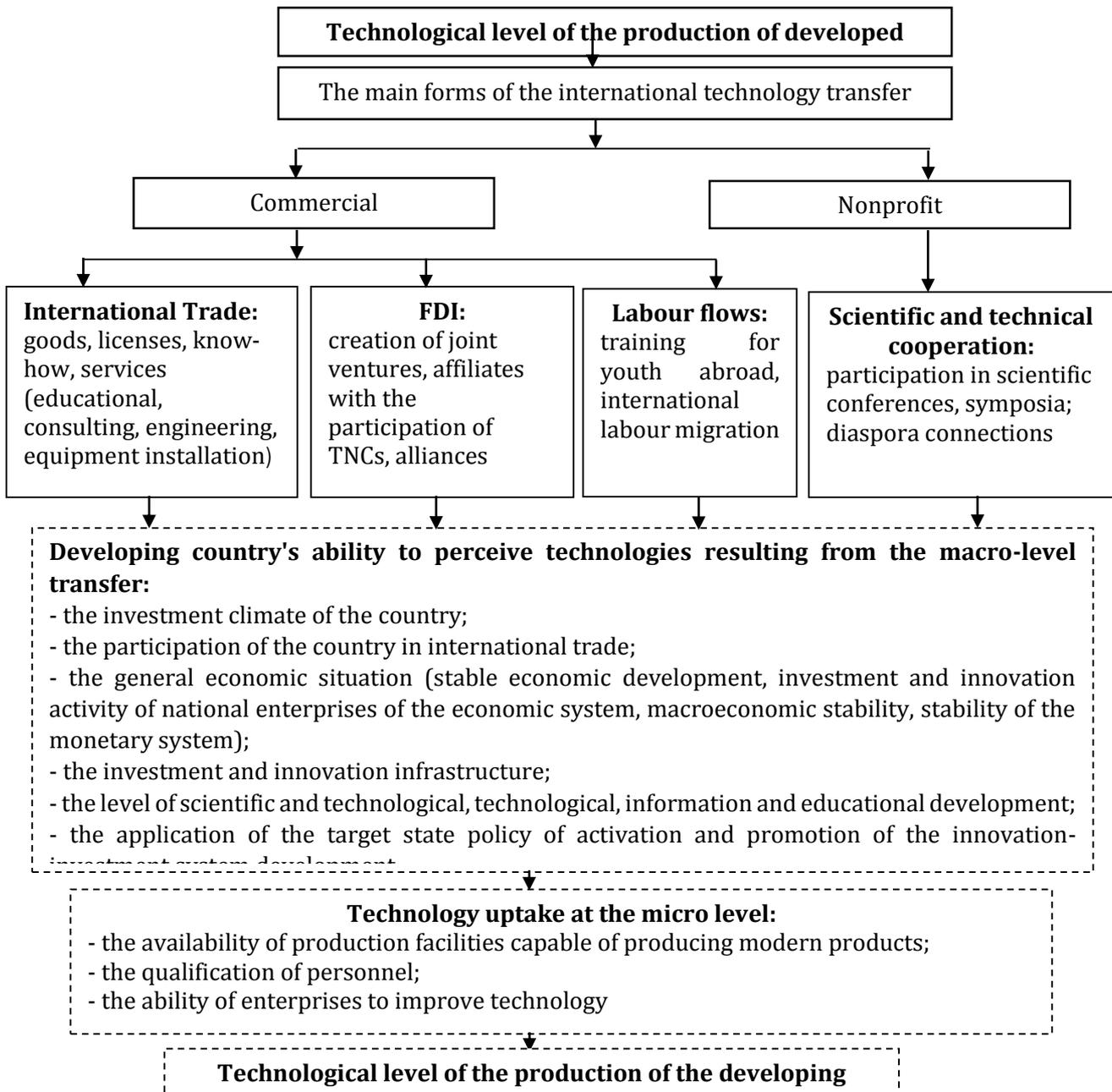


Source: Formed by the authors according to Official sites of The World Bank.

The economy of almost every country needs to import new technology in any form (development, equipment, patents, etc.), but it must learn to use these "inputs" effectively to transform it into its own technological capabilities. However, the use of new technologies is not a simple or automatic process. The process of the technology imports should lead to a conscious construction of the country's "technological capability", which requires the development of a new education system, infrastructure, fundamentally new characteristics of the internal market demand, etc. In fact, companies have no experience in the development of technology and must "learn to find out." In general, the processes

of the impact of the technology transfer on the technological level of the growth in the developing countries can be presented in the following form (Fig. 4).

Figure 4. Scheme of the impact of the international technology transfer on the technological level of the developing countries



Source: Author's development.

The following should be considered as the priority task in determining the technology transfer process.

- Receiving technology from the outside can only be an initial impetus to build the potential of its development domestically.
- Existing technologies can vary significantly in potential and useful life, and therefore the ideal option is to encourage the involvement of strategically important technologies.
- The technology adoption process will be most effective if many professionals (industrial enterprises, research institutes, laboratories) are attracted to it.
- The effective use of technology and its transformation into national developments can occur only in conditions of ensuring development of all subsystems of the process of creation and use of new knowledge.
- The lack of complete information on the possible technological solution of certain production problems can lead to the waste of effort, time and resources.

Summarizing the experience of technology leaders regarding encouraging the technology development by national companies, the following basic forms of integration of science and production can be distinguished: consulting, personnel exchange, scientific parks, territorial scientific and industrial complexes, regional agglomerations, venture capital. An important function in ensuring technological development state complies with the through budget financing of R&D, providing subsidies to the economic sectors, which contributes to the structural reform of the country's economy. If the country has not reached the level of the independent creation of new technologies, it is important to ensure the continuous access to new foreign technologies. Such access can be achieved through cooperation with TNCs, national enterprises without foreign investment, research institution, etc. One of the forms of the international technological integration of the national economy is the creation of branches, joint ventures, alliances in the process of FDI implementation. However, creating them does not solve the complex problem, but is only a partial attempt to ensure technological transfer. The main problems of participation in the alliances of domestic companies are different technological level and fundamentally different investment opportunities, and therefore it is difficult to expect partnerships.

The process of forming the technological capacity of the economic system, respectively, is advisable to consider in the context of four stages.

- Traditional production and ensuring its efficiency.
- Expanding investment opportunities increases the ability to buy and implement modern foreign technologies.
- Formation of adaptive abilities to adapt and improve imported technologies.
- Ensuring the level of R&D, which is “keeping pace” with modern scientific and technological progress, makes it possible to generate new technologies.

Over time, there will be real competition that promotes the dynamic development of the national market, if national technology providers emerge. Therefore, ensuring production efficiency in the today's environment requires the use of new technologies; however, a simple combination of international trade, investment and information may not ensure a positive outcome unless new opportunities are sought out. The perception of the knowledge gained by technology transfer depends on many factors and has a number of restrictions within the national economy: general investment climate in the country, macroeconomic instability, the level of development of investment and innovation infrastructure, the achieved level of scientific and technical, technological, information and educational development, etc.

The issue of improving the investment climate in the country should be considered from the standpoint of improving the legislative base for investment and innovation processes with the participation of foreign enterprises, political stabilization which is a prerequisite not only for influencing macroeconomic processes but above all for enhancing country's international investment attractiveness and contributing the rise in country's competitive position in the fight for investment resources, which are redistributed in world, the certainty of development which requires a clear justification of the content of the strategy of the long-term development of the Ukrainian economy (priorities, resources, forecasted monetary policy), simplification of the tax regulation from the standpoint of the improvement of regulatory mechanisms, raising the level of the energy security of the economic development, and upgrading the workforce qualification.

Summarizing the experience of the developing countries in the technology transfer has enabled the author to identify the main characteristics of this process and objectives for the domestic economy.

1. The technology transfer should be seen as a real and significant process for economic development, which requires considerable time and investment.
2. The current technological gap between countries necessitates investing not only in innovation but also in basic means, education, ensuring the development of all the factors the perception of knowledge acquired through transfer are dependent on.
3. Getting a certain technology because of the transfer does not solve the issue of scientific and technological development of the economic system and therefore the transfer is only a mechanism for launching internal systems for the production of technological innovations.
4. The need for rapid self-determination based on scientific and technological development determines the need to intensify the process of the technology transfer at the national level between the entities capable of producing new solutions and developments, which in turn requires the creation of information and communication networks.

5. The significant development of the country's scientific and technical potential should not be expected through the clear technology transfer even if substantial development is the object of the transfer.

## Conclusion

Therefore, the transition economies should not only promote technology transfer but also seek to develop the NIS capable of self-development. However, the experience of the developed countries is an example of the gradual evolution of the scientific progress and the process of NIS formation, which has taken place under relatively sufficient levels of financial support. From the standpoint of NIS formation in transition economies, it is more important to ensure a "technological" breakthrough in at least some industries.

Systematic shifts are needed to ensure technological shifts coordinated, since their integrity can be ensured primarily by the state. In general, there are two main strategies for government behaviour regarding the technology transfer.

- An autonomous strategy involves an active position of the state, which would promote the development of technological capabilities, increase the national ability to "keep pace" with new technologies.
- FDI dependency strategies which are divided into two types: a targeted strategy involves significantly less state intervention compared with an autonomous strategy. Free trade is being introduced but not for the whole economy, but for the export industries. The sources of the technological change remain exclusively in the hands of TNC; the passive strategy does not actually require TNC to the technology transfer. The choice of the strategy is determined by many factors but the decisive task of the developing country in terms of the technology transfer is not to remain dependent on the influx of foreign innovations but to form an internal base of opportunities in the fields of best practices.

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[https://doi.org/10.36708/Littera\\_Scripta2019/2/0](https://doi.org/10.36708/Littera_Scripta2019/2/0)

## Appendix A

## Dynamics of indicators characterizing the scale of international technology transfer

Country	Place GII 2018	Research and development expenditure (% of GDP)				Research and development expenditure per person				High-technology exports (% of manufactured exports)			Charges for the use of intellectual property, payments, million dollars USA						
		2000	2010	2015	2017	2000	2010	2015	2017	2010	2015	2018	1980	1990	2000	2005	2010	2015	2018
<b>Developed countries</b>																			
USA	6	2.62	2.74	2.73	2.80	955	1320	1568	1680	23.1	21.9	18.9	730	3140	16607	25577	32551	40609	56117
Canada	18	1.87	1.83	1.69	1.59	452	868	735	716	15.9	15.2	15.7	595	1664	3563	6959	9731	10733	11825
Germany	9	2.39	2.71	2.92	3.04	652	1064	1382	1360	17.0	17.9	15.8	1446	3797	4414	7212	7117	10115	15631
UK	4	1.63	1.67	1.67	1.67	456	653	742	670	23.6	22.7	22.6	924	3575	7139	10104	9810	11422	13364
Sweden	3	-	3.38	3.26	3.31	-	1342	1559	1760	19.7	18.1	14.3	203	742	991	1512	1498	4173	4863
Israel	11	3.93	3.94	4.28	4.58	826	1207	1534	1858	19.5	22.9	22.8	3	73	360	541	831	1062	1382
Japan	13	2.91	3.14	3.28	3.14	770	1099	1335	1203	19.2	18.1	17.3	-	-	11007	14654	18769	17034	21726
<b>Developing countries (Latin America)</b>																			
Argentina	80	0.44	0.56	0.61	0.53	34	58	84	77	7.7	9.3	5.3	101	409	580	650	1712	2178	2025
Brazil	64	1.00	1.16	1.34	1.27	90	165	183	125	12.1	13.1	12.9	38	54	1415	1197	3226	5250	4924
Mexico	56	0.32	0.53	0.52	0.49	33	79	95	48	22.2	19.7	21.0	177	380	406	1933	293	259	301
<b>Developing countries (NIS)</b>																			
South Korea	1.2	2.18	3.47	4.22	4.55	394	1048	1456	1354	32.0	31.2	36.3	125	1377	3300	4720	9183	10056	9881
Singapore	5	1.82	2.01	2.29	2.22	434	950	1275	1340	52.3	52.4	52.7	-	-	5099	9495	17029	19400	15178
<b>Developing countries (Asia)</b>																			
India	57	0.77	0.82	0.62	-	15	35	39	-	7.7	7.9	9.0	12	72	282	671	2248	5009	7906
China	17	0.89	1.71	2.06	2.13	26	160	165	186	32.1	30.4	30.9	-	-	1281	5321	13040	22022	35783
<b>Transitive economics</b>																			
Poland	39	0.64	0.72	1.0	1.04	68	152	125	144	7.7	11.0	10.6	-	-	555	1036	2248	2431	3571
Czech Republic	27	1.11	1.34	1.93	1.79	181	371	341	360	17.9	17.8	19.6	-	-	81	503	945	1227	1494
Belarus	86	0.72	0.67	0.50	0.59	9	41	30	34	3.0	4.4	3.9	-	-	2	19	102	132	177
Ukraine	43	0.96	0.83	0.62	0.45	36	64	49	12	4.9	8.5	5.4	-	-	663	421	744	358	592

Country	Foreign direct investment, net inflows (% of GDP)					Foreign direct investment, net inflows (BoP, current US\$)					Charges for the use of intellectual property, receipts million dollars USA							
	1990	2000	2010	2015	2018	1990	2000	2010	2015	2018	1980	1990	2000	2005	2010	2015	2018	
<b>Developed countries</b>																		
USA	0.81	3.41	1.76	2.79	1.26	48490	350066	264039	509087	258390	7080	16640	51807	74448	107522	124769	628748	
Canada	0.47	9.20	1.84	3.86	2.65	7581	68303	29715	59986	45416	32	234	2324	2873	2814	4087	4840	
Germany	0.17	12.72	2.52	1.85	2.63	3004	247987	86054	62462	105278	606	1987	2536	5750	8279	16049	24367	
UK	3.07	9.96	2.72	1.57	2.08	33504	164130	66735	45333	58651	1135	3055	10079	15376	16555	20260	22758	
Sweden	0.77	8.77	0.13	2.07	0.84	1982	22818	625	10319	4632	89	563	1414	3480	5813	8828	7444	
Israel	0.26	6.09	2.99	3.77	5.62	151	8047	6985	11336	20789	12	62	496	574	849	1096	1273	
Japan	0.06	0.22	0.13	0.12	0.52	1777	10688	7441	5252	25877	-	-	10227	17655	26680	36477	45519	
<b>Developing countries (Latin America)</b>																		
Argentina	1.29	3.67	2.68	1.98	2.24	1836	10418	11333	11759	11873	4	4	36	51	152	161	268	
Brazil	0.21	5.03	3.73	3.35	4.73	989	32995	82390	60334	88324	12	12	125	101	189	581	825	
Mexico	0.98	2.59	1.98	3.16	3.01	2549	18382	20925	37033	36871	21	21	43	2	9	7	7	
<b>Developing countries (Asia)</b>																		
India	0.28	2.05	0.87	0.29	0.89	788	11509	4497	4104	14479	23	37	701	2036	3188	6553	7752	
China	15.42	16.15	22.97	22.65	22.53	5575	15515	55076	69775	82040	-	-	64	650	1933	8651	8719	
<b>Developing countries (Asia)</b>																		
India	0.07	0.77	1.64	2.09	1.55	236	3584	27397	44005	42117	0.1	1	82	205	127	466	784	
China	0.97	3.48	4.00	2.20	1.49	3487	42095	243703	242489	203492	-	-	80	157	830	1085	5561	
<b>Transitive economics</b>																		
Poland	0.14	5.43	3.84	3.15	2.05	89	9335	18395	15065	12034	-	-	34	62	237	415	612	
Czech Republic	1.61	8.09	4.90	0.91	3.46	654	4987	10168	2	8494	-	-	44	39	249	465	495	
Belarus	0.04	0.93	2.38	2.93	2.47	7	118	1393	11759	11873	-	-	0.9	3	8	22	65	
Ukraine	0.27	1.90	4.74	3.35	1.89	200	595	6451	3050	2476	-	-	1	22	132	86	92	

Source: Formed by the authors according to Official sites of The World Bank.

## **Student-centered methods in entrepreneurship education to increase entrepreneurial intentions of students**

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### **Abstract**

Nowadays young people and students to prefer paid jobs over setting up of their own businesses. One of the possible ways to increase entrepreneurial intentions is to develop new student-centered entrepreneurship teaching methods. Despite European Commission recognizes that current entrepreneurship education in the EU in general works well and produces positive outcomes in a form of higher probability of starting business, there is a ongoing discussion on necessity to use more student-centered teaching approaches. The aim of the study is to identify the teaching methods to increase entrepreneurial intentions of students. The article addresses theoretical aspects of the role of entrepreneurship education in society, as well methodologies exploited in business education and their features. The core part of the paper contains analysis of survey results conducted among students in higher education institutions in selected European countries from different European parts as well as identification of students-centered teaching methods in entrepreneurship. The research is based on literature analysis, quantitative survey, analysis of statistical data and reports on entrepreneurial activity, new students-centered teaching methods in entrepreneurship education.

**Keywords:** entrepreneurship, entrepreneurial intentions, entrepreneurship education, teaching methods, student-centered learning.

### **Introduction**

This paper is devoted to constantly important business education issues. With the emergence of digitalization and artificial intelligence, higher education institutions are seeking for new approaches to more modern business studies and revising the old ones.

In recent years, trends have emerged that are unfavorable for higher education institutions offering entrepreneurship training. Given the scarcity of studies carried out outside of the business school, a number of scholars have called for a new approach to entrepreneurship education (Syed, Abdul and Norita, 2018)

Another problem is that business study courses lack student orientation and practical side of the learning, especially in non-business education institutions (e.g. engineering courses or vocational education institutions or even secondary schools). If these type of educational institutions deliver business study courses, they are mostly theoretical with lack of practical approach.

The importance of how entrepreneurship education should be taught or the appropriate teaching method is still a fundamental issue in entrepreneurship education (Syed, Abdul and Norita, 2018) that is part of an ongoing scholarly debate. Teaching contents and methods would be the decisive factors of success for teaching entrepreneurship in the twenty-first century. Unfortunately, very little is known about effective teaching techniques for entrepreneurship (Deale, 2016) and research and knowledge about how to teach entrepreneurship remains relatively underdeveloped despite the growing demand for more entrepreneurial-oriented graduates (Chief Scientist, 2019). Having recognized this gap, this paper aims to critically review and evaluate the main teaching methods of entrepreneurship and discusses the effectiveness of the specific teaching methods in entrepreneurship education.

This paper tries to determine the relevance of the teaching methods effectiveness in the entrepreneurship education specifically. However, this article is not intended to be a compendium that provides all the possible techniques on how to teach entrepreneurship but is rather an analysis of the widely used teaching pedagogy applied in the entrepreneurship education. The first step was to perform an evaluation or assessment of the past and present teaching methods of entrepreneurship education in terms of their strengths and limitations. While there exist many different definitions of teaching methods or practices, we define teaching method as the general principles, pedagogy and strategies used in teaching. One of the greatest challenges for educators is determining the effectiveness of teaching methods for students (Syed, Abdul and Norita, 2018)

Despite the shortcomings of the traditional teaching methods and overwhelming number of studies suggesting teaching of entrepreneurship using “innovative” methods (Hooshangi, Arasti, Hounshell and Sahebzamani, 2012) (Deale, 2016), lectures, case studies and group discussions continue to be the most commonly used pedagogies in many universities worldwide (Syed, Abdul, & Norita, 2018).

## **Methods and Data**

### **Entrepreneurship literature analysis**

The term entrepreneurship is always revolving and varies across different industries and fields, making it difficult for people to define it. For example, Jones (Jones, English, 2004) define entrepreneurship as “the process of providing individuals with the ability to recognize commercial opportunities and the insight, self-esteem, knowledge and skills to act on them”. Varley and Hardy (Varley, Hardy and Sewell, 2010), on the other hand,

define entrepreneurship as “the desire, motivation and skills necessary to start and manage a successful business”.

Joseph Schumpeter (1943), Frank Knight (1921) and Israel Kirzner (1973) investigated phenomena of entrepreneurship. Schumpeter suggested that entrepreneurs, not just companies, are responsible for the creation of new things in the search of profit. Knight focused on entrepreneurs as the bearers of uncertainty and believed they were responsible for risk premiums in financial markets and Kirzner thought of entrepreneurship as a process that leads to discovery. A summary of these ideas is available in a study conducted by Krumina (Krumina, 2017).

The authors believe entrepreneur is an individual who starts and runs a business with limited resources and planning, and is responsible for all the risks and rewards of his or her business venture.

Entrepreneurship is one of the main actors in national economy for any country (Salinas and Barroso, 2016). For Ahmad and Seymour (2008), there are some common elements that impulse people for entrepreneurship, such as the capacity for finding and exploiting a business opportunity, intention to understand the entrepreneur’s behaviour.

Feldman, Bolino (2010), as well as Katz (2004), believe that the intention to become an entrepreneur depends on the individual’s will because people value the possible results, economic impact and community benefits. This could be based on the environment, sociodemographic and perception features.

Drucker (2002) comments that successful entrepreneurs don’t wait for new and creative ideas to come. Would-be innovators and entrepreneurs must go out of the firm, look, ask and listen, in a process for exploring discovering-learning process. Family, personal economy and academic level also have influence in the process of entrepreneurship (Barroso, 2012; Salinas, 2014). Quijano (2006) argues that productivity is affected by factors such as motivation, labour satisfaction, learning, academic level, work habits, labour environment, attitudes, feelings, decision making, conflict solution, ergonomics, management style, organizational culture.

When entrepreneurship is treated as the ability to generate and implement novel ideas within a business context. Creativity can therefore be seen as an important antecedent of entrepreneurial intentions and consequently individuals with a well-trained creative skillset are more likely to engage in entrepreneurship (Ward, 2004).

There are people who think they are not creative, but everybody is. Creativity is inherent to our nature and must be, as Robinson (2006) said, treated at the same level and importance as literacy. It has its own value, as De la Torre (1997) stated, but only when it creates value and becomes innovation (Gupta, 2012), so to be innovative, the first step is fostering creativity. And if there’s orientation to innovation, there will be the possibility for individuals to be entrepreneurs. Barroso (2017) believes that the creator has an idea,

the inventor makes it work, the innovator gives value to that idea and the entrepreneur takes the risk and takes it to the market, transformed into a product.

The existence of a business idea is a primary determinant entrepreneurial intention in the early stage of a new business creation (Badri and Hachicha, 2019). One of the most common ways is to find a business idea in a familiar and close-knit sphere, but one's good hobby, professional skills or any other source of initiative can be just as good.

In most cases students intending to start their own business have an entrepreneurial idea before shaping their project. Evaluating the idea by attracting external expertise especially using digital systems can be a success and can significantly help to improve the idea, but at the same time, one can also give up the idea. New entrepreneurs should always take the external expertise seriously accept the assessment objectively and use several sources of expertise. Forming an entrepreneurial intention requires formulating an idea structured, which would explain the students' entrepreneurial expectations. Detaining an idea constitutes a necessary step in shaping the students' entrepreneurial intentions (Badri and Hachicha, 2019).

To implement the idea, to analyze the adequacy of initial ambitions of a business idea a business plan is drawn up in which entrepreneurs plan their business for a certain period. The business plan must be concrete, thoughtful, reflect the current situation and future perspectives, and highlight the strengths and weaknesses of the business. The business plan allows entrepreneurs to think about the things they will need when they start their business, to understand the strengths of their idea and to make the necessary computations for the viability of the idea. By setting up a business plan, entrepreneurs can define stop points and the nearest directions as a destination. In addition, the business plan will allow to analyses the adequacy of initial ambitions of a business idea.

Each business plan is based on financial plans that reflect the potential viability and potential return on the investment for the prospective investor, as well as providing insight into other financial indicators. The digital financial plan should include cash flow computation, profit/loss statement and balance sheet. Computations allow to avoid unexpected situations and help planning of coming periods. The most important benefit of the computations in digital formatting is the possibility to model different situations, as well as the possibility to evaluate whether the investment in the project is successful or not, compared to alternative investment possibilities.

### **Entrepreneurship education and its teaching methods**

Under different titles such as entrepreneurship, small business management, entrepreneurial growth, new ventures creation, new ventures management or enterprise development, many undergraduate and postgraduate programs in business management studies offer entrepreneurship education as compulsory subject (Syed, Abdul and Norita, 2018).

One of the most commonly used foundational objectives of entrepreneurship education is to encourage students to create their own businesses.

Responding to the importance of entrepreneurship as a major driver of economic growth, entrepreneurship education programs have developed globally in an effort to provide national future entrepreneurs with the necessary skills. The business education programs are generally considered to be an effective means of promoting student entrepreneurship, curricula are often focused only on the acquisition of knowledge, and developing skills to properly design a business plan and unfortunately often unable to adequately address and stimulate creative thinking (Sagie and Elizur, 1999).

The challenges that entrepreneurship education faces in the past have shifted from legitimacy issues to quality issues. The debate is no longer whether entrepreneurship can or should be taught but rather how to continuously improve its content and delivery methods to meet the needs of current students and industries (Syed, Abdul and Norita, 2018).

Audretsch (2014) describes the importance of education for entrepreneurial thinking, behavior and values within society. Universities with more extensive multidisciplinary profiles play a more significant role in the processes leading to the emergence of new businesses and the commercialization of scientific knowledge (Bonaccorsi et al., 2013). According to Badri and Hachicha (2019) educational level is also among the noticeable factors to significantly affect the individuals' desire to engage into an entrepreneurship.

The development of new study programs stimulating entrepreneurship, the involvement of students and lecturers in activities such as business-plan competitions, entrepreneurship clubs, and the practical training undertaken in existing startups and other enterprises is very important to make entrepreneurship studies more interactive and practical.

Entrepreneurship program must satisfy modern needs and comply with the current peculiarities of the business-creation process. Entrepreneurship education also depends on demographic factors such as gender, working experience, parental working experience (whether the student comes from a family of entrepreneurs) or environmental factors such as interactive communication between the students or their involvement and participation in other university communities or meetings.

Motivation for creativity opens another dimension in entrepreneurial process, that is, implementation of business idea. Creative young people can be more easily involved in entrepreneurship because they more obviously perceive feasibility of project.

An effective way to stimulate the creativity and entrepreneurial intentions is putting students in a real problem-solving situations. One of the forms of a personal experience is to attend business incubator. For example, 15 incubators in a small country Latvia ensure support to young entrepreneurs and established merchants, providing the necessary environment including software for business start-up and development, consultations,

training and events on general business issues, mentor support and grants. There are several business incubators all over the country in universities and business schools to stimulate entrepreneurial intentions and maturity of students in the age of digitalization.

Another innovative and multidisciplinary approach to teaching entrepreneurship is automatic digital system for assessment of business ideas. The system should assess the commercial viability and competitiveness, innovativeness and creativity of business idea, analyses the relevant personal characteristics and preconditions of business idea owner, that will be done automatically or semi-automatically.

Maresch and Harms (Maresch, Harms, Kailer, and Wimmer-Wurm, 2016) have shown that entrepreneurship education increases the entrepreneurial intention, therefore authors take a deeper insight in methods exploited in entrepreneurship education.

The current teaching method is argued to be mainly concerned with creating human resources to work for others not to work for oneself, which calls for a new approach in entrepreneurship education (Syed, Abdul and Norita, 2018) (Deale, 2016). Integrating an entrepreneurship module in the business management curriculum will provide students with the essential knowledge and skills to become effective managers with entrepreneurial skills and capabilities.

The entrepreneurial intention has always been affected by several factors derived from the relevant theoretical and empirical analyses. These factors involve, mainly, the relating individual characteristics, socio-cultural background, entrepreneurship education, the existence of a project-undertaking idea, etc. According to Ajzen's model (Leeuw, Valois, Ajzen and Schmidt, 2015) personality traits and demographic elements (gender, age, etc.), are believed to influence intentions in so far as they affect the individuals' beliefs, i.e. their intentions, to initiate a project. Despite researches (Badri and Hachicha, 2019) that emphasize the role of personal characteristics (age, gender and, above all, educational level), are the most determining variables affecting their intention to engage in entrepreneurship, there is teaching methods that could improve students' intention to start up a business.

One of the major issues in entrepreneurship is how the subject should be taught. It demands the formulation of an integrated learning and teaching strategy that aligns intended learning outcomes with the effective selection of pedagogy. Pedagogy or teaching method is of paramount importance in the learning process, involving effective method, competent instructor, lecturer and sufficient teaching facilities. Given there is somehow a consensus among entrepreneurship education scholars that entrepreneurship can be taught, the emphasis now shifted to what should be taught and how it should be taught (Chief Scientist, 2019) (Badri and Hachicha, 2019) (Deale, 2016). However, Rideout and Gray (Rideout and Grey, 2013) argued that even though there has been some progress in entrepreneurship education, the field is still at a very early stage of development (Syed, Abdul and Norita, 2018).

The studies dealing with the role of the educational system in developing entrepreneurship were suggested by Ulhoi (Ulhoi, 2005) (Badri and Hachicha, 2019). The impact of entrepreneurship teaching and training has become an important focus area for countries that sought to foster their students' entrepreneurial behavior intentions through education. A wide range of entrepreneurial activities and training were developed in higher education institutions.

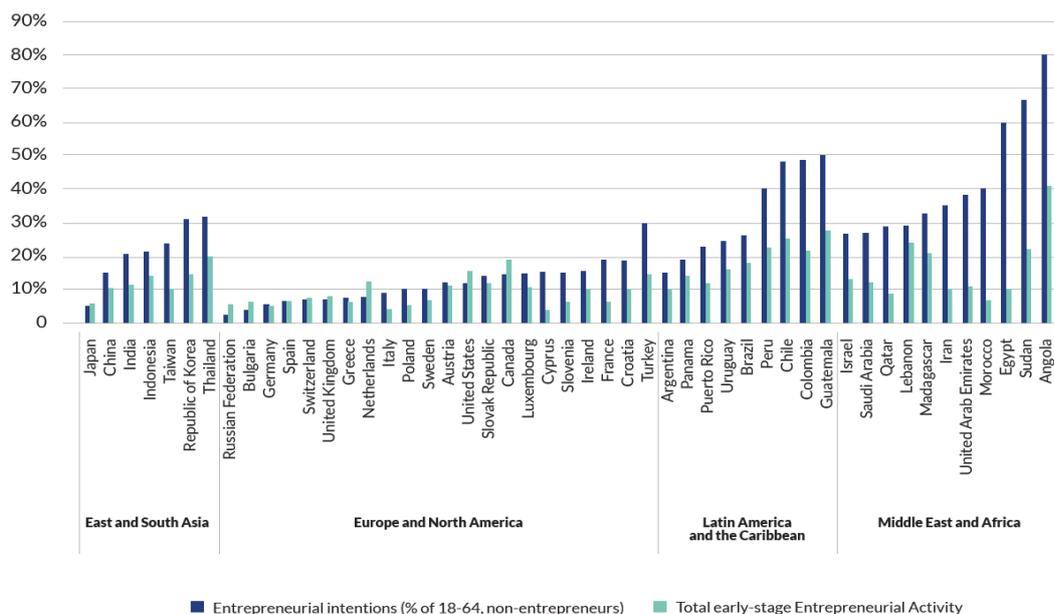
## Data

### Statistical data analysis

In order to achieve the objective of the research, authors analyzed statistical data about entrepreneurial intentions collected by survey organized in the beginning of 2019. More specific, the research was about qualities and preconditions one needs most to become a successful entrepreneur, the most problematic factors for doing business, skills students lack or need to improve most to be able to start an entrepreneurship, the most important factors discouraging students to start an entrepreneurship as well as conducted survey among students in European countries.

According to Global Entrepreneurship Monitor Adult Population Survey data, entrepreneurial intentions and early-stage entrepreneurial activity in Europe stands lowest among global geographic regions today (Graph 1).

Graph 1: Entrepreneurial Intentions and Total Entrepreneurial Activity (TEA) Rates among Adults (ages 18-64) in 48 Economies, in Four Geographic Regions



Source: Bosma and Kelley, 2018.

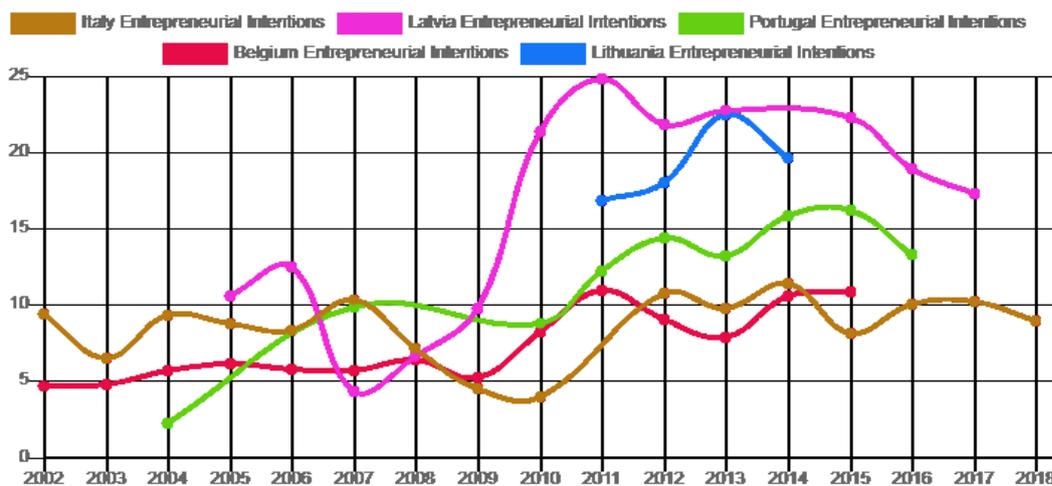
Entrepreneurial intentions and entrepreneurial activity use to decrease as economic model of the country matures, economy is highly competitive and activities are concentrated in efficient big scale organizations. It partially explains the reasons for low intentions and activity in European countries. At the same time, there is a risk of losing entrepreneurial potential and regeneration of entrepreneurs.

