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*Economics and Management in
times of change*

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Conference

October 16, 2020

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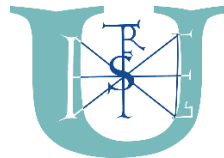
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BLOCKCHAIN: REVOLUTIONIZING THE AGRI-FOOD SUPPLY CHAIN BY BUILDING TRUST AND TRANSPARENCY

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Nikola M. Trendov
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Abstract

Blockchain is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. It was developed by the immense need for a more efficient, reliable, cost-effective, and secure system for conducting and recording financial transactions. There is a strong belief that blockchain will benefit almost all sectors. Blockchain is one of the most promising technologies, that will bring immense benefits in the agri-food sector. There are handful of successful cases where usage of blockchain enabled greater efficiency and value for complex agri-food supply chains. At the same time, these case studies show that blockchain is crucial for agri-food supply chains, as it provides new level of trust and transparency.

Keywords: agri-food, supply-chain, blockchain, visibility, transparency

JEL Classification: Q01, Q13

1 INTRODUCTION “Blockchain (here in after BCT) is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. Any asset of value (tangible, intangible, digital) can be virtually not only tracked, but also traded on a blockchain network, reducing risk and cutting costs for all involved (Manav, 2020).

BCT was developed by the immense need for a more efficient, reliable, cost-effective, and secure system for conducting and recording financial transactions. Despite the improvements in speed and efficiency in transactions, enabled by internet innovations and mobile technologies, the business transactions remain vulnerable, expensive and inefficient. And this being a problem in time when there are increased transaction volumes worldwide, signals that ensuring trustworthy transactions worldwide is crucial.

Despite the general thinking that BCT is a single technology, BCT is a type of technology that is based on using a combination of technologies with history in computer science and in commercial applications. These component technologies include public/private key cryptography (Rivest et al., 1978), cryptographic hash functions (Preneel, 1994), database technologies especially distributed databases, consensus algorithms (Vukolić, 2015) and decentralised processing. Main purpose is achieving integrity and database consistency in a context of a distributed decentralised database. Database can be either uncontrolled (‘unpermissioned’) or controlled (‘permissioned’). Uncontrolled is for example, bitcoin

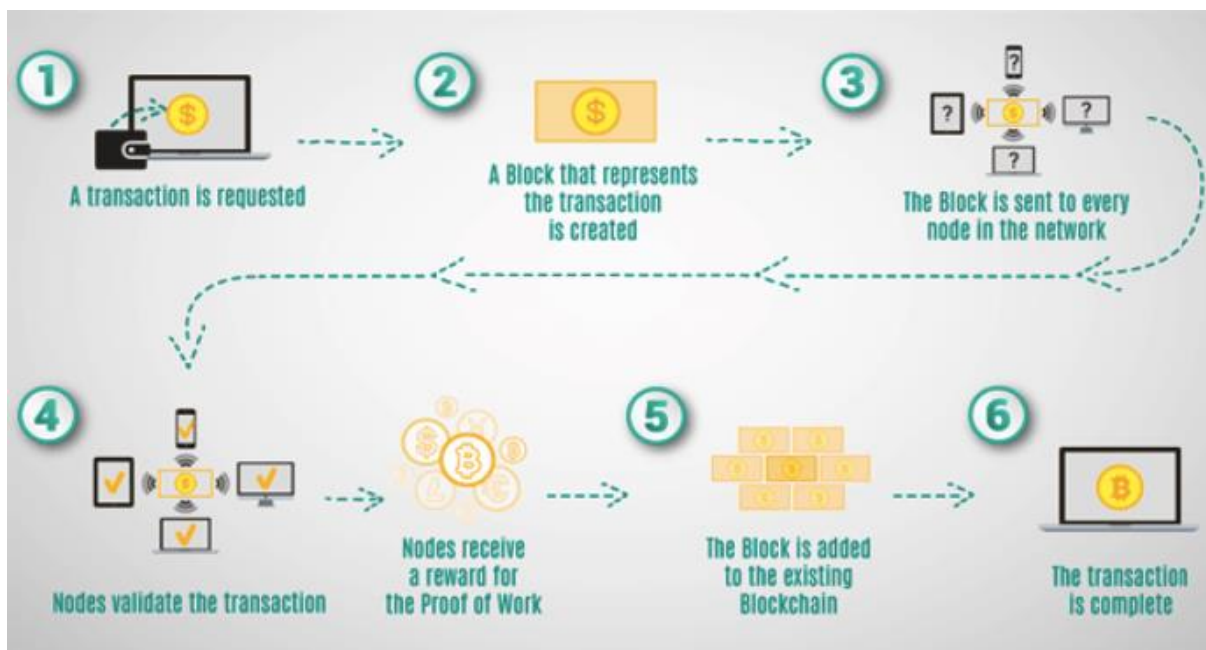


Fig 1. How blockchain works? Source: Zignuts, 2020.

2 THEORETICAL BACKGROUND Key technical choices of BCT include: 1) Permission design, i.e., whether permission is needed to access the blockchain; 2) Choice of consensus algorithm, i.e., how a new block is added to the blockchain; 3) Whether or not to use smart contract, i.e., whether to use the blockchain as a virtual machine where programs representing business processes are run; 4) Whether or not to use cryptocurrency, i.e., whether the consensus algorithm and smart contract operations depend on an artificial currency or not. Implementation of BCT depends and will result based on the technical choices from the governance model chosen for the ecosystem of participants. BCT provides permanent recording of data, and potential to facilitate sharing data between different actors in a food value chain. This potential of BCT may lead to an exciting paradigm shift facilitating transparency and trust in complex supply chains (Bessems and Bril 2017).

In the past years, we have witnessed that IBM has been a pioneer in developing various applications of the BCT. Even though BCT was firstly used in the financial industry, it is in IBM's and other parties' belief that BCT will have immense impact on other sectors, such as insurance, healthcare, supply chain management, government, retail and entertainment (Miller, 2017). Essentially, IBM is now offering Blockchain-as-a-service model, whereby the deployment of their software enables different sectors to build a permissioned BCT network, that enables accurate data access at real-time. IBM sees bright future for BCT, but also potential for improvements in the exchange of information, interaction of systems, and innovation of processes. It is expected that all of this will lead to a sharp reduction in frictions, and as a result, increased efficiency and reductions of costs (Brakeville and Perepa, 2016).

In the last three years, the interest for BCT increased rapidly, as we witness that many companies invested and focused on developing BCT applications for different sectors, not only limited to the financial sector. However, it is worth mentioning that BCT is still in an early stage of development, despite rapid pace of BCT applications and architecture development. This development is characterized as decentralised and disruptive to traditional way of operations in many industries. As the BCT development is rapid, governments and organisations have challenge on how to respond to it. BCT development is unpredictable and hard to regulate as it spreads over the national borders. As well as there might arise other challenges from governance and legal perspective.

3 RESEARCH OBJECTIVE, METHODOLOGY AND DATA Apart from above mentioned challenges, there are also many technical challenges such as scalability and throughput of transactions, suitability for data querying, and the digital to physical interface. It is crucial to ask "Who are the beneficiaries of BCT?", "How will BCT contribute to different sectors and solutions

can it provide?”, “What challenges and issues might arise from BCT?”. What impact will this new technology have on the digital ecosystems for transparency and trust in agri-food sector? Will this new kind of trust and transparency revolutionise the way agri-food chains are organised? What knowledge and expertise are needed in order to harness the power of the blockchain? These questions will be examined in the this paper by looking into couple of case studies.

3.1 Challenges of the supply-chain system

The present-day supply chains are faced with many challenges. Issues may include reliability of information, such as consumer trust, supply chain transparency, product quality, logistic issues, environmental impact, personal consumer data, fraud, food safety, etc. (Trienekens et al. 2012; Vasa et al., 2014; Ge and Brewster 2016). Before COVID-19 outbreak, trade tensions were already present, due to the tariff war and protectionism between China and US, which resulted with logistics and cost concerns worldwide.

According to Buatois and Cordon (2020) in the upcoming next years, we can expect to see a broad overhaul of our supply chain infrastructure and a new order based on three key dimensions. First, the supply-chains will move from globalization to regionalization, meaning that logistics hubs will emerge at the regional level. This will eliminate single-source dependencies, and at the same time will enable adaptable and flexible supply chain. This change had been kicked off several years ago because of increasing Chinese labor costs and decrease of the labor cost differences, but after the virus outbreak will accelerate even further.

Second, in a post-COVID-19 world, supply chain stress tests will become a new norm and the worldwide business model, optimized for minimum cost, is finished. Tomorrow’s model demands new priorities in optimization (Gál et al., 2013). In the past, volume stability enabled the supply chain to deliver with a high level of service while lowering costs at the accepted quality (Vásáry et al., 2012). But, as volumes are more variable, supply chains must become more adaptive, especially if, as forecasts suggest, large suppliers and logistics operators in the supply chain industry must prepare for major catastrophic events such as weather events, pandemic outbreaks, strikes, social unrest and other disruptions.

And finally, after the COVID-19 outbreak, it’s obvious that the human dimension is back, and it will play a prime role in rebalancing the global supply chain during this crisis and after, despite Artificial Intelligence’s (hereinafter AI) positive affect on efficient e-commerce, ‘the last mile’ of delivery – from distribution center to customer’s door still requires a human driver or drone operator.

3.2 Blockchain in agri-food supply chain

BCT is characterized by eliminating single point of failure, hence it provides increased data transparency and immutability and it will transform current economic organization and governance (Davidson et al., 2016). The competitiveness and cost-effectiveness of the BCT are likely to increase following three laws: Moore’s law, i.e., time required for data processing halves every 18 months; Kryder’s Law, i.e., data storage halves every year; and Nielsen’s Law, bandwidth doubles every two years (Davidson et al. 2016, Wiles 2015). Blockchain enables solutions that can increase the quality of the food supply and speed the movement of goods globally.

Due to the fact that BCT can facilitate different processes and transactions as a democratizing framework for a system of distributed networks (IBM, 2015), BCT infrastructure together with ICT in agriculture is the evolutionary next step for current ICT enabled farm systems and digital agriculture schemes. Thanks to the Internet of Things technology (here in after IoT), digitalized information can be shared. However, the IoT yields much ICT data currently stored in databases or networked databases with centralized cloud computing architecture. Agricultural and environmental monitoring data, which is stored in a distributed cloud, using blockchain technology, allows us to engineer trust and secure sustainable agricultural development with transparent data and ICT. This makes BCT the foundation for democratized, automatic, and transparent data management (Sun et al., 2016). ICT agricultural systems with BCT are therefore immutable and decentralized record

management systems. In addition, this immutability may revolutionize the way all biophysical resources are recorded and traced from source, to use, to reuse in large scale datasets (Nobre et al., 2016), and may ensure government record and service integrity (Walport, 2016).

When discussing BCT and taken in the context of trust, we discuss about centralized databases for storage of agricultural and environmental monitoring data. The traditional IT data management systems are typically used for national level data present a ‘high cost single point of failure’ prone to cyber-attack, asynchronous inaccurate data (Walport, 2016), censorship (MacNeil, 2014), data distortion (Lacetera and Zirulia, 2011), and scientific misconduct (Lacetera and Zirulia 2011). BCT, is the future’s technology that is characterized as being type of transformative ICT, by far-reaching implications for governance, management, and decision-making (Davidson et al., 2016). Additionally, it is characterized with the potential to eliminate the need for intermediaries (Lansiti and Lakhani, 2017; Back et al., 2014), BCT has changed the notion of trust requirements in centralized authorities (IBM, 2015). Even though BCT is not predicted to be mainstream until 2025 (i.e., the BCT market is estimated to grow from 210.2 million USD in 2016 to 2312.5 million USD by 2021 (DNV, 2017)), still the industry calls to action and increased focus on smart water technology opportunities further recognizes that BCT and AI is the ‘backbone’ technology going forward (DNV, 2017).

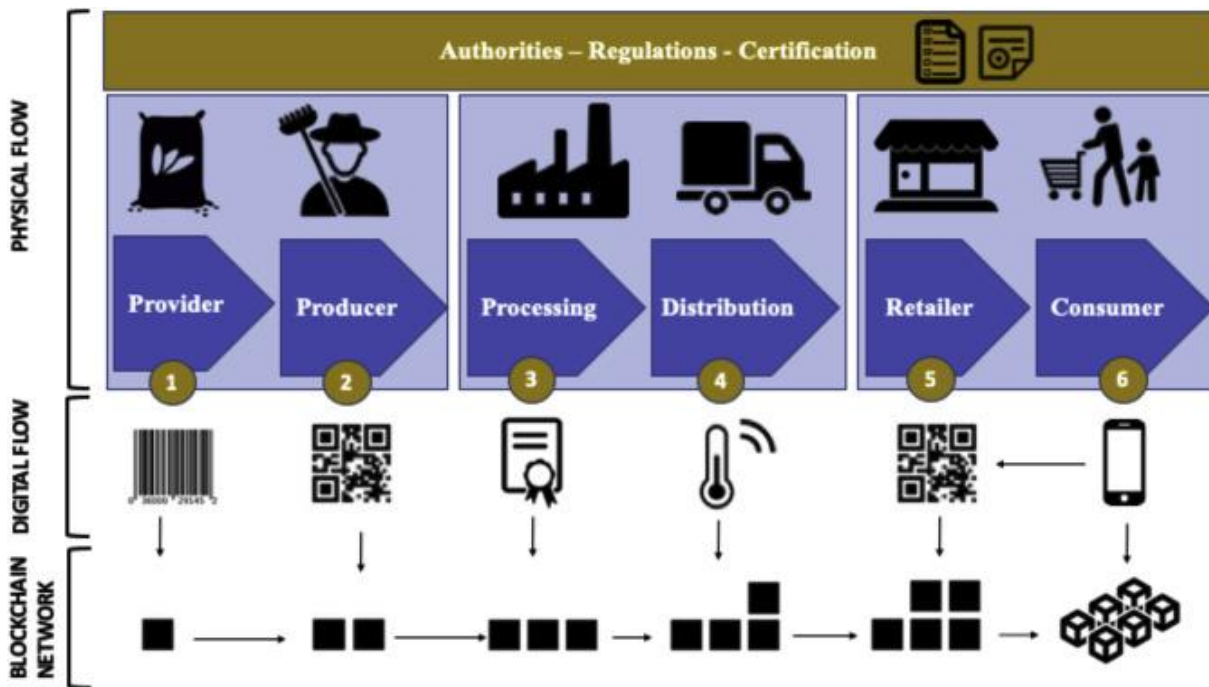


Fig. 2. BCT in agri-food supply chain. Source: Kamiliaris et al., 2019

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BCT is organized in a linear sequence of smaller encrypted datasets called ‘blocks’. Each block contains timestamped batches of transactions, but also a reference to its precedent block and an answer to a complex mathematical puzzle. This serves to validate the transactions it contains. More specifically, it is a decentralized ledger system of transaction records, which is distributed across a network of computers or databases (Pazaitis et al., 2017; Sutherland et al., 2017).

BCT are now firmly established and it is a digital technology that combines cryptographic, data management, networking, and incentive mechanisms to support the verification, execution, and recording of transactions between different parties. If originally, BCT were intended to support new forms of digital currency for easier and secure payments, now they give great promise for new foundation for all forms of transactions. Therefore, agribusiness stands to become a key beneficiary of this technology as a platform to execute ‘smart contracts’ for transactions, particularly for high-value produce.

4 RESULTS AND DISCUSSION

4.1 Supply-chain visibility and BCT

Supply chain visibility is the ability of stakeholders throughout the supply chain to access real-time data related to the order process, inventory, delivery and potential supply chain disruptions. Visibility is fundamental for supply-chains. Lack of inventory and transaction visibility remains still a significant challenge. This is crucial in today's economy, as one company or farm cannot manage, what cannot be seen. This challenge of lack of visibility is a barrier for proactively mitigating disruption risks.

Leveraging BCT can make difference and it will enable comprehensive visibility and access to accurate information quickly. BCT enables managing disruption and transparent and agile supply chain. BCT provides information and recommendations to reduce disruption mitigation time. BCT solutions enable real-time visibility in the agri-food system with suppliers, partners, customers and establish provenance.

The benefits from usage of BCT in agri-food supply-chains are threefold. First, the disruption impact will be reduced when BCT used. Agri-food supply-chains become more resilient, as at any point of time there is insight on data, patterns, historical trends and predictions on future events. Second, usage of BCT enables cost savings. Blockchain enables to achieve new levels of supply chain visibility and mitigate costly interruptions to product delivery. And last but not least, BCT enables traceability and transparency for all participants in the agri-food supply-chain, as it provides real-time information on the product movement and operations (Manav G., 2020).

4.2 Distributed ledgers and smart contracts for transparency in the agri-food systems

The creation of a distributed database (a ‘ledger’) can be used to record transactions of Bitcoins from one person (represented by their public key) to another. This database is characterized by being immutable and it is impossible to occur conflicting transactions. Much has been written on the significance of Bitcoin in and of itself and its potential to transform various sectors mostly related to finance (Frisby 2014, Scientist 2017). The distributed ledger feature has the potential for widespread use in agribusiness and trade financing, especially where workflows involve many different parties with no trusted central entity.

Smart contracts is one of the key concepts for BCT. These contracts are business terms included in the transaction database and executed as part of a transactions (Manav G., 2020). These are set of rules that govern certain transaction. BCT has the potential to disintermediate existing third-party arrangements, both in developed and less developed countries. In economies where third-party supply chain participants are not fully trustworthy, BCT can enable unchangeable, fix and permanent assurance of the product source. Furthermore, in economies with trustworthy third-party actors, BCT

benefits arise from reduced costs for business establishment, as well as mitigation of risk in the transactions themselves.

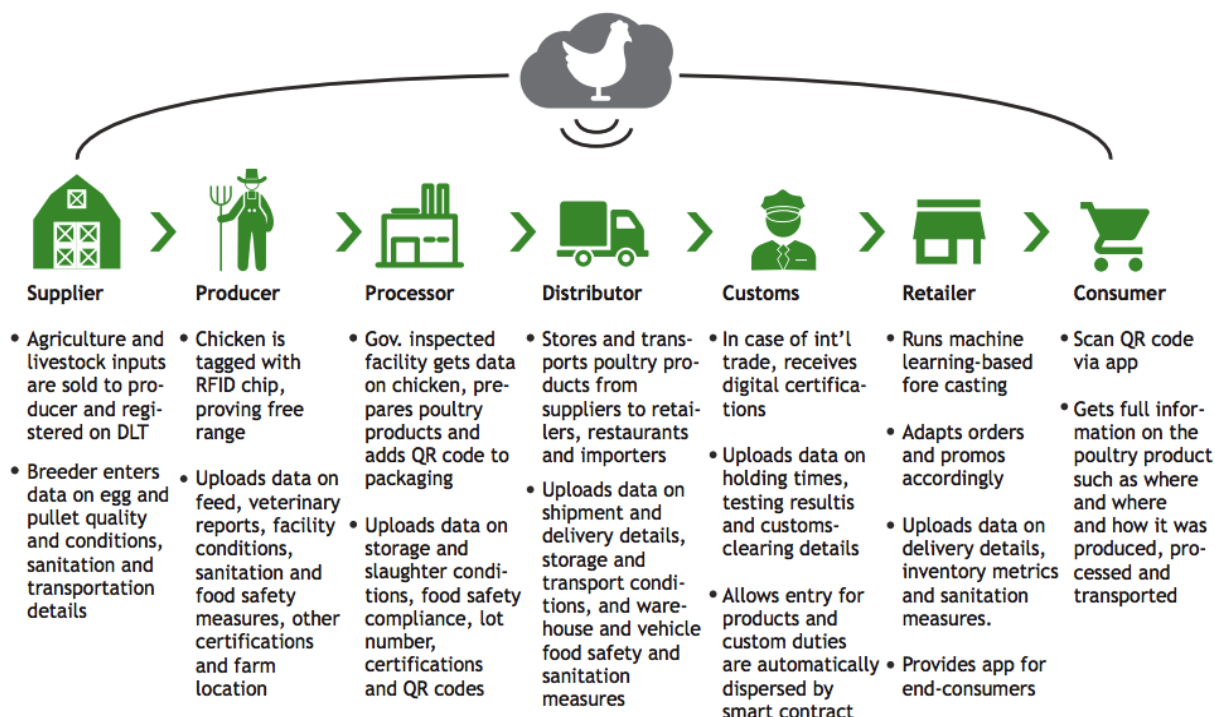


Fig. 3. Agricultural supply chain on distributed ledger technology. Source: Tripoli and Schmidhuber, 2018

Supply chains are crucial for agribusiness sector, therefore it is of critical importance to move goods across organisational boundaries. The contracts supporting the agri-food supply-chain too complex, as they include multiple parties and stakeholders, all of which have their own logistic and regulatory constraint. Payments are dependent on information content and quality at many different points, which highlights that information exchange in a supply chain, is just as important as the physical exchange of the goods themselves. Thorough documentation and evidence of provenance can thus expedite the processing of supply through bottlenecks such as at customs and biosecurity. The benefits from this are obvious, particularly when trade finance is a primary vehicle through which cross-border transactions occur. The neutral ground provided by the blockchain ledger allows complex agribusiness operations to integrate the disparate participants in their supply chain, as well as maintain an audit trail to govern and promote transparency through an entire suite of activities.

4.3 Case studies - benefits of BTC usage

IBM has handful of successful cases where usage of BCT enabled greater efficiency and value for complex agri-food supply chains. At the same time, these case studies show that BCT provided new level of trust and transparency. Below section shows two examples on transformation of the supply-chain by BCT usage.

Raw Seafoods Inc. is a successful case study where usage of BCT enabled increased efficiency, transparency and improved customer transparency. In Raw Seafoods Inc. after implementation of BCT all departments and parts of the chain are tighten together. For example all offshore data, scale data goes into computer system. This is when the supply chain starts. Sometimes customers lack trust in food companies, as they are hesitating when it comes to the food origin. By introducing BCT, Raw Seafood Inc. showed that they are serving the products that employees of Raw Seafoods would bring home. Customers have information where the scallops were caught, in what conditions they were caught, how are they stored etc. Sustainability and trust goes hand in hand with customers. Raw Seafoods Inc., has a trusted connection and real-time source of information that is shared, and

provides holistic picture of the supply chain. The ultimate result is sales increase. BCT enabled traceability, visibility, and trust from harvest to end user.

Another example is the joint effort of Maersk Line and IBM that resulted with developing TradeLens. More than 16 trillion USD in goods are shipped globally each year. However, the cost of trade documentation is estimated to reach one fifth of the actual physical transportation cost, due to different supply chain participants. If these costs are decreased, such as the documentation costs, the global trade could increase by 15%. TradeLens is neutral and open platform that is accessible to businesses and authorities in the supply chain, and provides single point for shipping data. By leveraging BCT, the global trade becomes more efficient, as it addresses issues in the fragmented supply chain. BCT enables access to end-to-end supply chain information, better risk assessment and lower administrative costs to move physical papers across international borders.

4.4 Future applications of blockchain for agri-food

BCT has immense potential for the agri-food sector. However, despite this potential, it is not yet ready for mass usage. This is due to the fact that both, the design and codebases are still being developed and redefined all the time. The challenge here is that, at this stage, we are not able to predict if the bandwidth exists for BCT to scale, but also it is hard to predict whether enough of a mass of adopters will come forward to ensure the network is wide enough to realize all the potential BCT. Ultimate belief is that global trade agri-food will evolve into a battle of specific agri-food supply chains. All these supply chains will be very efficient, huge optimization potential and innovative financing will yield best in breed organizations. As BCT gains momentum, “there will be real-time visibility, reduced complexities, improved accuracy and efficiency in the agri-food system, which in turn will help reduce costs and enhance trust from farm to fork. Its usefulness will not be limited to supplier or consumers but will extend to lowering trade barriers, especially for developing nations which are not able to participate in global agri-food trade owing to cost considerations” (Bajpai, 2017). Overall, “when adopted at scale, the solution has the potential to save the industry billions of dollars and benefit global trade and the world economy” (Bajpai, 2017).