The authors conducted survey among students of European higher education institutions to investigate entrepreneurial intentions, motivation, obstacles and assistance needed. The survey was focused on five EU countries — Latvia and Lithuania from Eastern Europe, Belgium from Western Europe, Italy and Portugal from Southern Europe.

Before conducting survey the authors analyzed Global Entrepreneurship Monitor online statistics data (Entrepreneurial behaviour and attitudes, 2019) for the same five countries.

During the analysis the authors found out that entrepreneurial intentions have recently decreased in all selected countries (Graph 2).

Graph 2: Entrepreneurial intentions in selected EU countries, in % of adult population



Source: Entrepreneurial behavior and attitudes, 2019.

After the observed increase of entrepreneurial intentions during the global financial crisis and some years after, as labour markets stabilize, unemployment rate decreases and labour market opportunities increase, entrepreneurial intentions start to gradually slow down.

### KABADA survey

In 2018 and the beginning of 2019, the authors developed survey named KABADA to investigate entrepreneurial intentions, motivation, obstacles and assistance needed among European students of higher education. Even though it was spread in many European countries, the focus was on five previously mentioned countries.

The aim of the survey was to analyze students' self-assessment about readiness to start their own business and possession of necessary entrepreneurial skills.

The questionnaire was divided in three sections. In the first section students were asked about their future career plans, in particular, whether they plan to be their own bosses and start their own companies. The second section was devoted to studies of entrepreneurial perceptions, but the third part investigated students' self-perceptions about their entrepreneurial skills and capabilities.

Number of absorbed respondents in survey is 947. To analyse regional differences, authors made a distinction between old EU members (EU15 or those countries that were already EU members until April 30, 2004) and new EU members (EU28 — EU15 or those countries which joined the EU from May 1, 2004 or later).

Most of the respondents were bachelor degree students (86.5%), the rest being in their master degree studies. The survey was mostly focused on economics, finance and business management programs' students (70.3% of all students). There were also 10.7% of respondents majoring in engineering, 6.1% in natural sciences, mathematics and IT and 4.5% in education.

Tab. 1 describes respondents' future professional career choices of all respondents. Even though the most popular answer was related to being an employee, 28.6% of respondents indicated that they see themselves developing and managing their own business which is quite remarkable percentage.

Tab. 1: Professional life intentions of respondents.

In my professional life I see myself:	Numbers	%
developing and managing my own business	271	29
I have not decided yet	225	24
working for private or public organization as a specialist or manager	451	48
	947	100

Source: KABADA Survey, 2019.

## Results

In KABADA survey, respondents were asked what kind of assistance they would prefer when working on their business ideas (several answers possible). The most popular answers were "finding financial sources" (65.4%), "checking potential of my business ideas" (59.6%) and "mentoring and consulting" (52.9%).

Further, authors decided to check the difference between country groups by detecting weather factor "country group" plays a significant role in distribution of answers to the questions (Tab.2).

Tab 2: Professional life intentions of respondents by country groups.

	EU-15				Total	%	EU-28			Total	%	Grand Total	%
	BE	IT	PT	Others			LT	LV	Others				
developing and managing my own business	25	12	19	3	59	24%	76	112	24	212	30%	271	29%
I have not decided yet	14	42	13	1	70	29%	55	89	11	155	22%	225	24%
working for private or public organization as a specialist or manager	20	50	34	12	116	47%	146	159	30	335	48%	451	48%
Grand Total	59	104	66	16	245	100%	277	360	65	702	100%	947	100%

Source: KABADA Survey, 2019.

The following hypotheses were tested:

H0 — there is no significant difference in answers' distribution by country groups

H1 — there is significant difference in answers' distribution by country groups

To test which hypothesis is true, a chi-squared test was run in each case. All tests and following calculations was executed with JASP software - JASP Team (2018), JASP (Version 0.9.2) [Computer software] and the received p-value was checked, where, if  $p\text{-value} > 0.05$ , then H0 is true, otherwise H1 is true.

In the case of preferred assistance, H0 was true for all types of possible assistance with an exception for answer "checking potential of my business ideas" ( $p\text{-value} 0.016$ ), where H1 turned out to be true.

Respondents were also asked which skill they lack or need to improve most to be able to start an entrepreneurship (several answers possible). The most popular answers were "communication, leadership and general management skills" ("54.5%"), "development of business ideas" (53.5%) and "financial management skills" (51.5%).

Testing of the same hypothesis was done. The results of test can be seen in Table 2.

Tab. 2: Hypothesis test for country group differences when answering question “Which skills you lack or need to improve most to be able to start an entrepreneurship? “

Answer	p-value	Which hypothesis is true
16.1 Development of business ideas	0.016	H1
16.2 Assessment of business potential of business ideas	0.153	H0
16.3 Communication, leadership and general management skills	0.165	H0
16.4 Sales and marketing skills	0.479	H0
16.5 Financial management skills	< .001	H1
16.6 Specific professional skills related to industry specifics	0.045	H1

Source: KABADA Survey, 2019.

The outcomes illustrated in Table 2 suggest that there is a substantial difference in self-perception of entrepreneurial skills and capabilities between old EU countries' group and new EU countries group students.

The most popular answers (several answers possible) to the question which are the most important factors discouraging to start an entrepreneurship, turned out to be “lack of necessary financial resources” (63.0%), “lack of experience and business network” (57.6%), “lack of knowledge and skills” (49.4%) and “fear of failure” (47.0%). Again country group difference hypotheses test was done (see Table 3).

Tab. 3: Hypothesis test for country group differences when answering question “What are the most important factors discouraging to start an entrepreneurship? “

Answer	p-value	Which hypothesis is true
17.1 Fear of failure	0.82	H <sub>0</sub>
17.2 Stress, possible impact on my health	0.112	H <sub>0</sub>
17.3 Lack of knowledge and skills	0.032	H <sub>1</sub>
17.4 Lack of experience and business network	< .001	H <sub>1</sub>
17.5 Lack of necessary financial resources	0.442	H <sub>0</sub>
17.6 Inappropriate business environment	0.004	H <sub>1</sub>
17.7 Lack of government support	0.274	H <sub>0</sub>
17.8 Personal and family preconditions	0.685	H <sub>0</sub>

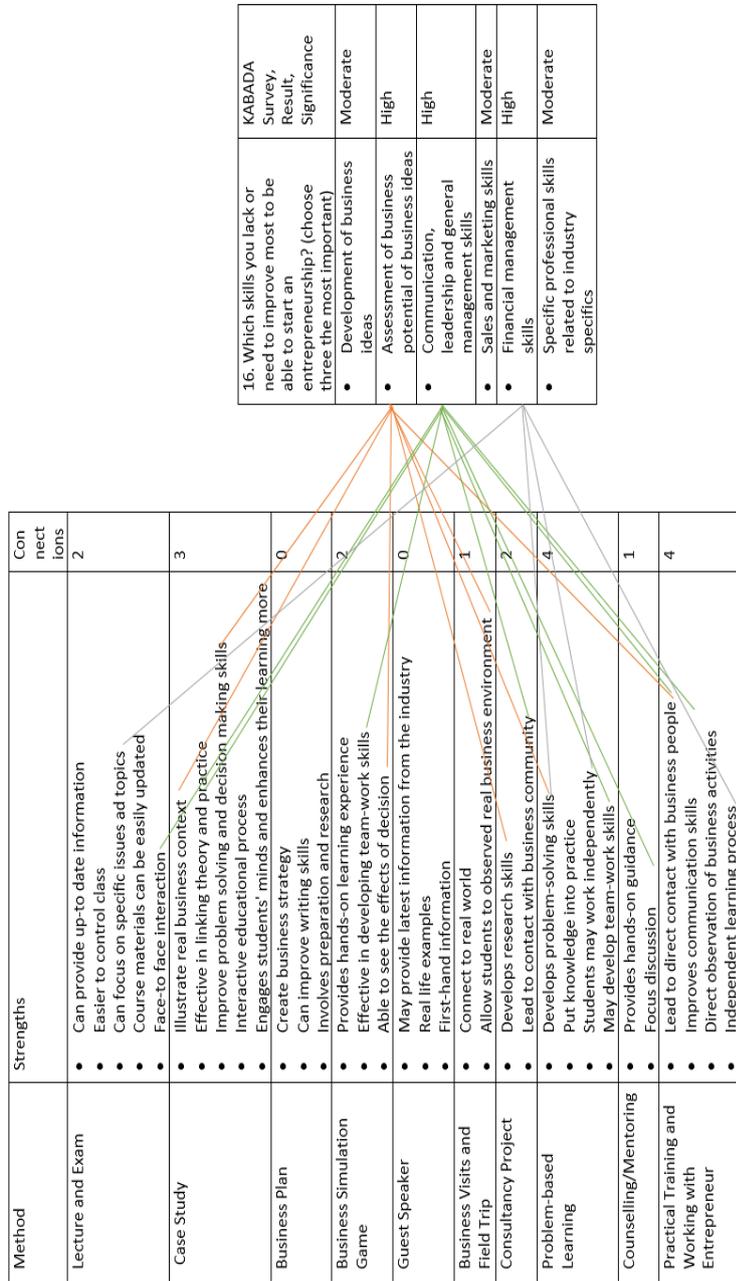
Source: KABADA Survey, 2019.

The outcomes in Table 3 again suggest that there are three answers where difference between old EU countries' group and new EU countries group students' answers is significant.

Despite the differences between the influencing factors (Tab. 3), students from all 16 countries included in the survey (verification) recognize that the teaching method needs to be improved and modern methods oriented to students related to practice should be used.

Another result (Graph 3) of the study is an attempt to link the skills students lack or need to improve most to be able to start an entrepreneurship (KABADA Survey, 2019) with the methods used in entrepreneurial education (Syed, Rahim and Norita, 2018).

Graph 3: Link between teaching methods and students' needs



Source: KABADA Survey, 2019 and Syed, Rahim and Norita, 2018.

Using the method of visual analysis (Drieger, 2013) authors conclude that the most intense connections of the students' needs with high significance are with the three teaching methods: "Practical Training and Working with Entrepreneur", "Problem-based Learning" and "Case study" (Graph 3).

## **Discussion**

Summing up the results of the research: there are low entrepreneurial intentions and growing doubts and fears about business potential in Europe in general. However, significant part of students in European Union wants to establish their own companies and even growingly perceive opportunities. This leads to the authors' belief that innovative digital tool in checking the business idea potential and consulting using multidisciplinary experiences of partners would allow to exploit entrepreneurial potential in the EU that is currently suppressed by fear of failure and deficit of some capabilities.

Students learn better when they are provided with the proper training and have the correct assistance over the time (Min, 2005). Real-world business cases are other possible way to introduce entrepreneurship and help students to develop both creative and feasible solutions. They enable students to focus on real projects, interact with real people and work on real business issues (Bordean, Sonea, 2018). By doing so, students are enabled to develop their creativity and ingenuity, in turn leading to an increased predisposition towards entrepreneurship.

According to Federico Cosenz and Guido Noto (Cosenz, Noto, 2018) entrepreneurial learning is a critical process in realizing the success or failure of a new business venture, as it implies that would-be entrepreneurs acquire those strategic management competencies required to start and manage a new business. Actually, statistics on new businesses failure rate reveal that the main reasons for failure are related to a lack of entrepreneurial competencies of start-uppers.

Lefebvre (2017) conducted several studies dealing with business survival or development issues and came to conclusion that is important for students to keep in touch with entrepreneurs long after the case studies to prolong the brainstorming exercise.

Neck and Greene (2011) identified the methods that must be applied in order to promote entrepreneurship at the university. They established that the following methods help achieve better results and contribute to successful entrepreneurship education: a portfolio of practice-based pedagogies, including starting businesses as part of the coursework, serious business games and simulations, design-based thinking and reflective practice.

Another student-centred and multidisciplinary method to teaching entrepreneurship is automatic digital system for assessment of business ideas. The system should assess the commercial viability and competitiveness of business idea, assess innovativeness and creativity of business idea, analyze the relevant personal characteristics and

preconditions of business idea owner, that will be done automatically or semi-automatically.

The authors argue that higher education institutions will have to use new student-centered teaching methods in entrepreneurship education to stay competitive and to satisfy needs of economy and students in the European Union by the use of emerging opportunities created by artificial intelligence and robotics in digital era.

## **Conclusions**

The authors believe that despite the low entrepreneurial intentions and growing doubts and fears about business potential in Europe in general the survey shown that significant part of students in European Union have high entrepreneurial intentions and even growingly perceive opportunities in business.

An emerging conclusion of the paper is that although traditional techniques such as lecturing, tutorial and the case study seem to have been commonly used in delivering entrepreneurship subject, no single teaching method appears to be adequate to achieve the objectives of the courses. There has to be a link, relationship between students' desires and needs and methods to fulfil them, as well as combination of theory and practice in order to contribute students' intention to start their own entrepreneurship. Therefore, teaching entrepreneurship should consider the contextual factors and, based on this, combine a number of teaching methods in order to provide students with wide range of required skills and an up-to-date knowledge of the entrepreneurial process.

The development of new study programs stimulating entrepreneurship, the involvement of students and lecturers in activities such as business-plan competitions, entrepreneurship clubs and the practical training undertaken in existing start-ups and other enterprises is very important to make entrepreneurship studies more interactive and practical.

To stimulate entrepreneurial intentions among students, creativity training should be included in business educational programs and special cases from real life should be studied as a means do it. Real-world business cases are other possible way to introduce entrepreneurship and help students to develop both creative and feasible solutions. They enable students to focus on real projects, interact with real people and work on real business issues

It is also necessary to develop practical tools like automatic digital system with data mining possibilities for assessment of business ideas of new entrepreneurs and to include such practices in course syllabus, thus offering better education practices.

As a result of the study, the most suitable methods to fulfill students' needs are practical training, working with entrepreneur to keep in touch with entrepreneurs and problem-based learning.

## Acknowledgements

The research was carried out within the framework of the BA School of Business and Finance internal research grant “Application of Modern Teaching Methods in Business Studies in Higher Education”.

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## **Perception of social companies at customers' side in Czech business environment**

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### **Abstract**

The mission of the social business is to create jobs for poorly unemployed people or to significantly care for nature. They are doing so more and more. Their activities bring potential and development for the whole of society. On the other hand, they have to face not only problems like current SMEs but also others that are specific to the area of social firms. In Czech Republic there are often launched companies as a kind of response to difficult life situations of founders or their neighbourhood. These companies are in a highly competitive environment where one of the main goals of maximizing profits. The main objective of the paper is identify relationship between knowledge of social companies and chosen demographic parameters in Czech Republic. There were returned questionnaires from 371 respondents (return rate is 36.77%). Own research survey has been realised during spring of 2019.

**Keywords:** social business, perception of customers, gender, education, level, Czech Republic.

### **Introduction**

Social entrepreneurship differs from classical business, in particular through its social dimension and mission. The concepts of social business and social enterprise are currently on the rise, and this leads to the question of what entities under these terms can be ranked. For the first time, these concepts appeared in the 1990's in Western Europe and the USA (Defourny, Nyssens, 2010). The understanding of these concepts is very different across the world, which has contributed to the different political and historical development of individual countries that adopt the social business to their cultural roots and conditions. In Western Europe, the perception of the social business is closely intertwined with European democratic values.

Definition of a social enterprise is ambiguous as there are various opinions what social business is and isn't. Choi and Majumdar (2014) claim that social entrepreneurship is an essentially contested concept (based on the original work of Gallie (1956), essentially contested concepts inevitably involve endless disputes about their proper uses on the part of their users.), and for that reason reaching one universal definition that would be accepted by everyone is hardly possible. Additional different concepts of social enterprises have developed in US and Europe. We were focus on Europe concept, where EMES European Research Network conducted the major research work in social enterprises in 1990s. Especially countries that were part of the European Union before 2004. One could view social enterprises as organisations with an explicit aim to benefit the community, initiated by a group of citizens and in which the material interest of capital investors is subject to limits (Defourny, Nyssens, 2006; Yunus, Moingeon, Lehmann-Ortega, 2010; Škarabelová, 2005; Evers, Laville, 2004).

Some authors don't class charities and charitable funds as the potential social businesses in their work (Hunčová, 2005). On the other hand Dohnalová (2011) believes that if charities and charitable funds have some supplementary economic activities then they belong to the social economy (Defourny, 2009). There are also different views on religious institutions that are not generally regarded as social businesses. However, according to Hunčová (2004) some of religious institutions, charities and sheltered workshops could be viewed as social businesses. A social business addresses a social issue while being financially sustainable (Yunus, Moingeon, Lehmann-Ortega, 2010). Social enterprises that complement the job offer for socially disadvantaged people in society are looking for answers to the question of how to engage new customers and keep them up.

Taking into account the EMES International Research Network definition, a social enterprise has these 4 characteristics (Defourny, Nyssens, 2006):

- a continuous activity, selling goods or/and services, it is not a non-profit organization;
- a high degree of autonomy, they may depend on public subsidies but are not managed by public authorities or other organizations;
- a significant level of economic risk;
- a minimum amount of paid work.

The social dimension of a social Enterprise is given by these 4 criteria:

- an explicit aim to benefit the community;
- an initiative launched by a group of citizens;
- decision-making power not based on capital ownership;
- a participatory nature, which involves the various parties affected by the activity.

All of these attributes point the social companies as a very effective solution for social cohesion and sustainable growth. The main goal of these enterprises is to benefit society.

In Czech context are often established as a response to difficult life situations in which family members, friends, and acquaintances were found. These companies are in a highly competitive environment where one of the main goals of maximizing profits. Their non-social competitors have other competitive tools to reach their customers. These "weapons" are backed up by a sufficient amount of money. The financial situation is one of the main situations that make the operation of social enterprises more difficult. However, there are approaches and methods that can be used to reach customers in case of low financial budgets. The Social Business Initiative (SBI) launched in 2011 is a plan to support the development of social enterprises and has the intention of making easier for the social companies to obtain funding, increase their visibility and making the legal environment friendlier for them.

Social Business is a comprehensive set of activities that are referred to as entrepreneurial activity and is based on three pillars - economic, environmental and social (Francová, Bednářiková, 2011), and on democratic principles and fundamental decisions are discussed with all shareholders. An important aspect distinguishing these businesses from classical is the emphasis on the balance between social and economic values, e.g. profit (Dohnalová, Průša, 2011).

Social enterprises are often set up as small, medium firms or large non-profit groups and are designed to ameliorate a difficult situation threatening certain people, the environment, or sometimes a combination of these parameters (Durieux, Stebbins, 2010). Some of these entrepreneurs are altruists (Durieux, Stebbins, 2010) what is one reason for their non-successes. Failures of non-profit organizations could be originated from similar problems as are in social companies (Gordon, 2015):

- Philanthropic inadequacy — it is described as lack of sources, which are required to full-function of social companies and their absence strike at the existence of that kind of companies;
- Philanthropic particularism — it is focused on preferences specific social problems in large amount instead others, which rise the situation, where some problems are not solved and are ignored;
- Philanthropic paternalism — it represents an effect of a dependence of social companies and financial help from external sources;
- Philanthropic amateurism — is related to employing non-qualified staff in social companies. These companies usually cannot employ qualified and educated staff because of their financial requirements. Therefore, they are reliant on the help of volunteers with no or low level of useful knowledge.

### **Social business in the Czech Republic**

In the last few years, there has been a development of social business in the Czech Republic, but the conditions for it are not ideal. Social entrepreneurship has almost no support in the Czech legislation (Dohnalová, Průša, 2011; Frič, Šilhánová, 2001), there is

as yet no generally accepted definition. In addition, these enterprises face general mistrust in this type of business activity (Dohnalová et al., 2009).

In 2017, however, the subject-matter of the Social Business Act was adopted, which respond to the need to create a unified legal environment for social business. The purpose of this law is to establish the conditions for granting the status of a social enterprise.

Several years ago were launched 10 indicators for social businesses in the Czech Republic. These indicators are based on five principles: public benefit, social benefit, economic benefit, local benefits, and environmental benefits. Social business must fulfil all of the mentioned principles. In the Czech Republic, there are currently 238 social enterprises registered with an organization called 3P. Their register, which is also known as the Ministry of Regional Government, is a unique source of information about social businesses in the Czech Republic. Disabled people, long-term unemployed people, youngsters in a difficult life situation or ethnic minorities are often employed in social businesses. Homeless people, ex-prisoners or drug-addict people are less likely to be employed by these types of firms (P3, 2015).

Based on 3P's annual register the majority of social businesses operate in agriculture services, education services, cleaning services, including property maintenance, hospitality and accommodation, ironing, and manufacturing of decorative products. We could have also seen a boost in transport, tourism, digitalization/copyright and manufacturing of metal products in 2015 and 2016. The highest concentration of social businesses is in Prague (more than 50 companies) and only lowest concentration is in Karlovy Vary region (Malá, 2017).

Social enterprises faced often problems they are related to limited human and financial resources, with 62% of social entrepreneurs, 48% marketing, 74% lacking time, and entrepreneurs often see the problem of insufficient volume the number of orders is 54%, which is related to the previous three points, and 39% of the employees represent a considerable percentage of the problems, which is obvious because these companies employ workers who are otherwise unemployed on the labour market (P3, 2015).

There is no mention in literature, what lead customers to make purchase product from social beneficial company and specification of his/her purchase decision-making process. In general, customer represents a key element for each company, on which must be targeted all business and marketing activities. The main condition for effective targeting is knowledge of customers' requirements, connected to individual person (Who), purchasing amount (How much), a way of purchasing (How) and purchasing motives (Why). The most difficult is a specification of customers' motives. Basic differentiation of all customers' motives is considered in accepting or rejecting an offer. Both cases need to answer relevant reasons for possible improvements and next developing the offer.

### **Adequate understanding of human reactions on individual products**

The basic premise for adequate marketing decisions is required a correct understanding of human reactions on individual products, prices, and kind of communication. Therefore, it is necessary to monitor the relationship between mall marketing suggestions and consumers' reactions (Tomek, Vávrová, 2011; Mulačová, Mulač et al., 2013; Bellini, Cardinali, Grandi, 2017; Sharma, Sivakumaran, Marshall, 2010).

The behaviour of customers in the consumer market is strongly influenced by various factors. The significant role in decision-making process makes actual impulse, which moved-out rational reasons and gives priority to purchasing-point (Betancourt, Gautschi, 1992). All impulsive buys are closely connected with emotional activities and cognitive learning, what lead to influencing behaviour and positive decision for purchase. If this decision is linked to needs satisfying, customers get correct experience and move them to other potential customers with positive purchase references (Puccinelli et al., 2009).

The most considerable model for analysing customers' reaction is "black-box model". This model helps to show problems in customers' behaviour prediction. There is put under research buying customers' behaviour in chain stimulus/suggestion – black box – reaction. The black box represents the interaction of consumer to causing factors in the decision-making process. All factors, which influencing customers and its mind, are based on three groups. The first group consists such kinds of stimulus, preparing from tools' combination in a marketing mix. These stimuli are connected together and impact customer in a complex way. The second group includes effects, which are employed in a marketing environment. Last third group includes internal factors such reaction of customers on previous groups (Mulačová, Mulač et al., 2013; Vysekalová et al., 2011; Muruganatham, Bhakat, 2013).

According to model black box, Kotler and Keller (2006) defined basic factors, developed from a specific environment, where purchasing consumer is located. These factors consist individual items of culture, social environment, personal and psychological. All of these factors must be comprehended to cause on customers' black boxes in an effective way.

Social enterprises usually provide services in own workplace (Koudelková, 2014). For this kind of businesses, there is the typical fact that customers are caused by factors like atmospherics, crowding perception and visitor satisfaction (based on tourism theory).

Atmospherics-according to marketing point-of-view, people are influenced by some environmental factors called as atmospherics such as colours, sounds, other people, forms of exhibition, in the process of purchasing decisions. Those factors influence people's purchasing and decision-making behaviour either positively or negatively. A study by Baker (1986) was a starting point for determining the factors that form atmospherics, e.g. layout, colours, complexity, employees, lifting, voices, smells. Bitner (1992) suggested that atmospherics can be measured by the evaluation of environmental conditions such as spatial order and functionality. To these factors proposed Bitner (1992), Evan and Berman (1995) the inclusion of external environment of a place, e.g. entrance, windows

exterior architecture, etc. These theories are based on in-store communication (Jesenský, 2013).

Crowding Perception – the crowding concept is mainly examined theoretically in the context of environmental and behavioural psychology (Neuts, Nijkamp, 2012) and exist two basic theories. The first one suggests that an individual's crowding perception is a kind of behavioural restraint and stimulus load (Kaya, Weber, 2003) which is an inappropriate social communication. According to the second perspective, crowding is perceived when other people intervene and individuals experience (Stokols, 1972).

Visitor satisfaction – is important e.g. in restaurant or cafeterias. Some researchers have suggested that satisfaction means the meeting of needs, while others have argued that it is a process influenced by psychological conditions (Tian-Cole, Crompton, 2003).

Gender differences are received as kind of social signals on base of comprehension of content. Effects of gender have been ignored. Nowadays, there are approaches to observe perception in social and mental fields to find out possible impacts on communication (Barkley, Gabriel, 2007; Pavlova, 2009). Many researchers (Costa, Terracciano, McCrae, 2001; Rahmani, Lavasani, 2012, He, Wong, 2011) consider, that there could be differences between perception of marketing campaigns from point of view men and women. At same time, they point out necessity adequate knowledge about target market. Perception of the company or product is based on the knowledge or experience with these elements at side of customers and consumers.

## **Methods and Data**

The purpose of the research as base for this paper is to find out differences between perception of final customers and companies, labelled as social ones. The main objective of the paper is identify relationship between knowledge of social companies and chosen demographics (region, gender, education) in Czech Republic. Main hypothesis is that there are dependence in between the perception of social companies in connection with these demographics.

To specify connection between perception and social business label questionnaire survey was realised. Sample population was created by 1009 consumers that were chosen in random way. There were returned questionnaires from 371 respondents (return rate is 36.77%). Own research survey has been realised during spring of 2019.

Gained data were processed by IBM SPSS Statistics 25. Then, there was employed calculation of dependency between two variables by means of contingency tables and Pearson's chi-squared test. Pearson's chi-square test for independence of variables provides a basic view on the relationship between variables and help to show intensity of the dependency.

## Results

Results of the questionnaire survey showed, that 74.7% of all respondents or don't want to visit or don't know, if they visit any company with social parameters. Just 25.3 % of all respondents visit social companies with direct plan. From visiting companies, the most visited kind of social company is café or restaurants. The highest concentration of visited cafés and restaurants is in Prague region and as second region is South Moravia (Table 1).

Tab. 1: Knowledge of visits social businesses according to their industry

	No visits	Café and restaurants	Production industry	Services	Total
Central bohemia region	37	7	1	3	48
South Bohemia region	10	0	2	1	13
Liberec region	6	2	0	0	8
Hradec Králové region	14	3	0	1	18
South Moravia region	67	8	9	10	94
Pardubice region	5	0	0	0	5
Prague region	57	18	3	2	80
Plzeň region	4	2	0	1	7
Karlovy Vary region	7	0	0	0	7
Ústí nad Labem region	11	5	0	0	16
Vysočina region	15	0	0	2	17
Olomouc region	10	2	0	2	14
Zlín region	6	2	2	2	12
Moravia-Silesia region	9	1	0	0	10
Slovakia and others	18	0	0	0	18

Source: own work of authors.

For evaluation of defined hypothesis there were chosen other variables except region of the respondents. Frequencies of the chosen variables are included in Table 2. Concept of social businesses know 45.73% of respondents (in connection to education level, the knowledge is mainly for undergraduates). In case of knowledge of any foundations, at least one foundation know 83.02% of all respondents.

Tab. 2: Frequencies of individual variables

		<b>Absolute</b>	<b>Percentage</b>
Gender	Woman	250	67.75
	Man	119	32.25
Education	high school - with graduation	117	31.54
	high school - with no graduation	1	0.27
	undergraduate / graduate	253	68.19
Knowledge of social business	Yes	166	45.73
	No	197	54.27
Foundation knowledge	No knowledge	63	16.98
	One foundation	74	19.95
	Two foundation	67	18.06
	Three foundation	167	45,01
Social business visits	Yes	94	25.34
	No	273	73.58
	Don't know	4	1.08

Source: own work of authors

The results of the dependency test are provided in Table 3 which examines the dependency between gender, region, education and knowing foundation, visiting social business. The results of the dependency examination in individual variable categories are depicted in the following results of Pearson's chi-square test.

Maintaining the % reliability of the test, there was compared the established value with 0.05 which represents a 5% reliability level. The value 0.050 of Pearson chi-square test is smaller than 0.05, which represents 5% error of bad decisions (95% confidence level). Therefore, it could be assumed that there is dependence between individual variables, i.e. education and knowing foundation (sig.=0.014), education and visiting social business (sig.=0.002), and region and knowing foundation (sig.=0.001). From point of view of the region and visiting social business, there is significance value of Pearson chi-square test at 0.062 which means that there could be potential dependence in the future (Table 3).

Tab. 3: Specifies of observed dependencies between individual variables

		<b>Value</b>	<b>Significance</b>
Gender vs knowing foundation	Pearson chi-square	2.384	0.497
	Contingency coefficient	0.080	
Gender vs visiting social business	Pearson chi-square	1.226	0.542
	Contingency coefficient	0.058	
Education vs knowing foundation	Pearson chi-square	15.885	0.014
	Contingency coefficient	0.203	
Education vs visiting social business	Pearson chi-square	17.253	0.002
	Contingency coefficient	0.211	
Region vs knowing foundation	Pearson chi-square	78.473	0.001
	Contingency coefficient	0.420	
Region vs visiting social business	Pearson chi-square	42.740	0.062
	Contingency coefficient	0.323	

Source: own work of authors.

## Conclusion

Social companies offer employment for disadvantaged citizens, what leads to develop present society on the way of getting new customers and keep actual customers. Main purpose to establish social company is difficult life situation of founders. Such kind of companies enter to high competitive business environment, where main business aim is to reach maximal profit and choose different business models.

Several years ago were launched 10 indicators for social businesses in the Czech Republic. These indicators are based on five principles: public benefit, social benefit, economic benefit, local benefits, and environmental benefits. Social business must fulfil all of mentioned principles. In the Czech Republic there are currently 216 social businesses registered with an organisation called 3P. Their register, which is also known at the Ministry of Regional Government, is a unique source of information about social businesses in the Czech Republic. Disabled people, long-term unemployed people, youngsters in a difficult life situation or ethnic minorities are often employed in social businesses. Homeless people, ex-prisoners or drug-addict people are less likely to be employed by these types of firms.

The main objective of the paper is identify relationship between knowledge of social companies and chosen demographics (region, gender, education) in Czech Republic. According to observed relationships of individual variables, there were defined three connections with defined statistical dependence:

- Education and knowing foundation (signif. = 0.014; conting. coef. = 0.203);
- Education and visiting social business (signif. = 0.002; conting. coef. = 0.211);
- Region and knowing foundation (signif. = 0.001; conting. coef. = 0.420).

From these dependencies, relationship between Region and knowing foundation reaches the highest intensity value in comparison to the rest. This intensity is 0.420, what could be considered as rather high value.

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## **Consequences of Workplace Stress – Company Case Study**

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### **Abstract**

The issue of work-related stress has been addressed by researchers for a decade, while less interest in the issue has been shown by company executives. In spite of the known effects of work-related stress, not sufficient attention is devoted to it by the top management. A case study was applied in our research to investigate the stress level of employees and consequences of workplace stress in the chosen company. Our research activity was supported by personal observation, document analysis, interviews and a questionnaire survey. The results show that negative impact of stress on the employee health (calculated economic effect of stress) is significantly higher than the cost of employee training. Creating a pleasant work environment and improving the cooperation of co-workers may result in reduction of sick leave and the employee fluctuation.

**Keywords:** workplace, workplace stress, employees, employee health.

### **Introduction**

The review of scientific literature shows that stress was an unknown phenomenon 100 years ago both in private life and the world of work. The first records about stress date back to the 1930s, when it was described as physical strain or physical symptoms resulting from overload. Over the years, both physical and psychological overload have become symbolic expressions (Seilerová, 2019), and nowadays we think about stress as mental strain.

What has changed during the years? What is the reason that people are unable or less able to cope with difficulties they face in life?

The answer can be approached from two different perspectives. Compared to the situation 100 years ago, the world has undergone tremendous changes in economic, social and scientific terms. Due to development, the labour market has undergone significant changes, the family model has changed and masses of women started to work. As a consequence of scientific development and changes in education systems, more and more students are entering higher education and finish their university studies. The life stages of young people have changed since they spend longer time in education. It is acceptable in the 21<sup>st</sup> century that young people live with their parents even in their twenties. A certain ratio of students take up work during their studies, while others do not have interest in that. Changes in lifestyle and shift of different important events in their life is characteristic compared to standards 100 or even 20 and 30 years ago. These trends brought changes in parenting; parents are protecting their children more than before, providing and ensuring everything for children has become their main goal. This is the reason why young people find it difficult to cope with stressful situations and lack coping skills (Klimplová, 2012). Parents have been protecting their children since early childhood, so their children face stressful situations and challenges rarely. They are trying to help their children, quite often by solving the problems their children face. As a result of this fact, young people do not develop the ability to cope with difficulties and stressful situations or it is developed later. Young people face less physical challenge than before, and they are not forced to encounter difficult situations.

As a global reason might be mentioned the busy lifestyle and the conflict of roles (Remi, 2018). Expectations are increasing in different areas of life and it is becoming increasingly difficult to meet them.

The study is examining the occurrence of workplace stress and its impact on employees. The main objective of the case study applied is to explore the most common causes of workplace stress; how employees experience the positive and negative impact of stressful situations; quantifying the consequences of stress and propose specific solutions for the company problems.