Unfortunately, many organizations rely heavily on extended terms and financing to float logistics and operations costs. Many companies, have adopted the practice to extend terms to free-up cash flow. This being said, in addition to the possibility that BCT backed by crypto currency becomes the norm, will cause for many food retailers to suffer cash flow issues. This is a result of them, being unable to pay for transactions real-time and thereby unable to compete on the global agri-food market. While currency inflation and deflation rates become more difficult to leverage, allowing for a fairer trading environment, we question if BCT somehow contributes to a de-evolution of sorts, where “the iron law oligarchy” will inevitably surface and farmers will harvest their benefits. However, the tremendous benefits gained using BCT should not be overshadowed by the potential risks (Brakeville and Perepa, 2016). For example, smart contracts can be used for transactions to exchange money, fertilisers, mechanization, property, or anything of value where BCT defines the rules and penalties of the contract and automatically enforce those obligations, including expiration dates and validity. In addition to this, if BCT is integrated in the IoT device management, it will vote confidence, and P2P insurance. All of these applications of BCT are already being vetted and show desired results.

The BCT has great potential to act as a single, immutable record of a food’s journey from farm to fork. Encryption and signature of provenance data makes it impossible to change. It is easier for suppliers to see and check the origin of the food, but also the time needed for the food to get there. In addition to this, they can also trace damaged or missing produce back to its precise location; the entire route can be tracked along the BCT. These are the benefits of the BCT; not only for guaranteeing provenance of high quality produce like seafood but also detecting inefficiencies in food distribution. At the moment, in the agri-food sector, BCT is one of the most promising technologies, that will bring immense benefits.

5 CONCLUSION In these extremely changing times, in order for stakeholders in the agri-food sector to be able to achieve economies of scale and minimize production costs, they must change the

traditional way of agri-food trade and go beyond themselves. In developing a competitive global multi-tiered supply chain, it is vital that agri-food stakeholders recognize that they have to better coordinate and manage processes in the supply chain and maintain global network.

Companies should all the time follow up on latest news and developments related to BCT, in order to grasp the developments in this sector. The cases studies above are only a small list now as this is only the beginning of BCT. As there are invested vast of capital, time and labour in BCT continuously, it is now clear that it is no longer a question whether BCT will revolutionize the agri-food sector and further develop the transactional transfer of value, assets, information and goods and services; rather, it is a simple question of when this will take shape. Despite considerable progress displayed by these early adopters shown in the case studies, the fact of matter is that the technology is still in its initial stage, especially in terms of bringing it to scale enough for widespread use in the agri-food sector and global supply chain.

There are still challenges, such as infrastructure investment, regulation and compatibility for those entities still using outdated systems. As the past couple of years shown, once BCT adoption gains true adoption, it's use in the agri-food sector will be widespread. The technology is likely to attract increasing attention as a superior alternative to traditional forms of data tracking and very soon and in near future BCT will capture considerable market share in the agri-food sector as the benefits become more apparent and the overall concept is continually proofed good.

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ON ORGANIZATIONAL ASPECTS OF ECONOMIC DIPLOMACY

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Abstract

Economic diplomacy is undoubtedly one of the instruments, services of which will be required in the course of the expected restart of individual economies and their international cooperation after the Covid-19 pandemic. This paper focuses on various organizational aspects related to economic diplomacy. It briefly describes three different perspectives that combined can give a comprehensive organizational picture of economic diplomacy. The first perspective relates to the number and the mutual relationship of main domestic actors, based on which it is possible to differentiate between an integrated and a dual model of organization. The second perspective focuses on organizational models of management describing the ability of main actors to send directives and instructions to economic diplomacy's bodies abroad. The last perspective describes organizational models of economic diplomacy abroad. The paper proposes thus a methodological framework for organizational characteristics of economic diplomacy.

Keywords: *economic diplomacy, organizational models, foreign service*

JEL Classification: F59

1 INTRODUCTION The number of actors involved in economic diplomacy leads to a variety of institutional solutions. Particular organization of economic diplomacy within the state, including the foreign service abroad, is a reflection of institutional traditions, degree of openness and competitiveness of the economy, as well as the needs of the private sector defining the order, which the state tries to satisfy. As a consequence, a *sui generis* model of economic diplomacy develops in every country.

The aim of the paper is to discuss various organizational aspects of economic diplomacy and identify – based on author's practical experience, numerous interviews with other practitioners and available literature – basic models in each of them. The paper contributes thus to the theoretical discussion on economic diplomacy. This rather conceptual than research nature of the paper shall be used for further empirical research in future. Thus, after a brief overview of main resources forming the discourse on economic diplomacy in the following part we will proceed directly with the discussion of organizational aspects.

With regard to the structure of the paper, we will firstly identify the various organizational perspectives of economic diplomacy both at home and abroad, and subsequently we will present basic organizational models. The reader shall be notified in advance, that the presented models do not intend to cover the whole spectrum of lively practices in economic diplomacy; they rather represent simplified constructs setting the general boundaries within which the bilateral economic diplomacy usually operates. In the center of our interest herein is the relationship between political headquarters at home and individual units or personnel responsible for economic diplomacy abroad.

Main limit of this paper is related to its focus on bilateral economic diplomacy. This article does not focus on specific organizational variations usually established for the plurilateral or multilateral economic diplomacy. At the same time, we do not aim here at the whole variety of activities undertaken within economic diplomacy and their management. We focus here solely on basic

institutional relations, organization and management lines between economic diplomacy's headquarters at home and permanent organizational units abroad.

2 THEORETICAL BACKGROUND Many concepts of economic diplomacy, including the variations on trade or commercial diplomacy have been presented during the last two or three decades, e.g. by generalists of diplomatic studies like Berridge (2015) or Hamilton & Langhorne (2011), but mainly by specialists in this area, nominally including trade or commercial diplomacy as well, like Carron de la Carrière (1998); van Bergeijk (1994, 2009); van Bergeijk et al. (2011); van Bergeijk & Moons (2018); Bayne & Woolcock (2011); Berridge & James (2003); Lee & Hudson (2004); Lee & Hocking (2010); Okano-Heijmans (2011, 2016); Ruël (2012); Ruël & Zuidema (2012); Kosteci & Naray (2007); Naray (2008, 2011, 2012, 2018), Woolcock (2013), or Chatterjee (2020). The latter group may be from our perspective also expanded by Slovak and Czech authors, e.g. Tóth (1994), Tóth & Horváthová (2006), Pajtinka (2007, 2016), Csabay (2019), Hladík (2001), Štouračová (2008), or Štouračová et al. (2010, 2012).

Diplomats and ministries of foreign affairs (MFAs) do not have a monopoly in economic diplomacy (compare e.g. Carron de la Carrière 1998; or Bayne & Woolcock 2011). Some authors even indicate that this monopoly is not even applicable to the classic diplomacy itself (Hamilton & Langhorne 2011). More specifically, the group of negotiators in international economic relations may include state representatives responsible for economy, industries, agriculture or trade, eventually by them appointed officials (Odell 2000). According to Sharp (2013), the portion of international affairs conducted through formally accredited diplomats is decreasing in comparison to the overall scope of relations between states. It seems that with regard to economic relations is this statement even more applicable. However, formal permanent structures of a foreign service still play an important and irreplaceable role. This paper focuses on this traditional dimension of economic diplomacy while recognizing the existence of other means and activities through which it may be performed.

Organizational aspects are, however, not very often part of the above-mentioned resources. Significant exceptions are e. g. Tóth & Horváthová (2006), Naray (2011), or Berridge (2015), to which we will refer later. Theories of management and organization are omitted with regard to the size limits of the paper.

3 DISCUSSION OF ORGANIZATIONAL ASPECTS In order to conceptualize the variability of organizational variations in economic diplomacy it is essential to identify the institutional areas, in which differences typically appear. These include mainly:

1. Variations in the number of main actors with competence in external economic relations;
2. Variations in management models;
3. Variations in organizational schemes abroad.

These three different perspectives combined shall give us the organizational image of individual schemes, based on which respective economic diplomacies are developed.

3.1 Addressing the competence at home

With regard to the number of actors with competence in external economic relations we refer to a specifically defined competence (usually by a sort of 'competence act' establishing the portfolios of individual ministries or departments), and thus do not take into account the obvious fact, that effectively almost all government members take part in the conduct of, or related to, external economic relations. According to Tóth & Horváthová (2006), it is crucial to identify the 'central state authority responsible for the conduct of external economic relations' in order to define the

organizational model. They postulate that it may be MFAs in the so-called *integrated model*, or a co-operating pair of ministries (departments) consisting of an MFA and a ministry (department) responsible for a trade-political or economic-political agenda within the so-called *dual model*.

In the case of the former, MFAs are responsible for foreign relations in general and at the same time for external economic relations of the state, including e.g. those trade-political, as it is the case of Canada or Belarus. In the case of the latter model we may find this agenda split between MFAs and at least one other ministry or department. We may here refer to the cases of China, Italy, Slovakia, Czech Republic, and many other countries that either directly establish a ministry of foreign trade, or integrate this agenda into the departments of economy, industries, economic development or similar. From the institutional view this helps us to identify the number and mutual relationship of main domestic actors of economic diplomacy. Thus, we adopt this concept to establish the first from the three above-mentioned perspectives on organizational models of economic diplomacy.

If the competences in external economic relations are split among two or more ministries, a very important question of coordination arises immediately. Possible tensions among main actors may then appear, however, they have to be tackled in order to establish an efficient and functioning institutional system. In the case of failing to do so, the disorder in the public service, or even a struggle for influence in economic diplomacy, will possibly have negative effects on the perception of the whole system by its main beneficiaries – the businesses. On the other hand, efficient coordination brings a more numerous and diversified service to entrepreneurs. Thus, in many systems involving multiple main actors of economic diplomacy we may observe a sort of a coordinating body, either at the government level as its advisory body, or at the inter-ministerial level e.g. in form of an operative working group. From the perspective of the management of economic diplomacy it is essential to take into account besides the above-mentioned organization of domestic bodies (*integrated vs. dual model*) also the models of management and models of organization abroad.

3.2 Managing the economic service abroad

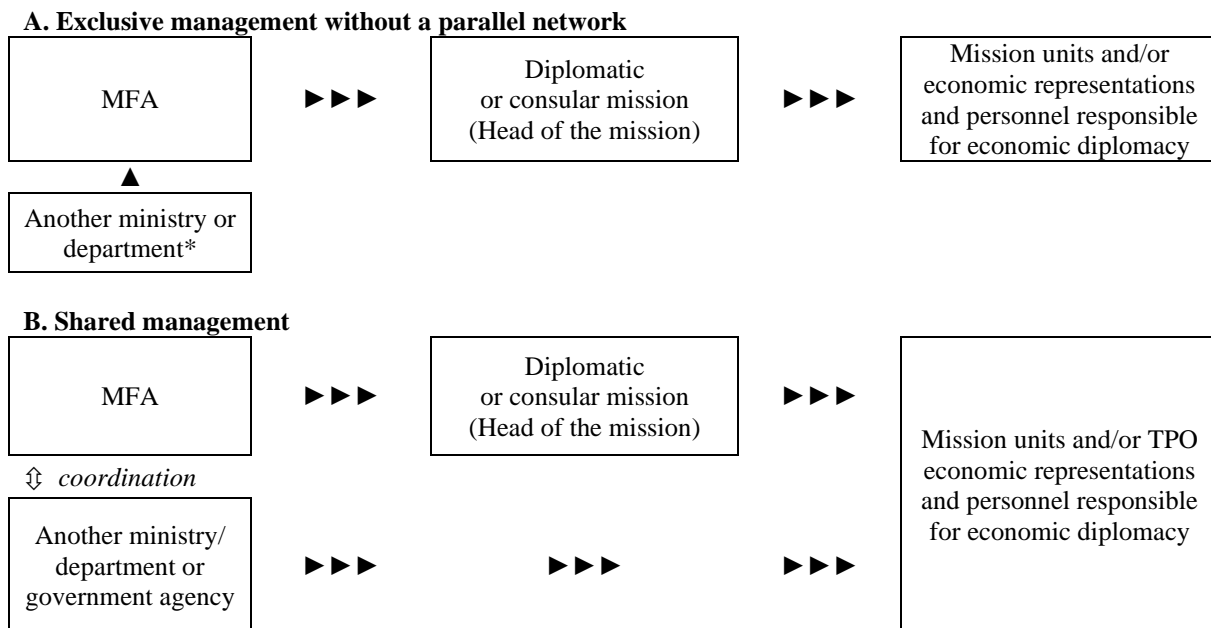
The range of actors involved in economic diplomacy creates complex preconditions for its management. Nevertheless, we can consider the system of unified management of the foreign service as the starting point for identification of economic diplomacy's management models. Based on the international customary practice, ministers of foreign affairs have the competence to manage and implement the state's foreign policy and, within it, to manage external relations through foreign representations – diplomatic missions. Any economic diplomacy's representation abroad should be managed, or at least coordinated, in accordance with the uniform implementation of the state's foreign policy, regardless of its institutional form or its founder, which may be the MFA itself, another ministry or ministries with appropriate competence in external economic relations, or even a specialized government agency responsible for promoting exports, investment, or tourism.

In all before-mentioned cases we may speak of an official economic or commercial representation of the state regardless of whether it is formally classified as a department of the diplomatic mission, or whether it operates independently inside or outside the premises of the diplomatic mission as a government agency representation. From the viewpoint of the receiving state, the head of the diplomatic mission may be held responsible for its activities as the highest representative of the sending state. For this reason, MFAs tend to insist on the inclusion of actors and activities of economic diplomacy, or at least their thorough coordination, into the system of foreign service's unified management and control. Of course, there is also a theoretical possibility of private (or public-private) representations of specialized government agencies. However, their activity without mutual agreement, acceptance, or at least notification to the receiving state is unacceptable. Even in the case of their legitimate activity in the receiving state, their operation (de facto as a representative of the sending state's executive branch) outside the framework of the unified (or coordinated) management of the foreign service can bring undesirable complications. However, the situation may be different

in this respect in countries, with which the state does not have diplomatic relations or in which a diplomatic mission is not established.

Direct and complete subordination of economic diplomacy to MFAs in its entirety is not feasible for several practical reasons. Firstly, natural partners for entrepreneurs within the scope of state administration are economic departments (e.g. of economy, trade, industry, energy, environment, transport, agriculture, finance, etc.), with which they have interactions in many other areas of state policy implementation. Moreover, when it comes to external economic relations, exports and foreign investments are an extension of domestic business activities. It is only natural that economic ministries have also developed institutional and personnel structures aimed at supporting business and its internationalization. At the same time, competencies in external economic relations are typically fragmented among several ministries. Leaving aside the activities of domestic actors (ministries or departments and their representatives), which is defined by a combination of general or personal political priorities, the calendar of regular formats, reactions to initiatives from foreign partners, responses to domestic business interests and, last but not least, individual interest in cross-border business support as a part of the political agenda, economic diplomacy management models can be in general applied almost exclusively to the activities of its bodies abroad. The necessary degree of generalization stems from the fact that each system of economic diplomacy, in terms of its elements (actors involved) and the relationships between them, is the result of specific conditions that are different in each country. In principle, however, we can distinguish in practice two models of economic diplomacy management: the *exclusive model* and the *shared model*. Main criterion for the description of economic diplomacy by one of them is the identification of the source (or sources), which generate instructions for economic diplomacy's bodies abroad. Figure 1 presents the two main models.

The instruction source in the case of the exclusive model is solely the MFA. Any request or task for the bodies of economic diplomacy abroad has to be assigned, authorized or mediated exclusively from the managing unit in MFA headquarters either directly or through the head of the mission (e.g. ambassador or consul-general). The exclusive management model can be combined with both the integrated and the dual model of economic diplomacy organization within the domestic institutional environment. In the case of the integrated model, in which the MFA acts also in the capacity of the domestic authority for external economic relations with competence in the implementation of the external economic policy, this is practically the only option for organizing the management of economic diplomacy. In the case of the dual model, in which the competence for external economic relations rests with a different ministry, the MFA acts as an essential transmitter of instructions for economic diplomacy bodies abroad. This is, however, applicable only for a construct with a single network abroad. Once a complementary network of commercial diplomacy is established under a different department or agency outside the MFA control, altered management processes including various coordination mechanisms take place.



* In the case of a dual organization of domestic authorities

Fig. 1 – Simplified schemes of main management models in economic diplomacy. Source: own research

3.3 Organizing the permanent network abroad

When we look at the organizational practices of the bilateral economic diplomacy abroad we may find – besides occasional trips of state representatives or temporary events like business missions, sourcing workshops or presentations at fairs – its core in activities of diplomatic and consular missions, their eventual economic or commercial departments, and representative offices of various government agencies focusing on trade, tourism, investment, or innovation promotion. These may be substituted by similar structures of economic, industrial or trade chambers if they act in the public interest. As we already indicated earlier, individual organizational elements may be established within a single diplomatic network (economic and/or commercial diplomacy being then part of the agenda of diplomatic missions), through a complementary network of commercial diplomacy, or by a combination of both. Distinct structures are usually established for the purposes of the plurilateral and multilateral economic diplomacy.

This organizational aspect has been touched in literature on economic diplomacy before. Berridge (2015) comments, that the practice of economic diplomacy provides only “a motley picture” with regard to its organization. Practices applied vary not only among states, but also within respective foreign services. Berridge (ibid.) indicates that the size of the embassy plays a role in the selected organizational model. Larger diplomatic missions may be divided into various sections, smaller missions have either a smaller number of sections or even do not have internal sections. Naray (2011) suggests basic organizational arrangement types, going thus more into the depth of this specific perspective on the practice of economic diplomacy. He defines several criteria such as level of decentralization in order to describe six different arrangements. From our viewpoint he combines the competence question, the management model and organization abroad within one overview. Our approach prefers a more structured approach with these three organizational aspects described separately.

Tóth & Horváthová (2006) also mention that institutional schemes of the economic diplomatic service are very diverse and, moreover, include variations. They differentiate with regard to bilateral economic diplomacy between three main groups of organizational models abroad. It seems that the

MFAs tend to deal with economic diplomacy, while the economic departments or ministries, including the specialized agencies, tend towards the commercial diplomacy. As a result, the three models presented by Tóth & Horváthová differ in the way, how the latter one is organized in relation to the diplomatic mission (see Fig. 2).

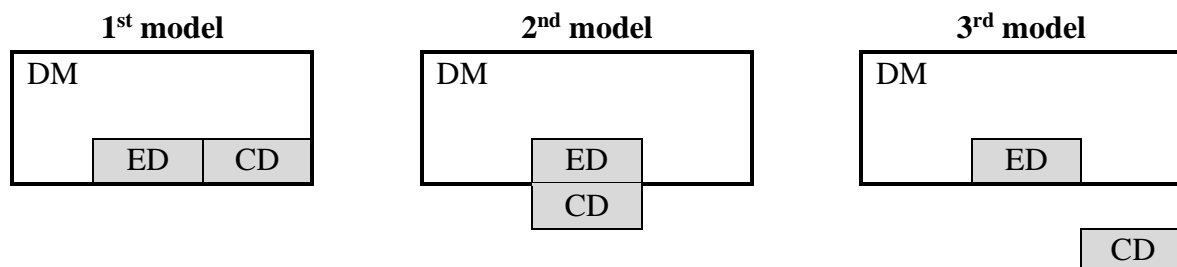


Fig. 2– Basic organizational models of economic (ED) and commercial (CD) diplomacy in relation to the diplomatic mission (DM). Source: author based on Tóth & Horváthová (2006)

Both economic and commercial diplomacy are performed by two independent sections or a single combined section of the diplomatic mission within the first model. Staffing of the sections (or section) is another question – both areas may be staffed either by the MFA personnel, or by professionals seconded from economic ministries and government (trade promoting) agencies, especially in the case of the commercial section. In case of smaller missions there is, naturally, no need for the departmental division – both areas are then covered by one or more diplomats embedded in the mission, which we regard here as a fully equivalent organizational model.

In the second model is the organizational unit responsible for commercial diplomacy typically interlinked with the mission via the person of its head as it usually appears as an independent representative office, auxiliary to the mission. Its founder may be an MFA, but more frequently it is an economic ministry or a government agency. Its linkage to the diplomatic mission does not necessarily mean that it has the same seat.

For the third model is typical, that the unit responsible for the commercial diplomacy is organizationally independent from the diplomatic mission. It is often found in more developed foreign economic networks with offices established also outside of national capitals. In such cases may this particular model be found in combination with one of the previous two. It can be quite often observed that such independent network of commercial diplomacy is run by a trade promoting government agency, and is eventually supplemented by similar offices focusing on tourism, investment or innovation promotion. Such model, however, places increased demands on coordination processes in the management of the foreign service.

Of course, it seems appropriate to admit that these models are, firstly, rough simplifications and, secondly, with the rising tendency to employ local personnel especially with regard to the agenda of commercial diplomacy, some of the differences among them are continuously disappearing.

4 CONCLUSION It seems that one of the most important remarks with regard to various organizational aspects of economic diplomacy rests in the fact, that any efforts to conceptualize them into generally applicable models will hardly cover the lively spectrum of variations that appear in the practice of economic diplomacy. Secondly, it is similarly important to acknowledge the fact, that although it appears that there is none, without a deeper analysis it is impossible to define any dependence between the affinities to organizational models, models of management, and models of organization abroad.

Every model, even every organizational aspect, seems to have its own advantages and disadvantages. Intriguing, however, is the fact that after numerous discussions with practitioners from different

states, as well as following our own observations, no organizational model appears to be developed deliberately in the entirety of all aspects indicated in this paper. The empirical reality of the particular organization of economic diplomacy is in most cases a *sui generis* result of the combination of nationally specific effects as is e.g. the division of competences among various executive actors, or their position in the promotion of external economic relations.

Exclusive management model represents the essence of the unified administration of foreign relations, in which an MFA governs their whole spectrum including external economic relations. On the other hand, a shared model allows bodies partially responsible for external economic relations (other than MFAs) to send direct and operational instructions to economic representations abroad, i. e. participate in the process of their direct management. Naturally, a greater or lesser degree of coordination with the MFA is required depending on whether the managed unit is a section of a diplomatic mission or a separate representation.

With regard to the organizational aspects abroad we find it necessary to mention that the use of a specific institutional solution has no direct link to economic diplomacy management models, although it can be assumed that once the number of actors establishing their own network of foreign trade representations increases, the probability of a participatory approach to economic diplomacy seems to rise together with the inclination towards the shared management model.

The core of regular or perpetual activities of economic diplomacy abroad, regardless of the chosen model of organization, seems to be anyway performed by diplomatic and consular missions, and eventually by other economic or commercial representations. Permanent missions represent the most numerous, and at the same time the most stable, form of the state economic representation abroad. At the end of the day, it is the head of the diplomatic or consular mission, who is accountable for the performance of economic diplomacy in the territory of his accreditation. Responsibilities of heads of mission include the redistribution of tasks within the mission sometimes – especially in smaller ones – regardless of their internal organization or nominal agenda assignments to staff members.

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MODELLING OF THE TENDENCIES OF FUNDING HEALTHCARE IN THE EU COUNTRIES

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Vira Dubrovina
Stanislav Filip

Abstract

Healthcare is one of the important sector in public economy in the EU countries. One of the important task of the analysis and prediction of the values for the funding healthcare is development and application of quantitative models based on the different mathematical methods. Three most popular indicators are used for the macroeconomic description of the funding of healthcare, such as: total government expenditure on health as % of GDP; total government expenditure on health as % of total general government expenditure; total government expenditure on health per capita. The purpose of this research was to study the tendencies for the main indicators of healthcare funding on macroeconomic level and to develop models based on times series methods for analysis of the features for tendencies and prediction of the values for next time period.

Keywords: *healthcare system, funding, indicator, times series analysis, model*

JEL Classification: I15; I18; C22

1 INTRODUCTION Healthcare is one of the important sector in public economy in the EU countries. Usually one or a set of most popular indicators are used for the macroeconomic description of the funding of healthcare. Mostly, these indicators are: total government expenditure on health as % of GDP; total government expenditure on health as % of total general government expenditure; total government expenditure on health per capita. These mentioned indicators are calculated for the reports in the EU countries, in the countries of OECD and for WHO.

In 2017 the value of total government expenditure on health as percentage of GDP in EU-28 was 7% of GDP and for EU-19 (Euro area) this indicator was 7,1% of GDP (Eurostat, 2020). As it is noted in recent news release No. 33.2020 of Eurostat that in the EU in 2018 highest proportion of government expenditure goes to social protection (19, 2% of GDP) and health (7% of GDP). For EU-28 countries total government expenditure on health as % of total government expenditure increased from 13,4% in 2001 to 15,35% in 2017. In EU-19 this indicator changed from 13,36% in 2001 to 15,05% in 2017. Values of the total government expenditure on health per capita demonstrated essential differences for EU-28, EU-27 and EU-19. The values of this indicator for EU-19 (Euro-area) is laying essentially higher, than curves of these indicators for EU-28 and EU-27. That, significant gap in more than 600 euro per capita in 2001 and more than 1000 euro per capita exists between Euro area and EU-27 or EU-28. In more rich and well-developed countries which involve in Euro area, the total government expenditure on health per capita much higher, than average values for all countries in the European Union. Thus, the features of financial mechanism for funding healthcare in the different countries should be analyzed more detail and more specifications of national models should be revealed.

One of the important tasks of the analysis and prediction of the values for the funding healthcare is development and application of quantitative models based on the different mathematical methods. In our research we studied the tendencies for three main indicators of funding healthcare in the EU countries and we focused on the development of models based on times series methods for analysis of the features for tendencies and prediction of the values for next time period.

2 THEORETICAL BACKGROUND It should be noted that the problems of funding healthcare in the EU countries and outside were studied in many research and articles provided by different scientists. Thus, E. Jakubowski and R. Busse provided the comparative study for health care systems in the EU (Jakubowski, Busse, 1998). In the book prepared by E. Mossialos and other authors they discussed possible options for the funding health care in Europe (Mossialos, 2002).

M. Kostičová and V. Ozorovský and their colleagues presented some characteristics of mechanisms for financing healthcare systems in different countries, such as selected countries of the EU, USA, Canada and Australia (Kostičová et al, 2011, Ozorovský et al, 2016). E. Benova E. and N. Dubrovina developed the classification system of the healthcare systems in the OECD countries based on the application of cluster analysis and set of the selected indicators characterizing the main features of the healthcare systems and their efficiency (Benova et al, 2014). In their paper N. Dubrovina and others studied government expenditures on health as percent of GDP in the EU countries and characterized the features of the modern tendencies for this indicators on the example of different countries of European Union (Dubrovina, 2020).

E. Docteur, Oxley H. (2003) and A. Dixon (2006) studied the effects of the reforms of healthcare systems in Europe. D. Simonet (2008) considered reforms of healthcare in Europe and development of new public management theory. The problem of the decentralization of healthcare systems and local cost on health was studied in some papers, for example, in research papers (Frag et al, 2013, Karlsberg et al, 2015, etc.).

The problems of the efficiency of healthcare systems and performance of their institutions were considered in the paper written by I. Joumard, C. André and C. Nicq (Joumard et al., 2010). The problem of austerity measure in the formation of health policy in Europe was discussed in paper prepared by T. Forster and A. Kentikelenis (Forster, Kentikelenis, 2019).

The health policy and increasing the efficiency of healthcare play an important role in the all countries of the EU (Mossialos et al, 2002; Thomson et al, 2009, Santos et al, 2020). The main aims of the EU policies in public health concern with protection and improvement health of EU citizens, modernization of the health infrastructure and increasing the efficiency of health systems (Greer et al, 2013, Frag et al, 2013). Legislation of the EU has an essential impact on the development of the national health care systems of the EU countries and creates the stimulations for reducing disparities in the national healthcare systems (Duncan, 2002; Hodgson, 2009). Nevertheless, national strategies of the EU countries depend on the different political, social and economic factors and features of the organization and funding healthcare (Jakubowski, Busse, 1998; Kostičová, 2011). In addition, it is need to take into account new changes and problems which are emerging in healthcare systems (Schmid et al, 2010, Gottlieb, 2019). Nevertheless, on the basis of the review of mentioned books, articles and reports, it is possible to note, that some of the articles or research provided only qualitative analysis or included data before EU enlargement, or studied funding healthcare in the OECD countries.

Thus, the problem of study the modern tendencies of funding healthcare systems in the EU countries with application of quantitative methods is important for the theoretical analysis and practical issues.

3 RESEARCH OBJECTIVE, METHODOLOGY AND DATA The purpose of this research was to study the tendencies for the main indicators of healthcare funding on macroeconomic level and to develop simple models based on times series methods for analysis of the features for tendencies and prediction of the values for next time period.

The comparative and quantitative analysis based on the database from Eurostat for main indicators for period of 2000-2017 (Eurostat, 2020).

For this study we used methods of descriptive statistics and time series analysis (linear trend and exponential smoothing).

Exponential smoothing is based on the idea, that each new smoothed value (forecast) is calculated as the weighted average of the current observation and the previous smoothed observation. Thus, in effect, each smoothed value is the weighted average of the previous observations, where the weights decrease exponentially depending on the value of parameter α . If α is equal to 1, then the previous

observations are ignored entirely; if α is equal to 0, then the current observation is ignored entirely, and the smoothed value consist of the previous smoothed value. Value of α in-between produce intermediate results (Borovikov, 2001, Harris, Sollis, 2003). When in Holt's model a trend component is included in the exponential smoothing process, an independent trend component is computed for each time and modified as a function of the forecast error and the respective parameter γ . If the parameter γ is 0, it means that the trend component is constant across all values of the time series and for all forecasts. If the parameter γ is 1, then the trend component is modified "maximally" from the observation to observation by the respective forecast error (Borovikov, 2001, Harris, Sollis, 2003). In Holt's model with two parameters α and γ the components S_0 (initial smoothed value) and T_0 (initial trend) are calculated according to formulas: $S_0 = x_1 - \frac{T_0}{2}$, $T_0 = \frac{x_n - x_1}{n-1}$, where x_1 – is the first value of the time series, x_n – is the last value of the time series, n – is the length of the series. Concerning the estimation of the parameters α and γ , in practice, the smoothing parameter is often chosen by a grid search of the parameter space. In Statistica (version 10) automatically search for the best parameters are available via a general function minimization of mean squared error or other measures of accuracy (Borovikov, 2001, Harris, Sollis, 2003). To evaluate the accuracy of the forecasts based on exponential smoothing with linear trend such indices as: mean error, mean absolute error, mean percentage error, mean absolute percentage error (Borovikov, 2001, Harris, Sollis, 2003).

4 RESULTS AND DISCUSSION In our research we used such indicators: first indicator - total government expenditure on health as % of GDP characterizes more the government policy in healthcare; second indicator - total government expenditure on health as % of total general government expenditure – describes budget policy and social policy of the government in its relation to healthcare; third indicator – total government expenditure on health per capita – shows the level of economic development of the country, well-being and relative value of the expenditure on health per capita, which are much more higher in rich and well-economically developed countries.

We studied the features of the dynamics of tendencies for the main macroeconomic indicators such as: total government expenditure on health as % of GDP (TGEH₁), total government expenditure on health as % of total general government expenditure (TGEH₂), total government expenditure on health per capita (TGEH₃). The graphical analysis of the plots for the dynamics of the indicators TGEH₁, TGEH₂ and TGEH₃ for each country of the EU-28 during period of 2000-2017, as well as the study of their basic descriptive statistics for mentioned indicators showed that for many countries of the EU-28 the tendencies to increase values were observed: in some countries, the values of these indicators were varied near average level; in other countries the more complicated changes in the values of the indicators were revealed, when during some period the values were growing till certain level and then they dramatically were falling.

These facts proved that on the dynamics of the main macroeconomic indicators (total government expenditure on health as % of GDP - TGEH₁; total government expenditure on health as % of total general government expenditure - TGEH₂; total government expenditure on health per capita - TGEH₃) a set of social, economic, political factors can have an impact. Of course, for many countries in transition, post socialist countries, which join to the EU since 2004 the initial values of total government expenditure on health per capita were much more low, in comparison with well-developed countries from Western Europe. Due to the crucial reforms in healthcare sector, structural investment programs from the EU, rapid economic growth in these countries the tendencies of the increasing total government expenditure on health per capita or total government expenditure on health as % of GDP were observed. Nevertheless, in some countries of the EU the change in the political impact for leading political parties, political or economic crises influenced on essential changes in national models of funding healthcare.

For the reason of the different regimes in the funding healthcare in the EU-28 countries for long-run period, we studied two basic models: 1) model based on the linear trend and 2) exponential smoothing with linear trend (Holt's model). Second model was used for the description of more complicated process than classical linear development, because exponential smoothing has important property such as adaptation of the recent values based on the changes of previous levels.

In table 1 the characteristics of linear trend models are given for the description of the features of dynamics for the indicator TGEH₁.

Tab. 1. - The characteristics of linear trend models for total government expenditure on health as % of GDP. Source: own elaboration in Statistica

No.	Country	Estimations of the parameters in linear trend		F- Criterion	Correlation coefficient for model	Std.Error of Estimate
		Intercept (a ₀)	Slope (a ₁)	F(1,16)	R	σ _ε
1	Belgium	6,42***	0,1***	25,82	0,79	0,44
2	Bulgaria	4,36***	0,03(n.s.)	1,54	0,3	0,63
3	Czechia	7,09***	0,03**	5,04	0,49	0,31
4	Denmark	7,11***	0,1***	20,52	0,75	0,5
5	Germany	6,43***	0,04***	17,33	0,72	0,22
6	Estonia	4,25***	0,06***	16,89	0,72	0,34
7	Ireland	6,2***	0,01(n.s.)	0,08	0,07	1
8	Greece	6,28***	-0,06*	4,34	0,46	0,61
9	Spain	5,36***	0,06***	12,14	0,66	0,41
10	France	7,28***	0,06***	27,71	0,8	0,24
11	Croatia	6,54***	-0,02(n.s.)	0,64	0,2	0,51
12	Italy	6,45***	0,05***	9,41	0,61	0,36
13	Cyprus	2,84***	-0,0045(n.s.)	0,23	0,12	0,21
14	Latvia	3,76***	0,01(n.s.)	0,36	0,15	0,4
15	Lithuania	5,1***	0,06*	4,26	0,46	0,63
16	Luxembourg	4,38***	0,04**	6,63	0,54	0,33
17	Hungary	5,44***	-0,03**	6,59	0,54	0,29
18	Malta	5,31***	0,02(n.s.)	1,28	0,27	0,34
19	Netherlands	5,31***	0,18***	24,08	0,78	0,82
20	Austria	7,15***	0,06***	65,84	0,9	0,17
21	Poland	4,32***	0,03***	8,54	0,59	0,24
22	Portugal	7,05***	-0,03(n.s.)	1,27	0,27	0,54
23	Romania	3,67***	0,03(n.s.)	2,81	0,39	0,34
24	Slovenia	6,56***	0,01(n.s.)	0,25	0,12	0,28
25	Slovakia	5,54***	0,11***	27,74	0,8	0,48
26	Finland	6,4***	0,09***	9,2	0,6	0,67
27	Sweden	6,32***	0,04***	14,5	0,69	0,23
28	United Kingdom	5,74***	0,13***	30,86	0,81	0,52

Note: *** - estimation is statistically significant at level $p < 0,01$; ** - estimation is statistically significant at level $p < 0,05$; * - estimation is statistically significant at level $p < 0,1$; (n.s.) - estimation is not statistically significant.

It is clear seen from table 4, that the most countries of the EU-28 the estimation of the parameters for linear trend models are statistically significant at level $p < 0,05$. For most countries of the EU-28 the estimations for the slope are statistically significant at level $p < 0,05$ and positive. The relatively high value of coefficient of correlation for essential part of linear trend models for the EU-28 countries means that this kind of model is appropriated for the description of the development of the dynamics of total government expenditure on health as % of GDP. For example, for such countries as: Belgium, Denmark, Germany, Estonia, France, Slovakia and the United Kingdom the values of the coefficient of correlation for linear trend models are more than 0,7; it means that in the mentioned countries the

linear trend models are valid and have good power for prediction. Nevertheless, some exemption exists, for example, for such countries as: Bulgaria, Ireland, Croatia, Cyprus, Latvia, Malta, Portugal and Slovenia, the values of the coefficient of correlation for linear trend models are less or equal than 0,3; it means that in the mentioned countries the processes of the dynamics of total government expenditure on health as % of GDP have more another character that linear tendency.

These features of the dynamics of total government expenditure on health as % of GDP should be taken into account and it was a reason why we applied another kind of models for analysis and prediction, such as exponential smoothing with linear trend or Holt's model. This model can be used for the description of more complicated character, it has adaptive property for the previous levels and it may include the different trend, such as linear trend, exponential trend, etc.

In table 2 the results of the exponential smoothing with linear trend are presented for TGEH₁.

Tab. 2. - The characteristics of exponential smoothing with linear trend (Holt's model) (as % GDP).

Source: own elaboration in Statistica

No.	Country	S ₀	T ₀	Alfa (α)	Gamma (γ)	Mean error (m.e.)	Mean absolute error (m.a.e)	Mean percentage error (m.p.e.)	Mean abs. perc. error (m.a.p.e.)
1	Belgium	5,950	0,1000	1,00	0,00	0	0,18	-0,03	2,52
2	Bulgaria	3,768	0,0647	1,00	0,00	0	0,41	-0,62	8,82
3	Czechia	6,779	0,0412	1,00	0,00	0	0,17	-0,06	2,3
4	Denmark	6,650	0,1000	0,840	0,00	0	0,17	-0,06	2,3
5	Germany	6,379	0,0412	0,020	0,00	-0,02	0,16	-0,33	2,35
6	Estonia	4,382	0,0353	0,00	1,00	0,03	0,29	-0,1	6,08
7	Ireland	4,791	0,0176	1,00	0,00	0	0,4	-0,31	6,4
8	Greece	5,612	-0,024	1,00	0,00	0	0,34	-0,26	5,82
9	Spain	5,176	0,0471	1,00	0,00	0	0,16	-0,06	2,59
10	France	6,971	0,0588	0,932	0,00	0	0,13	-0,02	1,65
11	Croatia	6,506	-0,012	0,030	0,00	0,01	0,33	-0,35	4,98
12	Italy	5,874	0,0529	1,00	0,00	0	0,17	-0,01	2,4
13	Cyprus	2,497	0,0059	0,948	0,00	0	0,13	-0,22	4,66
14	Latvia	3,912	-0,024	0,728	0,00	0	0,13	-0,22	4,66
15	Lithuania	4,876	0,0471	1,00	0,00	0	0,39	-0,42	7,17
16	Luxembourg	3,665	0,0706	0,736	0,00	0	0,27	-0,24	5,76
17	Hungary	5,212	-0,024	0,460	0,00	0,01	0,23	-0,14	4,33
18	Malta	4,679	0,0412	1,00	0,00	0	0,17	-0,06	3,13
19	Netherlands	4,512	0,1765	0,929	0,00	0	0,26	-0,02	3,78
20	Austria	7,068	0,0647	1,00	0,00	0	0,11	-0,04	1,42
21	Poland	3,876	0,0471	0,950	0,00	0	0,14	-0,06	3,12
22	Portugal	6,303	-0,006	1,00	0,00	0	0,24	-0,09	3,39
23	Romania	4,197	0,0059	1,00	0,00	0	0,18	-0,24	4,89
24	Slovenia	6,600	0,000	1,00	0,00	0	0,16	-0,06	2,38
25	Slovakia	5,247	0,1059	0,034	0,00	0,14	0,29	1,77	4,67
26	Finland	5,659	0,0824	1,00	0,00	0	0,24	-0,04	3,35
27	Sweden	5,768	0,0647	1,00	0,00	0	0,15	-0,03	2,29
28	United Kingdom	5,032	0,1353	1,00	0,00	0	0,18	0,03	2,53

Note: S₀ - initial smoothed value, T₀ - initial trend, α and γ are parameters for estimation.

As it is seen from table 2, for most countries of the EU-28 the estimations for parameter α are equal or closed to 1, nevertheless for Germany, Estonia, Croatia and Slovakia the estimations of the parameter α are equal or closed to 0. For all countries the estimation of the parameter γ are equal to 0, exception only for case of exponential smoothing with linear trend for Estonia.

It is should be noted that one of the popular measure of accuracy is mean absolute percentage error (m.a.p.e.), and for most models of exponential smoothing with linear trend value do not exceed 5%. It means that such models have relatively high fitness and accuracy for forecasts. For some countries, such as: Bulgaria, Estonia, Ireland, Greece, Lithuania, Luxembourg the values of m.a.p.e. exceed 5% and less than 10%, it means that their accuracy for forecasts is relatively lower, nevertheless such models can be used for predictions.

In next tables 3-6 the results of the linear trend models and Holt's models are presented for indicators TGEH₂ and TGEH₃.

In table 3 the characteristics of linear trend models are given for the description of the features of dynamics for the indicator TGEH₂.

Tab. 3. - The characteristics of linear trend models for total government expenditure on health as % of total general government expenditure. Source: own elaboration in Statistica

No,	Country	Estimations of the parameters in linear trend		F- Criterion	Correlation coefficient for model	Std, Error of Estimate
		Intercept (a_0)	Slope (a_1)	F(1,16)	R	σ_ε
1	Belgium	12,79***	0,13***	77,6	0,91	0,31
2	Bulgaria	11,35***	0,12(n.s.)	2,66	0,38	1,57
3	Czechia	15,85***	0,17***	57,03	0,88	0,49
4	Denmark	13,14***	0,19***	70,03	0,9	0,5
5	Germany	13,68***	0,15***	120,32	0,94	0,3
6	Estonia	12,01***	0,08***	23,26	0,77	0,36
7	Ireland	16,63***	0,08(n.s.)	0,92	0,23	1,84
8	Greece	13,68***	-0,23***	18,7	0,73	1,15
9	Spain	13,71***	0,03(n.s.)	1,52	0,29	0,61
10	France	13,88***	0,02**	5,63	0,51	0,22
11	Croatia	13,44***	0,01(n.s.)	0,02	0,04	1,01
12	Italy	13,55***	0,06**	5,35	0,5	0,55
13	Cyprus	7,53***	-0,06***	9	0,6	0,42
14	Latvia	10,59***	-0,04(n.s.)	0,75	0,21	0,91
15	Lithuania	13,45***	0,21***	33,71	0,82	0,79
16	Luxembourg	10,66***	0,06**	7,01	0,55	0,48
17	Hungary	11,19***	-0,07***	11	0,64	0,47
18	Malta	12,23***	0,12***	12,1	0,66	0,77
19	Netherlands	11,33***	0,44***	146,58	0,95	0,81
20	Austria	13,76***	0,13***	69,03	0,9	0,35
21	Poland	9,45***	0,12***	69,36	0,9	0,32
22	Portugal	15,93***	-0,16***	13,53	0,68	0,95
23	Romania	10***	0,08*	4,1	0,45	0,88
24	Slovenia	13,89***	-0,01(n.s.)	0,15	0,1	0,79
25	Slovakia	12,77***	0,33***	27,81	0,8	1,38
26	Finland	13,09***	0,06(n.s.)	2,86	0,39	0,8
27	Sweden	11,67***	0,15***	154,17	0,95	0,26
28	United Kingdom	14,27***	0,21***	168,54	0,96	0,36

Note: *** - estimation is statistically significant at level $p < 0,01$; ** - estimation is statistically significant at level $p < 0,05$; * - estimation is statistically significant at level $p < 0,1$; (n.s.) - estimation is not statistically significant.

It is clear seen from table 3, that the most countries of the EU-28 the estimation of the parameters for linear trend models are statistically significant at level $p < 0,05$. For most countries of the EU-28 the estimations for the slope are statistically significant at level $p < 0,05$ and positive. Nevertheless, some statistically significant negative estimations for slope exist for case of such countries, as: Greece, Cyprus, Hungary and Portugal; in these countries the tendency of reduction of total government expenditure on health as % of total general government expenditure was observed.

The relatively high value of coefficient of correlation for essential part of linear trend models for the EU-28 countries means that this kind of model is appropriated for the description of the development of the dynamics of total government expenditure on health as % of total general government expenditure. For example, for such countries as: Belgium, Czechia, Denmark, Germany, Estonia, Greece, Lithuania, Netherlands, Austria, Poland, Slovakia, Sweden and the United Kingdom the values of the coefficient of correlation for linear trend models are more than 0,7; it means that in the mentioned countries the linear trend models are valid and have good power for prediction. Nevertheless, some exemption exists, for example, for such countries as: Ireland, Spain, Croatia, Cyprus, Latvia and Slovenia the values of the coefficient of correlation for linear trend models are less or equal than 0,3; it means that in the mentioned countries the processes of the dynamics of total government expenditure on health as % of total general government expenditure have more another character that linear tendency.

In table 4 the results of the exponential smoothing with linear trend are presented for TGEH₂.

Tab. 4. - The characteristics of exponential smoothing with linear trend (Holt's model). Source: own elaboration in Statistica

No,	Country	S0	T0	Alfa (α)	Gamma (γ)	Mean error (m,e,)	Mean absolute error (m,a,e)	Mean percentage error (m,p,e,)	Mean abs, perc, error (m,a,p,e,)
1	Belgium	12,23	0,1418	0,443	0	0	0,24	0	1,75
2	Bulgaria	9,256	0,2671	1	0	-0,01	1,05	-0,55	8,62
3	Czechia	16,52	0,1512	0,447	0	-0,04	0,38	-0,38	2,29
4	Denmark	12,58	0,2218	1	0	-0,01	0,22	-0,05	1,49
5	Germany	14,34	0,1041	1	0	0	0,21	-0,05	1,39
6	Estonia	12,13	0,0318	0,022	0	0,22	0,37	1,64	2,87
7	Ireland	15,56	0,2294	0,555	0	-0,04	1,22	-1,3	7,89
8	Greece	12,13	-0,059	0,931	0	0	0,81	-0,52	7,36
9	Spain	13,12	0,08	1	0	0	0,28	-0,06	2,04
10	France	13,5	0,0412	1	0	0	0,11	-0,01	0,79
11	Croatia	14	0	0,09	0	-0,23	0,76	-2,2	5,66
12	Italy	12,57	0,0824	1	0	0	0,25	-0,01	1,75
13	Cyprus	7,137	-0,014	0,089	0	-0,04	0,28	-1,06	4,29
14	Latvia	10,41	-0,065	0,803	0	0,01	0,61	-0,3	5,99
15	Lithuania	12,41	0,2676	0,072	0	0,09	0,65	0,48	4,43
16	Luxembourg	9,673	0,0947	0,44	0	0,02	0,41	0,05	3,67
17	Hungary	11,1	-0,049	0,666	0	0	0,35	-0,12	3,34
18	Malta	11,69	0,1947	0,85	0	-0,01	0,52	-0,24	3,99
19	Netherlands	10,8	0,4041	0,475	0	0	0,47	-0,03	3,01
20	Austria	13,88	0,1571	0,675	0	-0,01	0,26	-0,16	1,72

21	Poland	9,126	0,1276	0,992	0	0	0,19	-0,04	1,82
22	Portugal	14,74	-0,055	1	0	0	0,41	-0,08	2,94
23	Romania	10,81	0,1176	1	0	0	0,42	-0,29	3,96
24	Slovenia	13,91	0,0659	0,74	0	-0,02	0,5	-0,4	3,83
25	Slovakia	10,06	0,4359	0,734	0	-0,01	0,86	0,01	5,54
26	Finland	11,9	0,0659	1	0	0	0,25	-0,02	1,91
27	Sweden	10,86	0,1741	1	0	0	0,16	-0,01	1,29
28	United Kingdom	14,19	0,2294	0,637	0	0	0,28	-0,09	1,74

Note: S_0 - initial smoothed value, T_0 - initial trend, α and γ are parameters for estimation.

As it is seen from table 4, for such countries of the EU-28 as: Bulgaria, Denmark, Germany, Greece, Spain, France, Italy, Latvia, Malta, Poland, Portugal, Romania, Finland and Sweden the estimations for parameter α are equal or closed to 1. Nevertheless, for Estonia, Croatia, Cyprus and Lithuania the estimations of the parameter α are equal or closed to 0. For all countries the estimation of the parameter γ are equal to 0, exception is only for case of exponential smoothing with linear trend for Estonia.