## **Theoretical overview**

### **The physiological impact of stress**

The concept of stress was first discussed in details by Hans Selye, the Hungarian physician (Selye, 1936; 1956; 1976). He was the first to define stress as „a nonspecific response of the body to any demand”, which is the lowest common multiple of an organism’s response to any stress it experiences (Cooper, 2000).

The term used by Selye caused confusion in the scientific community, since the term is interpreted in two different ways. One refers to external effects of stress on the organism, while the other refers to changes in human body caused by external factors (Juhász, 2002). Over the past few decades, various definitions of the term had been used that contributed to misinterpretation of the term (Le Fevre and Kolt, 2010; Jex, Beehr and

Roberts, 1992; Kahn and Byosiére, 1992). The terminology „stress“ has not disappeared from the scientific and everyday use (Briner, Harris and Daniels, 2004).

Kahn and Byosiére (1992) made more suggestion for the use of terminology „stress“, which made the research on stress more transparent.

Our study is based on the most general definition of stress applied by Cropanzano et al. (2005), Juhász (2002), Kahn and Byosiére (1992). According to this definition, stress is an interactive process, when the environmental circumstances and events (stressors) have impact (physical, psychological or social) on the individual. The factor that triggers stress is called a stressor. A stressor can be anything that causes a state of strain or tension and we treat it as a source of stress that generates reaction (Bagdy, 2007). The presence of some factors causes tension and dissatisfaction in almost everyone.

Stress is present in everyone’s life and might have different forms. There are basically two types of stress. Eustress is a term used for positive stress, which has positive impact, enhances our performance, exploits hidden energy reserves and has positive impact on our body. Distress refers to negative stress that impairs our performance, makes it difficult to cope with stressful situations and its constant presence can cause serious health problems and illnesses (Bernardi, 2019). It appears as a reaction to stressful life events e.g. heavy workload, financial problems, stressful relationships, death. The fast lifestyle is also contributing to increase of stress. Not everyone can cope with everyday stress. The first symptom might be the fatigue, but in long-term the immune system is affected. Cardiovascular disease, atherosclerosis, hypertension, stomach problems, indigestion, depression and sleep disorders can be the signals of stress. That is why it is important to reduce the level of stress at work and find the appropriate stress management techniques.

Most people are aware of the concept of stress. They can feel, experience and recognize the symptoms of stress, but they feel less informed how to prevent, avoid or combat it. Only few people know which factors influence the risk of developing stress and which are the factors that can reduce the level of stress. In order to provide a focused overview of the issue, we will only deal with work-related stress.

### **Work-related stress factors**

Since in most of the cases individuals are assessed based on their workplace performance, many people find their daily work stressful due to performance constraints.

The workplace stress models make it possible to capture the characteristics of the work environment and help in the analysis of work-related stress issues. The study highlights the most important sources of work-related stress below.

#### *Person Environment Fit Model*

According to this model, there are two sources of workplace stress. The first is, when the opportunities provided by work cannot meet the motivation and needs of the employee. The other source of stress is when the requirements and the skill-set of the employee are not in accordance with the job profile. The requirements include the workload or the

complexity of work to be conducted. Tension can arise if the employee does not have the skills to meet the requirements, but also if the skills are beyond the requirements of the job and cannot be appropriately utilized in the position. The disadvantage of this model is that cannot predict the expected occurrence of stress (Salavecz, 2011).

#### *Jobs-Demand Resources Model*

Requirements are considered the psychological stressors present in the work environment e.g. strained work pace, time pressure, demanding work, unclear and contradictory expectations. The control examines, whether the employee has the opportunity to use his or her abilities and skills, can learn new things and utilize his or her creativity. It also controls the decision-making power regarding the work conditions e.g. whether the employee can influence the manner and pace of the tasks he or she has to complete (Karasek, 1979).

Later, a new variable was added to the model: social support at the workplace. The model assumes that the worst health condition is expected when the requirements are high, but the decision-making ability, the employee control and the employee support are low (Salavecz, 2011).

#### *Effort-Reward Imbalance Model*

According to this model, if the effort between the work completed and the reward for this work is imbalanced, the tension caused might result in worsening health condition (Siegrist, 2004).

The effort and reward dimensions measure the factors of work-related stress. These efforts are the time pressure, interruptions, work responsibility, physical effort, overtime and the increasing workplace requirements (Salavecz, 2011).

#### *Workplace injustice*

The theory of workplace injustice highlights the importance of different types of unfair treatment the employee is directly involved. One of its components is related to the company's distribution systems, while the other focuses on the way the company operates. The unfair distribution is closely related to the fairness of the system the employees are rewarded (Moorman, 1991).

It is important how the company managers treat their subordinates, in what measure the employees are involved in decision-making processes, whether the decision-making is free from prejudice (Salavecz, 2011; Novotný, 2014; Kaźmierczyk, Chinalska, 2018).

#### *DRIVE-model of the workplace stress*

The DRIVE-model — „Demand - Resources and Individual Effects-model” presents the main external-organizational and internal-personal factors of the workplace stress (Mark, 2008). The detected level of workplace stress depends on the actual workload, workplace resources, personal factors and the subjective assessment. The interaction of these factors

and the effect of supporting factors will determine, whether stress will have a long-term effect or not.

Since the success of organizations depends, among other factors, on success, reliability, quantity and quality of the human performance, one of the most important managerial tasks is to provide working conditions that can support the expected performance of the employee both in physical and sociological terms. Ignored stressful situations might have serious consequences on the individual and the organization as well.

### **The consequences of work-related stress**

The research of British and American scientists highlights that the work-related stress increases the number of days spent on sick leave. The estimated numbers show that stress in the US economy reduces the productivity indicators by tree billion dollars yearly. The main reasons listed are the health insurance costs, the accidents and the replacement of the employee (Ember, 2009). The increased stress level can result in weak performance, increased employee fluctuation, absenteeism and customer dissatisfaction.

The state of emotional exhaustion is often associated with irritability, antipathy, repetitive use of power tools (e.g. punishment) and indifference (Jakab et al, 2006; Fapohunda, 2017). Positive emotions are a key factor in organizational performance and commitment. Understanding the emotions of employees is essential for HRM, since the managerial practices and the organizational environment influences the employee behaviour (Kanten-Sadullah, 2012; Bognár, Bencsik, 2016).

In recent years, many international organizations have raised awareness of psychosocial risks and work-related stress. However, steps ahead have been made in understanding work-related stress; there are still gaps in effective application of knowledge into practice on organizational level. Work-related stress is one of the most commonly reported causes of work-related illnesses, affecting more than 40 million people in the European Union. Reasons include the lack of awareness in the European countries that is often linked to lack of expertise and the appropriate infrastructure. There is a clear need to implement systematic and effective prevention strategies linked to company management practice (Zoni – Lucchini, 2012; Stefko, 2019).

The case study is the most suitable research method for detecting workplace incidents and work-related stress. The theoretical features of case study and its application in the company will be described below.

## **Research method**

### **Case study**

The case study is a systematic, well-prepared and methodologically sound observation and data recording method. Observation and interview techniques are mainly applied in case studies. There are four main characteristic features of case studies: openness, communication between the researcher and the participant, naturalness and clarity

(Dolnhof, 2001. p.9.). „The openness of case study means that the researcher does not work with pre-defined research questions and methods, but is open to change his or her ideas, questions and tools during the research“ (Kormos, 2004. p.26). The interpretative nature of case study stems from the fact that the case described appears „as a world interpreted by the researcher and the researched“ (Dolnhof, 2001. p. 16). The case study can support a theory or hypothesis and helps us draw some general conclusion.

### *Practical research*

#### Introduction of the company

The case study as a part of this research was conducted in a small retail shop, selling sport equipment. The worldwide success of the company is due to high-quality own-branded products, tailored to specific sport and sold at affordable price. The R&D activity serves as a basis to own-brand development. The long-term goal of the company is to operate as a 100% passion brand. It means to exclude the world known brands from their shelves (approx. 20%).

Organizational structure: the company is characterized by divisional organizational form. The divisions (21 stores) are organized according to achieved profit and territorial principle. In terms of management, the operational decisions are in the hands of store managers, while the leaders of strategic units are responsible for making strategic decisions.

Organizational culture: The company is proudly committed to core human values. It is looking for future employees considering these values, but also expects these values to be respected by all the employees of the company. These values are the following: honesty, responsibility, altruism, vitality. The pursuit of innovation and focus on the future are also important values.

Competitors and the market: Based on public data available, the company is close to the market leaders, but has to fight for the market leader position on domestic and international market as well.

The issue addressed in case study: The employees are exposed to self-perceived stress at work, and the workplace stress has impact on private life and health of the employees.

In order to provide in-depth investigation to the problem, personal interviews, observation and a questionnaire survey was conducted. The results of the questionnaire survey will be presented below. The questionnaire was accessible online and the respondents used the internal information system of the company to fill in the questionnaire survey. The questionnaire included 19 questions. The questions aimed at identifying stress situations, reactions of respondents to these situations and the consequences. The survey contained closed questions, nominal and metric variables and a 5-point Likert scale was applied. The data analysis methods were the following: frequency and mean tests, correlation, crosstab analysis, independent t-test in SPSS statistics.

The questionnaire survey was not compulsory; the employees were motivated by their managers to participate in the research. 87% of the staff, 165 employees participated in the survey, working in different stores.

Demographic data: the questionnaire was completed by 65.5% of female and 35.5% male respondents. This ratio reflects the proportion of man and woman working for the company. The average age of the respondents is 18 - 25; 41.2% of the respondents belong to this group. The ratio of respondents between 25 and 30 is 34.5%. This result reflects the average age of the company employee (27.5%).

21.2% of the respondents completed high school education, while 45.5% of them had a university degree. 50% of the female respondents had university or college degree, while this ratio of male respondents reached only 40%.

The survey differentiates 4 types of respondents based on their work position: sales staff, managers, office managers and other. 56% of the male respondents worked as sales staff compared to 70% of female respondents in the same position. Managerial position was taken over by 31% of the male respondents. This ratio was only 22% with female respondents. The survey has shown that respondents with college or university degree were in managerial positions (50%), while those with completed secondary education (89%) worked as a sales staff. Based on the observation technique and the questionnaire survey applied in our research, the following hypothesis was formulated.

### *Hypothesis*

The age, gender and job title affect how employees in the company experience work-related stress.

## **Results**

After collecting the demographic data of the respondents, the survey questions focused on work-related stress. The stress experienced by the employee can be positive or negative. 64% of the respondents experience stressful situations negatively, while 36% experienced stress in a positive way. The analyses show significant difference between the male and female respondents. Less than half of the male respondents (44%) and 73% of the female respondents had negative experience with work-related stress. The Chi-square test confirmed the gender difference (Pearson's Chi-square: 15.750 df: 1 sign.:.000  $p < 0.05$ ).

The question arises whether there is any relationship between the age of the respondent and the impact of stress. We determined three age groups: respondents under the age 30, respondents between 30 and 40, and the over 40 group. We detected no significant difference between the age groups experiencing stress (Pearson's Chi-square: 3.542 df: 2 sign.: .170  $p > 0.05$ ). 61% of the respondents in their twenties, 73% of the respondents in their thirties and all the respondents in their forties struggle with stress.

There was no significant difference in respondents' perception of stress in terms of their educational background (Pearson Chi-square: .116 df: 3 sign.: .990  $p > 0.05$ ).

Negative stress experience was detected among the representatives of sales staff (66%), while managers had positive stress experience (83%). Significant correlation with stress can also be observed in terms of work position: Pearson's Chi-square: 13.456 df: 3 sign.: .004  $p < 0.05$ . It can be summarized that the older female employees (sales staff) are more likely to have negative feeling with stressful situations.

Further target of the analysis was how employees feel the work-related stress influences their workplace performance. Most of the respondents (70%) reported that they have problems with concentration, more than a third of them make mistakes more frequently than in general and almost every second respondent feels more stressed and enters a conflict with colleague. Not only negative, but positive effects were mentioned by the respondents as well. One fifth of the respondents in this study gain energy from stress and almost a third of them perform better under stress.

The research highlighted the stress factors the employees of the company face. The respondents had to use a five-point scale to assess the frequency of stress factors (1=never and 5=always). The following table presents the mean and standard deviation of the stress factors.

Tab. 1: The occurrence of stress factors at workplace

	N		Mean	Standard deviation
	Valid	Missing		
Time management	165	0	2.87	1.054
Work-life balance	165	0	3.03	1.123
Relationship with colleagues	165	0	1.99	.907
Conformity and making mistakes	165	0	2.41	.999

Source: Own editing.

The results presented in Table 1 show that stressful situations connected to work-life balance is the most frequent. The highest value of standard deviation can be detected in this case, which shows that the respondents did not agree at this point. Stressful situations between the colleagues are the least frequent; the answers provided by the respondents are similar. The study also analyzed the relationship between these variables. A slightly strong correlation can be detected between time management and conformity (Pearson's correlation:  $r: .391$  sign.: .000  $p < 0.05$ ), similar level of correlation can be detected between time management and the work-life balance (Pearson's correlation:  $r: .379$  sign.: 0.00  $p < 0.05$ ). The obtained results are understandable. The less time the employee has to complete the task, the more likely they will make mistakes or experience problems with time management e.g. overtime. These also have impact on work-life balance.

The study examines how male and female respondents are affected by these factors. The results of Independent Samples T-Test are summarized in Table 2.

Tab. 2: Gender based Independent T-test (p=0.05)

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Time management	.285	.594	-.425	163	.671	-.074	.173	-.415	.268
Work-life balance	.307	.580	-2.630	163	.009	-.475	.181	-.832	-.118
Relationship with colleagues	1.426	.234	-.298	163	.766	-.044	.149	-.338	.250
Conformity and making mistakes	3.591	.060	-2.178	163	.031	-.352	.162	-.672	-.033

Source: Own editing.

Based on the results presented in Table 2 we can summarize that in terms of work-life balance and conformity there is difference between the male and female respondents. In both cases, these factors occur more frequently with female respondents. However, the ANOVA studies have shown that there is no significant difference in terms of the respondent age among the factors. Time management proved to be a problem in managerial positions (average: 3), while workplace conformity factor occurs more frequently with sales staff (average: 2.29). A significant difference can be detected in case of these two factors.

Tab. 3: ANOVA results (p=0.05)

		Sum of Squares	df	Mean Square	F	Sig.
Time management	Between Groups	36.015	3	12.005	13.210	.000
	Within Groups	146.313	161	.909		
	Total	182.327	164			
Work-life balance	Between Groups	4.575	3	1.525	1.214	.306
	Within Groups	202.273	161	1.256		
	Total	206.848	164			
Relationships with colleagues	Between Groups	.359	3	.120	.143	.934
	Within Groups	134.635	161	.836		
	Total	134.994	164			
Conformity and making mistakes	Between Groups	8.490	3	2.830	2.934	.035
	Within Groups	155.304	161	.965		
	Total	163.794	164			

Source: Own editing.

The results obtained also confirm the presence of the mentioned models above. Stress has a significant impact on the health of the respondents (average: 3.45 on a five-point scale, where 1= no impact, 5=high impact). Stress has higher impact on female respondents (female average: 3.61, male average: 3.19). Most of the respondents can cope with the consequences of stress (64%). About 66.1% of the respondents ask for help in dealing with stress. The age, gender and the work position do not make difference between the respondents.

Table 4 presents who is providing help for the respondents in stressful situations. The respondents had to assess whom they ask for help on a five-point scale (1= not characteristic at all, 5= absolutely characteristic).

Tab 4: Who do the respondents ask for help?

	Mean	Standard deviation
Family member	4.21	1.181
Friend	4.35	1.044
Colleague	3.34	1.239
Superior	3.33	1.364
Professional	3.05	1.510

Source: Own editing.

It can be summarized that respondents ask help from their family members or friends. In-company stress management is not common. Around 65% of the surveyed respondents expressed their interest in learning about stress management techniques.

Finally, the results above also confirm that there is a reason why stressful situations are not handled in the company. 23% of the respondents think that nobody examines the consequences of stress, while 71% of the respondents do not even know about this kind of activity.

No stress management data was found during the document analysis of the company, which would support the answer provided by the respondents. However, there is an employee satisfaction survey, so the problem can be indirectly addressed in the questionnaire survey.

## **Discussion**

The survey conducted in the company revealed that the most dominant stressors in day-to-day work are meeting the requirements, time pressure and maintaining the work-life balance.

The hypothesis was confirmed. The age, gender and work position influence how the respondents experience stress. Based on the answers, the Jobs-Demand Resources Model and the Person Fit Environment Model problems can be identified.

Differences between genders were identified in case of multiple factors, but the results reflect that women feel more uncomfortable in stressful situations. Negative stress has deeper impact on older colleagues.

In terms of position, salespeople are more likely to experience stressful situations, while the executives reported positive impact in the same situations. Concerning health, the respondents had different opinion about the impact of work-related stress on their health in terms of individual ability to cope with stress.

## **Solution to the problem, proposal**

The results of the analysis and the personal observation show that stress testing and measuring the consequences of stress are not present in the company. The employees rarely address the management with the problem, while direct and indirect effects of stress can be measured in terms of company performance.

In order to provide useful proposals for the management, additional company data was needed, which was obtained through document analysis. Although estimated results of company stress could be obtained, but more evidence is needed to call the attention of company management to address the issue of workplace stress. The data obtained from company documentation can be used to calculate the additional costs of stress-related health problems. The calculations are based on the answer of respondents participating in the survey. 64.2% of the employees reported that their health problems, and thus their time spent on sick leave and sick pay is closely linked to workplace distress. We also examined the proportion of those employees who considered their illnesses to be related to workplace stress. 35% of sales staff and 29% department managers considered their health problems are closely related to workplace stress, while neither of the directors reported clear answer to this question. This ratio was 50% in case of employees working at the headquarters. As we continue to examine the economic impact in terms of different work positions, this set of data is a basis for the following calculations.

The average gross salaries for different positions were considered, while calculating the company cost for a day sick leave. The following table presents the wages on monthly basis.

Tab. 5. Average wages

Jobs	Average wages
Sales staff	167.946 HUF
Department managers	326.174 HUF
Store managers	650.851 HUF
Headquarter employees	573.404 HUF
<b>Average</b>	<b>429.594 HUF</b>

Source: Own editing.

In addition to costs paid after the colleague on sick leave, the costs of employee replacement were also calculated to get the total cost.

The number of absent hours as a result of sick leave was 9483 hours in 2018, so the average per person was 50 hours a year. If calculations are made on full-time employment basis (8 hours a day), it means 6.25 days /employee. An average monthly wage of 429.594 HUF means the following costs for the employer:

- it means 6,25 days sick leave a year, during which the employer is obliged to pay a social contribution, which is 22% of the gross wage.
- replacing the colleague on sick leave

If calculations are made on basis of 9483 hours of sick leave, the following results are obtained:

- counting with 168 hours, the equivalent of hourly wage will be:  $429.594/168=2.557$  HUF
- the social contribution paid after 9483 day of sick leave is:  $(9483*2.557)*0,7*0.22=3,734,197$  HUF
- the cost of employee replacement in case of 9483 hours is  $9483*2557=24,248,031$  HUF
- in summary:  $3,734,197+24,248,031=27,982,228$  HUF

The result of final calculation above shows the costs of sick leave for the company on yearly basis. It is an important information, but does not provide detailed data regarding the research. It has to be emphasized that the stress-related diseases do not make up 100% of the sick leave on annual basis. According to our research results, 43% of the employees feel that their illness is closely related to workplace stress. If we consider only 43% of the sum above, we receive a substantial sum of 12 million HUF.

Using Internet resources and price quotations, we can conclude that the sum of 12 million HUF is far more higher than the cost spent on stress management training. It can be said that a 2-day multi-field stress management training designed for companies would cost 60 000-100 000 HUF/employee.

Being a sport-related trading company, special attention is paid to the qualification of employees in different kinds of sports. Participation on basic employee training is compulsory, while participation on innovative types of trainings is optional. The company is organizing in-house trainings, where the trainers are employed by the company and

provide trainings additionally to their day-to-day activities. The selection of trainers is made possible by the performance evaluation system.

Application for trainings and managing dates of trainings happens with a help of HR software, where the dates of trainings are uploaded by trainers and the employees can apply with the agreement of their supervisor. The level of employee qualification is also tracked with the help of this system as well as the availability of trainings designed for them.

In addition to in-house trainings, if the employee has been working more than five years for the company or more than three years in a higher position, they have a possibility to participate on trainings organized by external experts. These are self-awareness courses, communication or language courses.

### **Proposal**

An optimal solution can be to select an employee from each department store, who is keen on providing trainings for colleagues and open to addressing different issues, solving problems. Since qualifying trainers have already been successful on other areas, considering the company culture, this should not be a problem either. The company consists of 21 department stores and one headquarter. If we calculate the costs of qualifying 22 trainers, the highest cost of stress management training per capita is 100,00 HUF; calculating the total cost we get 2,200,000 HUF. This cost is much lower than the mentioned 12 million HUF. By providing a stress management training for employees following the probation period, the company would be able to improve its HR indicators e.g. fluctuation that was 37.5% in 2018.

### **Conclusion**

The company management and the employees have already recognized that they are exposed to work-related stress, which has impact on their private life. According to answers provided by the respondents, the biggest stress for the employees is maintaining the work-life balance. As one of the stressors was mentioned the company communication, whether the communication is realized with the headquarters or superiors. The communication is not always clear, direct and open. Employees also reported physical illness as a result of workplace stress.

The data obtained showed that the estimated cost of stress-related sick leave is much higher than the hypothetical cost the company would spend on helping employees to prevent stress or dealing with stressful problems. In addition to cost-efficiency, we proposed a solution that could be fully integrated into the current knowledge management system of the company. A smooth implementation of this solution is expected.

The mentioned data shows that all of the successful companies should consider an initiative related to stress prevention and dealing with workplace stress. This step would

be important not only to improve the economic performance of the company or reduce costs, but as the new tendencies show, this is the most valuable resource to ensure the performance of human capital and retaining employees in the workplace. Losing valuable workforce and the replacement is one of the biggest challenges the companies face nowadays.

Several previous case studies and the examination of models above demonstrates the relationship between the parameters we have also researched. Fan and Smith (2017) observed railway workers in terms of work-life balance and well-being at work based on the impact of workplace stress. The results showed that the staff who perceived high levels of control and support had a better work-life balance and an increased sense of well-being. A positive personality was associated with positive well-being both at work and outside of work. Williams et al. (2017) used the Demands-Resources- Individual Effects (DRIVE) Model and the Well-Being Process Questionnaire (WPQ) to reveal relationships, where the logistic regression showed that well-being outcomes were predicted by high positive personality and low negative coping. Positive job appraisals were predicted by high resources and low demand. Smith and Smith (2017) investigated the implications of well-being at work, considering the relationship between the individual and the organization. Their research results showed a positive relationship in terms of positive consequences of managerial decisions on their employees. Pisanti et al. (2011) detected a similar relationship investigating the job characteristics of Dutch and Italian nurses in relation to organizational conditions vs distress-eustress. Several further studies can be mentioned showing the same result. All of these support our proposal that the managers of organizations should pay emphasized attention on workplace-stress and its consequences.

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## **Financing of adverts and its impact on the brand value**

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### **Abstract**

The brand represents an important role not only for managers of companies of different sizes in strategic decisions, but also for consumers in their daily lives. It expresses the certain relationship between the product and the customer, and its value has both the ability and the power to influence the purchasing decision-making process of customers. Building brand value is a very important and fundamental step for every company. If a company wants to have a strong market position and also own a strong brand, it must make every effort and cost to implement the planned strategies.

The aim of this article is to define the theoretical basis of the brand as well as brand value and its relation with financing of adverts from the viewpoint of Slovak and foreign authors. This includes a regression and correlation analyses focused on investigate the dependence between the advertising costs and brand value in technology industry. The basic sources of research were secondary data obtained from worldwide surveys in the form of rankings published by Interbrand, Forbes magazine, annual reports of companies and published professional publications. General scientific methods were applied for the processing of the data, as well as mathematical-statistical methods to evaluate the data collated from the results of regression and correlation analyses and test the linear independence. The results of an analyses show that the advertising costs and brand value are linearly dependent, specifically it is medium-strong direct linear dependence. Therefore, the financing of adverts has a direct effect on brand value in technology industry.

**Keywords:** brand value, financing of adverts, advertising costs, technology brands, technology industry.

## **Introduction**

A brand that is associated with a product or service plays a critical role in developing customer relationships and business success. Through the right concept and efficient brand management, the company has the prospect of building a high-quality reputation that will help to increase the trust of its employees and, above all, its customers. Consumers can choose from a wide variety of product alternatives on the market, making them more difficult to make choices. The brand, therefore, plays an important role in the decision-making process.

Nowadays, brands have become a phenomenon whose importance goes far beyond the manufacturer's desire to differentiate itself from competing products or services. In recent years, brands have been a symbol of the quality and values they represent in their design. Also, the current global competitive market is pushing the company to a quick choice among the products offered (Siekelova and Podhorska, 2016; Salaga et al. 2015). Thus, the strong brand represents one of the most valuable assets of the company and also a very effective tool in a competitive battle.

The brand value for the consumer lies in the trust in the unmatched quality of the product at a stable price, advantageous purchase, product satisfaction, brand communications with consumers, traditions, customer's associations with a particular brand, the prestige given by using the product and so on (Lizbetinova 2017; Gajanova and Podhorska 2019). Associations that a consumer deals with in connection with the brand are such an abstract aspect that contributes to the brand value creation and can be both positive and negative.

The aim of this article is to define the theoretical basis of the brand as well as brand value and its relation with financing of adverts from the viewpoint of Slovak and foreign authors. This includes a regression and correlation analyses focused on investigate the dependence between the advertising costs and brand value in technology industry. The basic sources of research were secondary data obtained from worldwide surveys in the form of rankings published by Interbrand, Forbes magazine, annual reports of companies and published professional publications. General scientific methods were applied for the processing of the data, as well as mathematical-statistical methods to evaluate the data collated from the results of regression and correlation analyses and test the linear independence. The results of an analyses show that the advertising costs and brand value are linearly dependent, specifically it is medium-strong direct linear dependence. Therefore, the financing of adverts has a direct effect on brand value in technology industry.

The issue of the brand value has been researched and analysed by many foreign and domestic authors, and remains actual.

The brand value gives the product sufficient credibility. Borden (1942) called it "hidden value", which is not available or is not possible for consumers to check at the point of purchase. In other words, it is a kind of power that a brand has over its competitors or generic brands and that has evolved over time. Brand value refers to the added value that a particular brand can influence a customer's decision making and motivation to buy (Management Mania 2016). According to Aaker (2003), the brand value is a set of assets

or liabilities linked to a brand's name and symbol that adds to or subtracts from the value provided by a product or service. However, in addition to these standard items, the value of the brand and the company is also made up of extensive intellectual property, goodwill and last but not least, the price of brands that they have in their portfolio. On the other hand, Keller (1993) perceived the brand consistently from a consumer perspective. While the previous definition dealt with brand value as a corporate value, it focuses both on consumer response to target brand marketing through positive associations and on a different image compared to similar products. Keller also argued that brand value consists of only two dimensions: brand awareness and brand image. Leek and Christodoulides (2012) define brand value as the value of goods and services, as well as added value (functional and emotional) from the brand. The brand value is often monetizable because companies invest substantial funding in the creation and management of a brand (Rodrigues and Martines, 2016; Trinh et al., 2016). As a result, this effort leads to increased sales of branded production. Mostly, this element is referred to as the added value of products or services, which is based on how consumers perceive a brand in its price, market share, or the profit rate that the brand produces (Wang and Tzeng 2012).

We generally determine brand value in terms of marketing efficiency, but it is unique for each brand. Thus, according to several characteristics, it is possible to say that each market operator has, in his own subjective opinion rather than on the basis of facts and characteristics, a certain definition of brand value.

Over the years, many authors have dealt with the issue how financing of marketing communication including advertising affects brand value.

Villarejo-Ramos and Sanchez-Franco (2005) in their research indicate the positive effect of marketing communication on brand equity, and offer strong support for the measures of perceived quality, brand loyalty, brand awareness and brand image as antecedents of brand equity. Yang and Bai (2017) deals with the issue how promotion affects the brand value and highlighted the fact that brand value evaluation helps companies understand their own brands, so that they can take reasonable and effective measures of brand management to enhance their competitiveness, to create greater benefits. Peterson and Jeong (2010) empirically investigated and proposed the framework linking advertising expenditures and research and development expenditures to brand value, and brand value in turn to firm-level financial performance. Eng and Keh (2007) found out that spending on advertising results in better brand sales and brand profitability. Brand value is also a good predictor of brand performance. Thus, they concluded that advertising and brand value benefit the brand and the firm through improved accounting performance. Majerova and Krizanova (2014) deals with the impact of advertising on the brand value in Slovak Republic. Liu et al. (2018) compared the differential effects of event-marketing and advertising expenditures on brand value and company revenue. The authors found that both event-marketing and advertising expenditures had positive impacts on company revenue and brand value. As a brand aged, advertising expenditure continued to yield positive returns on brand value and company revenue, whereas event marketing had diminishing marginal returns on brand value and company revenue.

As follows from the above, combination of a brand's strategic emotional image, appropriate financing of adverts and thus effective marketing campaign is likely to lead to a stronger perception of the brand from a consumer perspective, and thus to an increase in brand value. Within a business entity, we can identify brand value as a relevant part of the value of the entire business. It can be stated that a truly valuable brand is able to generate certain planned benefits as one of the essential activities in building and managing brand value as a specific tool of the international corporate strategy. With the positive outcome of a successful brand value, a company can make more profits, improve brand awareness, as well as the overall reputation of the business. Increasing the value of a brand can create a strong relationship between sellers and customers, which has the effect of strengthening the competitive advantage over other companies.

## **Methods and Data**

As part of the science project APVV — Slovak abbreviation of Slovak Research and Development Agency, our study “Integrated model of management support for building and managing the brand value in the specific conditions of the Slovak Republic” we investigated the factors affecting brand value. We focused on the world’s most valuable brands, based on Best Global Brands 2019 Rankings published by Interbrand and The World's Most Valuable Brands 2019 Rankings published by Forbes magazine.

As mentioned, many different factors impact the brand value, such as total costs, market value, incomes, customer attitudes as well as financing of adverts, and so on. Advertising includes the means by which companies remind consumers, inform them or try to convince them of the brands they offer. It is a paid form of impersonal mass communication, presentation of products and ideas through various kinds of media (Nica and Taylor, 2017). We can say, it represents the brand's voice. Its advantage is that it can reach a large number of people dispersed over a large area in a relatively short time. The main drawback is that advertising takes the form of a monologue, that is, only one-way communication to a high cost consumer. Institutional advertising, which focuses on improving the brand image, raising its awareness, promoting consumer loyalty, etc. has a greater impact on building the brand value. On the other hand, product advertising emphasizes the characteristics and qualities of the products that are its object.

Our survey focused on investigation the dependence between a company’s advertising costs and the brand value in the rapidly developing technology field. Companies are constantly coming into the market with new innovative products, to which competitors immediately react by offering substitute products with comparable characteristics. Therefore, it is necessary for a company to strengthen its brand value, which should result in a competitive advantage. Every year, many brands spend huge amounts of money just on financing of adverts. However, advertising is useless if it does not bring the desired effect (i.e., it does not meet the target that was set at the start of the advertising process). The cause of failure may be an incorrect advertising strategy or ineffective communication (Hitka et al., 2017). The impact of financing of adverts and advertising

costs incurred in brand value is very difficult to quantify because brand value is affected by many other factors in addition to advertising.

Our sample included 20 of the most valuable global technology brands based on the previously mentioned worldwide surveys published in Forbes magazine. We assessed the impact of the advertising costs on the brand value set for the year 2019. In our study, the consistency of input data played a key role in the methodical approach for quantifying brand value.

From the group of 20 ranked brands, we eliminated brands without information on the amount of advertising costs in 2019. This sample was thus reduced to 16 brands. Table 1 shows the world's most valuable brands in the technology industry with information about their rank, brand value, brand value change, brand revenue, and company advertising costs (Forbes 2019; Interbrand 2019).

Tab. 1: The world's most valuable technology brands 2019

Rank	Brand	Brand Value (\$M)	Brand value change (%)	Brand revenue (\$M)	Company advertising (\$M)
1	Apple	205,500	12	265,800	-
2	Google	167,700	27	136,200	6,400
3	Microsoft	125,300	20	110,200	1,600
4	Amazon	97,000	37	211,400	8,200
5	Facebook	88,900	-6	48,800	1,100
7	Samsung	53,100	11	221,600	3,600
13	Intel	38,800	14	70,800	1,200
15	Cisco	34,500	7	49,300	166
18	Oracle	32,200	4	40	138
20	IBM	31,500	-2	79,600	1,500
22	SAP	28,700	10	29,100	-
38	Netflix	15,500	34	15,800	1,800
52	HP	12,500	1	52,100	-
60	SONY	11,300	10	66,900	3,700
66	Adobe	10,500	27	9,000	174
67	Ebay	10,500	2	9,700	1,400
77	PayPal	9,100	22	15,500	484
90	Dell	8,200	10	79,200	1,100
95	Hewlett-Packard Enterprise	8,100	-	30,900	568
97	Huawei	8,000	-4	108,900	-

Source: Forbes 2019; Interbrand 2019.

Statistical hypothesis testing is one of the most important statistical inference procedures. The role of statistical inference is to decide on the basis of information from the available

choice whether we accept or reject certain hypotheses regarding the basic set. In verifying the correctness or incorrectness, we proceeded in accordance with the methodology of statistical hypothesis testing, which consists of the following steps (Rimarcik 2007):

1. Formulation of the null hypothesis (H0).
2. Formulation of the alternative hypothesis (H1).
3. Determining the level of significance ( $\alpha$ ).
4. Calculation of test statistics and probability.
5. Decision.