It is should be noted that for most models of exponential smoothing with linear trend value m.a.p.e. do not exceed 5%. It means that such models have relatively high fitness and accuracy for forecasts. For some countries, such as: Bulgaria, Ireland, Greece, Croatia and Slovakia the values of m.a.p.e. exceed 5% and less than 10%, it means that their accuracy for forecasts is relatively lower, nevertheless such models can be used for predictions.

In table 5 the characteristics of linear trend models are given for the description of the features of dynamics for the indicator TGEH₃.

Tab. 5. - The characteristics of linear trend models for total government expenditure on health per capita. Source: own elaboration in Statistica

No,	Country	Estimations of the parameters in linear trend		F- Criterion	Correlation coefficient for model	Std, Error of Estimate
		Intercept (a_0)	Slope (a_1)	F(1,16)	R	σ_ε
1	Belgium	1722,42***	78,17***	49,716	0,87	250,1
2	Bulgaria	88,39***	15,19***	75,040	0,91	39,562
3	Czechia	609,2***	43,88***	40,235	0,85	156,06
4	Denmark	2508,85***	109,32***	49,608	0,87	350,15
5	Germany	1645,47***	63,05***	67,589	0,9	173,01
6	Estonia	230,42***	38,88***	68,130	0,9	106,26
7	Ireland	2050,64***	69,44***	25,484	0,78	310,31
8	Greece	1063,28***	-3,55(n.s.)	0,1103	0,08	241,23
9	Spain	1020,77***	33,28***	21,905	0,76	160,44
10	France	1893,36***	53,41***	56,940	0,88	159,69
11	Croatia	464,21***	16,59***	21,766	0,76	80,23
12	Italy	1555,4***	30,16***	18,393	0,73	158,65
13	Cyprus	533***	6,49*	2,8671	0,39	86,517
14	Latvia	179,67***	19,82***	31,004	0,81	80,311
15	Lithuania	216,67***	35,95***	55,376	0,88	108,98
16	Luxembourg	2496,98***	131,79***	55,617	0,88	398,67
17	Hungary	380,8***	12,94***	26,000	0,79	57,26

18	Malta	561,55***	38,54***	71,020	0,9	103,18
19	Netherlands	1655,08***	108,44***	36,388	0,83	405,55
20	Austria	1992,03***	81,63***	80,236	0,91	205,6
21	Poland	229,2***	20,18***	48,580	0,87	65,33
22	Portugal	976,14***	13,7**	6,2376	0,53	123,72
23	Romania	76,01***	17,67***	75,410	0,91	45,915
24	Slovenia	837,05***	31,26***	43,434	0,85	107,01
25	Slovakia	289,03***	51,52***	53,845	0,88	158,39
26	Finland	1842,64***	76,58***	27,186	0,79	331,32
27	Sweden	2007,99***	76,43***	41,108	0,85	268,93
28	United Kingdom	1745,92***	61,85***	41,574	0,85	216,42

Note: *** - estimation is statistically significant at level $p < 0,01$; ** - estimation is statistically significant at level $p < 0,05$; * - estimation is statistically significant at level $p < 0,1$; (n.s.) - estimation is not statistically significant.

It is clear seen from table 5, that the most countries of the EU-28 the estimation of the parameters for linear trend models are statistically significant at level $p < 0,05$ and positive. The negative non statistically significant estimation for slope was obtained for Greece. For some countries of the EU-28, such as: Denmark, Luxembourg and Netherlands the estimations for the slope are relatively high, it means that annual increase the total government expenditure on health per capita more than 100 euro per capita. In opposite, in such countries as: Bulgaria, Croatia, Cyprus, Latvia, Hungary, Portugal, Poland and Romania the estimations of slope are low, less or equal to 20 euro per capita is annual increase in total government expenditure on health per capita.

The high values of coefficient of correlation for linear trend models were obtained for 25 countries from the EU-28 countries. It means that this kind of model is appropriated for the description of the development of the dynamics of total government expenditure on health per capita. For example, for such countries as: Bulgaria, Germany, Estonia, Malta and Austria the values of the coefficient of correlation for linear trend models were equal 0,9 or more; it means that in the mentioned countries the linear trend models are valid and have high power for prediction. Nevertheless, some exemption exists, for example, for Greece the value of the coefficient of correlation for linear trend models is closed to 0. It means that in Greece the process of the dynamics of total government expenditure on health per capita has more another character that linear tendency.

In table 6 the results of the exponential smoothing with linear trend are presented for TGEH₃.

Tab. 6. - The characteristics of exponential smoothing with linear trend (Holt's model). Source: own elaboration in Statistica

No	Country	S0	T0	Alfa (α)	Gamma (γ)	Mean error (m,e)	Mean absolute error (m,a,e)	Mean percentage error (m,p,e)	Mean abs, perc, error (m,a,p,e)
1	Belgium	1479	85,05	0,909	0,00	-2,56	48,02	-0,05	2,14
2	Bulgaria	58,76	17,14	0,275	0,00	-1,92	15,19	-2,9	8,57
3	Czechia	415,6	53,58	1,00	0,00	-1,49	39,38	-0,05	4,28
4	Denmark	2174	119,6	1,00	0,00	-3,32	62,42	-0,05	1,84
5	Germany	1624	68,34	1,00	0,00	-1,9	27,72	-0,28	1,36
6	Estonia	173,9	41,63	1,00	0,00	-1,16	29	-1,33	6,03
7	Ireland	1336	104,3	1,00	0,00	-2,9	100,83	0,28	4,23
8	Greece	741,5	7,803	1,00	0,00	-0,22	81,91	-0,34	7,91
9	Spain	803,6	39,34	1,00	0,00	-1,09	48,53	0,09	3,68

10	France	1674	61,73	1,00	0,00	-1,72	20,08	0	0,91
11	Croatia	359,6	21,90	0,384	0,00	-1,03	35,24	-0,25	5,73
12	Italy	1260	39,08	1,00	0,00	-1,09	44,85	0,11	2,54
13	Cyprus	378,2	12,23	1,00	0,00	-0,34	31,19	0,06	5,48
14	Latvia	129,7	20,36	1,00	0,00	-0,57	32,7	-1,44	11,13
15	Lithuania	156,3	38,93	1,00	0,00	-1,08	30,79	-1,59	7,86
16	Luxembourg	1879	153,8	0,974	0,00	-4,43	134,73	0,07	4,02
17	Hungary	252,1	20,38	0,907	0,00	-0,78	27,5	0,02	5,74
18	Malta	512,9	46,26	1,00	0,00	-1,29	35	-0,67	4,17
19	Netherlands	1264	115,1	1,00	0,00	-3,2	86,65	-0,05	3,5
20	Austria	1856	90,95	1,00	0,00	-2,53	32,78	-0,19	1,3
21	Poland	176,9	22,83	0,652	0,00	-1,64	27,99	-1,16	7,98
22	Portugal	774,3	23,60	1,00	0,00	-0,66	48,16	-0,01	4,36
23	Romania	65,76	19,86	1,00	0,00	-0,55	19,03	-3,36	10,72
24	Slovenia	709,7	38,37	1,00	0,00	-1,07	31,07	-0,1	2,74
25	Slovakia	195,2	52,27	1,00	0,00	-1,45	35,38	-1,27	6,7
26	Finland	1469,	80,50	1,00	0,00	-2,24	64,52	0,12	2,61
27	Sweden	1827	83,53	1,00	0,00	-2,32	81,95	-0,18	3,24
28	United Kingdom	1508	64,57	1,00	0,00	-1,79	132,84	-0,13	5,64

Note: S_0 - initial smoothed value, T_0 - initial trend, α and γ are parameters for estimation.

As it is seen from table 6, for most countries of the EU-28 the estimations for parameter α are equal or closed to 1. Nevertheless, for Bulgaria and Croatia the estimations of the parameter α are less than 0,5. For all countries the estimation of the parameter γ are equal to 0.

It is should be noted that for more than a half of models of exponential smoothing with linear trend value m.a.p.e. do not exceed 5%. It means that such models have relatively high fitness and accuracy for forecasts. For some countries, such as: Bulgaria, Estonia, Greece, Croatia, Cyprus, Lithuania, Hungary, Poland, Slovakia and the United Kingdom the values of m.a.p.e. exceed 5% and less than 10%, it means that their accuracy for forecasts is relatively lower, nevertheless such models can be used for predictions. For such countries, as: Latvia and Romania the values of m.a.p.e. more than 10%, but less than 11,5%, thus the accuracy for forecasts of these models is relatively low and not so convenient.

5 CONCLUSION To describe the features of financing national health systems in the EU countries, it is necessary to study a set of indicators, such as: TGEH₁ (total government expenditure on health as % of GDP), TGEH₂ (total government expenditure on health as % of total general government expenditure) and TGEH₃ (total government expenditure on health per capita). For simple models of analysis and forecasts, it is sufficient to use basic models, such as a linear trend and exponential smoothing models, such as Holt's models. At the same time, for more detailed studies and forecasts for individual countries, it is advisable to use other, more advanced models, such as: ARIMA, VAR, etc. Nevertheless, models developed in our research can be used for the prediction on next time periods and the results of the prediction will be used as upper and lower limits of the values of mentioned indicators in our further study with application more advanced models for optimization of funding healthcare policy with taking into account the features of national healthcare systems.

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ONE OF THE MAJOR CHALLENGES OF THE 21st CENTURY: THE RISKS OF DIGITALIZATION

Edina Erdei

Abstract

The topic of risk and risk management covers several disciplines, so we may have problems clarifying the basic concepts, as each discipline has formulated definitions that suit their own environment and needs, which often differ completely from each other. Over the centuries, researchers have interpreted the concept of risk by developing numerical methods that can be applied well in practice, as a result of which risk-taking has become one of the main drivers of societies.

The primary goal of the research is to examine the extent to which the technological, financial, and social risks of Industry 4.0 contribute to increasing the performance, value, and competitiveness of enterprises in the face of dynamic changes in the external and internal environment.

I consider it important to examine the different sub-areas of business risk, including economic, market, financial, technological, personnel, business and legal risk sources, including individual key factors such as the rapid change in the external technological environment and the importance of data security.

From a methodological point of view, I summarize the risk concepts used in the domestic and international literature, as well as the main sources and methods of risk management in the food industry. My aim is also to clarify the concepts of uncertainty and risk-taking, as well as to present the individual risk management methods and to analyze the market, financial and social risks of the producing companies.

Keywords: *risk management, digitalization, uncertainty, food industry, technological risk*

JEL Classification: O33

1 INTRODUCTION The success of a food business depends on many factors, such as the market price, the political situation, the different natural environments, and the economic impacts in which one has to face some risk. These risks need to be addressed, managed and minimized as much as possible. There is a cost to avoiding or minimizing risk, and the decision maker must consider the magnitude of the affordability of the costs to reduce the risks (Vindics, 1997).

I consider the research of risk factors to be especially important for Hungarian food companies, where I present the sales, cost and income ratios of food companies in the light of different types of risks, as the goal of companies is to achieve the highest possible income in the long run (Gere, 2000). I examine the most important types of risks affecting food companies, ie technological, financial, economic, social, environmental, market, legal, political risks and the methods suitable for their management.

The topic is topical, as the current maturity of companies has a significant development potential for the introduction of new technologies, and requires significant physical, mental and material resources. The novelty of the research lies in the fact that Industry 4.0 focuses on both technologies and their risk factors.

In my analyzes, I also focus on the technological risks that affect the economic situation, revenues and costs of the production company, the basic operation of the company. First, I present the simpler mathematical, statistical methods that are most relevant to food manufacturing companies' decision-

making in terms of risk. We then describe more complex simulation methods given the complexity of the decision environment under study.

2 RESEARCH OBJECTIVE, METHODOLOGY AND DATA The primary goal of the research is to examine the extent to which the technological, financial, and social risks of Industry 4.0 contribute to increasing the performance, value, and competitiveness of enterprises in the face of dynamic changes in the external and internal environment.

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By processing the domestic and international literature, I present the peculiarities, advantages and disadvantages of risk management methods, pointing out their main applications, how these methods can be used among Hungarian food companies.

3 THEORETICAL BACKGROUND

3.1 Concept and types of risk among food companies

The topic of risk and risk management covers several disciplines, so we may have problems clarifying the basic concepts, as each discipline has formulated definitions appropriate to their own environment and needs, which are often completely different (Williams and Schroder, 2000). Over the centuries, researchers have interpreted the concept of risk by developing numerical methods that can be applied well in practice, as a result of which risk-taking has become one of the main drivers of societies.

One of the most defining works of economics is attributed to Knight (1921), who detailed the significance of risk for economic actors. One of the main aims of the research was to differentiate between the concepts of risk and uncertainty. Later, in the 1950s, Markowitz was the first to emphasize the role and importance of risk in the design of financial portfolios and the reduction of losses, thus laying the foundations for modern portfolio theory (Gallati, 2003).

Individual characteristics, past experiences and emotions all shape the risk-taking behavior of individuals and companies, which can be different from company to company (Kunreuther, 2002). According to Farkas and Szabó (1997), we can talk about risk if we do not know the future. It was thought that when we use the word risk, we mean uncertain chances of loss, staying the same, or profit.

Based on the research of Samuelson and Nordhaus (2005), the economic development of a country is inconceivable without owners and economic leaders who are willing to take risks in order to achieve higher profits, as profit is a reward for taking risks, so mostly taking higher risks in the hope of higher profits. happens.

Risks can be grouped according to several aspects. In the following, I describe the most common types of risk based on the domestic and international literature. The main component of financial risk is transactional and operational risk. The other two main components of transaction risk are price and credit risk, while operational risk comes from the business. We can also talk about liquidity risk, which is related to the liquidity of a firm (Waterhouse, 1993).

Several authors (Kay and Edwards, 1994; Moschini and Hennessy, 2001) agree that production, market, and financial risks are paramount in the food industry. Gabriel and Baker (1980) examine business risk separately, which includes production and market risks, and group financial risk

separately. Sonka and Patrick (1984) further expand the range of risk categories at that time with technological, legal / social and personal risk types.

Williams et al. (1995) first mention the range of cognitive risk categories, suggesting that within a firm, individuals who are specifically engaged in risk management do not themselves fully understand the risk groups and contexts that affect and surround the firm, which means that the picture of risks and the information gathered is often incomplete or misrepresenting the situation.

Majoros (1996) identifies three levels of risk:

- Macro level: the effects on business of the general political and economic situation in a given country.
- Sector level: Economic and sector-specific effects of the market demand of the product or service (product life cycle, capacity utilization).
- Company level: ownership interests, factors of production and risk related to the company's financial condition.

We can also group risk events based on their probability of occurrence, thus distinguishing between low, medium and high probability risks. Based on their impact, they can be low, medium and high impact. Usually, these two dimensions are used together, as they can be used to set up a so-called risk matrix, which is a common and easy-to-use method of risk assessment (Rodger and Petch, 1999). The risk matrix is an easy-to-use analysis tool that allows decision-makers to weigh the risks that arise, thereby also identifying those risks that require immediate response.

Decision makers can be classified into three types based on their risk appetite: risk averse, risk seekers, and risk indifferent. Based on expected utility and the expected decisions of decision makers, risks can be analyzed in terms of financial gain and utility (Vlahos, 2001).

The risks can be divided into two major groups in terms of expected impact. The first group includes the so-called simple or pure risks, for which the possible outcomes could be: either loss, damage, or no change. On the other hand, we speak of a complex risk if the examined risk can have three types of outcomes: damage or loss; the current situation remains unchanged; profit will be the result. Natural effects, machine failures and personal accidents can be classified as simple risks, during which the goal is to maintain the current situation. Complex risk is also called business risk, which is related to the expected income and investments (Illés and Megyeri, 2005).

Some authors, especially in the financial field, distinguish between diversifiable and non-diversifiable risks, where the former type of risk can be reduced by appropriate preventive measures, while in the latter case the risks arise from economic and social changes and therefore cannot be defended (Hardy, 2003).

Frame (2003) groups risks according to whether the firm has an influence on the factors that trigger the risks. According to this, we can distinguish between internal and external risks. We speak of internal risk if the company can influence various risk factors within its own competence, such as obsolescence of equipment, lack of maintenance, employment of unskilled labor, lack of internal procedures and regulations. In the case of external risks, the company has little influence on the factors that create the risk, so one of the most important tasks of the company is to develop some kind of strategic plan for such risks. Examples of external risks include changes in the regulatory environment for the industry, drastic and unfavorable changes in demand, and unexpected moves by competitors.

However, within external and internal risks, additional specific risk types can be identified (Chapman, 2006). For internal or micro risks, it distinguishes three main types: financial, operational and technological risks. For external or macro risks, it distinguishes six other types: economic, environmental, legal, political, market and social risks.

The methods used above are also partly suitable for categorizing the risks surrounding the processes and activities of food companies. Food companies are faced with a number of risks that are of similar importance in other areas of society and the economy, yet it is important to look at the risks that require the most attention in the food industry. The external and internal risks affecting food businesses are illustrated in *Figure 1*.



Fig. 1 - Types of risks Source: Own editing, 2020

Overall, the main risk groups in the food industry are:

- **Financial risk:** events that reduce profitability and, in the worst case, lead to the bankruptcy of the company. Food companies are at risk, for example, from unfavorable changes in exchange rates and interest rates, loss of customers, bad debts, bad investment decisions, and difficulties due to lack of inventory.
- **Technological risk:** any event from the design and development of a product through the manufacturing process to the completion of the final product due to a lack of information due to a lack of information.
- **Operational risk:** loss due to process, system and personnel errors. Losses due to operational failures can be very diverse, so each company must determine these risks for itself, as products are produced differently for each company. The significance of the risk of its operations lies in the fact that the quantity and quality of the outputs produced through the use of inputs cannot be known precisely in advance.
- **Economic risk:** the impact of the macroeconomic environment surrounding the company on the company. Examples are a drop in demand or too high inflation.
- **Social risk:** The education, health status and availability of the workforce affect the performance of the company. It is also important to mention theft, fires, depletion of inventories or the dismissal of employees, the possibility of looking for other jobs, as these have a significant impact on the company.
- **Political and legal risk:** We can talk about this risk if the company does not comply with its contractual obligations or the legal regulations applicable to it, or if it refuses to manage its legal affairs effectively. Furthermore, losses due to the inaction of official government bodies (withholding of requested permits) as well as stricter taxation and customs rules can be described as political risks.
- **Environmental risk:** identification of difficulties and costs arising from stricter environmental regulations and increased regulation of energy use. Fischhoff et al. (2000) also point out that the use of novel technologies used in food production also has adverse side effects, such as environmental pollution.
- **Market risk:** Changes in declining sales, revenues, and available prices and volumes of inputs

due to changes in market conditions. The behavior of suppliers and customers, the growing number of competitors and the development of the market position of substitute products may be considered risks.

- **Business risk:** Corruption and customer building have a significant impact on business performance, and the administrative burdens of individual contracts and tenders affect the company's business, so it is worth classifying this risk category in a separate group.

In addition to external risks, it is also necessary to explore the fundamental problems that threaten internal business operations, as perceiving and managing risks creates value for companies and provides a competitive advantage (Colacito et al., 2018).

Bodie et al (2005) divide risk into two parts. Systemic risk is the risk that affects all companies. Company-specific risk is defined as those that are specific to each company. Risk is classified by official organizations into the following three categories: negative risk, the effect of which is to cause some loss; positive risk, which is actually an opportunity, and the risk is neutral, ie its effect is undetectable, so we can talk about uncertainty.

When examining the risk sensitivity of entrepreneurs, Hardaker and Lien (2005) highlight that managers of food companies generally behave in a risk-averse manner, but this issue should be addressed in a nuanced way, as risk aversion is less important than short-term taking into account. Their analysis also shows that while their previous findings are correct for developed countries, the lower risks are significant for food-producing companies in developing countries. Just (2003) writes that, in general, long-term risks are more important because they significantly affect the wealth position of producing firms. The introduction of risk and risk management for small and medium-sized companies has a positive impact on financial results (Oláh et al., 2017).

In my study, I mean the possibility of loss, ie the probability of smaller results than desired, because in the case of food companies, taking the risk into account and managing it at the appropriate level is of paramount importance.

4 RESULTS AND DISCUSSION

4.1 Comparison of uncertainty and risk

Many literature sources treat uncertainty and risk as synonymous with each other, as many authors do not differentiate between them due to their practical applicability. By risk, we do not primarily mean uncertainty, but random loss. Risk means different chances of profit and loss. The higher the loss of the company due to the risk, the higher the risk can be considered (Kemenes, 1969). According to Knight (1921), the probability of the occurrence of each event during uncertainty is unknown, i.e., there is no probability distribution associated with the outcome. The occurrence of a risk can be determined with some probability, the degree of probability distribution of events can be specified.

According to Luce and Raiffa (1957), we can speak of certainty if all actions can result in one outcome in each case. Risk arises when the outcome of each action can have multiple outcomes, where the probability of occurrence of each outcome is known. Uncertainty is encountered when each action can have multiple outcomes, but the probability of the outcomes occurring is unknown. Barta (1979) examined risks from an investment perspective, finding that uncertainty is a phenomenon inherent in decisions and risk is a consequence of the uncertainty associated with a decision that, if it materializes, can lead to a loss of risk.

Similar to the research of Luce and Raiffa described above, Williams et al. (1995) interpret risk as a special form of uncertainty. According to them, we face uncertainty if we cannot estimate the possible probability of the outcomes, and we can talk about risk if the probability distribution of the outcomes is known. Holmes (2002) summarizes the results of previous research in such a way that we can manage risk from a practical point of view, but uncertainty can only be interpreted by setting up theoretical models.

According to Gallati (2003), uncertainty is closely related to risk, but in his research he highlights the exact definition as the main problem. He therefore applies his own definition of risk: this is a situation where there is a possibility of deviating from the expected and desired result. Hardker et al. (2004) also agreed with the definitions formulated by previous researchers, according to which we can talk about risk when the probability of the outcome of events is predictable, and about uncertainty when we cannot determine the possible ways of the outcome of events.

There are only theoretical assumptions to distinguish between risk and uncertainty, but we cannot be entirely sure whether we are facing risk or uncertainty. In the case of a decision in favor of uncertainty, the only possible solution seems to be the “more eyes see more” method. In the case of risk, it is worth deciding according to the rules of probability calculation (Medvedev, 2011).

Uncertainty cannot be linked to probability of occurrence, so the company cannot be fully prepared to deal with it. For risk management purposes, we can develop action plans, as when determining risk, it is important to strive to provide each outcome with appropriate probabilities (Megyeri, 2017).

In *Table 1*, I summarized the results of the literature and risk research on risk and uncertainty, which I consider to be one of the research backgrounds of my research.

Tab. 1 - Literature review of risk and uncertainty. Source: Own editing, 2020

Author	Allegations	
	Risk	Uncertainty
Knight (1921)	The occurrence of a risk can be determined with some probability.	Uncertainty is when the outcomes do not have a probability distribution.
Luce és Raiffa (1957)	The result of each action can be multiple outcomes where the probability is known.	The result of each action can be multiple outcomes where the probability is unknown.
Barta (1979)	The consequence of the uncertainty involved in the decision	A phenomenon typical of decisions.
Williams et al. (1995)	The probability distribution of the outcomes is known.	We cannot estimate the possible probability of outcomes.
Holmes (2002)	We can only deal with it from a practical point of view.	We can only deal with it from a theoretical point of view.
Gallati (2003)	Possibility to deviate from expected and desired result.	It is closely related to risk.
Hardker et al. (2004)	The probability of the outcome of the events can be calculated.	We cannot determine the possible ways in which events will occur.
Medvegyev (2011)	It is worth deciding according to the rules of probability calculation	“More eyes see more” thinking.
Megyeri (2017)	The company can be prepared to manage the risk by considering each outcome.	The company cannot be fully prepared to deal with the uncertainty.

4.2 Risks of digitization of food companies

Thanks to digitization, information is available quickly and in large quantities. In order to use resources more efficiently, increase productivity and solve labor shortages, it has also become important to strengthen innovation and digitalisation in the food industry. According to expert data, 80% of the problems of food companies could be solved using the applied Industry 4.0 technologies,

but most of the players in the industry are not even aware of the new tools and the developers are not aware of the problems of the sector (Dvorsky, 2018).