### **Hypothesis 1**

Hypothesis H0: Between the advertising costs and the brand value in technology industry there is no statistically significant relationship.

Hypothesis H1: Between the advertising costs and the brand value in technology industry there is statistically significant relationship.

Significance level  $\alpha$  was determined at 0.05. To calculate the test statistic, we used Microsoft Excel software.

We evaluated the relationship between brand value and the amount of advertising costs using the Pearson correlation coefficient (PCC), which is a measure of the linear dependence (correlation) between two variables, x and y:

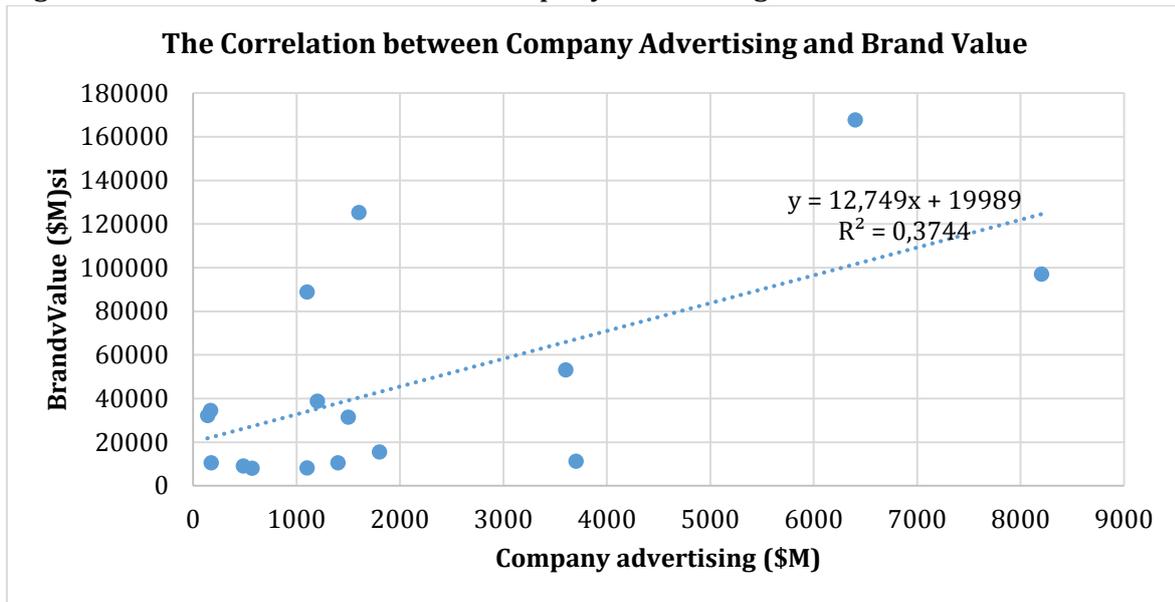
$$R = \frac{cov(x,y)}{s_x*s_y} = \frac{\bar{xy}-\bar{x}*\bar{y}}{\sqrt{\bar{x}^2-\bar{x}^2}*\sqrt{\bar{y}^2-\bar{y}^2}} \quad (1)$$

### **Results**

Figure 1 shows a graphical representation (scatter plot) of the relationship between a company's advertising cost and brand value, which we tried to express by means of a linear function.

Table 2 shows the results of our regression and correlation analysis, which we performed using Data Analysis in Excel. The PCC value is 0.6119, which means that the advertising costs and brand value are linearly dependent, specifically it is medium-strong direct linear dependence. However, it is necessary to verify whether examined parameters are indeed linear dependent or not. For verification, we use the test of linear independence.

Figure 1: The correlation between company advertising and brand value



Source: Authors.

Tab. 2: Summary output of regression statistics

Regression Statistics	
Multiple R	0.6119
R Square	0.3744
Adjusted R Square	0.3297
Standard Error	39577.8625
Observations	16

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1.31E+10	1.31E+10	8.3794	0.0118
Residual	14	2.19E+10	1.57E+09		
Total	15	3.51E+10			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	19989.0296	13456.0791	1.4855	0.1596	8871.3898	48849.4489	8871.3898	48849.4489
Company advertising (\$M)	12.7490	4.4042	2.8947	0.0118	3.3029	22.1952	3.3029	22.1952

Source: Authors.

We evaluated the degree of causal dependence between the brand value and amount of advertising costs by applying a coefficient of determination, which is defined as the square of the correlation coefficient R. The value of the coefficient of determination in this case is  $R^2 = 0.3744$ , which means that 37.44% of the variance brand value is explained by a linear

relationship with advertising costs (regression line). Up to 62.56% of the variability values of brands can be explained by other causes, such as a linear relationship between the advertising costs and brand value.

The test of linear independence includes the following steps:

1. Determination of the null hypothesis:

$$H_0: R=0 \quad (2)$$

The correlation coefficient is considered to be null, so the variables are linearly independent.

2. Determination of the alternative hypothesis:

$$H_1: R \neq 0 \dots \quad (3)$$

The correlation coefficient is significantly different from zero. Thus, the variables are linearly dependent.

3. Selection of the significance level

$$\alpha=0,1 \quad (4)$$

4. Application of the test criteria:

$$T = R \cdot \sqrt{\frac{n-2}{1-R^2}} \quad (5)$$

The test criteria in the case of causal dependence between the advertising costs and brand value is 2.8947.

5. Critical field of the test:

$$|T| \geq t_{\alpha} (n - 2) \quad (6)$$

where  $t_{\alpha} (n - 2)$  is the critical value of the  $t$ -distribution at the significance level  $\alpha$  with  $n-2$  degrees of freedom, to be 2.1448.

6. Decision:

In the case of causal dependence verification between the brand value and amount of advertising costs, the inequality applies, so we do not accept the hypothesis  $H_0$ , we accept the hypothesis  $H_1$ . Therefore, the correlation coefficient is significantly different from zero, and the variables are linearly dependent. It means, that the correlation between the brand value and amount of advertising costs exists.

## Discussion

In practice, the brand value can be positive or negative. Positive is created by effective and efficient promotion and satisfaction of customers' wishes, expectations and needs. On the other hand, negative brand value is often created by gambling and improper brand management.

A high value brand is an important business asset that can have a longer lifespan than the products themselves. The high brand value gives the company a range of competitive advantages and has a prominent place in consumer awareness, making it easier for them to gain loyalty. High-value brands also give companies a degree of protection in price competition.

Having a strong brand recognition can help sell products or services. But certain brands have become much more than that – they have become so ubiquitous that they are an integral part of the lives of millions worldwide. It can be hard to precisely measure the full value of a high-quality brand, but it goes far beyond just a familiar logo and the product or service. Companies spend enormous amounts of money, time, and energy to ensure their brands are not just well known, but also well liked, and therefore more profitable.

To maintain a strong brand, companies must offer high-quality products and good customer service while also supporting by appropriate financing of adverts focused on increasing the brand value and brand loyalty (Gajanova and Kramarova 2016).

The most valuable brands represent a wide array of different products and services. However, technology companies have emerged as the dominant sector, representing each of the top five brands, as well as six of the top 10 most valuable brands in the world. Technology companies are racing to make the next big breakthroughs in technology, particularly AI or artificial intelligence.

## **Conclusion**

Our results indicate that the brand values included in our analysis were directly determined by the amount of advertising costs. The brand value of technology brands is therefore significantly dependent on financing of adverts.

Innovation in IT technologies, evolving consumer tastes and preferences are creating a competitive landscape for technology brands. Thus, building and managing the brand value represents an important process. Due to the growing competition, this process requires its efficient operation and use well targeted financing of adverts. It is the brand value that gives the consumer a perception of the brand.

Effective brand value management allows to create a brand that is different from others. Based on its value, the brand improves customer loyalty and also helps to determine positioning, as it is essential for the brand to reach consumer awareness.

The issue of financing of adverts and its impact on the brand value has the potential for deeper research in the future - both qualitatively and quantitatively. To obtain statistical relevance, it would be appropriate to investigate the findings of qualitative research quantitatively. A further qualitative investigation would be appropriate for expanding knowledge and comparing the impact of advertising on brand value in other industries, possibly exploring the impact of other communication tools on brand value and their comparison.

## Acknowledgement

This paper is the outcome of the science project **APVV-15-0505: Integrated model of management support for building and managing brand value under the specific conditions of the Slovak Republic.**

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# **Customer segmentation based on psychographic and demographic aspects as a determinant of customer targeting in the online environment**

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## **Abstract**

Because of the large number of communication tools available in the online environment, besides creating an attractive product, hotel management needs to accurately target each segment through meaningful content and find a relevant communication journey of informational nature. For this reason, the aim of the contribution is to propose customer segmentation based on psychographic and demographic aspects as a determinant of customer targeting in the online environment. Due to the impossibility of its determination and subsequent application across the entire market, we determined the segmentation in the selected industry based on a survey of customers (hotel guests) in the Slovak Republic. By means of scientific research methods such as excerpting, description, comparative analysis, deduction and induction, determination of absolute and relative number, level of mean values, confirmation of the existence of dependency between variables, we extracted the obtained data from marketing research into the required information necessary to fulfill the aim of the contribution.

**Keywords:** customer, segmentation, online environment, hotel industry.

## **Introduction**

Because of the current global crisis of tourism, many entities seek to analyse the reasons and impacts of the crisis in the tourism and follow-up services. Regardless of the different

attributes for bringing the phenomenon of travel to the forefront to as many clients as possible, hotel marketing cannot neglect the appropriateness of distributing information (marketing communication). As the primary role of marketing communication is to influence the consumer towards purchasing a product or service, this marketing mix tool is under considerable pressure to achieve demonstrable business results in forms such as influencing the sale of products and services, increasing brand awareness, or getting customer information.

In order to reduce this pressure, hotels are looking for new solutions. It can be stated from the above that marketing communication is a tool of the marketing mix, which is characterized by constantly emerging new trends. With the development of the media, the structure of users and target clients has changed significantly. The enormous boom of the online environment gives multiple opportunities to communicate with target groups. Because of the large number of communication tools available in the online environment, besides creating an attractive product, hotel management needs to accurately target each segment through meaningful content and find a relevant communication journey of informational nature. For this reason, the aim of the contribution is to propose customer segmentation based on psychographic and demographic aspects as a determinant of customer targeting in the online environment. Due to the impossibility of its determination and subsequent application across the entire market, we determined the segmentation in the selected industry based on a survey of customers (hotel guests) in the Slovak Republic.

## **Literature review**

The marketing communication program can be built on the foundations provided by the communication model, respectively communication process (Clow and Back, 2008). This means that marketing communication involves identifying the target audience and shaping a coordinated communication program to produce the desired response from that audience, as the communication world has become a complicated complex and the changes have made it necessary to add new elements to the basic communication mix.

New forms of marketing communication are associated with the development of technology, online communication, the Internet and social media in the early 21st century. This means that the new form of marketing communication will be tools and techniques in an online environment that have not been involved in creating and building a strong and mutual relationship between the business and its customers. Pizano (2012) ranks among the new forms of marketing communication: behavioural targeted banner advertising, in-text advertising, social network marketing, online video advertising, location-based marketing, PPC marketing, influencer marketing, online booking systems, email marketing and enterprise web page.

The rise in promotional costs, especially in media, forces businesses to take a very responsible approach to identifying their customers (Krylov, 2019, Chijioke, 2018). This

implies that many businesses use the value spectrum model that according to Kramárová (2009) puts the system into marketing communications by determining the most effectiveness content and media combination. The whole model consists of the following steps:

- Creating a value spectrum - through which the company quantifies the value of its customers and then determines their importance.
- Extending the value spectrum with a dimension of loyalty - the success of a business is not only guaranteed by the individual value of the customer, but also by the long-term relationship between the business and the customer.
- Setting up a communication campaign for each segments based on the harmonization of communication tools.

At the same time, this model achieves a more efficient budget allocation according to the customer's lasting value (customer profitability determines the distribution of the communication budget between and among customer groups), gains more relevant customer information in each segment. The information mainly concerns the needs of customers, which can then be met in a targeted way, and a meaningful integration of communication tools according to specified tasks in individual segments will achieve a synergistic effect of marketing communication. (Kramárová, 2009). It follows that the effectiveness of marketing communication in the company is determined by the definition of target groups of customers. Socio-demographic variables (age, education, income, occupation and family status) are important factors in which an enterprise can detect its priority target segments. Psychographic segmentation is a response to demographic limitations in the area of behaviour prediction. The construct of the psychographic profile of the segment is based on person's characteristics according to AIO model. The AIO model monitors Activities, Interest and Opinions and combines both external and internal characteristics to map lifestyles. (Queiroz, 2019; Valetteflorence, 1990).

Determination of target groups helps the hotel better plan adequate online communication, i.e. for the hotel it is necessary to create heterogeneous communication messages for heterogeneous groups and to use adequate online communication channels or methods for each identified segment. In the case of the content of the communication report, Maráková (2016) distinguishes the following strategic aspects of its delivery to customers), emotionally (the content of the report raises positive or negative emotions motivating the purchase of a hotel product) and morally (the content of the report focuses on the recipients' ability to understand what is right). When selecting and creating a communication message, it is necessary to consider not only its content, but also its structure, style and format (Maráková, 2016). The hotel determines the structure by telling the communication message to the identified groups. The best communication messages include those that encourage the identified group to draw its own conclusions about it (Maráková, 2016). The hotel can apply formal or informal, simple, complex or professional style. The hotel determines the format of the communication message depending on the type of communication method (Kotler et al., 2007).

According to Maráková (2016), online communication channels through which the hotel can communicate its message are divided to primary and secondary ones. Primary online communication channels are made up of websites, including the hotel website, which constitute the primary source of information about hotel products respectively services. Secondary online communication channels consist of social networks, online advertising, online reservation systems, geolocation services etc. When choosing an online communication channel, the hotel should take into account the following decisive factors: to which online communication channels the target audience pay increased attention, and which online communication channels will highlight the hotel itself. Gúčík (2011) differentiates online communication channels into two groups. The first group consists of interactive online communication channels that provide information created and also verified by the hotel (online videos, hotel website). Their character is primary. These online communication channels are subject to the highest level of control, but with the possibility of a higher risk of distrust of customers. The group of interactive online communication channels is also made up of secondary ones, i.e. channels providing information created and verified by the company with the possibility of open discussion of the company with customers (social networks, interactive websites). The second group consists of personal online communication channels, which may also be primary or secondary in nature, based on the provision of information generated and verified by other people. Primary personal communication channels consist mainly of own experience or providing information directly from hotel staff. Secondary personal communication channels include communication activities related to e-WOM marketing, e-mailing and blogs.

## **Methods and Data**

The aim of the paper was to propose Customer segmentation based on psychographic and demographic aspects as a determinant of customer targeting in the online environment. Due to the impossibility of its determination and subsequent application across the entire market, we determined the segmentation in the selected industry based on a survey of customers (hotel guests) in the Slovak Republic. With regard to the objective of the paper, the information needs of research were formulated, namely the finding of the level of use (preference) of new forms of online marketing communication by customers in the Slovak Republic and the impact of these forms on their decision in the hotel selection. At the beginning of the research, we looked at its merits within the hotel industry and therefore we set out the research question: Does hotel online marketing communication affect the customer's decision?

To answer this research question, we asked the respondents in a marketing survey focused on customers (hotel guests), whether their communication with the hotel over the Internet suits them, whether they consider the hotel providing its information over the Internet to be better, and to what extent the respondents agree the fact that the

internet communication of the hotel influenced them in its choice. The obtained data were statistically tested using hypotheses:

- Hypothesis A: 80% of customers in the Slovak Republic are satisfied with communication with the hotel via the Internet.
- Hypothesis B: 80% of customers in the Slovak Republic think that marketing communication with the hotel via the Internet is more efficient than traditional communication tools.
- Hypothesis C: 80% of customers in the Slovak Republic agree that the new forms of online marketing communication used by hotels have an impact on their decision to choose this hotel.
- Hypothesis D: 80% of customers in the Slovak Republic consider a hotel that provides its information through the new forms of online marketing communication used to be of higher quality.

For customer-oriented hypotheses, we used statistical one tailed test with alpha level 0.05.

We assume that the research question will be evaluated positively, as online marketing communications in the hotel industry play an increasingly important role in shaping customer attitudes and evaluating online communication activities (Brettel a Spiller-Atting, 2013). The area of online marketing communications is becoming important for hotels due to a significant change in the characteristics of the hotel industry clientele. The post-crisis period brings to the scene a traveler who is aware of his values as well as the value of services offered to him through hotels (Jakovic, Galetic, 2014). While previously hoteliers have been more focused on the physical product itself, they are now more focused on guaranteeing the stability and clear image of their brand, transparent prices, and attracting clients, particularly with regard to re-interest through various forms of online marketing communications that different hotel from the rest of the competition (Järvinen et al., 2012). The effectiveness of marketing communication in the company is determined by the definition of target groups of customers.

Demographic criteria are most obvious to marketing and are quite easy to obtain compared to other ones. If these characteristics of customer change over time, it can be assumed that their consumer behaviour will also change (Kliestikova et al., 2019). In this respect, age, gender, as well as variables that are more socio-economic in nature like as education, economic status and income are generally monitored. Psychographic segmentation criteria divide consumers into different clusters based on different lifestyles (Kotler and Armstrong, 2004). Lifestyle as one of the characteristics of market behaviour can be tracked and analysed from many different viewpoints, often in combination with other segmentation factors. For purpose of the research we used lifestyle generational market segmentation (Michman et al., 2003). Understanding generation values and motivations has become essential because each generations is driven by unique ideas about the lifestyle to which it aspires (Smith and Clurman, 1997).

Each generation represents a different set of unique expectations, experiences, generational history, lifestyles, values, and demographics that influence their buying behaviours. There are many studies, which identify and analyse differences in consumer behaviour according to the customer generations (McCrinkle and Wolfinger, 2010, Schewe and Meredith, 2004, Bourcier-Bequaert and Barnier, 2010, Rentz and Reynolds, 1991, Reeves and Oh, 2008, Noble and Schewe, 2003, Sima, 2016, DeAlmeida et al, 2016, Chakraborty, 2017, Diaz-Samiento et al., 2017, Nadanyiova, 2018). For the purposes of this contribution, respondents are segmented into five classifications by their generational cohort: (The Baby Boomers; Silent Generation; Generation X; Generation Y and Generation Z.

For this reason, we investigated whether there were customer segments (based on demographic or psychographic factors) in the hotel industry preferring new forms of online marketing communications (banner advertising, online communities, hotel website, online booking systems, email marketing, SEO marketing, SEM marketing, podcasting, Wiki, Facebook, Twitter, Instagram, LinkedIn, YouTube, Blogs, Foursquare - geolocation, crowdsourcing, augmented reality, PPC marketing, affiliate marketing, adver gaming, copywriting, e-WOM marketing). Respondents were asked to choose the internet communication tool with the hotel they consider most advantageous.

To confirm the existence of such segments, we have established hypotheses:

- Hypothesis E: There is no statistical dependence between gender and some form of online marketing communications.
- Hypothesis F: There is no statistical dependence between education and some form of online marketing communication.
- Hypothesis G: There is no statistical dependence between economic status and some form of online marketing communication.
- Hypothesis H: There is no statistical dependence between income and some form of online marketing communication.
- Hypothesis I: There is no statistical dependence between the generation and some form of online marketing communication.

The variables examined are of nominal and ordinal character, therefore Kendall tau C and Kruskal wallis test were chosen as suitable measures of associations (Rimarčík, 2008).

As 730 respondents participated in the marketing survey, the minimum sample size requirement (384 respondents, at 95% confidence level and 5% confidence interval) was met and respondents' answers to individual questions asked during the survey period based on determined reliability coefficients with acceptable error estimates can be considered as relevant. For the purposes of the research we chose the questionnaire method via e-mail communication. The questionnaire consisted of three sections, where the first section concerned finding out whether respondents had visited a hotel in the Slovak Republic in the last 12 months. In this way, we only received answers from customers who visited the hotel. The second section of the questionnaire concerned

finding out the importance of the Internet for the respondent, the frequency of its use, its benefits and the level of use of internet communication and its tools in communication with the hotel. The last section of the questionnaire focused on the general profile of the respondent, i.e. gender, type of generation, highest level of education, economic status and net income.

By means of scientific research methods such as excerpting, description, comparative analysis, deduction and induction, determination of absolute and relative number, level of mean values, confirmation of the existence of dependency between variables, we extracted the obtained data from marketing research into the required information necessary to fulfill our goal.

## Results

Figure 1 shows the testing of all customer-oriented statistical hypotheses using statistical one tailed test statistical one tailed test.

Table 1: Testing of customer-oriented statistical hypotheses

Hypothesis	Level of significance	Test statistics (T-value)	Critical value of Z-score	Decision rule	Result of testing
<i>H<sub>0</sub>: 80% of customers in the Slovak Republic are satisfied with communication with the hotel via the Internet.</i> <i>H<sub>1</sub>: More than 80% of customers in the Slovak Republic are satisfied with communication with the hotel via the Internet.</i>					
<b>Hypothesis A</b>	<b>0.05</b>	<b>8,68037</b>	<b>1,64485</b>	<b>8,68037 &gt; 1,64485</b>	<b>H<sub>0</sub> rejection</b>
<i>H<sub>0</sub>: 80% of customers in the Slovak Republic think that marketing communication with the hotel via the Internet is more efficient than traditional communication tools.</i> <i>H<sub>1</sub>: More than 80% of customers in the Slovak Republic think that marketing communication with the hotel via the Internet is more efficient than traditional communication tools.</i>					
<b>Hypothesis B</b>	<b>0.05</b>	<b>6,87196</b>	<b>1,64485</b>	<b>6,87196 &gt; 1,64485</b>	<b>H<sub>0</sub> rejection</b>
<i>H<sub>0</sub>: 80% of customers in the Slovak Republic agree that the new forms of online marketing communication used by hotels have an impact on their decision to choose this hotel.</i> <i>H<sub>1</sub>: More than 80% of customers in the Slovak Republic agree that the new forms of online marketing communication used by hotels have an impact on their decision to choose this hotel.</i>					
<b>Hypothesis C</b>	<b>0.05</b>	<b>8,07757</b>	<b>1,64485</b>	<b>8,07757 &gt; 1,64485</b>	<b>H<sub>0</sub> rejection</b>
<i>H<sub>0</sub>: 80% of customers in the Slovak Republic consider a hotel that provides its information through the new forms of online marketing communication used to be of higher quality.</i> <i>H<sub>1</sub>: More than 80% of customers in the Slovak Republic consider a hotel that provides its information through the new forms of online marketing communication used to be of higher quality.</i>					
<b>Hypothesis D</b>	<b>0.05</b>	<b>4,58131</b>	<b>1,64485</b>	<b>4,58131 &gt; 1,64485</b>	<b>H<sub>0</sub> rejection</b>
<i>H<sub>0</sub>: 80% of customers in the Slovak Republic consider a hotel that provides its information through the new forms of online marketing communication used to be of higher quality.</i> <i>H<sub>1</sub>: More than 80% of customers in the Slovak Republic consider a hotel that provides its information through the new forms of online marketing communication used to be of higher quality.</i>					

Source: Authors.

Since the table shows that we have rejected the null hypothesis in all cases, when answering the research question, we can state that the selected new forms of online marketing communication used by the hotel have an impact on the customer's choice of the hotel. To determine the existence of segments preferring certain new forms of marketing communication, all established statistical hypotheses were tested, the results are shown in Figure 2.

Table 2: Testing of hypotheses in consideration of the existence of relationships

Hypothesis	Level of significance	Test statistics (p-value)	Decision rule	Result of testing
<i>H<sub>0</sub>: There is no statistical dependence between gender and some form of online marketing communications.</i>				
<i>H<sub>1</sub>: There is statistical dependence between gender and some form of online marketing communications.</i>				
<b>Hypothesis E</b>	<b>0.05</b>	<b>0.1798</b>	<b>0.05&lt;0.1798</b>	<b>H<sub>0</sub> acceptance</b>
<i>H<sub>0</sub>: There is no statistical dependence between education and some form of online marketing communication.</i>				
<i>H<sub>1</sub>: There is statistical dependence between education and some form of online marketing communication.</i>				
<b>Hypothesis F</b>	<b>0.05</b>	<b>0.2669</b>	<b>0.05&lt;0.2669</b>	<b>H<sub>0</sub> acceptance</b>
<i>H<sub>0</sub>: There is no statistical dependence between economic status and some form of online marketing communication.</i>				
<i>H<sub>1</sub>: There is statistical dependence between economic status and some form of online marketing communication.</i>				
<b>Hypothesis G</b>	<b>0.05</b>	<b>0.0731</b>	<b>0.05&lt;0.0731</b>	<b>H<sub>0</sub> acceptance</b>
<i>H<sub>0</sub>: There is no statistical dependence between income and some form of online marketing communication.</i>				
<i>H<sub>1</sub>: There is statistical dependence between income and some form of online marketing communication.</i>				
<b>Hypothesis H</b>	<b>0.05</b>	<b>0.3426</b>	<b>0.05&lt;0.3426</b>	<b>H<sub>0</sub> acceptance</b>
<i>H<sub>0</sub>: There is no statistical dependence between the generation and some form of online marketing communication.</i>				
<i>H<sub>1</sub>: There is statistical dependence between the generation and some form of online marketing communication.</i>				
<b>Hypothesis I</b>	<b>0.05</b>	<b>0.0000</b>	<b>0.05&gt;0.0000</b>	<b>H<sub>0</sub> rejection</b>

Source: Authors.

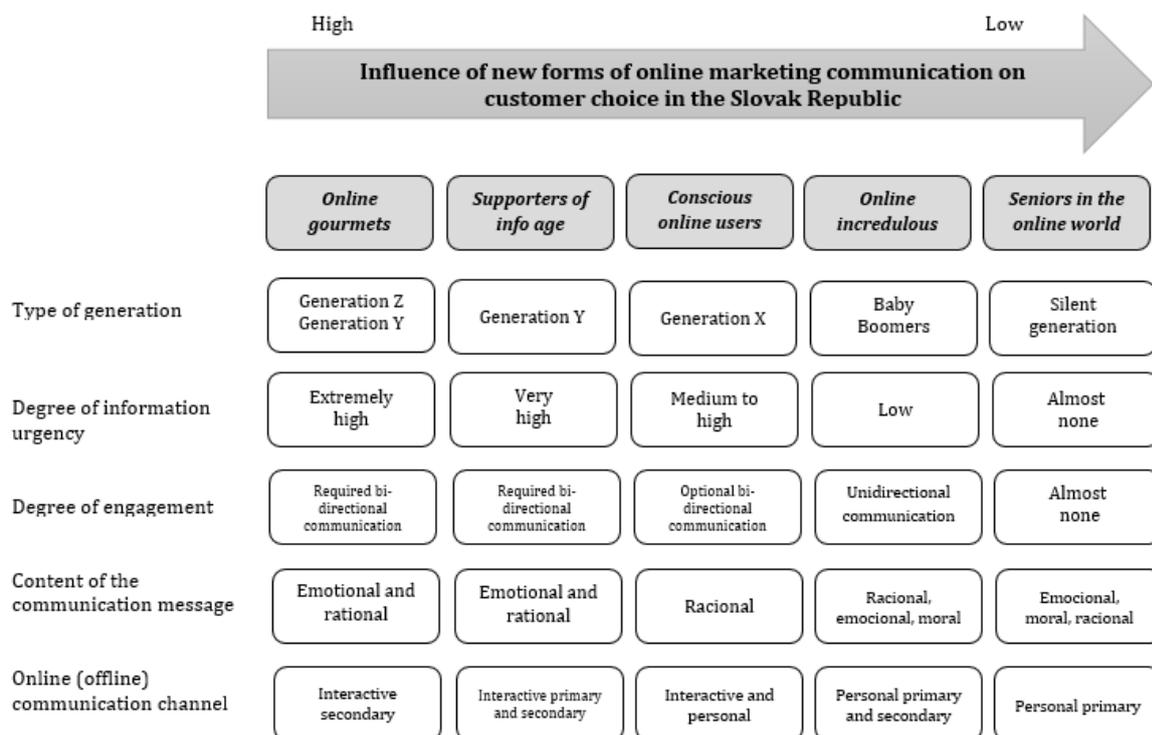
Since the table shows that we have accepted the null hypothesis in all cases, instead of the hypothesis I. So we can assume that there is a statistically dependence between surveyed variables (generation and forms of online marketing communications). These variables are of ordinal and nominal character, so the appropriate test was Kruskal wallis test of independence. The value measure of associations was 0.377, which indicates moderate dependence. So we can clearly claim that segmentation of hotel guests in the Slovak republic according the generation cohort is justified, so it is necessary to propose

customer segmentation just only on psychographic aspects as a determinant of customer targeting in the online environment.

## Discussion

From the above-mentioned analysis of customers (hotel guests) carried out from marketing research focused on them, content of communication message according to Maráková (2016), types of online communication channels according to Gúčik (2011) and secondary research of characteristic of generation cohorts (McCrandle and Wolfiger, 2010, Schewe and Meredith, 2004, Bourcier-Bequaert and Barnier, 2010, Rentz and Reynolds, 1991, Reeves and Oh, 2008, Noble and Schewe, 2003, Sima, 2016, DeAlmeida et al, 2016, Chakraborty, 2017, Diaz-Samiento et al., 2017) we categorized customers (hotel guests) into five groups, see Figure 3.

Figure 1: The categories of hotel guest according the influence of new form of online marketing communication

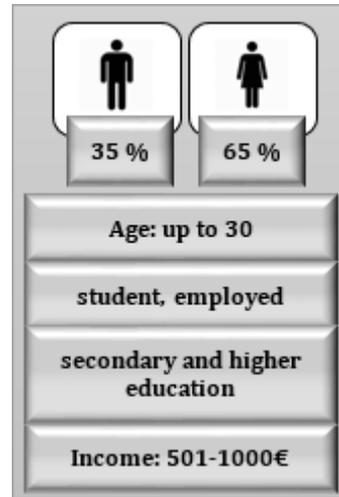


Source: Authors.

Based on the categorization, the hotel should select the appropriate content of the communication message, online communication channels and tools for each customer segment, and it is also necessary for the hotel to identify which customer segments want just only to be informed and which want to participate in the communication as well.

## Online gourmets

Figure. 2. Group 1.



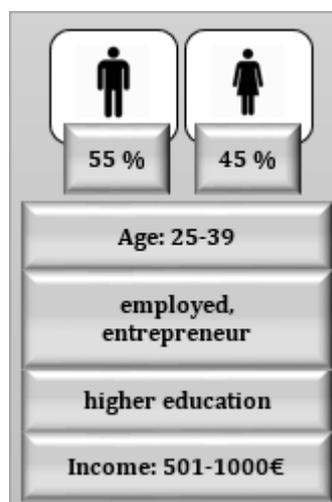
Source: Authors.

The online gourmet segment is made up of customers of the generation Y and mainly the generation Z, who are very technically and communication proficient and use modern technologies on a daily basis (Sladek and Grabinger, Ng and McGinnis, 2015). This group of customers is characterized by an exceptionally high degree of information urgency, as well as a degree of engagement in communicating with the hotel in an online environment through new communication tools. This is the type of customers actively seeking information about hotel services. As for the issue, online gourmets have an affective but also rational relationship to it, so the hotel should use a combination of emotional and rational approach to informing them. Since they are customers with their opinions and a high level of interest in information about hotel services, we recommend using two-way communication, which allows for dialogue between the hotel and its customers. For this reason, we also recommend the use of interactive secondary online communication channels with the possibility of open discussion. Media and information are an integral part of their lives and are therefore they are always online. Most of the day they spend on social networks, preferably on Facebook and Instagram, where they by comments, hashtags, likes and shares reflect about the activities of hotels, the quality of their services, the way of communication or the brand of the hotel itself (Cowan, 2014, Fromm and Read, 2018, Pate and Adams, 2013). They also consider online advertising on these social networks more attractive. Since the segment is not concerned about the misuse of its personal data, it is not hampered by behaviourally targeted online banner advertising, which even if it is in line with its interests, even clicks on it. Various websites offering different reviews or geolocation services or online reservation systems can also be an important source of information. Thanks to their skills and education, the online gourmet segment is highly motivated to progress in both professional and private life. Their enthusiasm for life expands with their outlook on travel with recognition (Seemiller and Grace, 2019, Twenge et al. 2010). That is why they are looking for luxury hotels of the \*\*\*\*

and \*\*\*\*\* class, congress, wellness, mountain and boutique hotel categories, where they enjoy their holidays with full sip and share all experiences with others through social media. From the point of view of traveling, they are mainly interested in working and educational activities, entertainment, relaxation, getting to know new places, adventure and tourism (Sima, 2016). They are an interesting segment for the hotel as they are perspective people up to the age of 30, single, educated, employed and interested in rising in the social ladder.

### Supporters of info age

Figure 3. Group 2



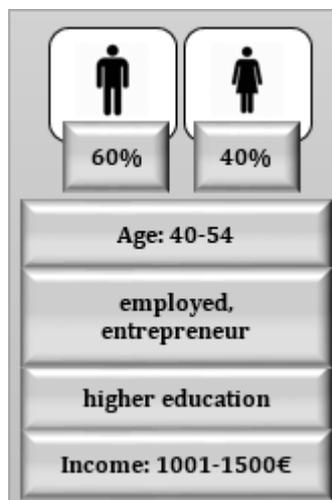
Source: Authors.

The second group of customers (hotel guests) is made up of Y-generation customers who are also technically and communicatively proficient, but did not completely succumb to the online environment (Mangold and Smith, 2012). Generation Y associates the best experiences of life with some purchased experience, such as an exotic journey, a concert visit, and so on. Part of these experiences is the social dimension. People are not alone, feel connected to others, or make new friends (Ng and McGinnis, 2015, Fromm, and Garton, 2013, Sima 2016)). Like customers in the first group, these customers are characterized by a high degree of information urgency and a degree of engagement in communicating with the hotel in an online environment through new communication tools. This segment of customers is also actively searching for information about hotel services through selected new forms of online marketing communication with the likelihood of a positive response to the emotional and rational approach of the hotel. Also in this segment we recommend to use two-way communication with the possibility of expressing the customer's specific opinion on the services provided by the hotel. Therefore, we also recommend the use of interactive secondary online communication channels with the possibility of open discussion, i. e. social networks (Facebook, Instagram, YouTube), PPC advertising, behaviourally targeted online banner advertising, geolocation services, websites including online reservation systems, email, content

marketing and blogs. Although the analysed segment of customers capitalizes their skills through computing and the Internet is their source of information, they do not spend most of the day on the Internet. For them, social media means a way of communicating with their friends, family and acquaintances, including communicating with hotels and brands. This segment is unique in nature, as it differentiates itself from others through its creativity, ideas, authority rejection, travel and shopping. Despite this, customers in this segment are not impulsive as they get to know people, places and things to get exactly what they are looking for. From the point of view of travel, they prefer tourism and adventure activities, work and education activities, entertainment, relax, festivals or accommodation activities (Klapilová Krbová, 2016, Pinzaru et al., 2013, Pate and Adams, 2013, Mangold, 2012). Therefore, they like to stay in cheaper classes of hotels (\*\*\*), but do not despise even luxury hotels (\*\*\*\*, \*\*\*\*\*). Within the hotel category they are interested in holiday, mountain, wellness and congress hotels. From the point of view of using new forms of online marketing communication, they are also a very interesting segment for the hotel, as they are perspective people aged 25 to 39 years, single, but also family based, educated, employed and interested in rising in the social ladder.

### Conscious online users

Figure 4. Group 3



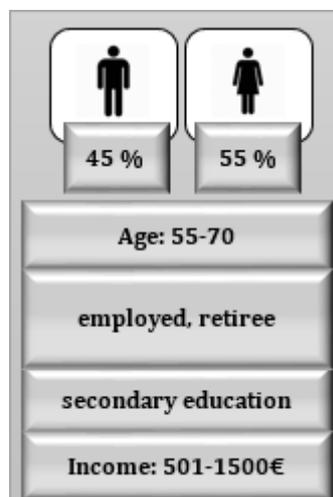
Source: Authors.

The third segment of customers consists of so-called the conscious online users of Generation X. Representatives of the Generation have the huge advantage of being one of the first to meet computers and current technology, so for this age category it is easy to adapt to the new technology industry (Dabija et al., 2018). Generation X has many ambitions and can adapt quickly. The typical characteristics of the representatives of this generation include independence and self-sufficiency (Hensler, 2013). The degree of urgency for information about hotel products and services is moderate compared to previous segments. While the segment's involvement in the hotel communication process through new forms of online marketing communications is bidirectional, it is based on a

voluntary basis, implying that customers pay more attention to convenience (DeAlmeida et al., 2016). The lack of initiative seeking information about hotel products and services, coupled with low customer effort and convenience, causes this segment to take into account only essential information based on figures and facts in its hotel selection decisions. For this reason, we recommend that hotels have to use a rational approach when creating the content of a communication message within this segment. Conscious online users prefer to receive information through both online interactive and personal channels, i. j. we recommend the hotel website, blogs, copywriting (content marketing) as they tend to believe in customer feedback about hotel services, discussions and reviews. Social networks need to be used to a lesser extent, since the communication of these customers is more clunky and consists only of communication with family, friends and acquaintances (Dabija et al., 2018). These customers also prefer to obtain information from hotel staff or their own experience. The conscious online users segment is stabilized in its life with a more or less fixed status. The shopping and travel an important part of their lifestyle. They like traveling for culture, exploring new places, hiking, entertainment, relaxing, educational and working activities (Sima, 2016, McRindle and Wolfinger, 2010, Twenge et al, 2010). Accommodation is more simple, rather hotels of \*\*\* and \*\*\*\* class and categories like as mountain recreational, wellness, spa and congress hotel.

### Online incredulous customers

Figure 5. Group 4



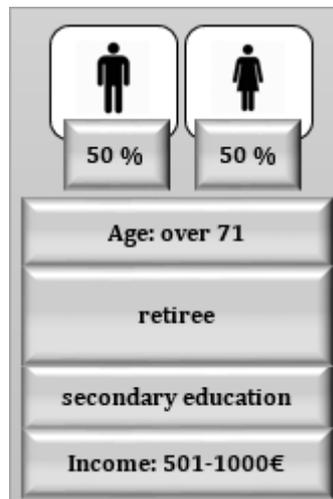
Source: Authors

The penultimate customer segment consists of customers of the Baby Boomers generation. Baby Boomers pay their children education, clothing, pocket money, they buy them apartments, caravans, new cars. After the birth of grandchildren, they save money for another gifts and dedicate their next life to the care of grandchildren. Many, however, live fully, pursue their hobbies, travel, educate (Patterson and Pegg, 2009, Pavlic et al., 2018). They are less proficient in technical, communication technologies and Internet use, but still have an interest and desire to continue their education at least to the extent that

they are able to use these technologies very easily. Rather, they are mistrustful of new forms of online marketing communications, taking into account the opinions of their closest friends and acquaintances (Tiago et al., 2016, Chakraborty, 2017). This segment's interest in information gained through new online forms of marketing communication used by the hotel is superficial, consisting of a low degree of urgency for this information. Therefore, the desired level of engagement is only one-way communication for even greater convenience than in the previous segment. The need for communication in its new online forms is limited. Therefore, we recommend that the hotel have to focus primarily on personal communication channels primarily consisting of providing information directly at the place of delivery of the hotel product, respectively services. The communication should be so imaginative that it can reach the customer segment. In addition, we also recommend the use of secondary personal communication channels providing information mainly via email or blogs as part of content marketing. This implies that when providing information, the hotel should apply a combination of rational, emotional and moral style when creating the content of the communication message. This segment likes to travel for culture, relaxation, exploring new places, undemanding tourism and natural beauties (Diaz-Samiento et al., 2017, Sima, 2016, Noble and Schewe, 2003). They prefer hotels of \*\*\* to \*\*\*\*\* class and from categories mainly spa, recreational and wellness hotels.

### Seniors in the online world

Figure 6. Group 5



Source: Authors

The last group of customers is made up of representatives of the silent generation. These people focused on the career they preferred to activism. They grew up at a time when it was not safe to express their views and attitudes (Joessalu, 2016). In terms of the use of communication technologies in the online environment, they use them mainly to stay in touch with their family and loved ones (Randal et al., 2015). It is very difficult to accept new things, especially things and forms of communication in the online environment

(Henger and Henger, 2012). Therefore, the degree of urgency of information and the degree of involvement, especially in the field of new forms of online marketing communications, are almost no ones. The only way the hotel should communicate with this customer segment is through primary personal communication channels presenting numbers, facts and moral-emotional attitude. An adequate means of communication could be to present information directly at the point of sale of a hotel product or service and, to a minimum, communicate by email or blogging. The seniors in the online world are a segment that is more or less retired and has more free time. Such people like to know new places and things, they like to relax and go for culture (Henger and Henger, 2012, Sima, 2016). When staying, they prefer spa and holiday hotels of \*\*\* to \*\*\*\* class.

## **Conclusion**

The current market offers a very wide range of products that are linked to even more content. Therefore, it is necessary from the position of the company to provide clear and purposeful information to its customers through appropriately selected and interconnected communication tools. From the customer's point of view, there is still a strong emphasis on their own experience, which they can spread and share very quickly and easily in today's electronic and mobile communications. It is therefore necessary to focus on new forms of online communication. However, the success of communication depends not only on broadcasting information, but also on the definition of target groups of customers. The determination of customers helps the hotel better plan adequate online communication, i.e. the hotel needs to create heterogeneous communication messages for heterogeneous groups and use adequate online communication channels or methods for each identified group. Therefore, the aim of this contribution was to propose the customer segmentation based on psychographic and demographic aspects as a determinant of customer targeting in the online environment. Time and geographical constraints can be considered as the main limits of work. This restriction was especially reflected in the selection of respondents, when only Slovak hotel customers were elected. This limitation can be removed if the research is considered to be relevant for the solution and the results achieved are subject to subsequent verification in an international environment. If these barriers were removed, more accurate results could be achieved. Another limit is that the found segments change over time. As consumers evolve and change as a result of time and life events, segments are also changing (their characteristics and size). It is therefore necessary to continuously check whether the segments maintain their profile and whether the marketing orientation still reaches the target group.

## **Acknowledgement**

This paper is an output of scientific project VEGA no. 1/0718/18: The impact of psychographic aspects of pricing on the marketing strategy of companies across products and markets.

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# **The Professional and Economic Development of Individuals with Disabilities in the Hospitality Sector with a Focus on the Importance of Training and Skill Enhancement at all levels: Hungarian Perspective**

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## **Abstract**

The paper provides an in-depth study on one of the significant management interventions within firms regarding the issues of training and skills development to create an inclusive workplace for the people with disabilities. This study aims to explore attitudes of employers toward training employees with disabilities in the hospitality sector in Hungary. Another objective of this study is to fill the gap with a focus on two more specifications: aesthetic labor as a key selection tool of hotel recruiters, and to gather information on the understanding of employers on providing reasonable accommodations for employees with disabilities. Survey method was adopted as the main data collection instrument. Primary data was collected majorly via paper-and-pencil administration and web based survey (google forms). 859 questionnaires distributed of which 212 questionnaires were returned, indicating a response rate of 24.6%, but only 174 questionnaires were used for the analysis. The one of the results highlighted was the importance of providing training on comprehensive work-related skills (soft, technical and social) which are considered crucial for people with disabilities to sustain in the labour market. This study also add new empirical insights into existing international literature on the importance of employees selection on the basis of their physical attributes, and the perception of employers on the range of workplace changes to accommodate employees with different forms of disabilities and their degree of severity. In the final section, the article offers recommendations for future research which if adopted could lead to professional advancement in the lives of people with disabilities.

**Keywords:** aesthetic labor, attitudes, employees with disabilities, reasonable accommodation, soft skills.

## Introduction

To participate and sustain in the labor market, it is quite essential for individuals to have requisite qualifications and appropriate skills. Acknowledging this reality, it is crucial for employees to professionally upgrade themselves from time to time and adapt their skills to changing technological and economical job market scenarios; in this people with disabilities (PWD) is no exception. Employment data on people with disabilities are hard to come by in almost every country within European Union. In the EU 28 member states, the employment rate of people aged 15 to 64 years with disability was documented at 47.3% and highest employment rate was reported for people with disabilities in Sweden, and lowest in Hungary (Eurostat 2014). In Visegrád Group (V4), which includes Hungary, Slovakia, the Czech Republic and Poland, the employment rate of persons with disabilities in Hungary, aged 15-64 was 23.7%. On the contrary, employment rate above 35% was recorded in Czech Republic, as shown in table 1.

Tab. 1: Employment rate in the V4 countries, by disability status, 2011 (people aged 15-64).

V4 countries	Persons with disabilities (in %)	Persons with no disability (in %)	Gap (in percentage points)
Czech Republic	38.6	68.5	-29.9
Hungary	23.7	61.1	-37.4
Poland	33.9	63.9	-30.0
Slovakia	31.9	62.6	-30.7

Source: EUROSTATS (2014).

According to the data published by the Hungarian Central Statistical Office (In Hungarian language Központi Statisztikai Hivatal (KSH)), almost half a million individual with disabilities reported in the country (KSH 2011), but the same population is expected to reach 1 million by 2021 (RHS 2018 citing Berend 2018). In most of the areas in Hungary, low unemployment rate was recorded and Hungary being one of the fastest-growing economies in Europe, there is shortage of labour (Alderman and Santora 2019). There were an estimated 140,086 people of working age (19 — 64) with disabilities who were employed, but with the participation of women with disabilities (72,403) in labour market being higher than the men with disabilities (67,683) (KSH 2016). Table 2, shows in-depth labour market scenario of people with disabilities (population aged 19 — 64 years) in Hungary. The labor shortage has grown acute as thousands of young Hungarians migrated to western European cities in recent years for better-paying jobs.

Addressing macro-economic trends in Hungary, the gross domestic product of Hungary rose by 2.0% in 2016 compared to a year earlier, with which Hungary is in

the middle of the ranking of EU member countries (KSH 2017). It has been recently reported that Hungary economic situation could face “a major macroeconomic constraint” as more than 80,000 positions are vacant in the construction, manufacturing, retail and tourism sectors (Alderman and Santora 2019). Specific and accurate data on the industry wise employment situation are harder to find in Hungarian context. According to data of 2011 of Hungarian Central Statistical Office (KSH), the highest participation was reported for manufacturing industry with 15,241 people with disabilities within working age population. Surprisingly, food and accommodation industry reported total participation of 2,416 PWD which reported one of the lowest employment engagement by people with disabilities (KSH 2011).

Tab. 2: Main Labour Market Indicators of population of people with disabilities (Aged 19-64 years, %) in Hungary.

<b>PWD active in the labour market</b>		140,086			
<b>Men with disabilities active in the labour market</b>		72,403			
<b>Women with disabilities active in the labour market</b>		67,683			
	<b>Employment rate (%)</b>	<b>Unemployment rate (%)</b>	<b>Participation rate (%)</b>	<b>Inactivity rate (%)</b>	
<b>Total</b>	20.8	18	25.4	74.6	
<b>Males (%)</b>	21.6	19.4	26.8	73.2	
<b>Females (%)</b>	20.2	16.6	24.2	75.8	
<b>Region wise statistics</b>	<b>Highest (%)</b>	Baranya (28.1)	Somogyi (30.6)	Baranya (31.6)	Nógrádand Zala (82.2)
	<b>Lowest (%)</b>	Nógrád (13.5)	Győr-Moson-Sopron (4.1)	Nógrádand Zala (17.8)	Vas (60.0)

Source: KSH (2016).

The highly competitive hospitality industry requires a skillful workforce to remain functional and one of the main problems is to find skilled manpower. Budapest city with a fascinating history and cultural heritage serves as an attraction for visitors from around the world. In such labor shortage scenario in Hungary, individuals with disabilities could represent an important under-utilized workforce source for hospitality sector. In connection with country’s economic performance as highlighted in KSH report titled Hungary 2016, “486 billion forints of gross value added were produced at current prices in accommodation and food service activities based on data for 2015, 1.7% of the total performance of the national economy” (KSH 2017 p.17).

Training and skill development programs are important for the professional growth of individuals with disabilities and it is rightfully important for them to have equal access to various strata of the labor market. People with disabilities when integrating into the job market face various professional barriers such as, non-availability of professional and managerial opportunities, qualification constraints, high level of economic imbalances, attitudes of co-workers with no disabilities and disability-job compatibility requisites.

Simply hiring individuals with disabilities is not enough, but the management needs to provide ample training and skills development recourses to world's largest minority to be competitive and sustainable in today's economic fluctuating trends. The rationale behind training and skill development endeavors is the identification of the key gaps in corporate strategies, and to provide material and program structure explicitly suited for individuals with diverse bodily and intellectual abilities.

The objective of this article is alleviating the long term problems related to the professional inclusion of individuals with disabilities in terms training and skill development avenues available to them to achieve their professional and personal goals. Following article contains topic-specific content on disability, training, skills (social, communication and technical) and cost related to training and skill development constraints. Therefore, the overall aim of this research is to evaluate the attitudes of employers toward employees with disabilities with regards to training and skills development. Two more objectives to ascertain: to what extent employers in hospitality industry in the city of Budapest are ready to make/would make reasonable accommodations for employees with disabilities, and to explore if employers perceive that aesthetic and self-presentation skills are pre-requisite requirement to apply for a position in hospitality industry. Above section has already provided background information on Hungarian and EU labor market participation statistics of people with disabilities. Authors have also discussed the purpose and objectives of study which led to a call for confirmatory approach to understand the employers attitudes in hospitality sector in Hungary. In below sections, research methodology is explained, as also quantitative research, the different procedures of data collection, validity and reliability analysis, and achieved response rate. The empirical part is exhibited in result section, which consists of the analysis and representation of data with furnishing of the quantitative outcomes, and comparison with international literature based on results interpreted from this research study. Finally in the last section, authors include the conclusion of the study with recommendations.

## **Methodology**

In the study the attitudes of employers (for example, chef, owners, supervisor, manager, etc.) about training and skill development issues in the hospitality sector with regards to employees with disabilities will be examined. In order to collect appropriate primary data, the researchers decided to go ahead with business survey (direct method approach). Kothari (2004 p. 95) in his book titled, *Research Methodology: Methods & Techniques*, refers surveys to the "method of securing information concerning a phenomen under study from all or a selected number of respondents of the concerned universe. In a survey, the investigator examines those phenomena which exist in the universe independent of his action". Originally, the employer attitude assessment questionnaire developed by Chi and Qu (2003), and same tested scale was again revised and utilized by Paez (2010). Both

studies were conducted in the USA but in different geographical locations. The instrument, re-designed and re-structured again by the authors included most of the questions from both instruments and in addition to the attitude measurement and knowledge about the concept of disability, the scale also included a demographic section. Email was sent to the authors of both studies to obtain approval to adopt their questionnaires for this current study. Below table 3 provide brief overview of previous instrument of Paez (2010), and revised instrument for the better understanding.

Tab. 3: Brief description of data collection instrument (original and final version).

Description	Key points
Original source of questionnaire (Paez 2010)	<ul style="list-style-type: none"> <li>• Study was carried once again in mid-western state of the United States.</li> <li>• The instrument of consisted of five sections.</li> <li>• Disability spectrum: mental and physical disabilities</li> <li>• Language of instrument: English</li> <li>• Instrument: Likert-type scale (5 scale) and corresponding descriptors, and employer and business demographic questions.</li> </ul>
Current Study (Revised Questionnaire)	<ul style="list-style-type: none"> <li>• Study was conducted in the city of Budapest, Hungary.</li> <li>• The instrument of consisted of four sections</li> <li>• Disability spectrum: sensory disability in addition to mental and physical disability, and another option, 'others'.</li> <li>• Language of instrument: English and Hungarian</li> <li>• Instrument: Likert-type scale (5 scale) and corresponding descriptors, employer and business demographic questions.</li> </ul>

Source: Authors own work.

The revised and final instrument consists of four sections, section 1: Personal beliefs, perception and attitudes scale (Q1 - Q35); section 2: Knowledge about disabilities (Q36, Q37, Q38); section 3: Tell us about your organisation (Q39-Q46); and finally section 4: Personal details (Q47 - Q53). Section 1 incorporates a 5-point Likert-style scale ranging from 1 (strongly disagree) to 5 (strongly agree), but authors included some negatively worded questions in the questionnaire (reversely coded, 1 (strongly agreed) to 5 (strongly disagree)). From a large pool of items from all sections; only 17 items from section 1 was retained for the analysis in this article as outlined in the table number 5 to address the first objective pertaining to training and skill development scenarios. Sekaran (2003) also recommends inclusion of negatively worded questions in the research, "include some negatively worded questions as well, so the tendency in respondents to mechanically circle the points toward one end of the scale is minimized" (p. 240).

The instrument was originally written in English and so had to be translated to Hungarian language. The official language of Hungary being Hungarian, entire questionnaire including supporting letters were translated to that language by a certified bilingual

translator, to ensure accuracy and quality of translated work. Hungarian is the largest of the Uralic languages and is very different from English and many other languages spoken in Central Europe. There were many challenges faced during the translation process, for example finding equivalent words. Compared to English, Hungarian is an agglutinative language (ICALTEFL n. d.). Therefore, special care was taken while translating the questionnaire from English to Hungarian to overcome language barriers.

Tab. 4: A brief description of the methodology design

Serial Number	Description	Details
1.	Pilot Survey	<ul style="list-style-type: none"> <li>• Previous pilot testing procedure by Paez (2010) was relied upon.</li> <li>• Included experts (from the USA, India, UAE, and Hungary) having several years of experience administering and collecting data (n=3), professionals from hospitality industry (n=3), disability specialists (n=2) and linguists/certified translators (n=2).</li> </ul>
2.	Validity of the questionnaire	<ul style="list-style-type: none"> <li>• To examine the completeness and appropriateness of the questionnaire, face, content and construct validity were adopted in this study.</li> </ul>
3.	Sample	<ul style="list-style-type: none"> <li>• Non-probability convenience and snow ball sampling</li> </ul>
4.	Data collection	<ul style="list-style-type: none"> <li>• Secondary data: desk research (Electronic databases, print media, census reports, corporate websites, annual reports, newsletters, Govt. publications, etc.).</li> <li>• Primary data: Emails (personal and professional); Web-based survey (Google forms); and Paper-and-pencil administration</li> </ul>
5.	Questionnaire distribution	859
6.	Return	212
7.	Response Rate	24.6%
8.	Used for Analysis	174

Source: Authors own work.

The official data collection was carried out in 2018 the city of Budapest, between February to May. Statistical analysis used Statistical Software for Social Science (SPSS) to address employer and business demographic data quantitatively.

Authors have had doubt in their minds regarding response rate prior distributing the questionnaires. There are many challenges faced by researchers to collect data through survey, especially on sensitive topics like disability studies which may create barrier for respondents in participating in such research. The respondents knowledge about the concept of disability (Fekete et al. 2015) or respondents general interest in research topic (Groves et al. 2004) may create general reluctance to participate in the study or respondents exit from the survey which eventually lowers the response rate. External surveys, no matter what distribution approach researcher choose, are expected to have an average 10 - 15% response rate (Fryrear, 2015). Already published literature focusing on hospitality industry has also managed to share their response rate constraints. There is no fixed logic to explain what would be the response rate, but in general, the response

rates are common, for example, response rate for employee surveys: 60 - 90%; customer and member surveys: 5 - 40%; general public: 1 - 20% (CIRT n. d.). A study by Cho et al. (2006), titled "Measuring the Impact of Human Resource Management Practices on Hospitality Firms' Performances" reported 36% usable response rate (received 78 completed questionnaires out of 219 sample frame via mail survey option). A study conducted in Australia to examine the dimensions of service quality in the hospitality industry had only 15.5%. In this study, a total of 1,000 questionnaires were distributed at five mid-luxury hotels in Australia, but 155 participants responses were collected (Wong et al. 1999).

## **Results and Discussion**

Of the 174 respondents, there was not a big difference in gender participation, 50.6 % male and 49.4% female respondents. 10.9% (n = 19) participants had less than a year experience in hospitality industry, 17.2% (n = 30) had 1-5 years of working experience, and 21.3% (n = 37) had 6 - 10 years of experience, 27.6% (n=48) had 11 - 15 years of working experience, 13.2% (n=23) had 16 - 25 years of working experience, and 9.8% (n=17) over 25 years of working experience in hospitality industry. 16.7% of respondents had been in the current position between five and ten years and 7.5% were in the current position between eleven and fifteen years. While 4.6% of respondents were in their post between sixteen and twenty-five years, 2.5% of them were in their organization for 25 years and above. It was found that the highest percentage of respondents (50%) belongs to the managerial cadre. Respondents from other management profiles, such as owners (15.5%) and supervisors (12.1%) constitute a higher percentage than from the area of other managerial designations. Beyond this, 137 respondents (53%) were engaged independently owned properties, and 18 respondents (6%) were in the franchised area and remaining (19 respondents) in chain organizations. The size of workforce within the respondent organizations: 60.9 % of the total number of organizations surveyed employed a workforce of up to or less than 10 persons, 17.8% of the firms between 10 - 30 employees, 8% of the firms between 31 - 49 employees, 3.4% of the firms between 50 - 99 employees, 6.3% of the firms between 100 - 249 employees, it was also found that 3.4% of respondent organizations had a workforce of over 250 persons.

On the issue of disability experiences of the respondents, 132 respondents reported experiences with people with disabilities, and only 1 respondent reported possessing some kind of a disability. Within the category of personal experiences with individuals with disabilities, 95 of respondents reported professional experience at work (co-workers possessing some kind of disability). The next group of respondent employing people with disabilities was found in a group of eleven departmental/job profiles comprising the supervisor, server, kitchen helper, cashier, custodian, maintenance, front desk, housekeeping, dish washer, manager, and others. Out of the total number of individuals with disabilities employed, it was observed that majority of employees with disabilities were actively involved in monotonous jobs or at the bottom of hierarchical

structure, for example kitchen helpers (n=63) and housekeeping staff (n=33), and dish washers (n=29). It can be also interpreted from this study that respondents currently working with employees with sensory, mental or physical disabilities. However, there was significantly disproportionate number reported for employees with physical disability (n=57) in comparison to mental (n=12) and sensory disability (n=40).

Descriptive statistics, including frequencies, means, and standard deviations, were computed. Mean scores on the 17 statements (from part I) regarding a range of employment issues of employees with disabilities were calculated to identify employers' training attitude towards workers with disabilities. In general, employers who participated in this study had neutral attitude toward training people with disabilities with overall mean was 3.01 (SD=0.34), scale of statements: scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*.

For decades, the belief on range of skills demanded by employers have been mentioned in social sciences conceptual texts and too much attention given to technical and social skills, and less attributes on soft skills, which is an indispensable composite part of the employment in hospitality sector. Respondents expressed their understanding on the importance of providing training on social (48.3% agreed) and communication (46.6% agreed) skills for employees with disabilities, but had a different response on the importance of providing training on technical skills (48.3% answered with neutral responses). Results reported differently by Paez (2010) on providing training to improve skills of PWD and also recorded highest mean for all three skills categories. One of the main barrier to the employment of people with disabilities is the lack of requisite skills and can have implications on the professional integration of PWD in the local work force. The hospitality industry provides numerous opportunities for people to break into the professional world, many positions are entry-level, and others demand much skill. The list of relevant skills is not exclusive, but includes skills such as knowledge in food service, hotel operations, food and beverage prep, maintenance, management, and more (Doyle 2019). The most important thing for employers to acknowledge that *no one possesses all skills*, individual with a disability is just as capable of being trained, groomed and efficient in accomplishing tasks as someone without a disability (Wiegand 2008).

A survey conducted by Cornell University involving private sector and federal human resource office holders to examine employer practices in response to the employment provisions of the Americans with Disabilities Act of 1990 (ADA) and related civil rights legislation (Bruyère 2000). It was published in the same document that 39 % for private sector and 45 % for federal respondents consented on lack of requisite skills and training strategies posing one of the largest continuing barriers to employment and advancement for persons with disabilities in the corporate world. Similarly, Huang & Chen (2015) interviewed 12 Taiwanese employers to explore the experiences of employing individuals with disabilities stressed on the requirement of social, soft and technical skills to enter paid employment. Interviewees from private enterprise sector considered all these three

skills relevant to perform tasks assigned to them and also as part of hiring guidelines to ascertain employee's ability to perform the job. Significantly, the issue of addressing and acknowledging training employees with disabilities in hospitality sector is another concern for managers. Can managers use/would use different training methods and topics for employees with disabilities, depending on disability and the job? Do managers need to develop and implement individualized training programs to address and accommodate each employee's disability? Would providing diverse training options (depending on the type and severity of disabilities, and job tasks) to individuals with disabilities incur extra cost for employers?

57.5% of respondents disagreed (either strongly or otherwise) with the statement, *depending on the job, it costs/would cost me more to train employees with disabilities*, 17.2% agreed or strongly agreed and 25.3% neither agreed nor disagreed (neutral). Similarly, 40.8% of the respondents disagreed or strongly disagreed, overall 59.2% of the respondents were either uncertain, agreed or strongly agreed with the statement, *depending on the disability, it costs/would cost me more to train employees with disabilities*. 66 individuals (37.9%) categorized themselves as respondents who disagree with the statement, *it is too costly to give additional training to employees with disabilities*, indicating the fact that employers have an open mind in providing training opportunities to EWD. An interesting trend noticed here in this study were the wide range of responses (either agree or disagree) reported in majority of responses and it can be interpreted as employers are unsure regarding the issues on providing training and skill development avenues to the employees with disabilities. Of the employers who gave information related to training methods they had provided, 72 out of 174 (41.4%) agreed *use different training methods for employees with disabilities*. Another group of respondents, 64 individuals (36.8%) also agreed *train/would train all employees using the same methods regardless of their disability*.

Tab. 5: Respondents Attitudes towards Training People with Disabilities in Hospitality Sector.

Statement	Mean (M)	Standard Deviation (SD)
Providing training on technical skills for employees with disabilities is important.	3.32	0.812
Providing training on social skills for employees with disabilities is important.	3.32	0.802
Providing training on communication skills for employees with disabilities is important	3.45	0.885
I use/would use different training methods for employees with disabilities.	3.36	0.814
I train/would train on different topics if a employee with disability has a specific disability.	3.47	0.839
I train/would train on different topics if an employee with disability has a certain job.	3.53	0.880
I train/would train all employees using the same methods whether they are disabled or not.	3.02	0.991
Depending on the job, I spend/would spend more time training employees with disabilities than employees without disabilities.	2.80	0.902
Depending on the disability, I spend/would spend more time training employees with disabilities than employees without disabilities.	2.61	0.968
I use/would use the same training tools for employees with disabilities as those without disabilities.	2.98	1.054
I do not believe employees with disabilities need to be trained differently than employees without disabilities.	3.02	1.032
Even after training, employees with disabilities need special attention from supervisors.	2.79	0.995
Depending on the job, employees with disabilities are harder to train than employees without disabilities.	2.91	0.935
Depending on the disability, employees with disabilities are harder to train than employees without disabilities.	2.68	0.894
I feel it is too costly to give additional training to employees with disabilities.	2.54	1.159
Depending on the job, it costs/would cost me more to train employees with disabilities.	2.55	1.075
Depending on the disability, it costs/would cost me more to train employees with disabilities.	2.74	1.035

Source: Authors own work based on SPSS results.

This research addressed training concerns across a variety of corporate domains associated with training, for example focus on different types of skills development strategies, selection of training methods and topics depending on the type of disability/job specification and finally, cost concerns of employers. The employers need to have a flexible approach on addressing training related issues pertaining to employees with disabilities, regardless of hierarchy of disabilities and job specifications. The different types and grades of disabilities can require different teaching methods for the same skill or task (Groschl 2012).

A survey by K.A. Dixon with Doug Kruse, and Carl E. Van Hornin in 2003 documented in their report that lack of skills and experience, and the lack of training programs are greatest barriers for people with disabilities to integrate into the labor market. Besides the cost of accommodation, the survey which incorporated completed 501 interviews in the USA divulgate that employers are divided on the cost and importance of training. A manager in a study which explored the experiences of major Canadian hotel organizations and employment agencies pointed that it costs more to the organization to train EWD than their counterparts without disabilities (Groschl 2007). Findings of this qualitative semi-structured interviews article which included 6 important tourist destinations in Canada, documented that employees with disabilities are less productive as compared to co-workers without disabilities, needs constant monitoring and take longer to be trained.

It has been pointed out in the international literature that job specifications and type/severity of disability possessed by an employee does influence employers perception towards integration EWD at the place of work. Globally, employers posit mental illness as compared to other types of disabilities, as a major employment issue and have their concerns regarding individuals with disabilities entering paid employment. Individuals with mental disability are more negatively stereotyped as compared to other disabilities, which may lead to discriminatory behavior towards individuals with disabilities in finding employment. Some theoretically and empirically based literature provides some sort of relationship between disability hierarchy and training/employment outcomes. A retrospective study conducted in Taiwan by Jang et al. (2014) to evaluate factors affecting employment outcomes for people with disabilities found that individuals with visual disabilities (86.6%) reported higher rate of successful employment outcomes after receiving Disability Employment Services (DES), and those with the emotional disabilities had the lowest (50.7%). The cost-related impact on enterprises in terms of money, time and productivity is one key concern faced by employers. The cost of additional supervision and training to support a person with disability, especially employing people with intellectual disabilities are one of the few findings of National Centre for Vocational Education Research (NCVER) report (Waterhouse et. al 2010). In this report, an employer in a focus group shared his experiences in providing training to individuals with intellectual disabilities. He stated that such individuals demand intense supervision despite of providing customized training schedule and same employer was still not confident of them working without any supervision, even after giving them ample learning opportunities. According to Chi & Qu, cited in Houtenville and Kalargyrou (2015 p. 170), restaurant employers were found to have more positive attitudes toward employees with sensory impairment and physical disabilities than toward employees with mental disabilities. On the contrary, an interviewee in study of K. Donnelly, K. and J. Joseph (2012) stated that the performance employees with physical or cognitive disabilities at The Murray Hill Inn and Suites (a 76-room property) was same (or higher) level as the rest of the employees following adequate training.

Importantly, benefits of providing training to employees can be categorized into two categories: “micro or individual level approach may allow companies to tailor their training programs to allow the maximum benefit for individuals, and in turn, the firm. From a societal perspective, training and placement may increase the economic independence of disabled individuals and reduce their financial dependence on the system” (Stahl, 2015 p. 27). Groschl (2012) in his article documented that employers can practically convert costs incurred in training individuals with disabilities into long term investments as it believed that such employees are loyal and committed to their employers for longer duration. This case study was conducted in five different hotels (within Germany’s Embrace hotel association) where more than 60% people with disabilities including individuals with severe disabilities were reported to professionally integrate into the workforce. Using 359 firms with over 12 years of longitudinal firm-level profit data, Kim and Ployhart (2014), highlighted in their study that internal training interactively influence firm profit growth, may be used strategically to weather economic uncertainty (recession effects), and corporate with efficient and well trained staff will outperform competitors throughout all pre- and post recessionary periods. Moreover, complexity of disabilities may be considered financial burden on companies, and employers prejudiced perception regarding EWD lacking the technical knowledge, skills and abilities can be dismissed by providing proper training and enhancing their jobs skills to enter and sustain in paid employment (Stahl 2015). All Employers do not have consensus on the economic benefits of employing individuals with disabilities. An employer who worked with few individuals with disabilities in his medium-sized furniture manufacturing enterprise in Australia talked about his social conscience as an employer, but stated that there is *‘definitely not an economic benefit for the employer it simply doesn’t add up’*. (Waterhouse et al. 2010 p. 19).