Digitization can bring competitiveness, safer food production to the food industry, due to the fact that a significant part of the products are perishable, therefore the use of more precise tools is more important from a safety point of view. It is worth starting development in areas where efficiency gains with new technologies are the fastest to achieve. Examples of such sectors are the dairy industry, the meat industry, the fruit and vegetable processing and baking industries. By automating the production processes, significant results can be achieved in the fields of baking, freezing, meat breaking and packaging, among others (Oláh et al., 2019).

An important challenge is to learn about new technologies as quickly as possible and to renew training. Using Industry 4.0 technologies would increase plant emissions by about ten percent, and a more cost-effective solution to energy use would also make a significant contribution to companies' profitability. Nevertheless, society is significantly slower to respond and adapt to the changes brought about by digitalisation. Historical experience also shows that industrial revolutions could only be followed by society for a longer period of time, which also led to economic and social crises. According to a study by the European Commission, digitalisation has a significant impact on the labor market, as working conditions are completely reorganized and new products and means of production lead to improved competitiveness. There has always been competition between machine and man, as machines are accurate, not sick, have no personal needs (Oláh et al., 2019).

In the case of food companies, let us not ignore safety issues either. The importance of data security is growing, as digitalisation causes companies to produce huge amounts of data that, if properly analyzed, can make better decisions. However, some of this information is sensitive data, so it is important to protect it. As a result of digitalisation, we distinguish the following sources of risk for food companies:

- Data management and encryption: From a security perspective, it is key for companies to be aware of how sensitive their data is and how they can properly encrypt and protect it from a security perspective.
- Zero trust: The essence of this method is that users only have access to sensitive data if they have verified their identity, which is a prerequisite for companies to use identity and access management systems that can also handle biometric identifiers and tokens. .
- Vision of the entire environment: With the introduction of an intelligent, centralized corporate governance system, it is necessary to monitor events and filter out suspicious activities.
- Analytics and automation: Automation can be used to eliminate human error, but care must be taken to ensure that individual processes can be modified to perform malicious activities.

Digitization and artificial intelligence offer great opportunities and risks. Of course, the competition that can be characterized by the digital transformation can be not only winners but also losers at all levels: individuals, professions, companies, sectors, countries, and societies. Managing challenges and risks is a shared responsibility of all stakeholders.

5 CONCLUSION In my research, I considered it important to examine different sub-areas of business risk, including economic, market, financial, technological, personnel, business and legal risk sources, including individual key factors such as the rapidly changing external technological environment and the importance of data security.

From a methodological point of view, I have summarized the risk concepts used in the domestic and international literature, as well as the main sources and methods of risk management in the food industry. I clarified the concepts of uncertainty and risk-taking and presented the risks of risk digitization of food production companies and analyzed the market, financial and social risks of production companies.

By processing the domestic and international literature, I presented the peculiarities, advantages and disadvantages of risk management methods, pointing out their main applications, how these methods can be used among Hungarian food production companies.

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INTERNATIONAL TRADE OF THE SLOVAK REPUBLIC IN TIMES OF SARS-COV-2 PANDEMIC

Michal Fabuš

Abstract

Globalization refers to the growing interdependence of countries, resulting from the increased integration of trade, finance, and global single market ideas. The main elements are international trade and the integration of the flow of foreign investment. Globalization is driven by two main factors. One involves technological advances that have reduced transport and communication costs. The other factor has to do with the increasing liberalization of trade and capital markets. The main drivers of global integration have been technological innovation, political change, and economic policy. Trade opening has taken place multilaterally through multilateral negotiations, bilaterally and regionally through preferential trade agreements. From an economic point of view, the case of free trade is based on the existence of profits, and most economists usually agree that trade derives an advantage. The aim of the paper is to characterize and analyze the development of the Slovak Republic in international trade after during COVID-19 pandemic.

Keywords: *International trade, export, import, European union, pandemic*

JEL Classification: F10, F16

1 INTRODUCTION International trade in goods and services today is one of the most important components of international economic relations. The volume of international trade is growing faster than the gross domestic product of the world economy, which increases its importance in the long run.

International trade gives a country the opportunity to consume more goods compared to the situation if the country's borders were closed and provides opportunities to expand the range of consumption by such goods that the country would not be able to produce for various reasons. It is essentially an exchange of goods, services, and capital across international territory. As a result of the movement of goods, services, capital and labor between the various economies and the subsequent development of international economic relations, an international market has emerged.

We are currently witnessing that free trade policy has created a level of competition in the open market that brings constant innovation and leads to better products, better paid jobs, new markets and greater savings and investment. All this is currently threatened by the SARS-CoV-19 pandemic. This paper is divided into several major parts, in first part we analyze the theoretical background of international trade based on known theories. In second part we characterize the current development of international trade focusing on Slovak republic.

2 THEORETICAL BACKGROUND Classical theories of international trade include the theory of absolute costs (or advantages), formulated by Adam Smith (1776 Treatise on the Essence of the Wealth of Nations). A. Smith was a supporter of the free market and an open economy. This theory advises a country to deal with the production of those products that it can produce the cheapest compared to other countries. A. Smith introduced the so-called labor theory of value, namely that the value of a good is given by the amount of labor required to produce it. Labor productivity per employee then determines the country's absolute advantage in producing the product over another country. This theory has proved to be only partially valid because countries can also export goods that do not have the absolute advantage of the lowest costs. (BALÁŽ, 2010; LIPKOVÁ, 2006)

Other classical theories include the theory of comparative costs (advantages) formulated by David Ricardo (in 1817 *Principles of Political Economy and Taxation*). Like Smith, Ricardo was in favor of an open economy and free trade. This theory suggests that it is worthwhile to produce goods for export even if these goods can be produced at a lower cost than another country. Thus, the country has lower comparative costs that will allow it to export (it is possible that they are also the absolute lowest costs, compared to the other country). If other countries can produce the goods more advantageously, the goods will be imported into the country. This allows for the international division of labor that is needed for an evolving free market. (KALÍNSKA, 2010; SVATOŠ, 2009)

John Stuart Mill was another who extended the classical theories of international trade. It was a theory of mutual demand, characterized by the fact that the goods and their value stabilized at a certain price level, which is given by the size of demand for the product. The fixed price is the world price of goods used for exchange on international markets. "According to Mill, the cost of commodity production affects only the national exchange rate, but not the international exchange rate." (MARCINČÁKOVÁ, 2012) How this price develops depends on the economic situation of individual states. If the world price is higher, the country will export products and, conversely, if it is lower, it will import them. (ŠTĚRBOVÁ, 2013)

Other more recent theories include neoclassical theories of international trade. The basis of the theory is the Heckscher-Ohlin-Samuelson (H-O-S) theory (originated in the 1930s). This theory rejects classical, not recognizing value based solely on work. It accepts supply and mutual demand, but they do not form its basis. They argued that the production of goods required factors of production, namely land, labor, and capital. Countries are differently equipped with production factors and this determines the total cost of production and thus whether this production is competitive. They respected the different pricing within the country, and pricing at the international level, as well as the different distribution of production factors across the market. (BALÁŽ, 2010)

Export - belongs to the basic forms of international trade. It is a business operation with the help of which we export goods or services across borders to obtain foreign exchange. Import - also belongs to the basic forms of MO. Its meaning is exactly the opposite of export. These are imports of goods and services from abroad, in exchange for cash or exported goods. Re-export - this is the re-export of goods. Upon re-export, the re-exporter imports the goods from one country to subsequently export the goods to another country. Depending on whether the goods cross the customs territory of the re-exporter, we divide the re-export into direct and indirect. Direct re-export is when the exported goods do not cross the customs territory of the re-exporter and indirect re-export is exactly when the goods cross the customs territory of the re-exporter. If a company chooses re-export as a form of MO, it is because there are certain advantages. One of the advantages is the position of the re-exporter on a foreign market, or the completion of a product from imported parts. (LIPKOVÁ, 2006)

Trade liberalization is one of the important forces that supports globalization processes. It is precisely the liberalization of international capital flows and the liberalization of goods flows. Liberalization in the economic sense means completely free trade, without any obstacles. The opposite of liberalization and the removal of obstacles is protectionism, the philosophy of which is the introduction of protective and free trade restrictive measures. In modern post-war times, the policies of individual countries try to respond differently to international pressure. It is a combination of liberalism and protectionism in conjunction with internationalization. Today, countries are merging into larger economically stronger units, within which the impact of globalization and liberalization is increasing, but externally the grouping has a protectionist approach. For this reason, the impact of globalization is different and is given by the policies of individual countries or their groupings. The openness of individual countries varies and indicates the extent to which exports and imports contribute to GDP. (MARCINČÁKOVÁ, 2012)

3 RESEARCH OBJECTIVE, METHODOLOGY AND DATA The main research goal of the presented study is the analysis of the development of international trade for the selected observed period and the impact of the SARS-CoV-2 pandemic. As part of the analysis of the development of

international trade, we limited the research set from the period from 2014 to 2018, in order to have a sufficient period of time to evaluate the analysis of time series. Within the application part, we used several research methods, which we implemented with a quantitative approach. The application part of the paper follows the theoretical analysis and synthesis of available foreign and domestic literature and foreign and domestic statistical data. One of the used mathematical-statistical methods is the analysis of time series. It is a gradual and chronological arrangement of values that are spatially, temporally, or factually comparable and recorded over time. The basic premise to create time series analysis is the use of the decomposition method. This is the composition of the basic components, which we quantify in the case of regular developments by analytical adjustment or in the case of irregular developments by moving averages.

The data of the research set (global data) were obtained from internationally publicly available databases, such as the United Nations databases - from the UNCTAD as well as the European Statistical Office (EUROSTAT). The data of the research set (national data for the Slovak Republic) were analyzed based on data from the Statistical Office of the Slovak Republic and the National Bank of Slovakia.

4 RESULTS AND DISCUSSION The volume of international trade is constantly increasing with the development of humanity, with the greatest growth recorded after the end of World War II. Increasing the volume and importance of international trade results in the specialization of individual countries in the production of goods, the division of labor and the availability of individual factors affecting production. The result of these processes is a constantly growing share of trade in the value of the final production.

4.1 Global development of international trade before SARS-CoV-2 pandemic

International trade has slowed significantly in recent years. The annual period from 2012 to 2015 remained at a growth rate below 3.1%. The World Trade Organization assumed a continued slow growth rate below 3% in 2016. The slow pace of trade expansion reflects the speed of the world economy. The main contributor was the slow growth of production in the main developed economies. Although trade grew twice as fast as production before the global crisis, a significant slowdown in trade growth compared to GDP growth had a declining trend. The decline in the reactivity of trade to GDP growth can be explained by a slowdown in global value chains. Some major players are increasingly gaining inputs to the domestic market, reflecting reindustrialization efforts. There may be a slight increase in investment to reduce the share of capital goods in total consumer goods exports. Another factor is the slow recovery of most major European economies, which account for a larger share of total trade and world trade.

As for the value of world trade in goods and services, it closed in 2015 for the first time since the global crisis. The nominal value of world goods in exports fell from \$ 19 trillion to \$ 16.5 trillion. This is due to the fact that while world trade growth has slowed, the volume depreciation of major currencies against the US dollar has led to a decline in the commercial value of dollars and a sharp decline in the price of commodities, especially mineral fuels. There are also significant differences between regions. The least developed countries and Africa were severely affected.

Developing countries accounted for 45% of world exports of goods in 2015. However, there are still large differences between the countries with the 18 largest exporters of goods, mainly developed economies, and Asia, which accounts for 70% of world exports of goods in 2015. Unequal trade emphasizes is a constant challenge. In 2015, commodity prices also fell. All commodity groups recorded a larger decline in prices than in 2014, when oil prices fell the most. The main factors behind the relatively low level of most price commodities in 2015 are related to the level of inventories. Low commodity prices have reduced demand for imports. As observed during the global economic crisis, trade in services has become more resilient than trade in goods.

In 2015, the nominal value of global exports fell by 6% from \$ 5.1 trillion. The worst decline was recorded in transforming economies, by more than 15%. Developing countries have increased their

share of global trade in services to 31%. The largest exporters of services in 2015 were the USA, the United Kingdom, China, Germany, and France.

International trade is largely about merchandise trade. In 2017, world trade in goods was valued at over \$ 17 trillion. Most international trade concerns goods, while services account for a much lower share. World trade in goods has increased dramatically over the last decade, rising from about \$ 10 trillion to more than \$ 18.5 trillion in 2014. It then declined in 2016 and returned to \$ 17.5 trillion in 2017.

In 2017, exports of goods in developed countries reached about \$ 9 trillion, while exports of services reached about \$ 3.5 trillion. Trade in goods in developing countries reached about \$ 8.5 trillion and in services about \$ 2 trillion. Since 2017, world trade has continued to be largely concentrated in three main regions: North America, East Asia, and Europe.

The value of merchandise trade increased by 10% in 2018. The increase in exports was mostly driven by high energy prices while Asia was the main contributor to an increase in global imports. Value of world merchandise trade in 2018 was \$ 19.67 trillion. Developing economies exported a total of US\$ 8,779 billion in 2018, of which US\$ 193 billion were from least developed countries. The top ten traders in merchandise trade accounted for a little over half of the world's total trade in 2018. Developing economies had a 44% share in world merchandise trade in 2018.

4.2 Development of international trade in Slovak republic before SARS-CoV-2 pandemic

Slovakia's accession to the European Union appears to be one of the key steps towards development and growth in terms of trade development. Given the size of the country and its geographical location, the single duty-free market with other countries of the Union, the opening of the economy and labor market, as well as the representation of a country included in the Union of the world's largest economies in Slovakia.

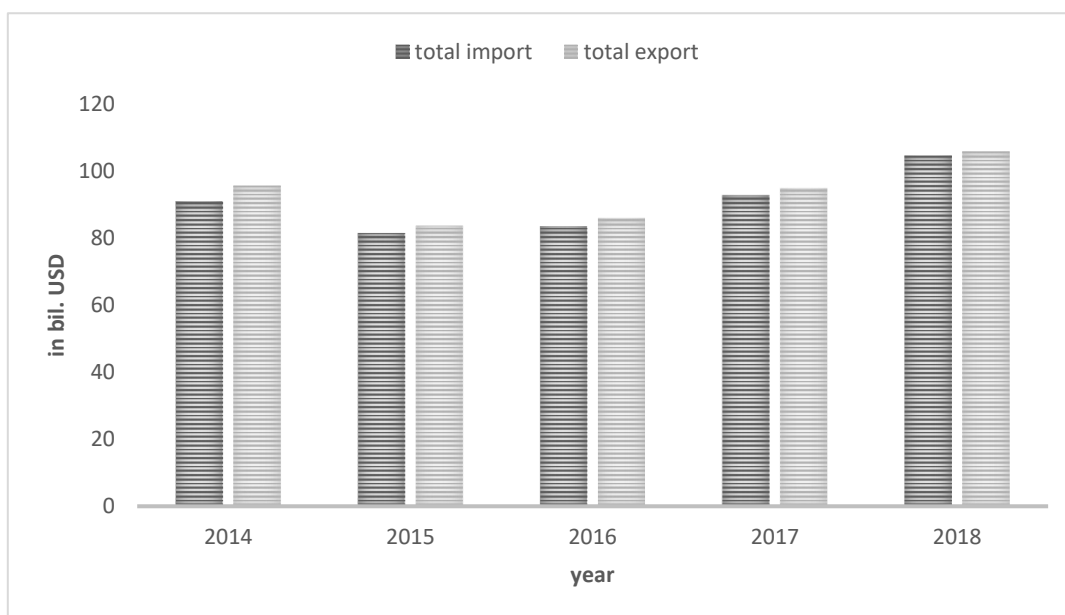


Fig. 1 – Import and export in Slovak republic from 2014 - 2018. Source: own research

Figure 1 shows the development of imports and exports of Slovakia in the period 2014-2018. Data for 2019 are not yet closed and are only available in the expected ratios. For the accuracy of the observation, we set the year 2018 as the end year. From the above values, we can observe a decrease in total imports and exports in 2015, compared to 2014 and the subsequent continuous growth until 2018.

The most significant reason for the decrease in imports was the decrease in imports of the group of mineral fuels, mineral oils, and products of their distillation from the level of 8,132,259 mil. \$ 5,373,265 million dollars. To this day, Slovak imports in this group have not reached the level of 2014. However, in addition to the group of furniture, bed linen, mattresses, pillows and similar stuffed equipment and the group of clothing and clothing accessories, Slovakia recorded a decrease in imports in each of the categories, which was reflected in a significant decrease in total imports. A significant decrease in imports in the given year was also recorded in the segment of business services from 8,900,924 mil. dollars to 7,912,526 mil. dollars. However, there was an exception in this area in that year, and since 2016 it has returned to the level of 2014 and increased in the following years.

In terms of exports of goods, there was a significant decrease in 2015 in electrical machinery and equipment and their components from 18,160,368 mil. USD to 15,542,713 mil. USD, car exports by 1,400,000 mil. USD and the overall decline in exports of most groups. In exports of services, Slovakia recorded the largest decrease in transport services from 2,312,098 mil. USD to 2,024,490 mil. USD and in tourism by about 300 mil. USD.

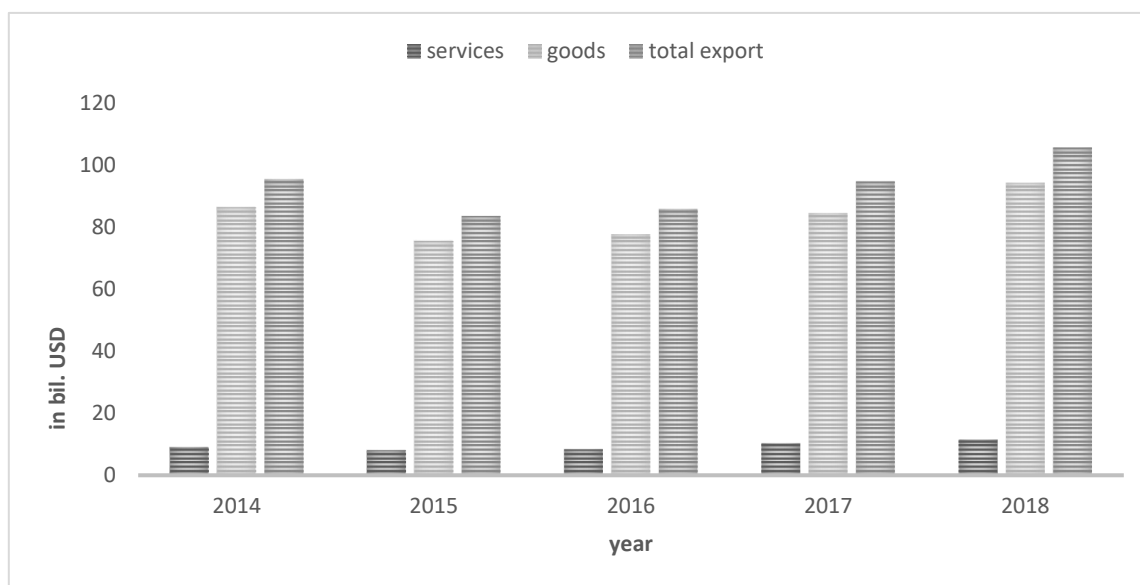


Fig. 2 – Share of goods and services in total exports from 2014 - 2018. Source: own research

From Figure 2 we can observe that in the years 2014 - 2018, exports of services contributed to the total exports of the Slovak Republic in the range of 9.5-10.9% and exports of goods in the range of 89.1-90.5%.

The most significant export services exported from Slovakia in 2018 were transport services 3.26 billion USD - 28.28%, tourism 3.17 billion USD - 27.5%, other business services 2.27 billion USD - 19.73%, telecommunications, computer and information services \$ 1.69 billion - 14.72% and services related to the production of physical inputs owned by other \$ 0.40 billion - 3.49%.

The largest share of Slovakia's exports of goods in 2018 was mainly in vehicles other than railway or tramway rolling stock and their parts, components and accessories in the amount of USD 27.79 billion, which represents 29.72%, followed by electrical machinery and equipment for sound recording and reproduction, television worth USD 18.04 billion - 19.30%, machines, mechanical devices, nuclear reactors, boilers, their parts and components USD 11.15 billion - 11.93%, iron and steel USD 4.40 billion - 4.71%, mineral fuels, mineral oils and products of their distillation, bituminous substances USD 2.74 billion - 2.93%, plastics and products from them USD 2.70 billion 2.88% and rubber and rubber products USD 2.65 billion - 2.83%.

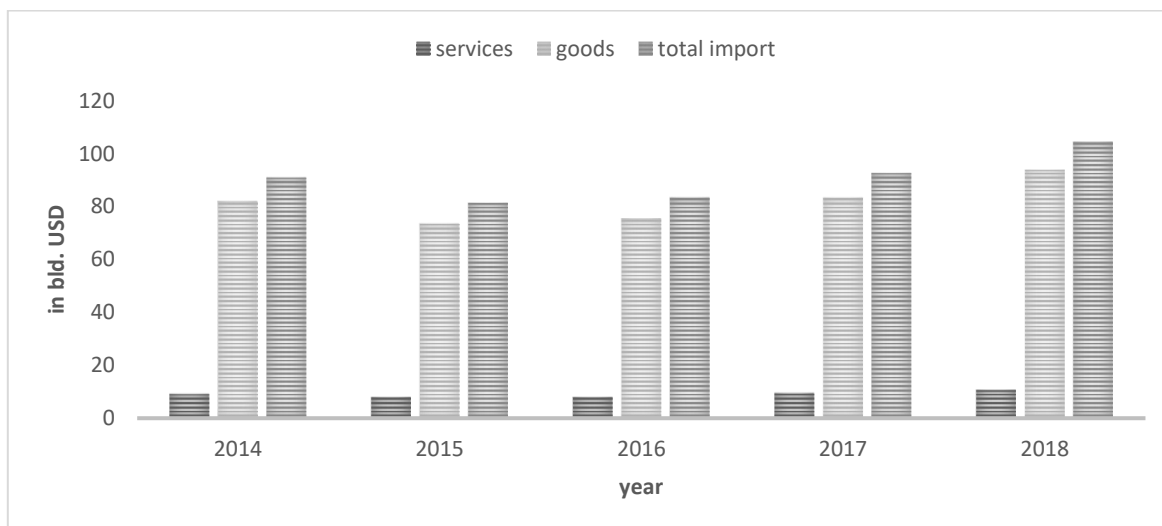


Fig. 3 – Share of goods and services in total imports from 2014 - 2018. Source: own research

Based on the processed data in Figure 3, we can observe that the import of services accounts for about 10% of the total imports of the country and the import of goods for about 90%.

The largest share in the import of services in 2018 had transport services in the amount of 2.96 billion USD, which represents 27.9%, followed by tourism 2.60 billion USD - 24.53%, class other business services 2.34 billion USD - 22.1% , telecommunications, computer and information services USD 0.93 billion - 8.8%, fees for the use of intellectual property USD 0.74 billion - 7.02% and maintenance and repairs USD 0.26 billion - 2.45%. In general, however, it can be said that the increase in imports of services in 2018 compared to 2017 occurred in all categories.

The largest share in the import of goods to Slovakia in 2018 was represented by electrical machinery and equipment and their parts and components, sound recorders and reproducers, television in the amount of 19.13 billion USD, which represents 20.57%, followed by vehicles other than railway or tram rail , vehicles and their parts and accessories in the amount of USD 15.04 billion - 16.17%, machinery, mechanical devices, nuclear reactors, boilers and their parts and components in the amount of USD 11.78 billion - 12.67%, mineral fuels, mineral oils and products of their distillation, bituminous substances in total USD 6.93 billion - 7.45%, plastics and products from them USD 3.87 billion - 4.16% and iron and steel USD 3.11 billion - 3.35%.

Slovakia has long recorded the largest volume of the surplus with Germany, the United Kingdom, France, Austria, the USA, Poland, Italy, Hungary, and the Czech Republic. These are the countries that are the largest customers, especially of products from the automotive industry and the cars themselves.