Employees with disabilities often require some sort of job accommodations (e.g., specialized equipment, facility modifications, adjustments to work schedules or job duties) to perform their professional tasks. The statement with the highest mean score was the one that related to statement, *I make/would make reasonable accommodations for employees with disabilities*, with mean 3.68 (SD=0.956). This was another research objective of this study to find out employers intentions on providing reasonable accommodation to hire and retain EWD at the place of work. 9.8% of respondents disagreed or strongly disagreed, and 60.3% agreed or strongly agreed with that statement. Thus, hundred and five respondents believe in providing additional support to employees with disabilities, if required, would enhance professional effectiveness in the place of work. To provide all inclusive work place, employers worldwide are legally required to make reasonable accommodations, such as making recruitment and selection procedures accessible, adapting the working environment, modifying working times, and providing assistive technologies (WHO 2011). The general notion behind providing reasonable accommodation to individual with disabilities at the place of work is to

confirm that the employer has legally acknowledged disability of employees, provides reasonable and necessary accommodation for employees to perform their official tasks effectively and efficiently, and the job related support provided at minimum costs (Telwatte et al. 2017). Internationally, several authors have probed the factors which influences behavior of employers towards providing reasonable accommodation: knowledge of disability legislation (Brohan et al. 2010); attitudes of managers towards employee with disabilities (Telwatte et al., 2017), and personal and professional contact with individuals with disabilities (Telwatte et al. 2017; Scherbaum et al., 2005), and financial burden concerns (Stahl, 2015; Kaye, Jans and Jones 2011; Donnelly and Joseph 2012)

The Job Accommodation Network (JAN) is a service of the Office of Disability Employment Policy of the U.S. Department of Labor conducted interviews in the USA to evaluate the impact of workplace accommodation (Loy 2017). It was reported that workplace accommodations not only are of low cost (cost absolutely nothing to make, while the rest typically cost only \$500), but also have many benefits for firms in longer term. In another survey report which highlighted the challenges of work place accommodations from employers perspectives and policy strategies needed to increase workplace accessibility for all employees and job prospects (Dixon et al. 2003). Majority of respondents (50%) in this report confirmed that the cost of making changes were less costly, but 14% of them expressed their concern on accommodation implementation being costly.

It also important for employers to acknowledge that developing well-designed accommodations will not only benefit employees with disabilities but such structural and technologically upgraded facilities will also attract customers with disabilities. Poria et al. (2011) interviewed 45 participants (20 used wheelchairs; ten were dependent on crutches; and 15 were blind) in their exploratory study focusing on the tourism experiences of people with disabilities. To encourage employers to consider the option of providing reasonable accommodations, states have introduced many financial supports, such as tax incentives that would eventually help employers to cover additional costs that would have incurred otherwise (WHO 2011).

Addressing the third objective of the study, respondents were asked if they perceive that aesthetic and self-presentation skills are pre-requisite requirement to apply for a position in hospitality industry; 39.7% agreed that it is important for hospitality industry, 37.9% answered with neutral response, and 10.9% agreed. It is usually assumed that customers immediately make judgments about the hotel or restaurant as soon as they enter. Front line employees make an impact on customers expectations as customers have many choices to patronize. To ensure welcoming environment, customer loyalty and build brand image, service managers will presumably opt for 'able-bodied' aspirants when hiring new employee/s. Likewise, Nickson et al. (2005) study based on the responses to a structured questionnaire from employers in the retail and hospitality industries in

Glasgow, suggested that in their study that employers are not generally looking for “hard” technical skills in their front-line employees, but rather “soft” skills (importantly “right” appearance).

Hui et al. (2017) in their mixed method study which was conducted in Hong Kong highlighted that PWD could face professional barriers to enter hospitality sector as they might not fit in the traditional concept of physical attractiveness with high self-presentation skills. Similarly, a study conducted in Turkey, where experts and professionals working in the fields of disability and hospitality sector participated to evaluate potential effects of employing PWD on management and organizational performance (Bengisua and Balta 2011). One of the important findings of this study was recruitment of employees should be based on merit, job suitability and individual capability, regardless of the presence or degree of disability. In this report it was mentioned that aspirants with orthopedic and other disabilities might not be considered for front line job profiles as employers emphasis is more on abilities of emotional display, aesthetics and physical appearance.

There are many possible ways for employers in service oriented industry to attract customers, gain market share and build customer loyalty. Corporate social strategy (CSR) can represent a potential input to differentiation strategy, and corporates can differentiate themselves effectively from rest of the competitors (Boehe and Cruz 2010). Kuo and Kalargyrou (2014) in their single-factor experimental design study found that consumers demonstrated a moderately positive purchase intention for a restaurant that employed individual with disabilities. A case study conducted in five Embrace member hotels where guests with and without disabilities shared their perception and confirmed that physical attributes of EWD did not interfere in their day to day performance, and guests reported no negative experiences (Groschl 2012).

## **Conclusion**

The article aimed to provide more detailed explanation and illustrations on the concept of inclusive corporate training and skill development avenues, and also as a starting point to exploring wider possibilities to promote the employment of people with disabilities in Hungarian context.

Overall, the analysis of survey data collected in 2018 from the city of Budapest, addresses several important questions into how employers perceive about providing training and skills development opportunities for people with disabilities and how they conceptually process accommodation requests. On the one hand, employers have expressed for the most part, neutral attitudes toward training employees with disabilities in the hospitality sector in Hungary, but on the other hand, 105 respondents reported greater willingness to grant reasonable accommodation.

While the current study examined training and skill development indicators in respect to employability of individuals with disabilities, it also has investigated the importance of aesthetic labor in hospitality industry. Empirically proven in this study that majority of respondents (69) agree to the statement, *aesthetic and self-presentation skills are prerequisite requirement to apply for a position in hospitality industry*, and this implies that this could diminish chances of professional integration of people with disabilities in the hospitality industry. Authors feel that the critical investigation of aesthetisation paradigm secure conceptual grip in international literature, concerning employees who do not fit into 'embodied dimensions' of aesthetic labor. It may be beneficial for employers to review and address this aesthetic related concern in a more positively manner to influence corporate culture.

Every research is limited by many personal, professional, theoretical, methodological and practical factors, and this article is not an exception. There is a possibility that employers (respondents) understanding and unfamiliarity with few definitions and key words, for instance aesthetic and self presentation skills, might have lead to deviation from realistic results. Though definitions of important terms were addressed in each section of the questionnaire, but respondents might have missed them while glancing through the questionnaire.

The findings of this study are inadequate to be generalized to the whole population of employers in hospitality sector who are working with individuals with disabilities. Since this study did not include all types of registered categories of disability, the generalization of this research should be made vigilantly. Another concern to be addressed, due to the nature of the study, is the issue that respondents may have expressed politically correct and socially desirable feedback (McCaughey and Strohmer 2005), instead of displaying realistic attitudes toward individuals with disabilities in the place of work.

Only employers from hospitality industry were included in this study, but there is a possibility that different display of attitudes would be observed from respondents from different sector. Similarly, different types of disability if included in this study might have resulted in far more positive findings, but this is an empirical question that would be addressed in forthcoming research papers. Despite few limitations mentioned in this study and based on results discussed above, few recommendations offered for different stakeholders. Disability research is a relatively new field in hospitality sector in Hungary, the data collection methods can be expanded to other geographical locations within Hungary, specifically Balaton Lake. Authors feel that this step in data collection would allow for optimum response rates and would eventually help to assess the impact on the labor market participation of people with disabilities. Additional research needed regarding employers reactions on aesthetic labor as very little research has addressed this issue in Hungary. Qualitative methods, for example focus group and interviews with employers in Hungary will help to better understand their perspectives on the importance of aesthetic and self presentations in the hospitality sector.

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# **The impact of age on the customers buying behaviour and attitude to price**

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## **Abstract**

Understanding consumer buying behaviour is a crucial element of any business activities. In a marketing-oriented economy, consumer buying behaviour represents a very significant factor in business success. Therefore, there are many studies, researches and papers focusing on this phenomenon. Many different factors and characteristics have a positive or negative impact on consumer buying behaviour. Studying and understanding these factors contributes to a better understanding of consumer behaviour. Personal and socio-demographic characteristics like age, lifestyle, occupation, and many other significantly influence consumer buying behaviour. This article focus especially on age as a significant factor influencing consumer buying behaviour and customer attitude to price. For the statistical analysis of the impact of the age on consumer behaviour, one-way ANOVA will be used. Stated hypotheses on attitude to branded and non-branded goods will be analysed by chi-squared test.

**Keywords:** consumer buying behaviour, age, price, customer loyalty.

## **Introduction**

Like any other people's behaviour, consumer buying behaviour can be seen as determined by many factors. Companies oriented on their customers represent companies seeking to customer satisfaction. These companies are not looking to sell but for long-term consumer satisfaction by providing products of high quality with their own continued survival and long term goal of the company (Haghshenas et al. 2013).

Since any customer is an individual person, there are lots of different factors influencing the customer buying decision. For many decades, consumer buying behaviour captured the imagination of researchers all over the world. Understanding buying behaviour is one of the critical elements of success of any business activity. Therefore, many types of research are interested in understanding consumer buying behaviour for many decades. Understanding consumer buying behaviour enables better forecasting and understanding purchasing habits and motives (Stávková, Stejskal, and Toufarová 2008). Customer buying behaviour has long been of interest to organizations, researchers, and customers. Generally, consumer behaviour represents consumer buying behaviour during any buying process.

Today, many scientific papers and researches are focusing on the consumer buying behaviour and different factors that the consumer buying behaviour influence (e.g., Durmaz 2014, Stávková, Stejskal, and Toufarová 2008, Khaniwale 2015, Chhabra 2018, Kumar, Hundal and Kaur 2019 and many others). Some authors — for example, McGuire (1976), or Lawan and Zanna (2013) distinguish internal and external factors that influence customer decisions. Internal factors are mainly represented by psychological and socio-demographic characteristics, and external factors are mainly represented by products or service variables.

Many researchers (e.g. Rehman, Yusoff, Zabri and Ismail 2017, Rani 2014, Lichev 2017, Durmaz 2014, Martins, Yusuf, & Swanson 2011, Cranfield, Henson and Blandon 2012, Ostrovskiy, Garkavenko and Rybina 2019) focus on the influence of psychological and socio-demographic variables on customers' purchasing behaviour, as they play an important role in purchasing decisions. Khaniwale (2015), as well as Sukdeo (2018) and Yakup and Jablonsk (2012), suggest that it is necessary to take into account personal characteristic of the customer since each customer as an individual is unique by personal characteristics and nature. Rani (2014) states that it is crucial to know that lots of factors influencing buying behaviour derive from psychology, and it is necessary to understand these factors to understand consumer buying behaviour. These characteristics shape a person as an individual, and influence his or her view of the world, ways of making decisions, including purchasing decisions. As stated Rani (2014), psychological and socio-demographic characteristics like age, annual income, economic conditions, occupation, or personal lifestyle, and many others have a significant influence on the consumer buying behaviour as each individual is a unique person with unique personal characteristics. Based on many types of research, it is clear that social, cultural, personal, and psychological characteristics influence directly marketing strategy (Sukdeo 2018). Marketing starts with the needs, wants, and desires of the consumer and finishes with the satisfaction of these needs and wants, and desires to achieve companies' goals (Dumaz 2014).

Age is considered to be one of the key demographic factors that influence customer purchasing behaviour. Rani (2014) states that age is a significant factor for marketing strategy since age creates a critical difference among consumer choices and consumers'

consumption habits and patterns. Although age is considered to be one of the most significant factors of consumer behaviour, there are not too many scientific studies and articles that focus exclusively on these socio-demographic characteristics (e.g., Hervé and Mullet, 2009, Rani, 2014). Therefore, the author, in her research, focused on demographic variables and their influence on consumer purchasing behaviour and preferences in the choice of products and services. This article aims to examine the impact of age on customer perception of price, as the price is also one of the main factors that the customers evaluate in their purchasing decision process.

## **Theoretical background**

Any business entity studies consumer buying behaviour to obtain crucial information on the consumer decision process and choice of products and services. This information is a crucial element for a successful marketing strategy that is developed based on the understanding of consumers buying behaviour needs and wants (Łatuszyńska, Furajji and Wawrzyniak, 2012, Sukdeo, 2018, Haghshenas, Abedi and Ghorbani, 2013).

Many authors started to study consumer buying behaviour during the 1950s-1960s. First theoretical postulates claim that consumer buying behaviour represents a function of needs, beliefs, and desires that are connected to individual behaviour and represent the predominant determinant of personal actions and intentions (Łatuszyńska, Furajji and Wawrzyniak, 2012).

As stated Haghshenas, Abedi and Ghorbani (2013), generally speaking, consumer buying behaviour studies how and why customers buy or not to buy any product. There are many definitions of consumer behaviour since there are several different approaches adopted in the study of customer buying behaviour. The main theories studying follows — Ajzen's theory of planned behaviour, Alphabet theory, ABC (Attitude-Behaviour-Context) theory, VBN (Value-Belief-Norm) theory or VAB (Value-Attitude-Behaviour), Theory of reasoned action, EKB model Motivation-need Theory and many others (Zepeda and Deal 2009, Tan 2011). Each theory tries to explain consumer buying behaviour based on different approaches and factors. For example, VAB model is a prevalent model used in green buying behaviour studies (Tan, 2011). VAB model implies that any influence could theoretically flow from the abstract values to specific buying behaviour since values can influence attitude and attitude can influence behaviour (Homer and Kahle, 1988). Sharma (2014) claims that consumer buying behaviour is the consumer decision process and following acts of people involved in searching, choosing, buying, and using products. Dawson, Findlay, and Sparks (2008) define consumer buying behaviour as a set of attitudes characterizing patterns of consumer choices. Solomon et al. (2006) state that consumer buying behaviour represents a study of a process, during which groups or individuals select, purchase, use, and dispose of products of services to satisfy their needs, wants, and desires. Schiffman et al. (2007) claim that consumer buying behaviour is behaviour that any consumer displays in searching, purchasing, using, and disposing of products the consumer expects to satisfy his or her needs, wants, and desires.

Analysis of consumer buying behaviour has been in the focus of many authors for a long time. Foxall (2001) defines consumer buying behaviour analysis as a synthesis of behavioural economics and real-world complexities of consumer choices in the marketing-oriented economy. These analyses, based on Wells and Foxall (2011), developed principally in response to cognitive domination of customer behaviour research off their needs and wants to explore patterns of customer choice. The core of consumer behaviour analysis was developed together with other behaviour theories focusing on the understanding of psychological and other phenomena (Foxall 2010). The elementary of consumer buying behaviour represents three terms discriminative stimulus, response, and reward. In these terms, consumer buying behaviour analysis represents an interdisciplinary approach to customer choice. The consumer buying behaviour analysis include technology, psychology and business schools (Wells and Foxall 2011).

Chiu, Chen, Tzeng, and Shyu (2006) claim that the traditional basic concept of the marketing strategy employs decision making and many methods used to detect factors influencing customer buying behaviour and decisions. Furthermore, as stated above, any institution can survive without a good marketing strategy since this strategy is essential to marketing planning a decision making of any institution and is dependent on the product, customer behaviour, marketing communication, etc.

Customer buying behaviour is closely connected with marketing since marketing focuses on customer satisfaction as well as institutional goals. Marketing decisions and tactics are connected with the understanding of customer needs, wants, and desires, as well as developing the right products or services for the right customers, informing the organization's customers about the availability of the company offer and possibilities of delivery, or exchange process. (Haghshenas et al. 2013).

There are several different approaches to the study of consumer buying behaviour and consumer decision making. Foxall (1990) distinguishes five main approaches to studying consumer behaviour as follow:

- behaviourist,
- cognitive,
- economic Man,
- humanist,
- psychodynamic.

One of the oldest approaches is the behaviourist approach that was published in the study of Watson in the 1920s. This study tries to prove that consumer behaviour is learned during consumer life (Watson et al. 1920). The cognitive approach is based on the elements and rules of the Cognitive Psychology that dates back to Plato, or Aristoteles 350 B. C. Descartes followed the works of Plato and Aristoteles in his works, and today cognitive approach follows these works and develop the study of the Stimulus Organism Response (Cziko 2000). There are two main cognitive models of consumer buying

behaviour — analytical model and cognitive model. These models identify factors influencing consumer buying behaviour and typically tend to the traditional five-step classification. The five-step classification of consumer buying behaviour outline – recognition of the problem, information search, evaluation of alternatives, the choice from the alternative, evaluation of outcomes. These steps represent elementary stages in the consumer buying behaviour process (Schiffman et al. 2007). There are many cognitive models of customer buying behaviour, e.g. Analytic Cognitive Models based on the Theory of buying behaviour, The Model of Goal-Directed Behaviour, Consumer Decision Model – known as the Engel-Blackwell-Miniard Model, Theory of Reasoned Action, or Prescriptive Cognitive Models based on the Theories of Reasoned Action (TRA) and Planned Behaviour (TPB) — e. g. Fishbein Model and many others.

First, researches regarded men as individually rational and self-interested, making the decision. Based on several researches, the theory of the Economic Man was developed. Based on this model, the customer reacts rationally in the economic sense. The consumer is aware of all available options and selects the optimal one based on the economic aspects (Schiffman et al. 2007).

Theory of Trying represents one of the Humanic models that provides an alternate approach to models previously mentioned. Based on this model, past consumer buying behaviour influence future consumer choice (Bagozzi et al. 1990).

### **Factors influencing consumer buying behaviour**

As stated above, many types of research are focusing on the customer buying behaviour and factors that influencing consumer buying behaviour.

Dumaz (2014) claims that the main factors influencing the consumer buying behaviour are psychological factors connected with motivation, learning (experiential or conceptual), beliefs, and attitudes. Łatuszyńska, Furaiji, and Wawrzyniak (2012) indicate many internal and external factors influencing consumer buying behaviour as many other authors — for detail, follow the next table.

Tab. 1: General factors influencing consumer buying behaviour

Author	Factors
Łatuszyńska, Furaiji, and Wawrzyniak (2012)	4Ps (product, price place promotion) Internal (Beliefs, attitudes, values, Learning, Motives, Leeds, Perception, Personality, Lifestyle) Other (demographic, economic, situational, lifestyle, social)
Keegan (1995)	social, cultural, economic, personal, and geographic
Kotler and Armstrong (2007)	physical, social, cultural, and personal
Pride and Ferrell (2000)	social, physical, demographic, and attitudinal

Source: Łatuszyńska, Furaiji, and Wawrzyniak (2012), Keegan (1995), Kotler and Armstrong (2007), Pride and Ferrell (2000).

This table involved only several authors focusing on the factors influencing consumer buying behaviour, but we can see that demographic and personal factors are one of the most frequently mentioned.

Lots of authors focusing on the impact of general factors on other factors of consumer buying behaviour — e.g. customer satisfaction, quality, trust, expectation, customer and brand loyalty, price sensitivity, previous experience and many other (Bilal et al. 2010, Ukenna et al. 2012, Petruzzellis, Romanazzi and Gurrieri 2014, and many others).

Dick and Basu (1994) view customer loyalty as the strength of the relationship between an individual customer relative attitude and repeat patronage. Based on Jacoby and Chestnut (1978), there are more than 50 definitions of customer and brand loyalty in the literature in the 1970s. Nowadays, there are many different approaches to customer loyalty. Celuch, Goodwin, and Taylor (2007) define customer loyalty based on the Theory of Planned Behaviour. Moreover, Aaker and Keller (1990) interconnect customer loyalty with various factors – such as experience or brand. Lewis (1997) defined price sensitivity as consumers price perceptions determined by levels of consumer resistance as they relate to perceived quality. Customer expectation is very closely connected with previous customer experience. Both of these factors influence the brand and customer loyalty. Customer satisfaction is influenced usually by trust and previous experience with the brand (Kharim 20114).

According to Foster and Cadogan (2002), price is one of the most critical factors that is considered during the customer buying decision process by the average customer. Loyal customers are willing to pay higher prices for the product and its quality that encompasses characteristics and features of a product that bears on its ability to satisfy customer needs and wants (Russell and Taylor 2006).

## **Methods and data**

Customer preferences change during each customer's life cycle. One of the critical factors that influence these preferences is precisely age. That is why the author focuses on this aspect - age in the article. In the research, the author deals with the influence of age on consumer decision-making and buying behavior. Age is closely connected with the customer life cycle; therefore, the author involved in her marital research status, number of family members, and monthly income. The other factors will be examined separated in the following papers of the author.

Based on the literature search author generated the first initial version of the marketing research. The author focuses on the consumer buying behavior based on the predestinated characteristics, and less effort is devoted to other characteristics of consumer buying behavior. The main aim is to explore the impact of the age of the customer attitude to price, branded and non-branded goods, and customer loyalty.

The primary author's method for obtaining data was a questionnaire. Thirty-five questionnaires were excluded from the final evaluation because of incomplete of the questionnaire or incorrect answer. The final size of this paper is 350 questionnaires.

The questionnaire used as the main tool for collecting primary data was divided into three main parts as follows:

1. general questions on consumer buying behaviour,
2. questions on the perception of price,
3. demographic information, including age, and another characteristic – for detail see Tab 4. Demographic profile of respondents.

A set of statements was submitted to respondents. Respondents should assess the level of agreement with these statements on the five-point Likert scale with the following measurement: 1 indicates strongly agree, 2 indicates agree, 3 indicates neutral, 4 indicates disagree, 5 indicates strongly disagree.

In this article, the author will use one-way ANOVA to determine whether there is a statistically significant relationship between independent variables (age and customer attitude to price, branded and non-branded goods, and customer loyalty). The author will use ANOVA since the ANOVA is considered as a statistically appropriate test for testing more than two groups measured on some interval scale (in this case, five-point Likert scale). ANOVA determines the variability of the sample.

The statements were divided into groups based on the evaluated factors — attitude to the branded and non-branded goods, attitude to price, and customer loyalty. Based on the literature search of mainly foreign scientific papers and researches, the author selected four statements for attitude to price and four statements for attitude to branded and non-branded goods and customer loyalty. For detail, see the following table.

Tab 3: Ranking statements

Factor	Statement
Attitude to price	S1: Price is an essential factor for my buying decision
	S2: Price reduction motivates me to buy the product
	S3: In the case of buying a more expensive product, the price does not affect my decision
	S4: I am a price-sensitive customer
Attitude to branded and non-branded goods and customer loyalty	S1: I consider myself as a loyal customer
	S2: I prefer branded goods
	S3: I prefer non-branded products
	S4: I prefer products with which I have a good previous experience

Source: Author's research.

Moreover, author will use chi-square test for testing of the following hypotheses:

H0<sub>1</sub>: The preference of branded goods is independent on the age

H0<sub>2</sub>: The preference of non-branded goods is independent on the age

The chi-square test is a statistical method for testing the independency of data for comparison of observed data with expected to a specific hypothesis. The formula for calculation of chi-square test follows.

$$\chi^2 = \sum_{i=1}^k \frac{(X_i - Np_i)^2}{Np_i} \quad (1)$$

## Results and Discussion

As stated above, the final sample for this article was 350 respondents. Necessary information was sorted via descriptive statistics. This information about the sample is summarized in the following table. Among the 350 valid samples, the percentages of women and men are 56% and 44%, respectively, with more female subjects than male subjects. In terms of age, the largest age group belongs between 25 and 34 years, following 35 and 44 years. The smallest group of subjects is over 64 years old. The largest group in terms of education is the group of a bachelor's degree.

Tab 4: Demographic profile of respondents

Characteristic	Type	Absolut frequency	Relative frequency
Age	16-24	52	15%
	25-34	95	27%
	35-44	74	21%
	45-54	56	16%
	55-64	48	14%
	64+	25	7%
The average income per month	less than 10,000CZK	30	9%
	10,001 - 20,000 CZK	95	27%
	20,001 - 30,000 CZK	133	38%
	30,001 - 40,000 CZK	53	15%
	40,000 CZK and more	39	11%
Marital status	single	152	43%
	married	156	45%
	divorce	38	11%
	widow	4	1%
Number of a family member	1	38	11%
	2	89	25%
	3	89	25%
	4	132	38%
	5 and more	2	1%

Source: Author's research.

The following table summarised ranking statements based on the respondents' evaluation on the Likert scale.

Tab 5: Ranking statements

Factor	Statement	Mean	Standard deviation
Attitude to price	S1: Price is an essential factor for my buying decision	2.325	1.010
	S2: Price reduction motivates me to buy the product	2.452	1.159
	S3: In the case of buying a more expensive product, the price does not affect my decision	2.891	1.320
	S4: I am a price-sensitive customer	3.211	1.980
Attitude to branded and non-branded goods and customer loyalty	S1: I consider myself as a loyal customer	2.960	0.895
	S2: I prefer branded goods	1.963	0.056
	S3: I prefer non-branded products	2.963	0.198
	S4: I prefer products with which I have a good previous experience	1.895	0.369

Source: Author's research.

As we can see from the table above most of the respondents prefer branded goods (with the lowest standard deviation). Major of the respondents stated that they are not price-sensitive customers, but the standard deviation of this statement is the highest among the others.

One-way ANOVA analysis between age and other factor was executed. The results of the ANOVA table are summarized in the following table and text.

Tab 6: Age versus evaluated statements concerning price

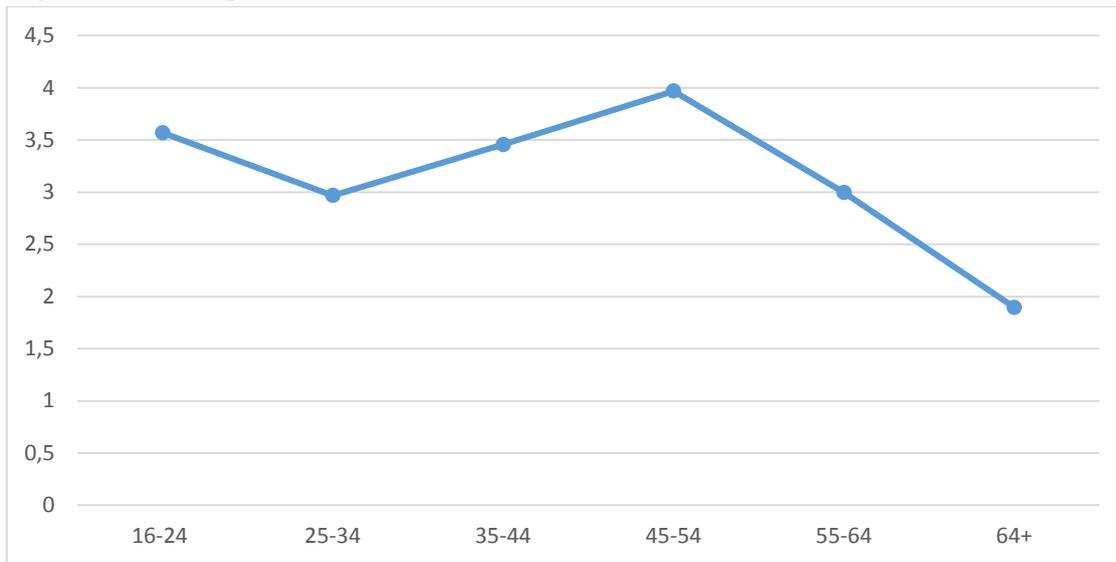
Statement	Age (Mean)					
	16-24	25-34	35-44	45-54	55-64	64+
S1: Price is an essential factor for my buying decision	3.012	2.695	1.896	2.109	2.963	1.269
S2: Price reduction motivates me to buy the product	1.968	2.986	2.1036	1.968	2.560	3.129
S3: In the case of buying a more expensive product, the price does not affect my decision	3.156	1.963	2.986	2.968	2.789	3.489
S4: I am a price-sensitive customer	3.569	2.968	3.456	3.968	2.997	1.896

Source: Author's research.

As stated above, the author executed a one-way between groups analysis of variance to explore the impact of age on ranking statements (these statements were measured by the Likert scale). All respondents were divided into six groups according to their age). ANOVA revealed statistically significant differences at the confidence level of 95% for statement 1 Price is an essential factor for my buying decision between group 16-24, 55-64, and 64+ ( $F(5,350) = 2,33, p=0.0031$ ). Another significant difference at the p-value 0,05 was revealed for statement 3 In the case of buying a more expensive product, the price does not affect my decision mainly for age groups 16 - 24, 25 - 34 and 64+ ( $F(5,350) = 3,2, p=0.00112$ ) and for statement 4 I am a price-sensitive customer 16 - 24, 25 - 34, 45 - 54 and 64+ ( $F(5,350) = 2.9, p=0.00212$ ).

Despite the fact that most of the respondents (except age group 64+) stated that they do not agree with the statement that they are price-sensitive customers — for detail see following graph, author's research revealed that the most price-sensitive group is group 64+, followed by the age group 35 — 44.

Figure 1: I am a price-sensitive customer



Source: Author's research.

### Results of the chi-square test

The author tested the following hypotheses:

H0<sub>1</sub>: The preference of branded goods is independent on the age

H0<sub>2</sub>: The preference of non-branded goods is independent on the age

Both hypotheses were tested at the 95% confidence level. In both cases the p-value is less than 0.05. Therefore, we can reject the null hypothesis that the preference of branded and non-branded goods is independent on the age. P-value for H0<sub>1</sub> is 0,00326 and p-value for H0<sub>2</sub> is 0,00126.

### Conclusion

The finding of the author's research revealed that age is one of the factors influencing consumer buying behaviour and attitude of the customer to price. The most price-sensitive consumer group is the oldest age group, 64+. ANOVA analysis proved that there are statistically significant differences among several age groups (statements 1, 3, and 4). The chi-squared test proved that preferences of branded and non-branded goods is not independent on the age.

As stated above, age is one of the factors connected with the consumer life cycle that influencing consumer buying behaviour. In the next research author will focus on other aspects of the consumer life cycle — monthly income, number of family members, and marital status.

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# **Structural Development of Utilised Agricultural Area in EU Countries**

## **Subsidy Policy of the Czech Republic**

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### **Abstract**

In the introductory part the authors deal with the importance of agricultural land, its influence on water management, on the production of food for inhabitants, the utilization of land in agriculture, the influence on the climatic condition and the global ecosystem. They point out the problems related to the reduction of agricultural areas and they quote opinions of selected environmental specialists. They mention the issue of the subsidies in the Czech Republic, their sources and accounting.

In the next part the authors focus on the analysis of the reduction of and the situation in the utilized agricultural area in thousands of hectares in EU countries. For this purpose, they utilize historic statistical data on the quantity and structure of utilized agricultural area. They represent the respective time series in tables and figures, calculate and compare their average absolute changes (increments or reductions) and percentage coefficients of growth (decrease). These coefficients are also used for the establishment of simple predictions obtained by extrapolation methods and by means of the linear trend function. The comparison of the results from individual EU countries was also represented graphically.

More advanced and exact forecast models, which also provide interval forecasts, not only point forecasts, are applied on the CR and its neighbours, on the EU and its largest countries, by means of SPPS software. Balanced values and forecasts for 5 successive periods since 2017 have been calculated and tabulated. Everything is represented by means of suitable figures.

**Key words:** utilised agricultural area in EU countries, average annual changes in utilized agricultural area, average growth/reduction rate, forecasts of the condition of the utilized land, subsidies.

## **Introduction**

Breathable air together with water form the basis for the life. Like the heart and the lungs form communicating vessels, the land quality and water depend on each other in the landscape. Land is a natural product, but is not freely available. Under the term land as a factor of production economists understand the land used for agricultural production, or a place where other economic activities (e.g. construction) take place, but also all the natural resources. We must realize that their value is still growing.

The goal of the article is to compare the development of the structure of utilized agricultural area in EU countries, to compare and highlight the importance of the present permanent reduction of agricultural land, particularly in the new EU countries, and to carry out prediction of the condition of agricultural land up to the present on the basis of historic data. Such forecasts can be useful for example for the preparation of the economic policy in the individual countries, which might influence the behaviour of the time series.

## **Data and methodology**

### **Ecological materials, literature searches and the applied methodology**

Blackbourn (2009) points out that there are no doubts of the devastating human influence on the world of nature in the late 18th century. It started before the industrialization era based on fossil fuels and led to devastation of the biological diversity in numerous areas.

People have been breeding animals and growing plants purposefully for about ten thousand years. Land treatment related to the start of farming is a great turning point in the human history (Haptnan, Pošmourný and Němec, 2009).

According to the Directive of the European Parliament and of the Council establishing a framework for the protection of soil, soil is essentially a non-renewable resource in that the degradation rates can be rapid whereas the formation and regeneration processes are extremely slow. Its fundamental functions are biomass production, storing, filtering and transformation of nutrients and water, providing the background for biological diversity, acting as a platform for most human activities, providing raw materials, acting as a carbon pool and storing the geological and archaeological heritage. It should be used in a sustainable manner which preserves its capacity to deliver ecological, economic and social services, while maintaining its functions so that future generations can meet their needs. In fact, numerous areas are degraded to lands poor with water. The highest quality soil is being removed from the natural cycle as a consequence of urbanization. Soil is contaminated with gas emissions, dust, inputs of chemicals are increasing with the intensive agricultural methods, soil is degraded by waste dumping or ecological disasters. (European Parliament, 2019).

According to the Draft Directive of the European Parliament and of the Council soil is mostly in private hands in the Community. Despite this fact we need to protect it for future generations as it is a natural resource of public interest. As a consequence of the

rapid growth of municipalities and the increasing demand for soil from numerous spheres of the economy the coverage of soil is alarmingly increasing, which requires even more sustainable use of soil.

Soils started to appear on the Earth surface at the same time when life started to appear on the land. The presence of live microorganisms and their remnants is one of the most important definitional conditions. Nevertheless, agricultural land is exposed to degradation as a consequence of more and more unscrupulous exploitation and it is more and more receding from its natural character. Soil is not protected sufficiently due to the demand for the generation of profit by its conversion to construction plots. The appropriation after 1948 led to the breakage of the relations to the land built during generations. The condition of the soil is also a significant cause of the occurrence of extreme phenomena like floods or droughts. Soil has lost its ability to eliminate hard rains as well as longer periods without precipitations.

Soil is also an important aspect of water management. It holds water in the landscape as water is infiltrated through it and creates underground storages. On its way to the ground water is enriched with minerals, its Ph is modified and harmful substances are separated. Soil is being destroyed by wrong cultivation of fields, wrong choice of crops, insufficient balks in large fields, compaction. The total reduction of soil, which is one of the main causes of the fluctuation of temperature, is probably the most significant problem. The ideal state is, when a part of the soil is covered with grass and serves as pasture (Janků, 2016).

The government should subsidize the maintenance of the landscape and its functions. Quantity is being preferred instead, still bigger and heavier mechanisms, which compact the soil and destroy water springs, are used in forests. Landscape drainage is another long-standing problem.

The general knowledge of the importance of soil and the necessity of its protection should be improved. It is a non-renewable component, which has a direct influence on human life as the environment for food production. However, the pressure from developers, speculators, governments and local governments continues, and real needs are overlooked under the pretext of public interest. Areas with quality arable land are chosen for the construction of highways, roads, stores and residential houses, and there is only a minimum interest in the utilization of the areas of old factories.

Land grabbing for the construction of new roads, highways and industrial areas is an everyday problem in the Czech Republic. The costs of the toll and fuel in the Czech Republic belong to the lowest in Europe. According to an analysis carried out by the Centre of Economic and Market Analyses, heavy trucks pay in average CZK 1, 195 per 100 km for the toll and fuel in the Czech Republic. In Austria this amount is about CZK 1, 346 in Germany 1, 500, in Poland 1,499 and in Slovakia 1,421. As the costs in the neighbouring countries are higher, the CR is used as a transit country. This is why valuable arable land is being damaged due to the profits of private entities in the Czech Republic (Czech Statistical Office, 2019).

The industry, transport and decisions made by politicians endanger the environment in general. Thousands of hectares of arable land are covered by industrial zones, warehouses, highways, even though politicians claim that they want to protect the land fund. These operations do not have resources of industrial water for their operation, so they use potable water and they often even draw ground water. Agriculture deserves higher attention than industry, even though it has not such a financial effect for the state. However, it feeds us (Nikitina, 2014).

According to Kabourková (2018), in addition to capital and labour, the basic economic factor is soil. Unlike other factors, soil does not lose its value over the years; in fact, its value increases over the years. It is an irreplaceable natural resource, valuable asset of society.

Adherence to agricultural procedures favourable for the climate and the environment, the so-called Greening, has been one of the conditions for the use of agricultural subsidies within the EU Common Agricultural Policy since 2015. An applicant for such a subsidy has to use 5% of the cultivated land as ecological focus area (EFA — areas with crops retaining nitrogen). Lands left fallow belong among ecological focus areas according to a Regulation of the European Commission (European Commission, 2019).

It is necessary to start to respond to the incoming climatic conditions and to work with the landscape. To set such conditions for farmers and tree farmers that would lead to the recovery of the retention potential of soil, which we imprudently reduced so significantly in previous years. A landscape with large areas of cultivated land hardly copes with extremes like droughts and floods (Sklenička, 2017).

The goals of the sustainable development of the United Nations pronounce plans of the global solution of problems related to soil. The Global Land Indicators Initiative was founded in 2012. Its main task is to elaborate a set of soil indicators, which could be prepared globally and compared on a long-term basis. The European Environment Agency (EEA) and the Institute for Advanced Sustainability Studies have proposed soil indicators for the monitoring of the fulfilment of the goals of the sustainable development from the point of view of the changes of the landscape surface — the use of areas, soil productivity, and the content of organic carbon in soil. Land grabbing, soil impermeability, landscape fragmentation, erosion and soil humidity are studied.

United Nations present and systemically evaluate the condition and the development of the environment in the world. It comes with warning facts on the climate change, biodiversity reduction, including the drop of pollinators, soil degradation and contamination of all components of the environment.

The UN Report points out that the rate of the degradation of the condition of the environment is faster than ever before. 75% of the terrestrial environment and 66% of the sea surface are seriously damaged (Fritz, 2019).

The damaged ecosystems can only be saved by a totally complete change of the approach to agricultural production and consumption (Fanta, 2018).

The change of agricultural land accompanied with the reduction of the number of insects is a serious threat. This might lead to an even worse imbalance of the environment.

Traditional agricultural landscape is disappearing and being replaced with large monocultural fields. Modern industrial agriculture destroys soils, which also leads to reduction of underground water. Water is moreover often led beyond its natural flow for the agriculture (Etienne, 2019).

Soil is the top layer of the Earth surface, which originates from organic matter and erosion of the fundamental stone. It is bound to a certain location, has typical structure. It is a dynamic system permanently developing as a consequence of the activity of organisms living therein.

Agricultural land is a part of the Earth surface used for crop growing or animal grazing. It also includes fruit orchards, vineyards or gardens.

The agricultural land fund is the basic natural asset of our country, and irreplaceable means of production. It consists of agricultural land and land that should be farmed but is not temporarily farmed.

The maintenance and renewal of quality environment costs, however, it leads to results that cannot be expressed in economic terms. Agriculture has always been and still is a part of the care about the landscape. Here comes the subsidy policy, which is intended to maintain the landscape in highlands and mountains in cultivated condition and to award farmers for these activities, to grass or afforest arable land where it is possible, to return cattle to the landscape and to maintain soil fertile (van der Ploeg, 2019).

From the economic point of view a subsidy means a free payment provided directly or indirectly from the government budget, from the state financial assets, from the National Fund, from state funds, from the budget of a regional authority, from European Community funds, from the public funds of a foreign country, from PHARE or a similar programme. It is a transfer of resources to an entity, where such an entity is obliged to meet certain conditions, which are usually linked to its business activity. If an entrepreneur fails to meet the subsidy condition, he/she has to return the subsidy. Subsidies are basically divided into those for the reimbursement of costs and those for the acquisition of fixed tangible assets (through a purchase or own activity). Subsidies are only booked at the moment of the receipt or at the moment when their approval is unquestionable or highly probable. No estimated receivables or deferred revenues are prepared for them as if the exact amount of the subsidy is unknown on the balance sheet day or the unquestionable legal entitlement to it is not given, this would lead to unjustified overvaluation of revenues. If a subsidy has to be returned, this fact is booked in the costs of the accounting period when the decision on the subsidy return comes into force. If a subsidy for acquisition of fixed assets has to be returned, their purchase price is increased and an additional depreciation is entered as if the increased purchasing price were depreciated from the beginning (Ryneš, 2018).

In the Czech Republic, grant resources can be divided into two basic groups by the source of funds. After the accession of the CR into the European Union (EU), farmers are offered European subsidy programmes (mostly partly co-financed from the state budget of the CR), which are suitably complemented by national subsidy programmes (fully financed from the state budget). European subsidy programmes, together with the national

supplementary programmes, are administered and paid by the State Agricultural Intervention Fund.

Subsidies, together with quotas and duties, represent the most common trade barriers. According to the author of this contribution, governments often use taxpayers' money for providing subsidies to local manufacturers, which artificially reduces the price of domestic goods and puts the imported goods at disadvantage.

According to international accounting standards, state subsidies for biological assets measured at fair value are divided into conditional and unconditional. Fair value here refers to the quoted price of a biological asset in its active market. Biological asset includes animals and plants that are subject of a company's agricultural activity. Conditional subsidy is recognised as income after the conditions related to the state subsidy are met. Unconditional subsidy is recognised as income at the moment it is granted to the company (Kouřilová, Nývltová, Rybová, 2016).

The development of the utilized agricultural land in the individual EU countries and in the EU average is going to be compared in the following analytic part on the basis of historic data, and its reduction is going to be pointed out. The basic numeric characteristics of the appropriate time series are going to be determined and interpreted and their point as well as interval predictions carried out.

The statistic means applied here are tabular and graphic means of descriptive statistics, the analysis of time series, particularly trend analysis, linear and non-linear regression, and Holt's smoothing as a more advanced prediction method.

Numeric calculations are carried out by means of Excel and IBM SPSS Statgraphics v. 25 (Chajdiak, 2013, Stuchlý, 2004, Řehák et al., 2015).

## **Results and Discussion**

### **Analysis of the development of utilized agricultural land in EU countries**

The applied historic data on the structure and price of land represent moment time series. This is why we use usual means used for the calculation and interpretation of some numeric characteristics of numeric time series and their average values for their analyses. Time series are illustrated graphically. Trend analyses and more advanced statistic methods are particularly used for more detailed assessment of the results from EU countries. (Stuchlý, 2015, Cipra, 1986 and 2013).

#### *The development of the overall structure of utilized agricultural land in EU countries*

From the Eurostat internet output (Eurostat, 2019) we have used the current data of the development structure Utilised agricultural area by categories in 2007 to 2017 in EU countries in thousand hectares (see table 1). The utilized agricultural area (abbreviated UAA) describes the area utilized for agriculture. This includes the following land categories: arable land; permanent grass greens; permanent crops; other agricultural land, like kitchen gardens (even though they only represent small areas of the overall

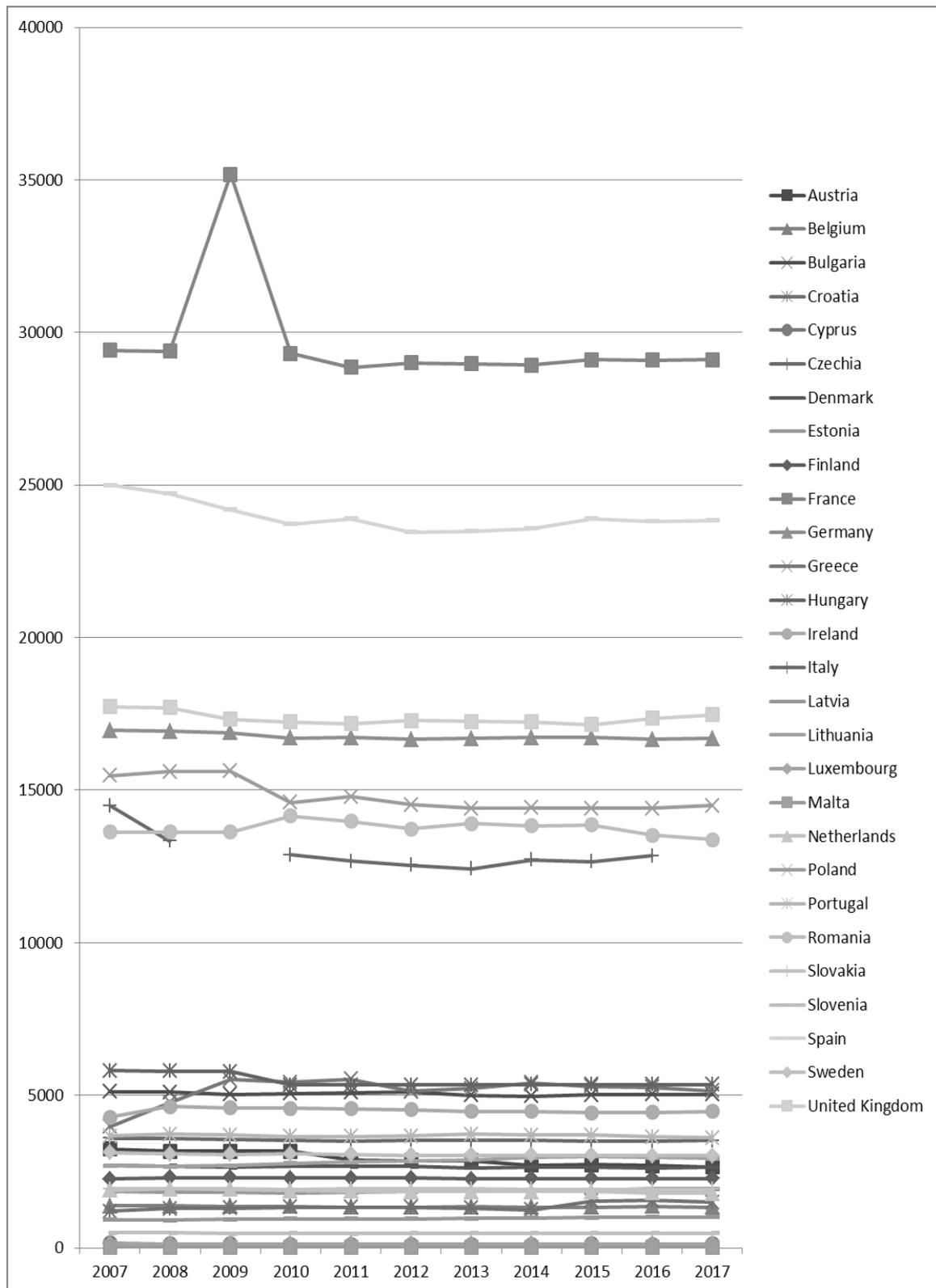
UAA). The term does not include unused agricultural land, forests and land covered with buildings, farm courts, warehouses, lakes etc. These data are illustrated in Figure 1.

Table 1: Total utilized agricultural area (thousands of hectares) in EU countries

Country/year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	průměr m odchylnka s odchylnka s	směrodatná var. koe- ficient V	stats. chyba Δ	prům. přínástek	předpověď na rok 2018	předpověď na rok 2019	prům.koef. růstu	prům.koef. růstu v %
Austria	3238.6	3171	3168.6	3165.8	2868.15	2863.58	2862.44	2716.16	2720.4	2688.83	2655.56	2919.92	223.76	0.077	150.32	2597.26	2538.95	0.980	-1.97
Belgium	1370.3	1373.8	1365.2	1358.02	1337.25	1333.91	1338.57	1333.4	1330.98	1352.95	1329.15	1347.58	16.87	0.013	11.33	1325.04	1320.92	0.997	-0.30
Bulgaria	5116.2	5100.8	5029.6	5051.86	5087.95	5122.98	4995.11	4976.82	5011.49	5021.41	5029.53	5049.43	50.23	0.010	33.75	5020.86	5012.20	0.998	-0.17
Croatia	1201.76	1289.09	1299.58	1333.84	1326.08	1330.97	1300.81	1240.87	1537.63	1546.02	1496.66	1354.85	117.74	0.087	79.10	1528.15	1555.64	1.022	2.22
Cyprus	149.5	126.51	124.52	114.79	115.59	115.94	107.13	107.03	126.47	112.31	121.73	120.17	11.96	0.100	8.04	118.95	116.18	0.980	-2.03
Czechia	3596.72	3571.59	3545.84	3523.86	3504.03	3525.89	3521.33	3515.56	3493.72	3488.79	3521.33	3528.03	32.40	0.009	21.77	3513.79	3506.25	0.998	-0.21
Denmark	2694.5	2682.9	2639	2676.2	2672.6	2663.6	2627.8	2652	2632.95	2625.1	2631.3	2654.36	24.73	0.009	16.61	2624.98	2618.66	0.998	-0.24
Estonia	914.7	906.5	931.8	948.8	946	955.9	965.9	974.8	993.6	1003.51	1002.24	958.52	33.29	0.035	22.37	1010.99	1019.75	1.009	0.92
Finland	2255.3	2296	2295.9	2291.5	2286.7	2285.2	2258.6	2267.2	2273.3	2274.5	2272.2	2277.85	14.25	0.006	9.57	2273.89	2275.58	1.001	0.07
France	29413.9	29385	35177.8	28311.03	2852.55	29000.83	28975.97	28929.82	29115.25	29088.88	29101.33	29668.40	1836.46	0.062	1233.75	29070.07	29038.82	0.999	-0.11
Germany	16954.3	16925.7	16889.6	16704.04	16721.3	16667.3	16699.6	16724.8	16730.7	16658.9	16687.3	16760.32	107.93	0.006	72.51	16660.60	16633.90	0.998	-0.16
Greece	3968.66	4758.34	5607.39	5425.62	5532.34	5134.71	5213.04	5406.72	5291.71	5259.7	5152.43	5150.06	447.33	0.087	300.52	5270.81	5389.18	1.026	2.94
Hungary	5807.1	5789.7	5783.3	5342.7	5337.23	5338.02	5339.53	5346.3	5346.45	5348.97	5352.28	5466.51	210.05	0.038	141.11	5306.80	5261.32	0.992	-0.81
Ireland	4275.89	4629	4593.92	4588.93	4555.5	4532.29	4477.39	4465.37	4429.08	4446.84	4470.24	4494.95	97.33	0.022	65.39	4489.68	4509.11	1.004	0.45
Italy	14490.3	13337.7	12885.19	12670.2	12548.1	12426	12720.15	12660.89	12843.32	12853.54	12853.54	12853.54	631.38	0.049	451.66	12477.32	12294.33	0.987	-1.33
Latvia	1839.2	1825.1	1833	1805.5	1815.9	1840.9	1877.7	1872.5	1894.8	1930.6	1932.2	1889.76	43.52	0.023	29.24	1941.50	1950.80	1.005	0.49
Lithuania	2695.9	2672.1	2689	2772.3	2805.9	2842.2	2891.4	2952.4	3005.96	2954.07	2935.51	2837.87	119.32	0.042	80.16	2959.25	2983.19	1.009	0.95
Luxembourg	130.9	130.5	130.8	131.22	131.27	131.42	131.04	131.08	131.38	130.65	131.16	131.04	0.30	0.002	0.20	131.19	131.21	1.000	0.02
Malta	10.33	10.33	10.33	11.45	11.45	11.45	11.69	11.69	11.69	11.58	11.58	11.23	0.59	0.062	0.39	11.71	11.83	1.011	1.15
Netherlands	1866.4	1833.2	1921.4	1872.36	1858.39	1841.6	1847.6	1839	1845.75	1796.26	1789.99	1857.45	44.73	0.024	30.05	1780.35	1770.71	0.995	-0.52
Poland	15477.2	15607.7	15624.6	14603.2	14780.2	14529.4	14409.9	14424.2	14398.2	14405.6	14497.6	14796.16	510.39	0.034	342.88	14399.64	14301.68	0.993	-0.65
Portugal	3660.98	3725.7	3695.16	3653.93	3649.56	3664.7	3718.16	3699.69	3695.03	3636.46	3602.68	3672.91	37.30	0.010	25.06	3596.85	3591.02	0.998	-0.16
Romania	13629.81	13633.81	13620.86	14156.48	13981.62	13733.14	13904.64	13830.42	13858.42	13520.85	13377.93	13749.82	222.90	0.016	149.75	13352.74	13327.55	0.998	-0.19
Slovakia	1930.6	1936	1930.3	1921.61	1929.7	1927.45	1928.51	1924.73	1921.56	1918.88	1910.65	1925.45	6.97	0.004	4.68	1908.66	1906.66	0.999	-0.10
Slovenia	498.47	492.42	468.5	482.65	458.2	479.65	478.89	482.21	476.86	477.67	481.42	479.72	10.64	0.022	7.15	479.72	478.01	0.997	-0.35
Spain	25003	24718.1	24190.4	23719.23	23894.37	23463.12	23494.57	23571.78	23897.14	23816.33	23840.7	23964.43	493.03	0.021	331.22	23724.47	23608.24	0.995	-0.47
Sweden	3120.9	3075.8	3067.2	3073.7	3063.1	3031.5	3036.08	3036.07	3028.35	3020.92	3011.37	3051.36	32.00	0.010	21.50	3000.42	2989.46	0.996	-0.36
United Kingdom	1737.1	17703.4	17325	17231	17172	17282	17259	17240	17144	17357	17472	17356.59	200.77	0.012	134.88	17445.49	17418.98	0.998	-0.15
EU (28 countries)	183068.5	182807.8	180136.8	179365.4	178197.8	178098.1	178392.8	178993.7	178736.9	179755.29	1911.77	0.011	1284.34	481.29	17774.29	177292.99	0.997	-0.27	

Source: Eurostat, 2019.

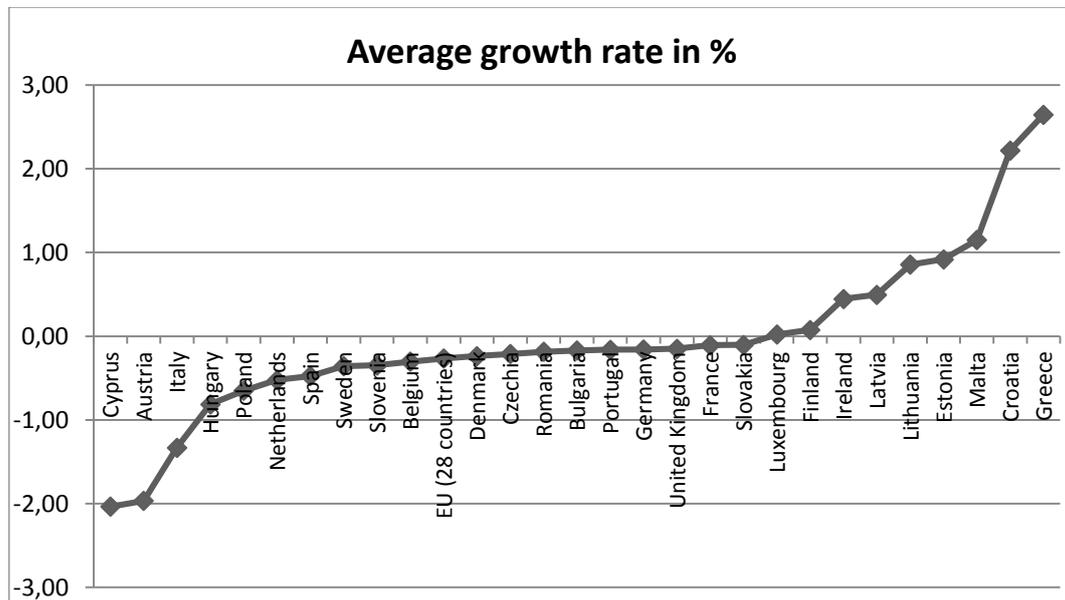
Figure1: The course of the dependence of the values of agricultural area in all EU countries (in thousands of hectares)



Source: Authors'.

This data on the individual EU countries represent time series about the condition of the utilized agricultural area in thousands of hectares in individual years, some with missing data. The highest values of utilized agricultural area are achieved in large countries (France, Spain, Great Britain and Germany) and the lowest values in the smallest countries (Malta, Luxembourg, Cyprus and Slovenia). The most fluctuating data is in Greece between 2007 and 2014. Columns 13 - 16 contain calculated basic numeric characteristics of the variable, utilized agricultural area in individual EU countries and in the whole EU: the average  $m$ , standard deviation  $s$ , coefficient of variation  $V$  and the statistical discrepancy of the average value  $\Delta$ . In the whole EU these characteristics are:  $m = 179,755.3$  thousand ha,  $s = 1,911.8$  thousand ha,  $V = 0.011$ ,  $\Delta = 1,284.3$  thousand ha; in the CR these characteristics are:  $m = 3,528$  thousand ha,  $s = 32.4$  thousand ha,  $V = 0.009$ ,  $\Delta = 21.8$  thousand ha; in the SR these characteristics are:  $m = 1,925.5$  thousand ha,  $s = 7.0$  thousand ha,  $V = 0.004$ ,  $\Delta = 4.7$  thousand ha. The highest relative variability of the data is in Cyprus (0.10), in Greece and Croatia (0.087). The double of the statistical discrepancy represents in average a 95% width of the confidence interval of the average. Column 17 contains calculated average annual increments (decrements with negative value) of utilized agriculture area during the whole period of 2007 - 2017. Columns 18 and 19 contain approximate estimations of the predictions of utilized agricultural area in 2018 and 2019 obtained by means of interpolation from the linear trend. The last but one column contains determined average growth (fall) coefficients of utilized agricultural area. They state how many times the value of utilized agricultural area increased (decreased) in average per year during the whole period of 2007 - 2017. The last column contains a relative representation of the results in %. Figure 2 shows a comparison between the individual countries according to the relative percentage growth coefficient. The highest average relative decreases of utilized agricultural land are in Cyprus (by 2.03% - in absolute numbers by 2.78 thousand ha), in Austria (by 1.97% - in absolute numbers by 58.3 thousand ha) and in Italy (by 1.33% — in absolute numbers by 183 thousand ha). The highest average relative increases of utilized agricultural land are in Greece (by 2.64% — in absolute numbers by 118.4 thousand ha), Croatia (by 2.22% - in absolute numbers by 29.5 thousand ha) and Malta (by 1.15% — in absolute numbers by 0.13 thousand ha). The average relative decrease in the whole EU is 0.27% - in absolute numbers by 481.1 thousand ha. In the CR there is an average annual decrease of 0.21% - in absolute numbers by 7.54 thousand ha, and in the SR the decrease is 0.10% — in absolute numbers by 1.99 thousand ha.

Figure 2: Comparison of the values of average relative growth (fall) coefficients of utilized agricultural area (in %) according to the size.



Source: Authors.

Forecasting by extrapolation by means of the linear trend cannot be considered optimal for most countries. The quality of smoothening of a time series by means of a suitable trend function can be assessed on the basis of various rates of smoothening accuracy (e.g. the determination coefficient  $R^2$ , mean squared error MSE, mean absolute percentage error MAPE, mean absolute error MAE). Accuracy can also be enhanced by the application of adaptive smoothening methods, which weight individual members of a time series by means of assigning higher weights to newer values than older ones (method based on exponential smoothening and on weighted moving averages). Applied statistical models should moreover have good statistical properties. We assess them according to the properties of residues.

Holt's smoothening, offered in software IBM SPSS v. 25 provides more accurate and adequate results of forecasts based on linear trend (the method is described for example in Stuchlý, 2004. Cipra, 2013). Calculations are carried out for the CR, its neighbours, the largest EU countries and finally for the whole EU. Table 2 shows absolute and relative precision rates of the applied Holt's smoothening. Exponential smoothening of the level and the direction of the trend function was used. The programme chooses the optimum smoothening constants. We applied MAPE (MAE) to the comparison of the smoothening accuracy. It expresses the average relative (absolute) errors of the smoothening of the individual values in % (thousands of hectares).

The most accurate results are in Slovakia (0.18% — in absolute numbers 3.49 thousand ha) and in Germany (0.25% — in absolute numbers 41.50 thousand ha). The least

accurate results are in France (3.63% — in absolute numbers 1,136.03 thousand ha) and in Austria (1.89 % — in absolute numbers 54.64 thousand ha). In the CR MAPE = 0.40%, MAE = 13.97 thousand ha and in the whole EU MAPE = 0,98%, MAE = 1,773.21 thousand ha.

Table 2: Precision rates of the Holt's smoothening

Model	Model Fit Statistics			
	R-squared	RMSE	MAPE	MAE
Czechia-Model_1	0.648	20.263	0.396	13.971
Slovakia-Model_2	0.622	4.514	0.181	3.489
Hungary-Model_3	0.610	138.210	1.360	73.215
Austria-Model_4	0.897	75.661	1.889	54.644
Germany-Model_5	0.663	66.016	0.248	41.496
Poland-Model_6	0.650	318.419	1.601	236.537
France-Model_7	0.031	1905.561	3.630	1136.025
Spain-Model_8	0.716	276.774	0.798	190.537
UnitedKingdom-Model_9	0.428	160.042	0.555	96.116
EU-Model_10	0.427	2403.426	0.977	1773.207

Source: Authors.

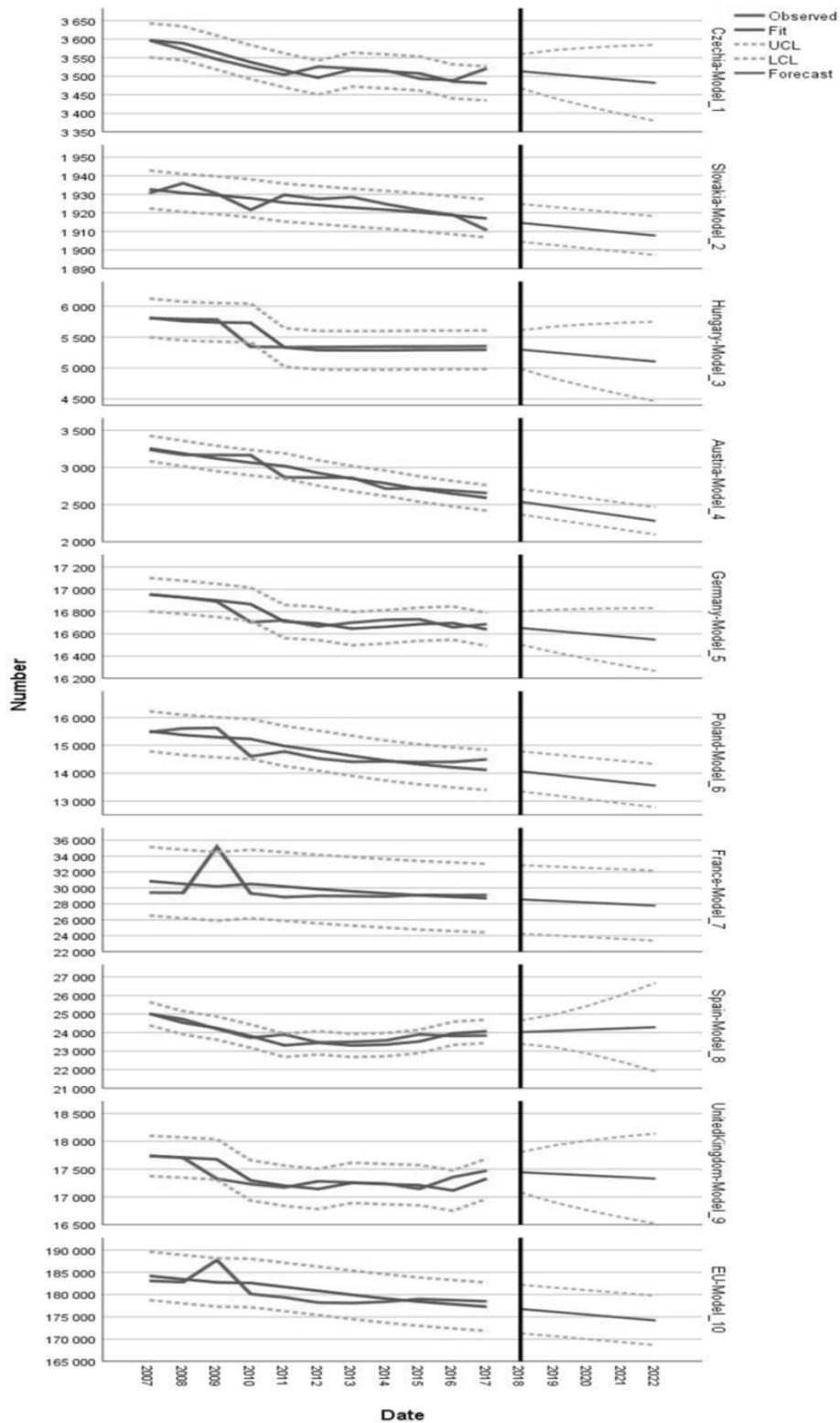
Table 3 shows point and 95% interval forecasts of the utilized agricultural area in 2018 - 2022 in the monitored countries by means of Holt's method. These forecasts for the individual countries are illustrated in the following Figure 3 together with the measured and the smoothened values. Holt's method predicts a permanent decrease of the utilized agricultural area in all countries except for Spain. The growth in Spain can be explained by the fact that Holt's method prefers current measurements to older measurements, and as we can see in Figure 1, the utilized agricultural area has really been growing in Spain in recent years.

Table 3: Point and interval forecasts of the situation in utilized agricultural area according to Holt's model

Model		2018	2019	2020	2021	2022
Czechia-Model_1	Forecast	3,513.47	3,505.62	3,497.76	3,489.90	3,482.05
	UCL	3,559.31	3,570.44	3,577.15	3,581.57	3,584.54
	LCL	3,467.63	3,440.79	3,418.37	3,398.23	3,379.56
Slovakia-Model_2	Forecast	1,914.61	1,912.89	1,911.16	1,909.44	1,907.72
	UCL	1,924.82	1,923.15	1,921.48	1,919.81	1,918.14
	LCL	1,904.40	1,902.62	1,900.85	1,899.08	1,897.30
Hungary-Model_3	Forecast	5,298.00	5,249.48	5,200.95	5,152.43	5,103.90
	UCL	5,610.65	5,670.10	5,707.02	5,731.46	5,747.69
	LCL	4,985.35	4,828.85	4,694.89	4,573.39	4,460.11
Austria-Model_4	Forecast	2,538.76	2,474.28	2,409.79	2,345.30	2,280.82
	UCL	2,709.92	2,648.64	2,587.30	2,525.90	2,464.46
	LCL	2,367.61	2,299.92	2,232.28	2,164.70	2,097.18
Germany-Model_5	Forecast	16,651.92	16,625.92	16,599.93	16,573.94	16,547.95
	UCL	16,801.25	16,817.19	16,825.46	16,829.17	16,829.77
	LCL	16,502.58	16,434.66	16,374.41	16,318.71	16,266.13
Poland-Model_6	Forecast	14,065.33	13,937.02	13,808.72	13,680.41	13,552.10
	UCL	14,785.64	14,671.40	14,556.89	14,442.13	14,327.13
	LCL	13,345.02	13,202.65	13,060.54	12,918.69	12,777.07
France-Model_7	Forecast	28,556.44	28,360.32	28,164.19	27,968.07	27,771.95
	UCL	32,867.12	32,691.97	32,516.72	32,341.37	32,165.92
	LCL	24,245.76	24,028.67	23,811.67	23,594.77	23,377.97
Spain-Model_8	Forecast	24,019.41	24,085.92	24,152.43	24,218.94	24,285.46
	UCL	24,645.52	24,971.53	25,443.54	26,017.87	26,670.40
	LCL	23,393.31	23,200.31	22,861.32	22,420.02	21,900.51
UnitedKingdom-Model_9	Forecast	17,443.38	17,414.77	17,386.16	17,357.55	17,328.94
	UCL	17,805.42	17,926.82	18,013.36	18,081.87	18,138.85
	LCL	17,081.34	16,902.72	16,758.96	16,633.23	16,519.02
EU-Model_10	Forecast	176,758.53	176,119.69	175,480.85	174,842.02	174,203.18
	UCL	182,195.45	181,583.85	180,972.12	180,360.26	179,748.28
	LCL	171,321.60	170,655.53	169,989.58	169,323.77	168,658.08

Source: Authors.