The largest volume of deficit is recorded in the Slovak Republic with Vietnam, Korea, China, Russia, Malaysia, Japan, and Taiwan. This is a crowd of Asian countries importing mostly cheap goods, whose production in Slovakia would not be profitable and high-tech technologies in which these countries dominate. In the case of Russia, these are imports of minerals such as coal, steel, iron, and gas through the “brotherhood” gas pipeline.

The massive spread of the COVID-19 pandemic across Europe and the resulting several measures restricting movement and economic activity in European countries, including Slovakia, already fully affected Slovak foreign trade in March of 2020.

Not only the balance of foreign trade, but also the turnover in foreign trade recorded a significant deterioration. Compared to the previous month (seasonally adjusted), exports decreased by an unprecedented 22.6% and were thus lower by 19.2% compared to the same period of 2019. The decline was observed mainly in the key category of Slovak exports - machinery and transport equipment. Their exports fell by as much as 22.8% compared to previous year.

Imports recorded a slight decline than exports. However, they also recorded double-digit decline dynamics - compared to the previous month (seasonally adjusted) they decreased by 12.7%, while they were lower by 11.6% compared to the same period last year (2019). The nominal decline in imports was further accentuated by lower oil prices on world markets, while imports adjusted for imports of mineral fuels and lubricants decreased "only" by -10.1% compared to previous year. The decline in imports was mainly dampened by growing imports of food and live animals, which rose by as much as 14.7% year on year and were probably related to increased household demand for food at the beginning of the month (frontloading).

In the preliminary report, the Statistical Office of the Slovak Republic informed that in March 2020, the total export of goods from the Slovak Republic reached the value of EUR 5.887 billion, with a year-on-year decrease of 19.2%. Total imports of goods to the Slovak Republic decreased by 11.6% to 6.219 billion euros. The foreign trade balance was negative in the amount of EUR 331.7 million.

Slovakia's foreign trade reached a record surplus in June as well as a significant recovery in exports. The increase in car exports pushed the trade-balance surplus to a record-high EUR 710 million, beating the so-far record of €665 million from May 2014.

5 CONCLUSION While world trade was already slowing down prior to the COVID-19 pandemic, the economic and social disruptions brought by COVID-19 are resulting in a dramatic decline in trade. International trade is likely to remain below the levels observed in 2019 in the second half of the year. The magnitude of which will be dependent upon not only additional economic disruptions brought by the COVID-19 pandemic but also on the type and extent of policies that countries will adopt to restart their economies.

International trade contracted for most countries during Q1 2020, incoming data for Q2 2020 indicate a much more severe downturn. While world trade was already slowing down prior to the COVID-19 pandemic, the economic and social disruptions brought by COVID-19 are resulting in a dramatic decline in trade. The value of international trade in goods has declined by about 5% in Q1 2020 and is expected to decline further by 27% in Q2 2020. While trade continue to collapse in most regions, the East Asia and Pacific regions show signs of recovery. Trade in the automotive and energy sector collapsed while trade in agri-food products has been stable. Trade of medical products related to COVID-19 has more than doubled in April 2020.

The general decline in international trade in Q1 2020 has been followed by a much more substantial decline in April. This trend has been observed for developing and developed countries. However, trade in developing countries appears to have fallen faster in April relative to developed countries. This is especially noticeable for imports. For developing countries, while declines in exports are likely driven by reduced demand in destination markets, declines in imports may indicate not only reduced demand but also exchange rate movements, concerns regarding debt and shortage of foreign currency.

Economic disruptions brought by COVID-19 have affected some sectors significantly more than others. In the first quarter of 2020, textiles and apparel declined by almost 12 percent, while office machinery and automotive sectors have fallen by about 8 percent. On the other hand, the value of international trade in the agri-food sector increased by about 2 percent. Preliminary data for April indicates further declines in most sectors and a very sharp contraction in trade of energy and automotive products, about -40 percent and -50 percent in values, respectively. Significant declines are also observed in chemicals, machineries, and precision instruments with drops above 10 percent. Conversely, office machinery appears to have rebounded in April, largely because of the positive export performance of China. Trade in agri-food products has been so far the least volatile. In general, the variance across sectors has been driven by decreases in demand and disruptions of supply capacity and on disruption of global value chains due to COVID-19.

Slovakia exported goods worth EUR 6.4 billion in June, only 1.2 percent down year-on-year. Imports reached EUR 5.686 billion, decreasing by 8.9 percent year-on-year. The trade balance surplus of EUR 709.9 million was EUR 480.2 million higher than it was in June 2019, according data from the Slovak

Statistics Office. June exports increased by more than a third month-on-month, resulting from the increase in exports of machinery and transport equipment, which also includes car exports. This category even reported an increase of 2.1 percent y-o-y. In June it made up as much as two-thirds of the total export, or EUR 4.3 billion, up from May's EUR 2.074 billion. Although the current figures from Europe are rather a positive surprise, we still expect that the pandemic will erase a part of the demand – especially investment, but also consumption – in Europe and will also affect Slovakia's foreign trade. The restart of the Slovak economy will not only depend on domestic demand, but also, to a large extent, on the demand from abroad.

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CORPORATE FINANCIAL INDICATORS ACCORDING NACE, PROCESSING, AND APPLICATIONS – CASE SLOVAKIA

Ladislav Kabát

Abstract

Qualified management in general and, therefore, the management of economic entities on corporate level and ongoing processes requires both, timely and content-reliable data. The data are largely taken from the final accounts of individual businesses. Notwithstanding the above, data for individual reporting units are often incomplete, value-unrealistic, or significantly different from analogous indicators of other undertakings with a similar business focus. These facts weaken the usefulness of such data for an in-depth analysis.

The main goal of this paper is to present the up to date results of the author's study of the sectoral (NACE) values for selected financial indicators (as ROA, ROE, EBITDA, ...) frequently applied in corporate economics. The studied data are selected from the final balance sheets of more than 900 thousand small and medium enterprises operating in Slovakia at least three full years. The generalized statistical distributions of the sectoral indicators and their practical applications are presented as the core results of this study.

Key words: *Data quality, creative accounting, financial ratios, ROA, ROE, EBITDA*

JEL: G10, G34, H32

1 INTRODUCTION Efficient management in general and, therefore, the management of economic entities on corporate level and ongoing processes requires both, timely and content-reliable data. The data is largely extracted from the final accounts of individual businesses, which are defined by their uniform structure, the scope of the indicators monitored and definition of their content. Notwithstanding the above, data for individual reporting units are often incomplete, value-unrealistic, or significantly different from analogous indicators of other undertakings with a similar business focus.

Problems are even more serious, when national data is compared, or complemented with data generated in foreign economic and/or statistical system. These facts hinder or at least weaken the usefulness of such data for the more sophisticated analyses, modeling and comparative economic and social studies.

There are various attempts, many projects and active institutions trying to solve these problems and to assist in improving statistical data quality in general. The important role in this effort is played by relevant international institutions.

The attempt to develop efficient, internationally accepted system for statistical data collection, processing and archiving requires enormous energy, financial and material support, as well as full cooperation and support from political bodies in individual countries, on EU level as well as on United Nations bodies' level. The below scheme presents the core levels, components and agents taking part in this endeavor.

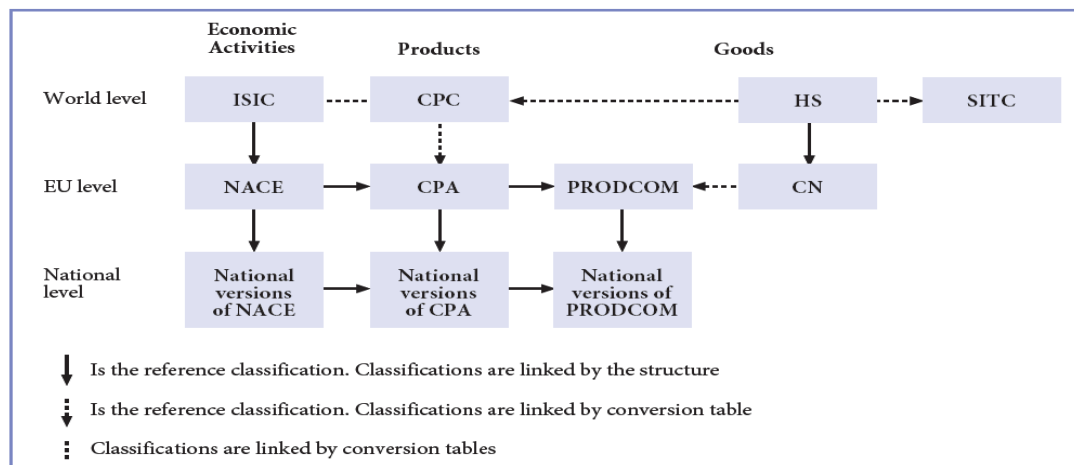


Fig. 1 - Classification of economic activities. Source: <https://www.europeandataportal.eu/en>

In this structure **economic activities** are classified and reported on world level under the International Standard Industrial Classification (ISIC), on EU level under the NACE (the term NACE is derived from the French *Nomenclature Statistique des Activités économiques dans la Communauté Européenne*). classification system, while on national levels some versions of NACE are adopted. The NACE is a four-digit classification providing the framework for collecting a large range of statistical data according to economic activity of individual enterprises within the European statistical system (ESS).

Concerning **the products**, the world level adopted the Central Product Classification (CPC), EU level adopted the Classification of Products by Activity (CPA), while on national levels also some versions of the same system are used.

The statistics on the production of manufactured **goods** is provided by the EU PRODCOM system (ec.europa.eu/eurostat/web/prodcom). The Harmonized Commodity Description and Coding Systems (HS) allows participating countries to classify traded goods on a common basis for customs purposes.

The Combined Nomenclature (CN) “is a tool for classifying goods, set up to meet the requirements both of the Common Customs Tariff and of the EU’s external trade statistics”.

The Standard International Trade Classification (SITC) is maintained by the United Nations and recommended for analytical purposes. It fulfils also special role in reporting export and import statistics and for international comparisons of commodities and manufactured goods.

All actors of the above indicated programs in data collection produce their own specific directives and guidelines for their member countries, or member institutions to assist them in correct application of the methodological requirements in data collection and data processing with aim to enable their efficient global acceptance and use.

The main goal of this paper is to present the up to date results of the author’s study of the sectoral (NACE) values for selected financial indicators, frequently applied in corporate economics. The studied data are selected from the final balance sheets of more than 900 thousand small and medium enterprises operating in Slovakia. The generalized statistical distributions of the sectoral indicators are presented as the core results of the author’s study.

The paper presents the results on group of randomly selected 389 entrepreneurial entities which were statistically analyzed according to the submitted methodology. The selected indicators are presented

through statistical parameters for the group of companies as well as for their subgroups. The developed financial indicators enable the authorities to check the correctness of partial accounting data, which are later utilized in the calculation of the tax base.

2 THEORETICAL BACKGROUND Availability and access to reliable statistical data is frequently commented in academic journals, as well as in public media. There are many reasons for that. Results of economic and social development, presented by governments and other official authorities, are evaluated and scrutinized and confronted by various nonpartisan institutions for what the objective data is needed. The data for these purposes should be accessible in real time, in requested content and structure in user friendly and easy understandable form. Another reason for demand for reliable data is narrowly linked with the other scientific studies expecting such data as input data for their own studies (VLAEMINCK).

Any deficiencies in referred statistical data, namely their incompleteness in content or time coverage, can cause various slowdowns in research, or public service projects. To find the ultimate solution to these problems is not an easy task, as expressed by McCullough, who pointed out that “results published in economic journals are accepted at face value and rarely subjected to the independent verification that is the cornerstone of the scientific method. Most results published in economics journals cannot be subjected to verification, even in principle, because authors typically are not required to make their data and code available for verification.”

In case of the corporate economic entities, these facts can weaken the usefulness and acceptability of such data for an in-depth analysis of the group of companies concerned and for the derivation of universally valid relationships among their performance indicators (AYODOTUN). It also weakens the possibility of mutual comparing the companies whose databases are inconsistent and reduce the more sophisticated applications of accounting data. This can lead to some question on usefulness and applicability of the economic data in general.

Processing of incomplete data sets by statistical methods, with the aim of identification and quantification of their mutual relationships, raises the questions on possible negative impact of missing and incorrect values. Problem of missing and incorrect data cannot be solved simply by standard procedures such as elimination of extreme values, or mechanical imputation of missing values (LITTLE, MACNEIS).

The notion of *extreme values* in the case of economic indicators calls for specific assessment criteria based on deeper knowledge of the economic relations and the context of how they are changed over time and how they are collected under which methodology. All this can help with correct interpretation and understanding of the extreme values (TOWE).

Discussion on reliable data covers rather broad spectrum of issues. To keep the discussion more concrete, we narrow it on the data, produced by the corporate accounting system (STERNHEIMER).

The subsequent applications of such data can be utilized with the assumption that even the so-called *reliable data* of corporate accounting is not statistically exactly defined. The methodology for their collection provides rather a broad option for their "creative construction" and consequently their copying into the archived accounting documents. A possible solution is only through the comparison of these extreme values with identical indicators of other enterprises.

Reliable data and their statistical identification

The concept of *reliable data* refers to characteristics like inputs and outputs of the tracked entities with defined content, the way they are collected, updated, archived and processed.

An essential document defining the obligations of intelligence units at the micro level is known as **International Financial Reporting Standards (IFRS)**. The IFRS are developed by an independent body based in London, the International Financial Reporting Standards Foundation and International Accounting Standards Board (IFRS). Their implementation within the EU is specified by the EU Commission Directive 2013/34/EU. It stipulates that all business operators must process their consolidated financial reports in accordance with the single system of international standards. They enable the subsequent comparisons of the results of businesses as well as an in-depth analysis of their activities. Also, the search for bottlenecks in production or marketing processes is possible (EU)

The proper classification of enterprises with respect to IFRS standards allows the creation of the NACE groups and the quasi-homogeneous subgroups of enterprises at different levels. This justifies accepting them as individual industry standards. The knowledge of these standards can be utilized by reporting firms for checking their own accounting data prior to their savings into a standardized database of consolidated reports. This creates a possibility for auditors and auditing institutions to adopt such standards for their checking activities, which could be executed more easily, faster and in more qualified mode. Particularly by comparing the results between enterprises in the same NACE groups or subgroups, or by comparing them with the derived sectoral standards (EU).

At the level of macroeconomic reporting in the international environment, as guidance documents are most often reported **the System of National Accounts (SNA)** and Compilation Guide on Inventories (EUROSTAT and OECD). These internationally respected documents arose on the land of the United Nations Statistical Commission in 1947 and 2017. Since their inception, they have undergone several major updates, the last one being held in 2018. The SNA represents a set of standards on how to collect data on the economic results of individual countries and enterprises. Consequently, these results are mutually comparable and consistent with accepted concepts and definitions, classification and accounting rules. The National Accounts system is one of the pillars of macroeconomic statistics and the basis for economic analysis and the development of economic policy scenarios at national and economic clusters.

Several specialized international organizations have developed rules on the collection and processing of information on specific products and services provided by their member States, largely incorporated into the United Nations system. As an example, the World Trade Organization (WTO) should be named.

The World Customs Organization cooperates closely with the WTO and manages the most significant, globally implemented tools for organizing trade and customs data. This platform is called **the Harmonized System (HS) of the trade and tariffs**. The Handbook (HS Classification) introduces the Harmonized Commodity Description and Coding System usually referred to as the Harmonized System or the "HS". This system links the goods or downstream technological components with their statistical and custom specifications.

The HS system is valid since 1988 and is managed by the World Customs Organization. The main objective of the above-mentioned instruments is to contribute to maintaining the legislative and statistical clarity of the business environment where an international exchange of goods and services is carried and where the GDP is calculated. In case of the international trade, all statistical information provided by both, the reporting country and the partner country of the business relationship, must comply with the formal requirements of the IFRS, SNA and HS systems. Consistent methodological monitoring of the formation of gross domestic product in accordance with the SNA rules and the customs measures has a clear positive impact on the quality of statistical information reflected by these processes. Consequently, they contribute to a qualified estimation of the macroeconomic development indicators of the countries concerned, namely to the estimation of the development of the gross domestic product, which is one of the most important and generally respected macroeconomic indicators (AITKEN).

All the above presented methodological tools are intended to support the production, collection, processing and distribution of economic data on micro and macro levels. Our aim to present how these tools could be employed in data producing and data collection processes on the level of corporate level, particularly under the NACE system.

3 RESEARCH OBJECTIVES, METHODOLOGY AND DATA The accounting data, in accordance with their definition, should be a "*non-distorted information mirror*" of economic, financial, production and distribution processes. Its actors are suppliers, manufacturers, distributors, dealers, financial institutions, as well as public authorities. Their mutual interaction generates information that is methodically processed, summarized and presented publicly under the established rules in a broad-based system of accounting documents.

In checking the primary data, it is necessary to analyze and to treat data that differ significantly from the same indicators of undertakings with similar size, sector classification, legislative structure, and business history.

The higher attention deserves the data that are statistically classified as the "*outliers*". The simple elimination of them according to strict statistical rules is not the only and correct solution for the authorization of the data. Their identification and quantification can be an incentive for further and deeper economic analysis or for managerial decisions.

From data obtained, subsequently by appropriate sorting and eliminating the extreme values in data files, it is possible to derive statistically quasi-homogeneous sets of enterprises in grading according to the legislative form, size, NACE group and more. Subsequently, it is possible to derive the sectoral indicators for individual variables and groups of enterprises. The industry or branch standards are represented by a set of parameters of descriptive statistics as **mean, median, modus, standard deviation, and quadrant values, skewness and kurtosis.**

In the first phase we focus on creating a primary database that allows us to verify the reliability and efficiency of calculation algorithms and the presentation and interpretation of the selected ratio indicators for measuring and evaluating activity, profitability efficiency and performance of enterprises within the meaning of their definition (ZALAI) and in line with the new requirements of the ATAD directive. We calculate the selected financial ratios according the following relationships:

1. ROA – Return on Assets
2. ROE - Return on Equity
3. EBITDA in Sales
4. VAinS - Share of value added in sales (1)
5. NVAINs - Share of newly value added in sales
6. AT - Assets of Turnover
7. ITT - Inventory Turnover Time
8. MD - Maturity of Debts

In the line with the accepted rules, the above ratios are calculated only for enterprises for which:

$$\text{ROA and ROE and VAinS and NVAINs} > 0 \quad (2)$$

For all ratios the following statistics are calculated:

- Descriptive statistics – minimum, maximum, mean, median, mode, standard deviation, kurtosis and skew
- Quartile values and number of enterprises in each quartile
- Number of enterprises with specific values of ratios (<0 , $=0$)

All enterprises fulfilling condition (2) create the database of so-called **standard entities**, which could be used for further studies and possibly for deriving the probability distribution of values of sectoral ratios.

The ratio indicators provide the useful information on general economic performance evaluation of companies. However, the ratio indicators lack the clear direct reflection of the input and output factors, which contribute to generating final economic effect of individual companies. Having in mind this, we perform deeper analysis of assets, sales and inventories, as key production factors. Initial data is extracted from the final accounting balance sheets for 2018 year.

4 RESULTS AND DISCUSSION The proposed methodology employed on the group of 393 enterprises randomly selected from the set of 500 enterprises of NACE 011. We found relatively high proportion of the incorrect, dubious, and missing data, as shown in Table 1 below.

After elimination the data, which did not comply with condition (1) we obtained a set of 393 companies with full data necessary for calculation their financial ratios and statistical parameters as outlined in the Methodology section. This means 21.4 % of reporting entities must be excluded from the further statistical processing.

The most “vulnerable” ratio indicators in our group of companies were ROE with 27% of incorrect original accounting data. Slightly less companies reported incorrect original data for calculation ratios in EBITDA, VA in Sales and VA in New Sales indicator.

Our findings are indication requests for more careful corporate accounting system, particularly for systematic quality of original data, before they are transferred into official data registries.

Tab. 1 - Overview of the basic structure of financial ratios of 389 companies of NACE 011. Source: own research

Overview of the values of financial ratios									
Legenda	ROA	ROE	EBITDA	VA in Sales	NEW VA in Sales	Assets	Debts	Inventory	Maturity of debts
Correct data	389	283	297	297	297	389	207	297	297
in %	100	73	77	76	76	100	53	76	76
Value is ≤ 0	0	106	91	92	92	0	182	92	92
%	0,0	27,2	23,5	23,7	23,7	0,0	46,8	23,7	23,7
All	389	389	388	389	389	389	389	389	389
%	100	100	100	100	100	100	100	100	100

The complete results of statistical processing of the financial ratios values and their parameters (1) are presented in **Table 2** under several sections.

The first section presents the descriptive statistics for each financial ratio and these values could be used for further in-depth data analysis. The second section presents the quartile values of the ratio indicators. The third and fourth sections present the number of companies according to their quartile values. The last two sections present the information on the number of companies with special values of ratio indicators. Such data could be effectively adopted in the identification of highly incorrect initial accounting data.

Tab. 2 - Overview of the financial ratios for selected 393 companies of NACE 011.
Source: own research

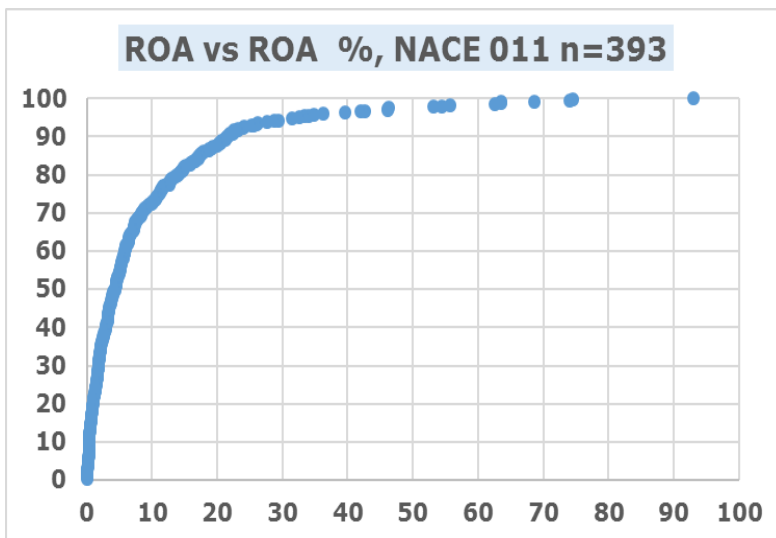
Overview of the values of selected financial ratios for 393 companies of NACE 011									
Selected ratios									
	ROA	ROE	EBITDA/S	NVHvS	NVAInS	ASSETS TURNOVER	TZ	INVENTORY TURNOVER	Maturity of debts
Measures of position									
MINIMUM	0,04	0,01	0,32	-168,58	-157,22	0,81	0,03	0,00	0,00
MAXIMUM	92,97	1 286,12	484,02	99,26	118,43	99,72	1 522,28	1 200,00	922,21
AVERAGE	8,88	24,31	32,91	-13,57	17,14	56,34	21,65	113,31	68,34
STDEV	12,85	76,17	34,96	31,03	30,45	27,84	130,25	133,26	103,21
MEDIAN	4,43	10,81	25,71	-10,91	19,96	58,00	4,19	84,85	37,80
KURTOSIS	11,44	203,70	76,85	5,69	6,18	-1,02	99,05	22,69	18,20
SKEWNESS	3,03	13,19	6,98	-1,30	-1,26	-0,33	9,82	3,70	3,59
Quartile values									
0-Minimum	0,04	0,01	0,32	-168,58	-157,22	0,81	0,03	0,00	0,00
1	1,45	3,57	15,72	-22,46	6,12	33,14	1,99	28,15	6,34
2-Median	4,43	10,81	25,71	-10,91	19,96	58,00	4,19	84,85	37,80
3	11,21	25,26	39,97	1,69	32,18	80,17	9,11	154,76	80,57
4-Maximum	92,97	1 286,12	484,02	99,26	118,43	99,72	1 522,28	1 200,00	922,21
Number of companies within quartile									
1	99	99	99	99	99	99	99	99	99
2	98	98	98	98	98	98	98	98	98
3	98	98	98	98	98	99	98	98	98
4	98	98	98	98	98	97	98	98	98
Sum	393	393	393	393	393	393	393	393	393
Share of companies within quartile in %									
1	25	25	25	25	25	25	25	25	25
2	25	25	25	25	25	25	25	25	25
3	25	25	25	25	25	25	25	25	25
4	25	25	25	25	25	25	25	25	25
Sum	100	100	100	100	100	100	100	100	100
The number of companies with specific values									
< 0	0	0	0	284	74	0	0	0	0
. = 0	0	0	0	0	1	0	0	56	53
AVG+-1STDEV	354	386	365	325	320	235	387	357	360
AVG+-2STDEV	375	390	386	367	369	393	388	381	372
AVG+-3STDEV	383	390	388	384	386	393	389	389	382
Outliers -	0	0	0	8	6	0	0	0	0
Outliers +	10	3	5	1	1	0	4	4	11
The ratios with specific values in %									
< 0	0,0	0,0	0,0	72,3	18,8	0,0	0,0	0,0	0,0
. = 0	0,0	0,0	0,0	0,0	0,3	0,0	0,0	14,2	13,5
AVG+-1STDEV	90,1	98,2	92,9	82,7	81,4	59,8	98,5	90,8	91,6
AVG+-2STDEV	95,4	99,2	98,2	93,4	93,9	100,0	98,7	96,9	94,7
AVG+-3STDEV	97,5	99,2	98,7	97,7	98,2	100,0	99,0	99,0	97,2
Outliers -	0,0	0,0	0,0	2,0	1,5	0,0	0,0	0,0	0,0
Outliers +	2,5	0,8	1,3	0,3	0,3	0,0	1,0	1,0	2,8

The above presented results are important for in-depth studies on the accounting data quality of all companies. They can be used as the standard values for comparing mutually various companies with aim to identify their strong and week sections in their economic activities. For practical application,

we propose to use the graphical presentation of the statistical distribution of some selected tabulated data, namely ROA, ROE and EBITDA.