Figure 3: Smoothened values and forecasts of utilized agricultural area



Source: Authors.

## Conclusion

The analysis focused on the comparison of changes (decreases or increases) of utilized agricultural area in individual EU countries and the overall situation in utilized agricultural area in thousands of hectares (in the whole EU) in 2007 — 2017. We ascertained a significant drop of the area of agricultural land in most EU countries. With regard to the different sizes of countries the average percentage coefficient of growth (fall) was used for the comparison. The highest average relative drops of utilized agricultural area are in Cyprus (by 2.03% – in absolute numbers by 2.78 thousand ha) and in Austria (by 1.97 % — in absolute numbers by 58.3 thousand ha). The highest average relative increases of utilized agricultural land are in Greece (by 2.64% — in absolute numbers by 118.4 thousand ha) and in Croatia (by 2.22% — in absolute numbers by 29.5 thousand ha). In the whole EU there is a relative drop of 0.27% — in absolute numbers 481.1 thousand ha. In the CR there is a relative drop 0.21% — in absolute numbers 7.54 thousand ha.

The overall situation in agricultural land in EU countries was forecast approximately by means of interpolation. Holt's method was applied for the CR, its closest neighbours, the largest EU countries and the EU as a whole to obtain more accurate point and interval forecasts until 2022. The results are summarized in tables and figures.

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[https://doi.org/10.36708/Littera\\_Scripta2019/2/0](https://doi.org/10.36708/Littera_Scripta2019/2/0)

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# **Considering seasonal fluctuations in equalizing time series by means of artificial neural networks for predicting development of USA and People's Republic of China trade balance**

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## **Abstract**

Balance of payments is an accounting identity of each country. The ability to make a qualified and accurate prediction of trade balance of huge world economies such as the USA and the People's Republic of China economies can have influence on the world's economy. An enormous expansion and advancement of artificial intelligence offers a possibility to measure and predict also this indicator. The aim of the contribution is to propose a methodology for taking into account the seasonal fluctuations in equalizing time series by means of artificial neural networks on the example of the USA and People's Republic of China trade balance. For the analysis, the trade balance data of the two countries from the period between 1985 and 2018 are used. Regression by means of neural structures is carried out in two alternatives, where the second calculation takes into account the monthly seasonality of the time series. The result indicates that the additional variable in the form of the month in which the value was measured enables more order and accuracy. The other experimental calculation indicates that especially the fourth and the fifth retained neural networks are able to capture the whole course of the trade balance. They are thus able to identify and maintain local fluctuations of the time series, that is, to maintain its seasonal course. An interesting fact is also that in the case of the first alternative, the most successful networks were only the radial basis function neural networks, while in the second alternative those were only the multilayer perceptron networks.

**Keywords:** time series; artificial neural networks; trade balance; seasonal fluctuations; additional categorical variable; prediction.

## **Introduction**

Global market has improved the living standards of people all over the world. The global market offers individual services and products produced in a certain state, but are sold and used in a different state. As a result, a term referring to goods produced “in the world” emerged (Lawrence, 2018). After the converting all exported and imported goods to monetary value and determining the proportion between the value of imported and exported goods, it is possible to speak about balance of payments for a concrete state. The trade balance of payments is an accounting identity of each state (Müller-Plantenberg, 2010). Moreover, this contribution will deal with the USA and the People’s Republic of China (PRC) trade balance of payments.

Zhang et al. (2017) says that the overall USA balance of payments has been negative since 1975. However, in 2009, the USA became a net exporter as regards forestry products. This could have been due to the reduction of forestry products in the USA between 2007 and 2010. Luppold et al. (2014) focused on analyzing the amount of exported and imported hardwood, which, according to his study, has increased significantly in the last years. According to Zhang et al. (2017), only a change in target exporting and importing countries was observed. Increase in products purchasing power was also due to depreciation of American dollar. These facts, together with the Lacey’s Act on the ban of illegal trade with animals, affected the balance of payments in several branches. According to Chen (2014), the USA is the world’s largest consumer of goods. In recent years, the USA imports more technologically advanced products (Wang, 2018). Ali (2016) states, that the USA has a higher return on investment than the other compared states. This fact has been a subject of literature on global imbalance. While since 1990, the USA imported the goods especially from and to Europe, in 2013 the PRC became the most important market (Zhang et al., 2017). Bahmani-Oskooee et al. (2013) focused on the export from the USA to Hong Kong for 143 industrial sectors and import from Hong Kong to the USA for 110 industrial sectors and found differences in export and import between the individual sectors. Standard International Trade Classification (SITC 7) shows a low negative coefficient both for the export and import from the USA. Most probably, these industrial sectors are protected against external competition better than smaller industrial sectors.

Based on the analysis of the PRC import and export data from the period of 1997—2012, the PRC becomes the world’s leading purchaser of goods. However, this growth can be gradually limited by lagging behind the technical development. Over time, the PRC became the world and regional second largest purchaser of goods. The current pace of the PRC growth may cause that the USA will lose its leading position. In the case of primary purchased PRC goods, the current price on the global market is set according to the needs of the PRC, which improves its position on the global markets (Chen, 2014). In recent years, the PRC balance of payments has been increasingly destabilizing. Currently, the economic balance is a global problem (Huang et al., 2017). In this context, Murakami et al. (2018) investigated the PRC economic growth impact on Brazil, Chile and Peru and stated that the PRC economic growth impact on these states is minimal (1%).

According to the USA government, the trade with the PRC in 2005 showed a deficit of USD 201,6 billion. According to the PRC, this deficit in the same year was USD 114,2 billion.

This is 85.4-billion difference, which is not sufficiently explained. Fung et al. (2006) attempted to adjust the calculation of the overall balance by completing this equation by 4 other important import and export data, which had not been included by the governments. After adjustment, the import and export differences between the PRC and USA are still high — USD 189,7 billion vs. 219,5 billion. These differences are attributed by the authors to the re-export through other destinations, such as Macao, Japan, South Korea, the Philippines, Singapore, or even Taiwan. In 2005, the PRC showed a deficit of nearly USD 80 billion USD. According to Rasheed et al. (2019) the balance of payments deficit in the importing countries can be reduced by reducing the import of luxury goods, encouraging domestic producers to export or lowering the exchange rate.

In theory, it is possible to predict the fluctuations of the balance of payments based on the financial flows. According to Kandil (2009), this theoretical basis cannot be used to identify the trade balance of payments between the individual states. In accordance with the results of her study, financial flows fluctuation in individual states is random, as evidenced by statistical tests. However, such randomness raises concerns about the sustainability of the growing trade deficit and funding sources in many developing countries. Gouvea et al. (2010) used a multi-sectoral approach of Thirlwall's growth model to analyze the balance of payments growth and to create alternative methodology for analyzing the development of export and import elasticity. This alternative methodology enables to capture the impact of structural change reflected in the change of sector composition of international trade, in changing the elasticity of aggregate income.

Since the balance of payments analysis is always based on the data from a time series, for its prediction it is possible to use increasingly popular Kohonen artificial neural networks. Kohonen artificial neural networks are networks with future ties to historic financial data. However, in the economic sector using artificial neural networks is still at its beginning (Fioretti, 2004). The author of the artificial neural networks (Dr. Teuvo Kohonen) originally designed these networks for recognition of speech and its translation into text (Kohonen, 1990). The advantage of the artificial neural networks is their ability to predict a future development on the basis of non-linear relations of training data (Kahya-Özyirmidokuz et al., 2015). Kohonen artificial neural network works on the principle of assigning weight to the individual vectors, where the winning neurons are the neurons with the shortest Euclidean distance. The selected neurons activate all surrounding neurons and assign a higher weight to their vectors (Cai et al., 2008). Vochozka (2018) or Konečný et al. (2010) have already explored the usability of these neural networks in the economic sector. Also Šuleř (2017) points to a high degree of their future use.

The objective of the contribution is to propose a methodology for considering seasonal fluctuations when equalizing the time series by means of artificial neural networks on the example of the United States of America and the PRC trade balance.

## **Methods and Data**

The data for analysis are available at the World Bank websites, etc. For the analysis, the information about the trade balance between the USA and the PRC. It will refer to the

difference between the total export and import between the two countries from the USA's point of view. The time interval for which the data is available is the monthly balance starting from January 1985 and ending in August 2018, that is, 404 input data in total. The unit is billions of US dollars.

The data descriptive characteristics are given in Table 1.

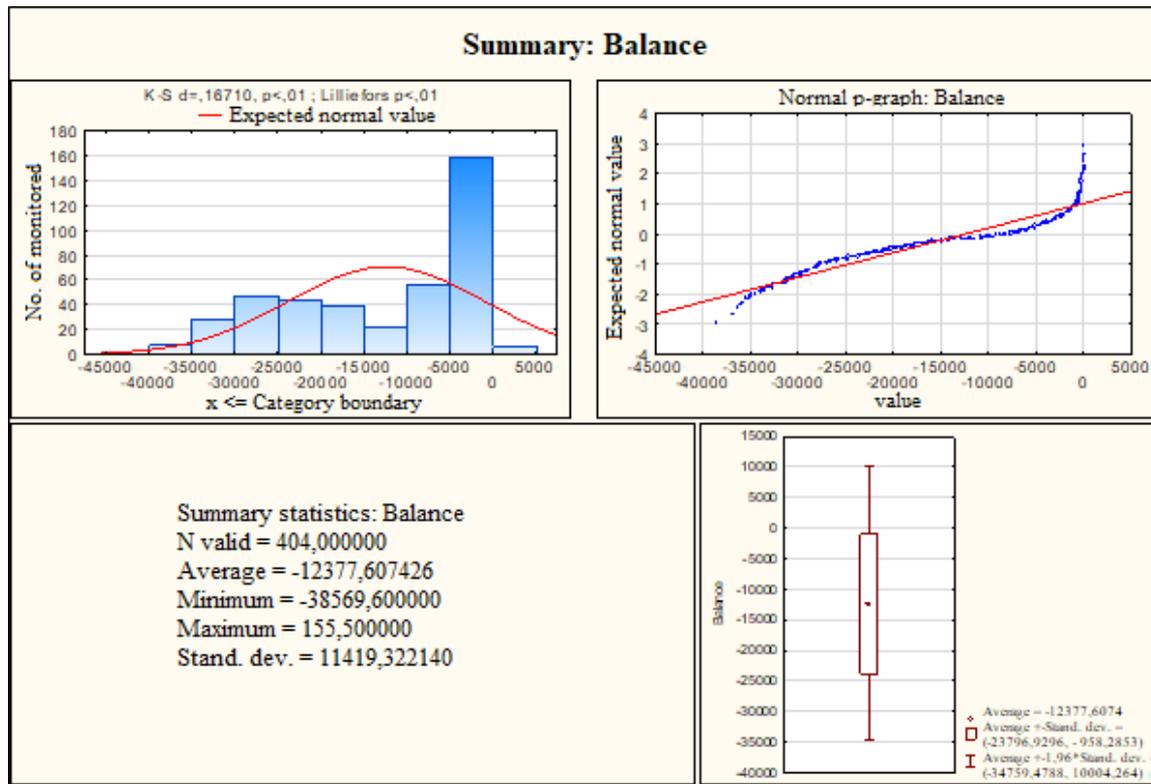
Table 1.

Samples	Month (Input variable)	Balance (Output (target))
Minimum (Training)	31048.00	-38569.6
Maximum (Training)	43313.00	155.5
Average (Training)	37316.95	-12814.0
Standard deviation (Training)	3549.13	11337.5
Minimum (Testing)	31138.00	-34989.5
Maximum (Testing)	42948.00	-17.7
Average (Testing)	36651.48	-11114.8
Standard deviation (Testing)	3758.45	12253.4
Minimum (Validation)	31199.00	-34518.0
Maximum (Validation)	42979.00	-67.8
Average (Validation)	37060.87	-11574.6
Standard deviation (Validation)	5186.49	11435.8
Minimum (Overall)	31048.00	-38569.6
Maximum (Overall)	43313.00	155.5
Average (Overall)	37180.08	-12377.6
Standard deviation (Overall)	3554.16	11419.3

Source: Own processing.

An interesting phenomenon is the development of the trade balance over time. Figure 1 shows graphs of chosen statistic characteristics, including the input data histogram.

Figure 1. Basic statistic characteristics



Source: Own processing.

What is interesting is the fact that the histogram does not correspond with the standard division. For data processing, DELL's Statistica software, version 12 will be used. Regression using neural structures will be carried out. Multi-layer perceptron networks and radial basis function networks will be generated. Two sets of artificial neural networks will be generated:

1. An independent variable will be time. A dependent variable will be the USA and the PRC trade balance.
2. A continuous dependent variable will be time. Seasonal fluctuations will be represented by categorical variable — a month in which the value was measured. We will thus work with a possible monthly seasonality of the time series. The dependent variable will be the USA and the PRC trade balance.

We will then work analogically with the data sets. The time series will be divided into three data sets — training, testing and validation data set. The first group will contain 70% of the input data. Based on the training data set, neural structures will be generated. The remaining two data sets will contain 15% of the input information each. Both data sets will be used for verification of the generated neural structure or model reliability. The delay of the time series will be 1. 10,000 neural networks will be generated, out of which 5 with the best characteristics will be retained. The hidden layer will contain at least to neurons (50 at most). In the case of the radial basis neural structure, the hidden layer will contain at least 21 neurons (30 at most). For the multi-layer perceptron network will

consider the following distribution functions in the hidden and output layers: Linear, Logistic, Atanh, Exponential, Sinus.

Other settings will remain default (according to the ANS tool – automated neural networks). Finally, both groups of retained neural networks will be compared.

## Results

### *Neural structures A*

Based on the aforementioned procedure, 10,000 neural networks were generated, out of which 5 with the best parameters were retained. For the overview of the retained networks, see Table 2.

Table 2. Retained neural networks

Network	Training performance	Testing performance	Validation performance	Training error	Testing error	Validation error	Training algorithm	Error function	Activation of hidden layer	Output activation function
RBF 1-22-1	0.976717	0.990200	0.981291	2934406	1486327	2303652	RBFT	Sum. quart.	Gaussian	Identity
RBF 1-21-1	0.980752	0.994040	0.981226	2429586	1528877	2305187	RBFT	Sum. quart.	Gaussian	Identity
RBF 1-29-1	0.980805	0.991049	0.983911	2422931	1506385	1945204	RBFT	Sum. quart.	Gaussian	Identity
RBF 1-25-1	0.979270	0.991914	0.981607	2614728	1343300	2402934	RBFT	Sum. quart.	Gaussian	Identity
RBF 1-24-1	0.979458	0.991623	0.980938	2591340	1413482	2353812	RBFT	Sum. quart.	Gaussian	Identity

Source: Own processing.

The retained networks are only the radial basis function networks. The hidden layer contains only one variable – time. The neural networks contain 21-29 neurons in the hidden layer. The output layer contains logically only 1 neuron and 1 output variable – the USA and PRC trade balance. For all networks, RBFT training algorithm was applied. In addition, all neural networks used the same function to activate the neurons in hidden layer, namely Gaussian curve. Similarly, for the activation of the neurons in the output layer, the same function was used, namely the identity function (for more details, see Table 2).

Training, testing and validation performances are also interesting. In general, we are looking for such a network, whose performance is ideally the same in all data sets (here it should be noted that the data were randomly divided into the data sets). At the same time, the error should be as small as possible.

The individual data sets performance is given in the form of correlation coefficient. The individual data sets values by specific neural networks are given in Table 3.

Table 3. Correlation coefficient of individual data sets

Neural structure	Balance (Training)	Balance (Testing)	Balance (Validation)
1.RBF 1-22-1	0.976717	0.990200	0.981291
2.RBF 1-21-1	0.980752	0.994040	0.981226
3.RBF 1-29-1	0.980805	0.991049	0.983911
4.RBF 1-25-1	0.979270	0.991914	0.981607
5.RBF 1-24-1	0.979458	0.991623	0.980938

Source: Own processing.

It results from the table, that the performance of all the retained neural structures is almost identical. The slight differences detected do not affect the performance of the individual networks. The value of all training data sets correlation coefficient ranges between more than 0.97 to more than 0.98. The value of testing data sets for all neural networks is more than 0.99. In the case of the validation data sets, the correlation coefficient for all neural networks is above 0.98. In order to choose the most suitable neural network, a more detailed analysis of the results obtained must be carried out. Table 4 shows the basis statistic characteristics of the individual data sets for all neural structures.

Table 4. Statistics of individual data sets by retained neural structures

Statistics	1. RBF 1-22-1	2. RBF 1-21-1	3. RBF 1-29-1	4. RBF 1-25-1	5. RBF 1-24-1
Minimum prediction (Training)	-33729.8	-32812.1	-35611.6	-30887.5	-32039.2
Maximum prediction (Training)	385.0	202.7	465.0	312.0	312.4
Minimum prediction (Testing)	-33279.1	-31325.5	-31741.1	-30826.9	-31946.5
Maximum prediction (Testing)	275.2	162.1	464.2	168.6	294.9
Minimum prediction (Validation)	-33365.7	-31632.1	-31812.1	-30843.1	-31988.5
Maximum prediction (Validation)	298.4	24.6	392.5	201.5	218.5
Minimum residuals (Training)	-9657.5	-6683.2	-7327.8	-7711.6	-7774.1
Maximum residuals (Training)	9716.2	8571.1	8882.7	9283.4	10189.8
Minimum residuals (Testing)	-5983.8	-5753.2	-6109.0	-5218.5	-5993.8
Maximum residuals (Testing)	4588.2	2638.7	4905.4	3590.0	3531.9
Minimum residuals (Validation)	-6164.3	-5445.2	-5767.4	-4992.1	-6785.3
Maximum residuals (Validation)	6573.3	8822.7	5667.2	7733.7	7408.2
Minimum standard residuals (Training)	-5.6	-4.3	-4.7	-4.8	-4.8
Maximum standard residuals (Training)	5.7	5.5	5.7	5.7	6.3
Minimum standard residuals (Testing)	-4.9	-4.7	-5.0	-4.5	-5.0
Maximum standard residuals (Testing)	3.8	2.1	4.0	3.1	3.0
Minimum standard residuals (Validation)	-4.1	-3.6	-4.1	-3.2	-4.4
Maximum standard residuals (Validation)	4.3	5.8	4.1	5.0	4.8

Source: Own processing.

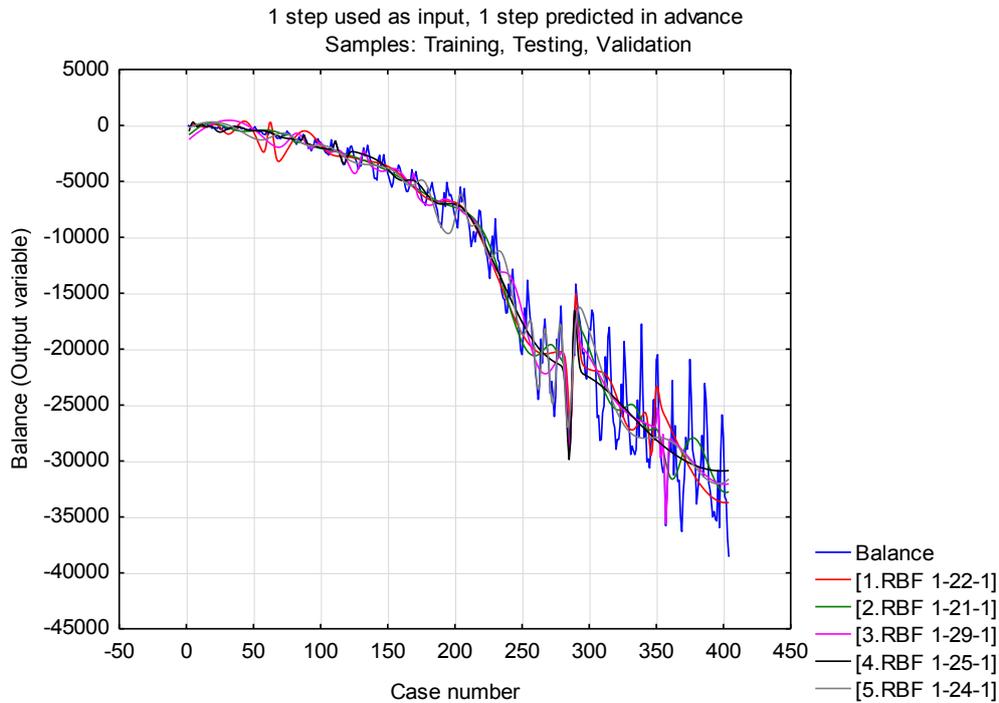
Ideally, the individual statistics of a neural network are horizontally identical in all data sets (minimum, maximum, residuals, etc.). In the case of equalized time series, the differences are minimal. There are bigger differences in the residuals characteristics. However, it is not possible to determine the retained neural networks with the best results unequivocally. Based on Table 4, it can be the network No. 3. RBF1—29—1.

Figure 2 shows a line graph representing the actual development of the USA and the PRC trade balance and at the same time the predictions development made by means of the individual generated and retained networks.

It follows from the graph that each neural network's prediction of the trade balance development is slightly different. However, what is important is not the similarity of the individual networks' prediction but the similarity (or the degree of consistency) with the actual trade balance development. Even in this respect, it can be stated that all the retained neural networks appear to be interesting at first sight. They follow the gradient

of the curve showing the trade balance development and at the same time show the extremes of this curve.

Figure 2. Line graph of USA and PRC trade balance predicted using neural network – comparison with actual trade balance in monitored period



Source: Own processing.

*Neural structures B*

In accordance with the procedure described above, other 10,000 neural networks were generated, out of which 5 with the best parameters were retained. Table 5 shows the overview of the retained networks.

Table 5. Retained neural networks

Network	Training performance	Testing performance	Validation performance	Training error	Testing error	Validation error	Training algorithm	Error function	Activation of hidden layer	Output activation function
MLP 13-23-1	0.993132	0.994897	0.992814	879530.4	880802.0	950952.0	BFGS 147	Sum.quart.	Logistic	Logistic
MLP 13-4-1	0.992884	0.994211	0.992703	914069.2	941123.8	983968.1	BFGS 99	Sum.quart.	Tanh	Logistic
MLP 13-6-1	0.993308	0.995170	0.992898	849468.7	866824.0	950204.7	BFGS 161	Sum.quart.	Logistic	Identity
MLP 13-13-1	0.993615	0.994443	0.992741	815152.2	924102.1	967511.0	BFGS 66	Sum.quart.	Tanh	Logistic
MLP 13-8-1	0.994173	0.994883	0.993739	740142.4	872853.2	865006.4	BFGS 94	Sum.quart.	Tanh	Logistic

Note: BFGS (= Quasi-Newton algorithm).

Source: Own processing

The networks are multi-layer perceptron networks only. The hidden layer contains two variables — time (continuous variable) and the month in which the measurements were carried out (categorical variable). Time is represented by one neuron in the input layer, while the relevant month by 12 neurons. The neural networks in the hidden layer contain between 4 — 23 neurons. The output layer logically contains only one neuron and one output variable, i.e. the USA and PRC trade balance. The Quasi-Newton training algorithm was used for all networks, but for each network, a different alternative was used. The neural networks used logistics and hyperbolic tangent functions for the activation of the neurons in the hidden layer. Similarly, two functions are used for the activation of the neurons in the output layer — identity and logistic functions (for more details, see Table 5). As an error function, all the retained neural structures used the sum of the least squares.

Table 6 shows the values of the individual data sets by the concrete neural networks.

Table 6. Correlation coefficient of individual data sets

Neural structure	Balance (Training)	Balance (Testing)	Balance (Validation)
1.MLP 13-23-1	0.993132	0.994897	0.992814
2.MLP 13-4-1	0.992884	0.994211	0.992703
3.MLP 13-6-1	0.993308	0.995170	0.992898
4.MLP 13-13-1	0.993615	0.994443	0.992741
5.MLP 13-8-1	0.994173	0.994883	0.993739

Source: Own processing

It follows from the table that the performance of all the retained neural structures is nearly identical. The slight differences detected do not have any influence on the individual network's performance. The correlation coefficient value of all training data sets ranges between the values higher than 0.992 and above 0.994. The testing data sets correlation coefficient achieves the value above 0.994 for all neural networks, while the value of the validation data sets correlation coefficient is above 0.992. In order to choose the most suitable neural structure, a more detailed analysis of the results obtained must be carried out. Table 7 shows the basic statistic characteristics of the individual data sets for all neural structures.

Table 7. Statistics of individual data sets by retained neural networks

Statistics	1.MLP 13-23-1	2.MLP 13-4-1	3.MLP 13-6-1	4.MLP 13-13-1	5.MLP 13-8-1
Minimum prediction (Training)	-35608.8	-34320.2	-35612.9	-35883.9	-36063.3
Maximum prediction (Training)	155.5	153.2	843.7	135.8	152.2
Minimum prediction (Testing)	-34787.1	-33761.5	-34802.6	-35030.4	-35370.1
Maximum prediction (Testing)	155.5	-488.0	1019.6	127.4	146.9
Minimum prediction (Validation)	-35600.9	-34020.4	-35380.9	-35884.5	-36220.2
Maximum prediction (Validation)	155.2	-484.4	-28.3	96.8	97.6
Minimum residuals (Training)	-8864.3	-7831.5	-8582.0	-8458.7	-8676.8
Maximum residuals (Training)	4727.0	4753.2	4531.0	5026.8	4597.4
Minimum residuals (Testing)	-2208.9	-3086.0	-1950.0	-2274.1	-1976.0
Maximum residuals (Testing)	5194.4	6059.4	5326.8	5487.6	5404.7
Minimum residuals (Validation)	-2593.3	-2683.1	-2708.5	-2110.6	-2298.8
Maximum residuals (Validation)	4776.6	5348.1	4812.7	4475.3	4736.8
Minimum standard residuals (Training)	-9.5	-8.2	-9.3	-9.4	-10.1
Maximum standard residuals (Training)	5.0	5.0	4.9	5.6	5.3
Minimum standard residuals (Testing)	-2.4	-3.2	-2.1	-2.4	-2.1
Maximum standard residuals (Testing)	5.5	6.2	5.7	5.7	5.8
Minimum standard residuals (Validation)	-2.7	-2.7	-2.8	-2.1	-2.5
Maximum standard residuals (Validation)	4.9	5.4	4.9	4.5	5.1

Source: Own processing

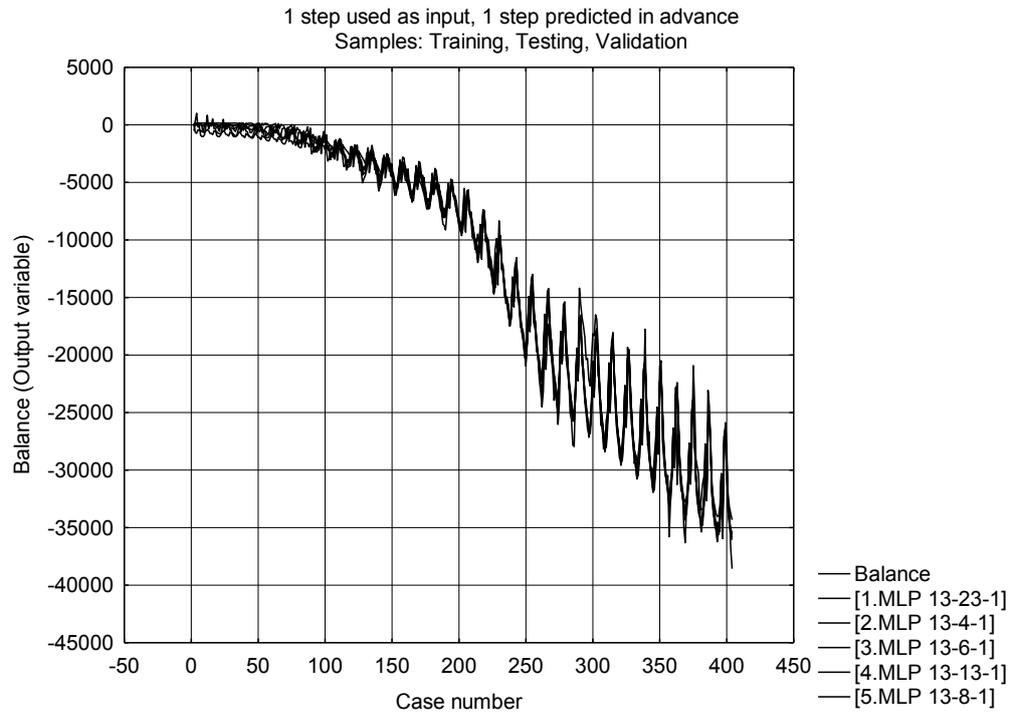
The individual statistics of the neural networks are horizontally identical in ideal case (minimum, maximum, residuals, etc.). In the case of equalized time series, the differences are minimal. Minimal differences also appear at the residual's characteristics. In spite of this, we are not able to determine unequivocally the retained neural network with the most suitable results. According to Table 4, it may be the network No. 4 MLP 13-13-1.

Figure 3 shows a line graph representing the actual development of the USA and the PRC trade balance as well as the development of the predictions made by means of the individual generated and retained networks.

The graph clearly indicates that all neural networks' predictions of the trade balance development in the individual intervals are slightly different. However, what is important is not the similarity of the individual networks' predictions, but the similarity (or the degree of consistency) with the actual trade balance development. Even in this respect, it can be stated that all the retained neural networks appear to be interesting at first sight.

All of them predict not only the basic trade balance development trend but are also able to predict local minimum and maximum.

Figure 1. Line graph – development of USA and PRC trade balance predicted by means of neural networks. Comparison with actual trade balance in the monitored period



Source: Own processing

The figure indicates that there are two neural networks particularly applicable: 4<sup>th</sup> MLP 13-13-1 and 5<sup>th</sup> MLP 13-8-1.

### *Comparison of A and B results*

All generated and retained artificial neural networks were capable of equalizing the time series – the USA and the PRC trade balance. It results from the comparison of correlation coefficients (see Tables 3 and 6) that the B alternative's performance (i.e. the retained MLP networks) is higher (when the additional categorical variable is included). This is reflected also when evaluating the basis predictions statistics (equalized time series) in Tables 4 and 7. The retained MLP networks, or their equalized time series, show smaller differences in the training, testing and validation data sets compared to the RBF networks (without additional variable). This can be clearly seen in Figures 2 and 3. At a glance, it is obvious that only the MLP networks, alternative B, are able to capture the time series in accordance with its actual course. At the beginning of the time series it seems that the results are similar to the A alternative (at least in the case of the 1.MLP 12 — 23 — 1, 2.MLP 13 — 4 — 1 and 3.MLP 13 — 1 networks). Only the networks 4.MLP 13 — 13 — 1 and 5.MLP 13 — 8 — 1 are able to capture the entire course of the USA and PRC trade

balance. However, since the 150<sup>th</sup> observation, all five multi-layer perceptron networks are able to identify and follow the local fluctuations of the time series, that is, to preserve its seasonal course.

## **Conclusion**

The objective of the contribution was to propose a methodology for considering seasonal fluctuations when equalizing the time series by means of artificial neural networks on the example of the United States of America and the PRC trade balance.

In general, each prediction is given by a certain probability degree of its fulfilment. To predict the development trend of any variable means to estimate its future development on the basis of the data from the previous periods. Although we are able to include most of the factors influencing the target variable in the model, there is always certain simplification of the reality; we thus work with a certain degree of probability that the scenario predicted will come true.

It can be stated that due to great simplification of the reality it is not possible to predict extraordinary situations and their possible influence on the USA and the PRC trade balance (maybe only in the short term). Prediction in the order of days would be ideal; however, currently it is not possible to obtain data for such a short-term prediction.

In this contribution, the results of applying the same tool with a different initial instructions. Although before the experiment it seemed unnecessary to use categorical variable in order to consider the seasonal fluctuations of the trade balance, the opposite proved to be true. Using an additional variable in the form of the month in which the measurements had been carried out resulted in better order and greater accuracy of the equalized time series.

The trade balance of both states can be identified based on the statistical, causal and intuitive methods. This contribution dealt with comparing the statistical methods. However, we only got a possible framework of the variable development. It is important to work with the information about a possible development of the economic, political or legal environment. If we are able to predict its development, we will be able to incorporate it in the monitored trade balance. However, what is of the same importance is the personality of the evaluator – an economist who corrects the price set by means of statistical methods and specified on the basis of the causal links in line with his / her experience and knowledge. Nevertheless, in this case it is only possible to test the prediction using the B alternative, which enables a high degree of accuracy. Very interesting results are shown by the networks 4. MLP 13 — 13 — 1 and 5. MLP 13 — 81. The objective of the contribution was achieved.

A very interesting fact is that in the case of the A alternative, the most suitable structures were only the radial basis neural networks. On the contrary, in the case of the B alternative, those were only the multilayer perceptron neural networks. It would certainly be an interesting experiment, if we generated only one type of neural networks

for a given situation, always different from the results obtained (that is, the MLP networks for the A alternative, RBF networks for the B alternative).

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[https://doi.org/10.36708/Littera\\_Scripta2019/2/0](https://doi.org/10.36708/Littera_Scripta2019/2/0)

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