Such presentation, **Fig. 1**, makes the obtained statistical result easy understandable. It shows the statistical distribution of the **ROA** for values for entire group of 393 companies.

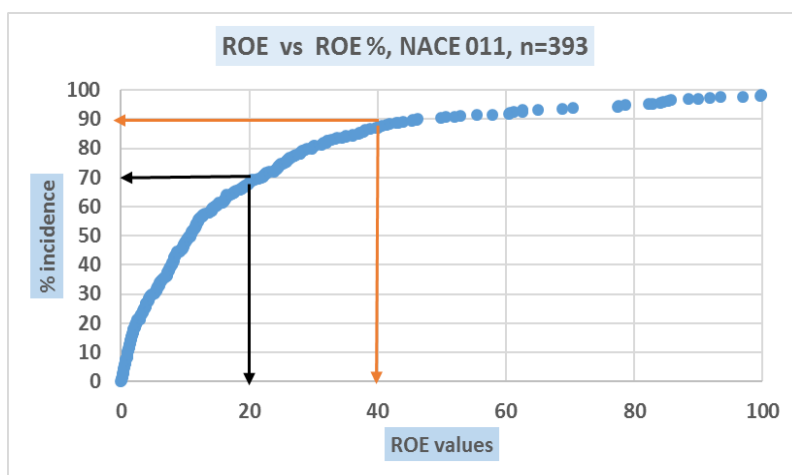
Combining the graphical presentation and table data the following conclusions could be made – the ROA values for these 393 companies lay within interval between 0.4 and 92.97. The quartile values show that 50% of all companies report ROA values between 1.45 and 11.21. This finding enables the auditing authority to check randomly not only the completeness of the reported data, but also their quality.



The graph shows also that almost 90 % of companies report ROA values less than 20 and only very small proportion of companies report ROA values over 40. These findings should be analyzed in connection with other financial ratios of the same company, or with similarly profiled companies.

Fig. 1 - Distribution of the ROA values. Source: own research

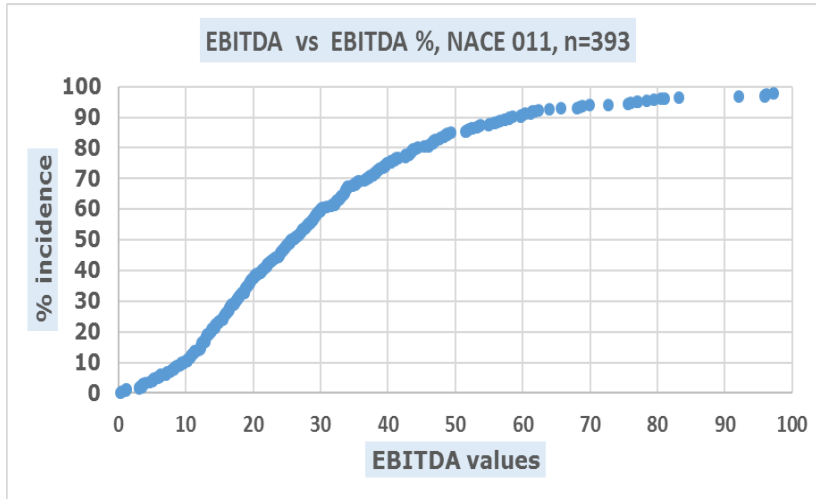
The ROE distribution for the same group of companies shows **Fig. 2**.



The graphical presentation indicates that about 70 % of companies report ROE values less than 20. Based this presentation we can estimate that about 20% of companies report the ROE value between 20 and 40

Fig. 2 - Distribution of the ROE values. Source: own research

Slightly different distribution of EBITDA values presents **Fig. 3**.



In this situation the median value **25.71** divides the total group of companies into two subgroups with the same number actively broad interval of companies. Despite the EBITDA values, more than 92% of them lay within interval round mean plus and minus one standard deviation.

Fig. 3 - Distribution of the EBITDA values. Source: own research

Fig. 4, 5 and 6 compare the ROA, ROE and EBITDA values for two different groups of companies. The first set of companies is represented by all 393 studied companies, while the second group of 115 companies represent only the “small” companies. Their distributions are very similar. These findings offer an useful arguments in discussing the role in size of companies in values of their ratio values. To derive the general conclusion on importance of the NACE factor would, however, require more data processing.

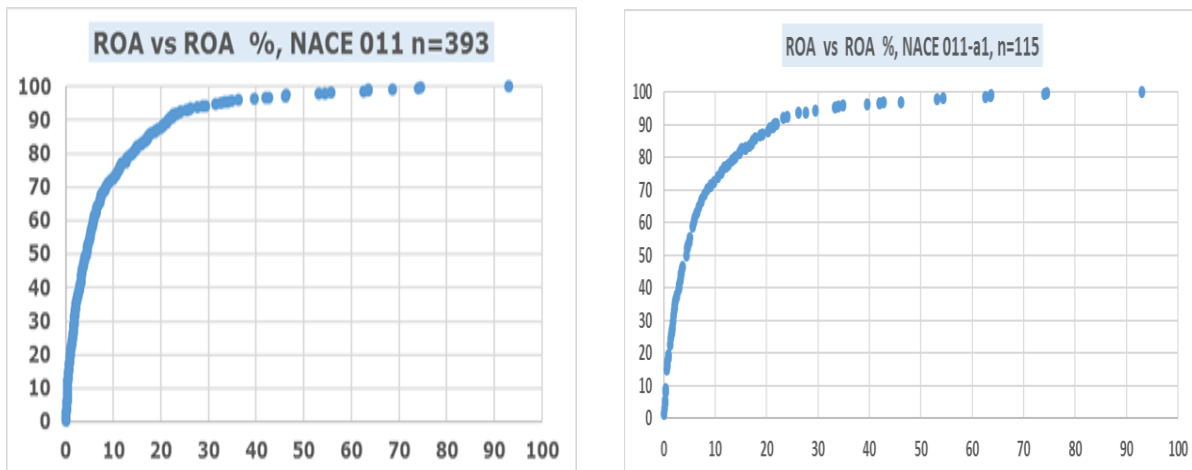


Fig. 4 - Distribution of the ROA values for groups NACE 011 and NACE 011-a1. Source: own research

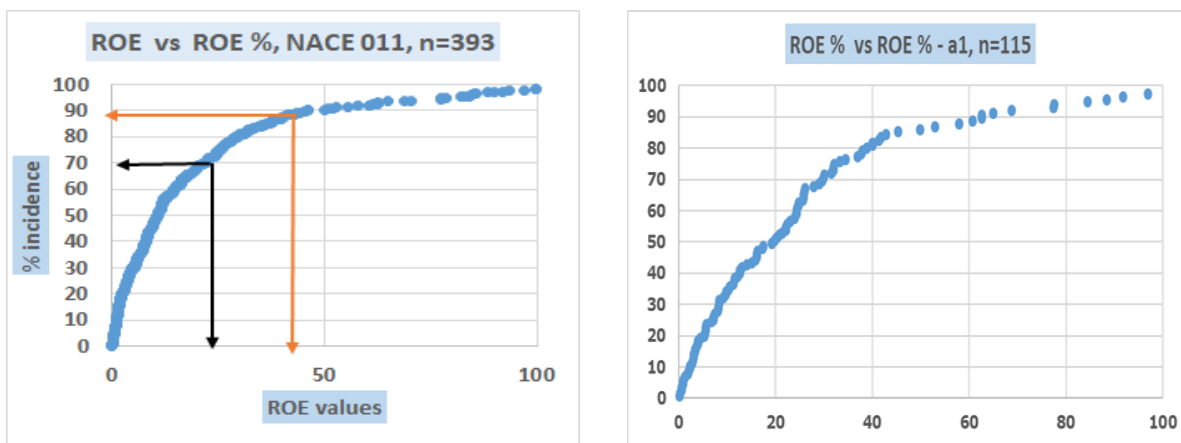


Fig. 5 - Distribution of the ROE values for groups NACE 011 and NACE 011-a1. Source: own research

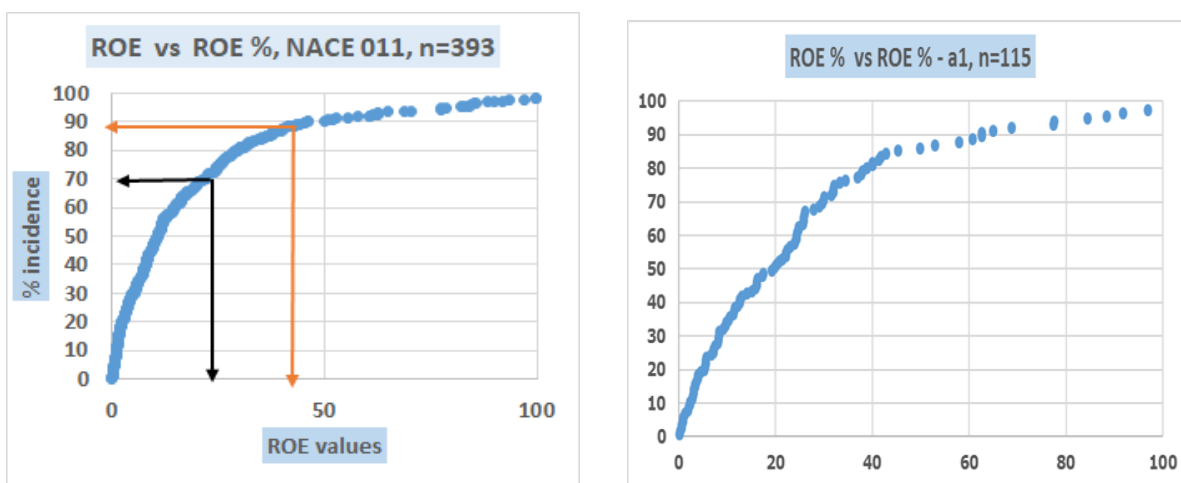


Fig. 6 - Distribution of the EBITDA values for groups NACE 011 and NACE 011-a1. Source: own research

Our current research is concentrated on in-dept study of accounting procedures on corporate levels in protecting quality of primary data before they are statistically processed and/or adopted for various modelling procedures.

5 CONCLUSION The aim of this paper was to present the current theoretical views and opinions on the quality of statistical data, their collection, checking their correctness, processing, and archiving into publicly accessible data sets. Particular attention is devoted to the primary data generated by entrepreneurial entities classified under various **NACE** groups. Namely, their quality is analyzed and various numerical tools are offered for checking their quality and consistency with the relevant data for the other entrepreneurial units belonging to the same NACE subgroupings.

The purpose of such approach is to present the outputs which are reliable in presenting economic situation of the studied companies and enabling their mutual comparison. This could be useful both, for individual company as well as for all its potential technological and marketing partners. Statistical data quality is presented not only as the microeconomic problem, related to the mutual relation among the various members of the market environment. The data quality is discussed also as a requirement of the OECD/G20 initiative, expressed in the Base Erosion and Profit Shifting document (BEPS) based on the International Finance Reporting Standards (IFRS). The paper points

the harmfulness of violations of these requirements by disrupting the stability and efficiency of the tax and derivative system.

The developed and presented sectoral indicators could be used as an efficient tool in checking the accounting data on their correctness, before they are adopted for modelling and calculations of various important economic indicators as GDP and/or tax base. In such way, they can contribute to improving the quality of modelling tools in economic analyses, which is consistent with our original research aims.

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EVOLUTION OF MAIN IDEAS ABOUT SOCIAL RESPONSIBILITY – LITERATURE REVIEW

Pavol Križo

Abstract

This article provides an overview of historical sources of social responsibility. An overview based on a content analysis of essential scientific and professional sources that deal with individual aspects of social responsibility. The results of this analysis are divided into ten-year intervals, which are characterized by different streams of thought on a given topic. In a chronological way, we present the development of the concept of CSR with regard to the most important personalities in this field and the effect that their work had on the academic or economic sector. This article can serve as a suitable platform for a wider scientific discussion on the contextual links of social responsibility or it can serve as a starting point for some current topics related to CSR.

Keywords: *social responsibility, CSR, evolution, corporate citizenship*

JEL Classification: M14, O10

1 INTRODUCTION The term "social responsibility" can also be found in Slovak under other related names such as "socially responsible behavior" or "socially responsible business". There is a relatively extensive history in the evolution of views on social responsibility, and related to this is the evolution of terminology associated with this topic. The aim of this paper is to present a literary review of historical milestones documenting the development of social responsibility from about the middle of the last century to the present. This conceived overview will allow for a more focused professional discussion taking into account the context of social responsibility.

2 THEORETICAL BACKGROUND Formally, the first mention of corporate social responsibility can be dated to the 1950s (Carroll, 1999), when scientific sources expanded considerably and theoretical concepts about social responsibility and its practical implications began to emerge. Since this period, a relatively large set of original sources can be found in the literature to map the development of the concept of social responsibility. For the sake of completeness, however, it should be noted that the first indications of social responsibility can be found in the earlier 1930s and 1940s. These are, for example, three works that were not significantly appreciated by the scientific or practical community, but contained some indications that were later developed more systematically - the book "The Functions of the Executive" (Barnard, 1938), the book "Social Control of Business" (Clark, 1939) and the article "Measurement of the Social Performance of Business" (Kreps, 1940). However, with regard to the need to clarify the definitions, we will deal with more content-intensive sources that have begun to emerge since the 1950s.

Social responsibility is a topic that arouses a wide social interest - not only in the academic field, but also in the field of business or international politics. The dynamics of the development of social responsibility and the continuing interest from various social groups have resulted in quite a number of practically or theoretically oriented topics that would require a deeper and more systematic examination. The range of these topics is very wide and easily exceeds the possibilities of this habilitation thesis. In this work, however, we focus on areas that are not sufficiently covered by empirical knowledge or evoke academic or social discourse. An overview of academic interest in the topic of social responsibility can be found in Figure 1, which shows the number of records containing "CSR" or "Corporate social responsibility" in the title. After entering this string, the Scopus database will offer 4744 records (data valid as of June 26, 2020).

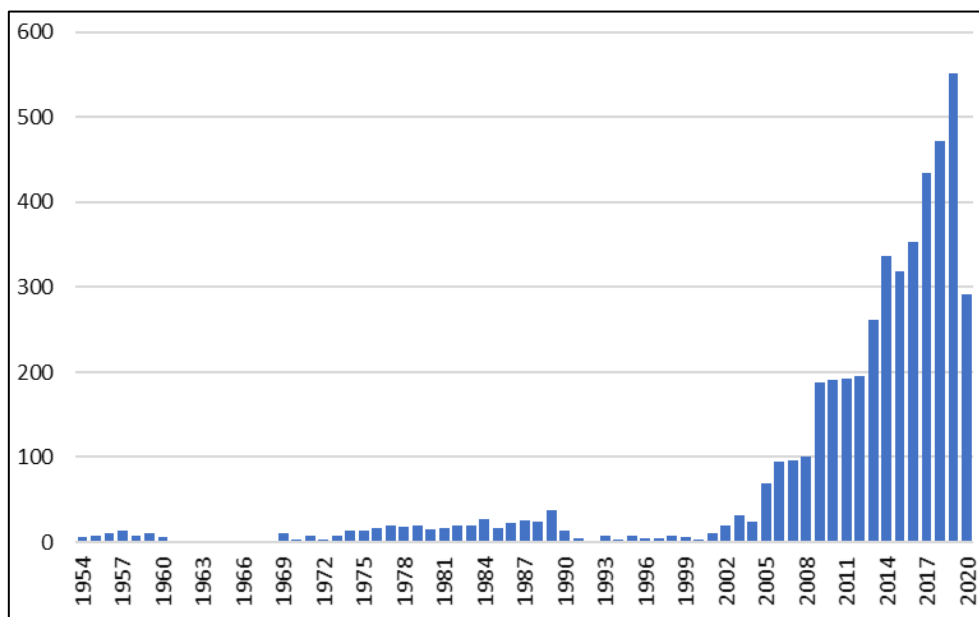


Fig. 1 An overview of the number of articles in the Scopus database focused on CSR

If we looked at the keywords in these articles, we could partially show the areas on which this concept has focused. Of course, this is only a very rough analysis, but for illustrative purposes it will suffice in this case. The range of keywords is quite wide and also captures inappropriate words that do not represent topics. These were excluded from the list - for example, words that represented bibliographic information (e.g. article, review, abstract), the search phrase itself (e.g. CSR or corporate social responsibility), unrelated abbreviations (e.g. Coherent Synchrotron Radiation) or country (e.g. China, Czechoslovakia). At the same time, some keywords were combined - for example, the separate categories "Stakeholders," "Stakeholder," and "Stakeholder theory" were aggregated into one category. This overview is in the form of a tree map in Figure 2.

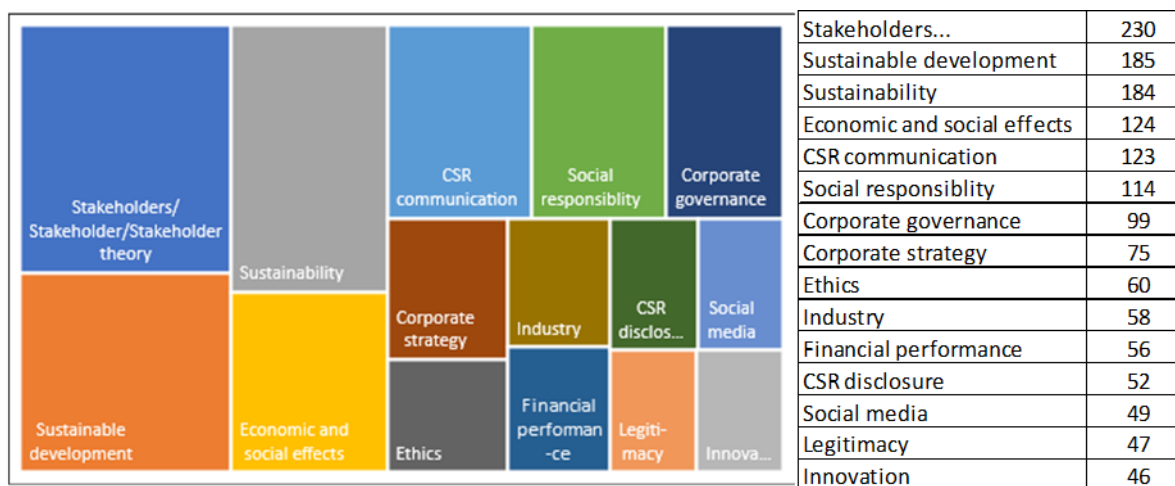


Fig. 2 Overview of the occurrence of keywords related to the topic of CSR

Just to clarify, we performed the same analysis in such a way that we searched for search phrases ("CSR" or "corporate social responsibility") in the keyword list (e.g. not in the title of the record). Although the list of results contained about 2,000 more records (specifically 6896), the results did not differ much from those shown above. However, areas such as "Supply chains", "Commerce", "Decision making", "Competition" and "Financial Performance" were also among the most frequent topics. These results in principle roughly correspond to the lines of thought that we presented in the historical overview in the previous chapter.

From the quick overview mentioned above, it can be clearly stated that the topic of social responsibility and its modified versions (e.g. CSR) is currently very topical. A systematic review of the literature on this topic could provide a suitable contextual framework to explain the current perception of social responsibility in historical contexts.

3 RESEARCH OBJECTIVE, METHODOLOGY AND DATA This article aims to present the evolution of views on social responsibility. Its aim is to present an overview of the main currents of thought regarding social responsibility in certain time periods. The purpose of this review is to capture and explain the attitudes of key academics who have shaped the concept of social responsibility in the past.

To fulfill the defined goal, a historical analysis was used, which is based on the elaboration of a literary review of essential academic and professional works in the form of books, articles or conference papers. Within the historical analysis, emphasis was placed on the content of the analysis. We tried to capture and contextually describe the essential aspects of the period and the topic of social responsibility.

4 RESULTS AND DISCUSSION The following chapters contain the development of views on social responsibility over time. We have divided this development into ten-year time periods, in which we will present the main representatives and opinion leaders in the field of social responsibility.

4.1 The concept of social responsibility in the 1950s

In the 1950s, the concept of CSR appeared rather under the acronym SR, which represented Social Responsibility. The breakthrough came in Howard R. Bowen's "Social Responsibility of the Businessman" (Bowen, 1953). This work is considered by several authors to be the basis of the modern concept of social responsibility (Carroll, 1999). It defines the social responsibility of the entrepreneur as follows: "the obligation of the entrepreneur to conduct such policies and to make such decisions or such activities as are required with regard to the aims and values of society" (Bowen, 1953). In this work, Bowen cites a 1946 survey by Fortune magazine, in which the magazine asked social entrepreneurs about social consciousness. The results of this survey showed that up to 93.5% of the surveyed entrepreneurs agreed with the statement that the entrepreneur is responsible for the consequences of his actions to a greater extent than that which covers business activities.

Despite the general acceptance of Bowen's concept of social responsibility, the author himself states that social responsibility is not a panacea for all social problems, but contains an important principle to help entrepreneurs correct their behavior. In addition to Bowen, who according to several sources is considered the "father of social responsibility" (Carroll, 1999), social responsibility was part of other important works in the 1950s, such as: "Moral philosophy for management" (Selekman, 1959), "Management's Responsibility to Society: The Growth of an Idea" (Heald, 1957) and "Corporate Giving in a Free Society" (Eells, 1956).

4.2 The concept of social responsibility in the 1960s

In the 1960s, there was a significant increase in attempts to formalize and more precisely define CSR. One of the most important representatives of this period was Keith Davis, who later wrote about social responsibility both scientifically and practically and conceptually. He perceived social responsibility as "decisions and activities of the entrepreneur that were implemented with regard to at least partially exceeding the economic or technical interest of the enterprise" (Davis, 1960). At the same time, Davis argued that social responsibility is a vague / vague concept, but one that needs to be seen in a managerial context. In 1966, Davis and his colleague Blomstrom published the first edition of the book "Business and its Environment," in which he defines social responsibility as follows: "An entrepreneur acts socially responsibly when he takes into account the needs and interests of others who may be affected by his activities." (Davis, 1966)

Other key figures in the field of social responsibility included William C. Frederick, whose definition of social responsibility was as follows: "Entrepreneurs should oversee the functioning of an economic system that meets public expectations. This means that the means of production of the economy should be used in such a way as to increase overall social and economic well-being." (Frederick, 1960).

A few years later, the topic of social responsibility was the main idea of McGuire's book. In this book, the term social responsibility has been clarified as follows: "The idea of social responsibility presupposes that a company has not only economic and legal obligations but also certain responsibilities to society that go beyond those obligations" (McGuire, 1963). Although the author did not state in this definition what specific responsibilities are involved, his later work can already be clarified, stating that companies must take into account the political environment, community well-being, education, employee satisfaction, and basically the entire social system that surrounds the company. Therefore, an entrepreneur should act exactly like a conscious citizen (McGuire, 1963).

4.3 The concept of social responsibility in the 1970s

The 1970s saw a significant increase in interest in the CSR concept. In 1970, Morell Heald published a book entitled "The Social Responsibilities of Business: Company and Community, 1900-1960" (Heald, 1970). Although Heald did not give a brief definition of CSR in this publication, it is relatively clear that his perception of the term corresponds to the currents of opinion of the 1960s. At the same time, in the foreword to his book, he states that the importance of social responsibility for entrepreneurs must be perceived in the light of the current policies to which they relate. He sought links with social responsibility in historical sources covering the period from the early 20th century to the 1960s. This review led him to the conclusion that during this period, entrepreneurs became significantly involved in corporate philanthropy and community relations.

One year after Heald's book, another interesting publication with a more conceptual focus was published - "Business in Contemporary Society: Framework and Issues" - by Harold Johnson (Johnson, 1971). In this publication, Johnson summarized several views and definitions of CSR, which he critically analyzed. Its conclusions led him to define the term "conventional wisdom" in the following way: "A socially responsible company is one in which managers shuffle among several interests. Instead of focusing exclusively on high shareholder profits, a socially responsible company considers the interests of employees, suppliers, intermediaries, local communities and the nation" (Johnson, 1971). Johnson also defined three key perspectives on CSR - multiplicity of interests, maximizing long-term profits, and maximizing utility. Based on them, Johnson presented a fourth (own) view of CSR, where he redefined the concept as follows and named it a "lexicographic view of social responsibility": "The company's goals, as well as the customer's goals, are graded according to importance. This importance is made up of a variety of factors, the most important of which is the company's previous experience with these goals and the previous performance associated with them." (Johnson, 1971).

In 1979, Archie Carroll introduced a four-component definition of CSR, which was linked to CSP (Corporate Social Performance). Its definition includes the main aspects of CSR, which, as we will see later, are part of the modern definition of this concept. Carroll explains the concept of CSR as follows: "Socially responsible business involves the economic, legal, ethical and discretionary expectations that a company has over an organization at a given point in time" (Carroll, 1979). This definition is explained by its author through four of its components. He explains economic responsibility (the first component of CSR) by saying that companies are primarily economic units in our society. They are also responsible for producing the goods and providing the services that society needs. The company buys goods and services and thus creates a profit for the company. All other business tasks are affected by this basic premise. He explains ethical responsibility (the third component of CSR) by saying that it is a type of behavior that takes into account the ethical principles that a company expects from a company - that is, beyond legal obligations (the second component of

CSR). Discretionary responsibility (the fourth component of CSR) is explained as the performance of voluntary tasks that a company performs, but for which society does not provide such unambiguous expectations as ethical responsibility (Carroll, 1979).

4.4 The concept of social responsibility in the 1980s

The next decade was characterized by less attention being paid to defining CSR. It has moved from theoretical concepts to practice-oriented research focused on implementation and the effects of social responsibility. At the same time, several authors focused on alternative topics related to CSR, such as corporate social responsibility, corporate social performance, public policy, business ethics, corporate ethics), stakeholder theory. The overview in this chapter captures the most important currents of thought of the 1980s.

In 1980, Thomas Jones introduced an interesting perspective on CSR. He first defined CSR as follows: "CSR means that organizations have obligations to essential groups of society in addition to shareholders and beyond the law. Two aspects are key in this definition - these responsibilities must be voluntarily accepted by companies and must involve multiple stakeholders such as customers, employees, suppliers, and the community." (Jones, 1980) Based on this definition, Jones stated that CSR should be a process and explained how the company should implement this process.

The development of mechanisms for assessing CSR was the subject of a study by two authors in 1981 - Frank Tuzzolin and Barry Armandi. These authors developed Maslow's model of the hierarchy of needs into a new form, considering the concept of social responsibility. The authors did not directly (re) define CSR but pointed out the links between individual and organizational needs. Maslow's hierarchy of needs categorizes individual needs into groups according to the individual's priorities and can be needs of varying intensity and importance falling into five groups: physiological needs, safety needs, group membership, respect, and self-realization needs. Tuzzolino and Armandi pointed out the parallels of this concept to organizational needs and presented the approach as "a conceptual tool that could adequately assess an organization's corporate social responsibility" (Tuzzolino, 1981).

An analytical approach to understanding the concept of CSR was chosen in 1982 by Dalton and Cosier. They created a two-dimensional matrix, one axis of which was the level of activities of the organization in terms of legality (on the one hand legally and on the other illegal) and the other axis was the rate of activities in terms of responsibility (on the one hand irresponsible and on the other responsible). The matrix with these two axes divided the space into four quadrants. The authors determined that the most suitable quadrant for the application of CSR principles for a company is legal and responsible activities. This is not a surprising finding, but the authors themselves were aware that in some cases it was difficult to assess the extent of these two aspects for a particular activity (Dalton, 1982).

4.5 The concept of social responsibility in the 1990s

In the next decade, attempts to define CSR accounted for only a fraction of all publications devoted to this topic. Topics that focused on the integration of CSR into other and broader system units appeared much more frequently. CSR thus became a kind of building block or starting point for other concepts that were directly or indirectly related to social responsibility. These included, for example, CSP (Corporate Social Performance), Stakeholder Theory, Business Ethics Theory and Corporate Citizenship. In the following text, we will focus on the most important conceptual concepts of CSR in the 1990s.

In 1991, Donna Wood made a significant contribution to the CSR debate by revising the Corporate Social Performance (CSP) model. It thus reflected the growing popularity of the term CSP and its model was based on the approaches of Carroll of 1979 (responsibility, responsiveness and societal issues) and Wartick and Cochran of 1985 (principles, processes and policies related to CSR). The author reformulated them into three principles of CSR, which took into account Carroll's four-

component definition. These were the following three principles: (1) social legitimacy, which manifests itself at the institutional level, (2) public responsibility, which manifests itself at the organizational level, and (3) managerial balance sheet. (managerial discretion), which manifests itself on an individual level. In addition, the four main processes of socially responsible responsiveness - reactive, defensive, relaxed and proactive (reactive, defensive, accommodative, proactive). In Wartick and Cochran's work, socially responsible responsiveness was seen more as a set of policies / strategies, and Wood extended it to include environmental assessment, stakeholder management, and problem management (Wood, 1991).

The redefinition of the four-component view of CSR occurred in 1991, when its author (Archie Carroll) again slightly modified the fourth component of CSR. The first three components remained unchanged (economic, legal, ethical), but the fourth component - discretionary, which was later reformulated to be voluntary and philanthropic - was again changed to the term "corporate citizenship". In the study, Carroll states the following: "For CSR to be accepted by entrepreneurs, it must be framed in such a way as to cover the full range of social responsibility. It must be said that four types of social responsibility are CSR: economic, legal, ethical, and philanthropic. In addition, these four categories or components of CSR can be represented as a pyramid. For the sake of accuracy, all these types of responsibilities have always existed to some extent, but in recent years the ethical and philanthropic aspects of social responsibility have grown significantly" (Carroll, 1991). The pyramid Carroll considered would have an economic component as the basis (the basis without which the other components would not function), over which they were successively legal, ethical, and philanthropic. At the same time, Carroll considered that it was not necessary for managers to address one component first and then another, but argued that all components were filled substantially continuously, only to varying degrees. The pyramid, which later became a successful platform for further theoretical development of CSR, was perceived by its author not only as a graphical expression of social responsibility as a way of a new perception of the four-component definition of CSR. In this context, he stated that "a socially responsible company should strive to make a profit, comply with the law, be ethical and be a good citizen of society" (Carroll, 1991). In the same article, Carroll proposed a transition from CSR to Stakeholder Theory / Management and explained that there is a natural coherence between these concepts. At the same time, he stated that the word "social" can be perceived as relatively vague and abstract, while the term stakeholder is much more targeted and gives this meaning to social groups "names and faces".

4.6 The concept of social responsibility in the zero years of the 21st century

The zero years of this century were characterized in the field of CSR by deeper and broader integration with other related topics. In the literature from this period, the authors dealt with topics such as sustainable development, corporate sustainability, social contract theory, legitimacy theory and growing the topic of corporate citizenship is also growing, as Carroll had anticipated in 1994.

Around the year 2000, it was possible to perceive relatively strong shifts in the field of sustainable development in the academic world. This concept has been evolving since the middle of the 20th century and from the beginning it took the form of discussions about the environment and the impact of society on it. Later, the topics of sustainability were extended to other areas in order to align with the concept of CSR around the year 2000.

In 2002, the Dutchman Marcel van Marrewijk published a study on corporate sustainability. His approach is based on an awareness of the trend that business links with the state and citizens are intensifying. Each of these components has its own specific mechanism by which it coordinates its behavior and fulfills its role in society. While in the past the links (mainly legislative) between the company and the state were dominant, the involvement of companies in solving social problems has become an increasingly intense social and scientific topic. In this study, the author addressed sustainability issues, which he saw as "meeting today's needs without compromising the ability of future generations to meet their own needs" (Marrewijk, 2002). Based on this definition, Marrewijk

defined five ways in which the sustainability of a company can be viewed. The first is the sustainability of the company focused on achieving compliance (Ang. Compliance-driven CS). At this level, the sustainability of a business consists of ensuring the well-being of society within the laws and regulations of the relevant authorities. In this context, the sustainability of a business is perceived as a service, a duty or good behavior. The second way to define sustainability is to look through profitability (Profit-driven CS). At this level, the view of business sustainability is explained as the integration of social, ethical and environmental aspects into business activities and decisions. The third way is taking into account the approach to business sustainability (Caring CS). It involves balancing the economic, social and environmental interests of the company vis-à-vis others. This is reflected in activities that go beyond legal regulations and profitability. This third view is characterized by areas such as trust in human potential, social responsibility and care for the planet. The author called the fourth view as synergistic (Synergistic CS). This is characterized by the search for balanced functional solutions that add value in the economic, social or environmental aspects of business performance. Such added value often has a synergistic effect and affects several stakeholders. The last - the fifth - aspect to the sustainability of the company is holistic (Holistic CS). It is a fully functional integration of all aspects of the organization into the provision and improvement of the quality of life of each person and entity now and in the future. Everyone in the organization must be intrinsically responsible to others (Marrewijk, 2002).

In 2002, a pair of American authors Brenda Joyner and Dinah Payne published an overview of the development of values, business ethics and CSR over the past period. They are based on earlier claims based on the fact that good ethics means good business. To illustrate their position, they used case studies in two organizations, in which they tried to connect examples of the implementation of business ethics with the results that the organization achieved. At the same time, the study contains a relatively good overview of the development of CSR values and predispositions, such as morale, adaptation, responsibility, leadership, ethical behavior, or corporate strategy. They found that the impact of values, business ethics and CSR on an organization's financial performance can be both direct and indirect. They analyzed individual impacts through Carroll's four-component concept of CSR based on economic, legal, ethical, and discretionary responsibilities.

4.7 Current perception of the concept of social responsibility

In 2011, the American authors Michael Porter and Mark Kramer introduced the concept of creating shared values, which the authors perceived as a natural evolutionary step in business. Creation of Shared Values (CSV) has been characterized as “a policy and practice that increases a company's competitiveness while contributing to the improvement of economic and social conditions in the communities in which the company operates. CSV focuses on identifying and developing the relationship between social and economic development” (Porter, 2011). The concept of CSV was perceived by its authors as an extension of a narrow view of business strategy, which usually does not consider the factors causing long-term success. According to the authors, the position of CSR is already an outdated / limited concept and they call for its replacement by their own CSV concept, the purpose of which is perceived as "companies must be redefined to create shared values" (Porter, 2011). To achieve this, companies should focus on three areas: (1) reassessing products and markets, through (2) redefining productivity in the value chain and (3) creating supportive industrial clusters where the company operates.

Porter and Kramer called for a new approach to CSR based on shared values. A similar attitude was promoted by the Danish author Leila Trapp, who described the shared values as the third generation of CSR. This is characterized by the fact that companies consider social and global issues in their activities, even in cases where they are not directly related to their main business (Trapp, 2012). According to Aguada (2019), this approach may at first sight resemble the fourth level of the Carroll pyramid (philanthropic responsibility), but in fact stems from a different understanding of the roles of companies in a social context. In its 2012 study, Trapp drew on Marrewijk's work to explain what

she called the third generation of CSR: "as an output of the evolution of the roles and responsibilities of each sector of society, with the public, private and social sectors becoming increasingly independent" (Trapp, 2012). The author explains the practical implications of this, using the example of a Swedish energy company, which launched a socially responsible campaign in 2008 to increase stakeholder engagement (CSR). This campaign focused on climate change but still respected the main business goals of the organization. The work of this Danish author has highlighted the importance of new roles and responsibilities of companies that they should take on to produce shared value.

In 2013, David Chandler and William Werther Jr. published the book "Strategic Corporate Social Responsibility", in which they also pointed out the importance of shared values. The fact that these authors attached great importance to these values is documented, for example, by the fact that the original 2006 book was subtitled "Stakeholders in a Global Environment" and the third edition of the 2013 book was subtitled "Stakeholders, Globalization, and Sustainable Value Creation." ". In it, the authors relatively intensively promote the concept of SCSR - Sustainable Corporate Social Responsibility, while at the same time stating that SCSR has the potential to create sustainable value. According to the authors, the first step in fulfilling this potential is the identification of social problems for which the company can subsequently create suitable and effective business strategies (Chandler, 2013). In the fourth version of the book, which was published in 2016, Chandler presents the evolution of CSR and its growing acceptance as one of the central themes of strategic business decision-making as well as daily decisions. Chandler sees shared values as one of the main goals of the SCSR, emphasizing that "shared values cannot be circumvented, on the contrary, they must be included (in business activities)" (Chandler, 2016). He clarifies this statement by stating that the principles of shared values should be integrated into businesses into daily operations. Sustainable Corporate Social Responsibility (SCSR) Chandler and Werther define as follows: "The inclusion of a holistic perspective on CSR in corporate strategic planning with core operations in such a way that the company is managed taking into account the interests of a wide range of stakeholders to achieve economic and social value in long-term" (Chandler, 2016).

5 CONCLUSION Several publications and various strategic documents show a constant interest in topics related to social responsibility. The historical context and the development of the concept of CSR play a key role in understanding it. From the overview presented in this article, it is possible to see the various currents of thought that have influenced CSR, both theoretically and practically. Of course, for reasons of scale, it is not possible to list all theoretical and practical initiatives in this field - it would not be effective and would increase the risk of opacity.

Almost 70 years have passed since Bowen's work "Social Responsibilities of the Businessmen", which formally started CSR life. While at first the efforts to grasp social responsibility were mainly of an academic nature (they focused on the definition of essential topics and terminology), later a practical approach focused on various aspects associated with the implementation of CSR began to dominate.

Several leading authors in the field of social responsibility have tried to estimate the trends that this topic will take at the time. This is no exception at this time, so we can offer an overview of possible scenarios from one of the current academic leaders. One of the current most important academic staff in the field of CSR - Archie Carroll - offered his perspective on the future direction of CSR in his 2015 work. Carroll predicts that corporate social responsibility will shift to topics such as stakeholder involvement, the growth of ethically sensitive consumers, the level of sophistication of nonprofits, employees as the driving force behind CSR, increasing socially responsible activities in the global supply chain (Carroll, 2015). At the same time, the author expects that CSR will continue to evolve, but rather in an evolutionary way. As this scenario seems most likely, Carroll said, emphasizing that CSR is still a relevant concept and that the rate of its implementation is growing, some approaches are contradictory. This could slow down the global expansion of CSR or shift it to other related topics

such as Corporate Sustainability, Corporate Social Performance, Creation of Shared Value, Corporate Citizenship.), Environmental Corporate Social Responsibility and others (Carroll, 2015).

The presented paper aimed to summarize the main currents of thought in the field of social responsibility. This summary was based on an analysis of the historical sources of important personalities. The overview in this article can serve as a suitable platform for more systematic research on social responsibility, taking into account the contextual links to past developments in this topic.

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ANALYSIS OF THE OPPORTUNITIES TO PREVENT EXTREMISM AND OTHER FORMS OF INTOLERANCE MORE EFFECTIVELY AGAINST MIGRANTS IN THE EUROPEAN UNION

Marcel Lincényi

Abstract

The European dimension of the education is topical not only for old member states of European Union but also for the new and future member states. The citizenship education unites several social science fields and disciplines such as education for Europeanism or environmental, global, media, multi-cultural, personal and social education and education for constitutional democracy. The main research objective of the presented research study was to look for the opportunities to more effectively prevent extremism and other forms of intolerance against migrants in the European Union.

Keywords: citizenship, education, Europeanism, media, the Slovak Republic

JEL Classification: F50, F68, Z11

1 INTRODUCTION Despite of the active education for citizenship and democratic values in the Slovak Republic, in recent years, hate speech in society has grown, while at the same time increasing opinions casting doubt on the Holocaust or even presenting admiration for totalitarian regimes and their representatives.

Migration is often narrowed down to an economic problem (Mura, Daňová, Vavrek, Dúbravská 2017), but it is also a political, sociological or intercultural issue.

The alarming threat of spreading extremism in schools is highlighted by the results of the 2016 Survey, which has been conducted by the State School Inspectorate on a sample of pupils of the 8th year of elementary and secondary school students. With the symbols and manifestations of extremism, majority of elementary and secondary school pupils met at school. Whether in the form of t-shirts and other clothing with typical symbols, but also through the propagation of materials that promote it.

Against the reallocation of refugees on the basis of the so-called "mandatory quotas" were not only former Prime Minister Robert Fico but also representatives of opposition parties.

The citizenship education, respectively basics of civics and social sciences at the secondary level of education, utilizes the knowledge of several social science fields and disciplines. The aim is to contribute to the citizenship education of the youth, to strengthen their respect to the basic principles of democracy and prepare them for responsible citizen life in the democratic society (Staněk, A., 2009, p. 11-13). As Kredátus presents (2013, p. 5), the aim of the civic education is to form young people according to the traditional values of the society and with simultaneous acceptance of the current European and world integration process.

The European dimension of the education has occurred as a relatively new issue in our pedagogy, although the initial lack of study materials for the European Studies has been overcome. According to Staněk (2007, p. 80) the European dimension in the school education is without ambitions to become a new subject at the schools. Its intention is to provide the educational experts with enough impulses for the change initiation of the formal and hidden curriculum and therefore support the expansion of pupils' horizons and increase the quality of the whole educational system. "With new social trends and changes on local and global level the task of education has been developed according to the needs of today's students. The education for democratic citizenship and human rights is the

fundamental connection of peace and dialogue in the Europe and the world of tomorrow. The basic themes of school institutions are the conflict management issue, diversity respect, intercultural awareness, understanding of the citizen rights and obligations. (Brett, P. et. al., 2012, p. 75)

However, the issue of radicalization and extremism is extensive, diverse and difficult, especially for teachers working with youth. In addition, radicalization is a dynamic process influenced by the changing of external conditions and behavior of actors. For example, actors from an extremist environment regularly change strategies to avoid interference with state security forces, while at the same time being able to influence as many potential adherents as possible. On the other hand, especially students and young people often change their unstable attitudes to current social issues. We agree with the views of several experts that it is necessary to work on further updated teaching aids in this area for schools.

2 THEORETICAL BACKGROUND As part of research into the current public opinion of Slovaks on migration issues in connection with the current refugee crisis, we have carried out several research studies in recently years.

The first research survey was conducted in the fourth quarter 2015 The sample of respondents in 1033, which was representative of the population in terms of gender, age and region. The research sample consisted of 492 men and 541 women. (Lincényi, 2017, p. 357-367)

From realized analyses public opinion of citizens of the Slovak Republic has come out strongly questioned cautious stance on the issue of migration, while it should be noted that a similar approach is also seen in other countries of the Visegrad Group.

Migrants interviewed by the Slovaks were not important, but rather a burden because they would not be willing to respect local traditions and standards and contribute to increased crime. Only 7.6% of all respondents believe that refugees can contribute to Slovakia. In contrast, only 75.5% of respondents were concerned that the arrival of asylum seekers in Slovakia may increase crime.

Slovaks interviewed in any way disagree with the refugees upon arrival to obtain permanent residence in Slovakia, they themselves would want to live next to the migrant would not employ him at work and would not want to close to them has grown mosque. Most Slovaks polled 82.55% disagree with the fact that refugees gain permanent residence in Slovakia. Up to 76.5% of all respondents are in fact concerned that refugees are unable to comply with Slovak traditions and norms.

Slovaks, however, were not willing to accept some of the habits of migrants (80.3% of respondents) that asylum seekers raised with their arrival in Slovakia. Almost half of respondents would be unemployed refugees in their companies, while 22.6% of those questioned can imagine it, and the remaining respondents to this question could not answer. In contrast, more than half of those surveyed would be willing to change their minds if it happens that mothers came with their children to Slovakia.

Interviewees Slovak citizens do not agree with mandatory quotas for the distribution of refugees in the EU as well as the dictation of these quotas, the EU Member States, while not respecting these quotas believed to be correct. They think that migration policy should be to limit those asylum seekers who, forced to flee the home armed conflicts. According to the interviewed respondents would be most effective solution of the refugee crisis, combating its causes therefore wars and terror in Syria.

Another research survey was conducted in the first quarter of 2016 with 1398 respondents who were representative of the adult population in terms of gender, age, education and regions. A survey sample consisted of 643 men and 712 women, with 43 respondents not reporting their gender. (Lincényi, 2017, p. 165-175)

Research from the Slovaks, among other things, showed that migrants (36 %), terrorism (20 %) and bureaucracy (18 %) are the biggest problems in the European Union today.

Most of the Slovaks addressed (72 %) are not satisfied with how the European Union has so far addressed the refugee crisis. Only 10 % of the interviewed respondents agree with the decisions of the European leaders.

On the other hand, we have to say, that research survey showed that the Slovaks are not convinced that the issue of migration, terrorism, and the like should be addressed by joint military forces. A common European Army can imagine 36 % of the respondents, but the opposite is 39 % of respondents.

3 RESEARCH OBJECTIVE, METHODOLOGY AND DATA The main research objective of the presented research study was to look for the opportunities to more effectively prevent extremism and other forms of intolerance against migrants in the European Union.

The secondary research objective of the presented research study was analysis of the current public opinion of the Slovaks on the issue of migration in connection with the current refugee crisis.

Another secondary research objective was analysis of the current state of education and education in relation to citizenship and Europanness in the Slovak Republic.

We identified one research question (RQ) that we developed in two other specific research questions (SRQ), that we developed in two other specific research questions (SRQ):

RQ1: What is the current public opinion of the Slovaks on the issue of migration in connection with the current refugee crisis?

SRQ1: How much Slovaks trust people in other states in Europe?

SRQ2: What is current public opinion of the Slovaks about relations of the Slovak republic with the neighboring?

4 RESULTS AND DISCUSSION The research was realized in the first quarter of 2018 on the research sample of 817 respondents from the Slovak Republic). The research consisted of 296 men and 521 women, with 2 respondents not mentioning their gender.

The research has shown that Slovaks rather trust in Europe Belgians (526), Brits (533), Czechs (573), Danes (505), Estonians (438), Finns (524), French (470), Dutch (518), Iris (493), Latvian (397), Luxemburgish (450), German (426), Polish (487), Portuguese (437), Austrian (508), Slovenian (466), Spanish (497), Swede (513), Italian (474).

On the other hand, research has shown that Slovaks do not trust Bulgarians (418), Cypriot (403), Lithuanian (408), Hungarian (411), Maltese (398), Romanian (458), Greek (421), Turk (565).

Overall, Slovaks trust most Czechs (573) and do not trust the most Turk (565). For more information see graph 1.

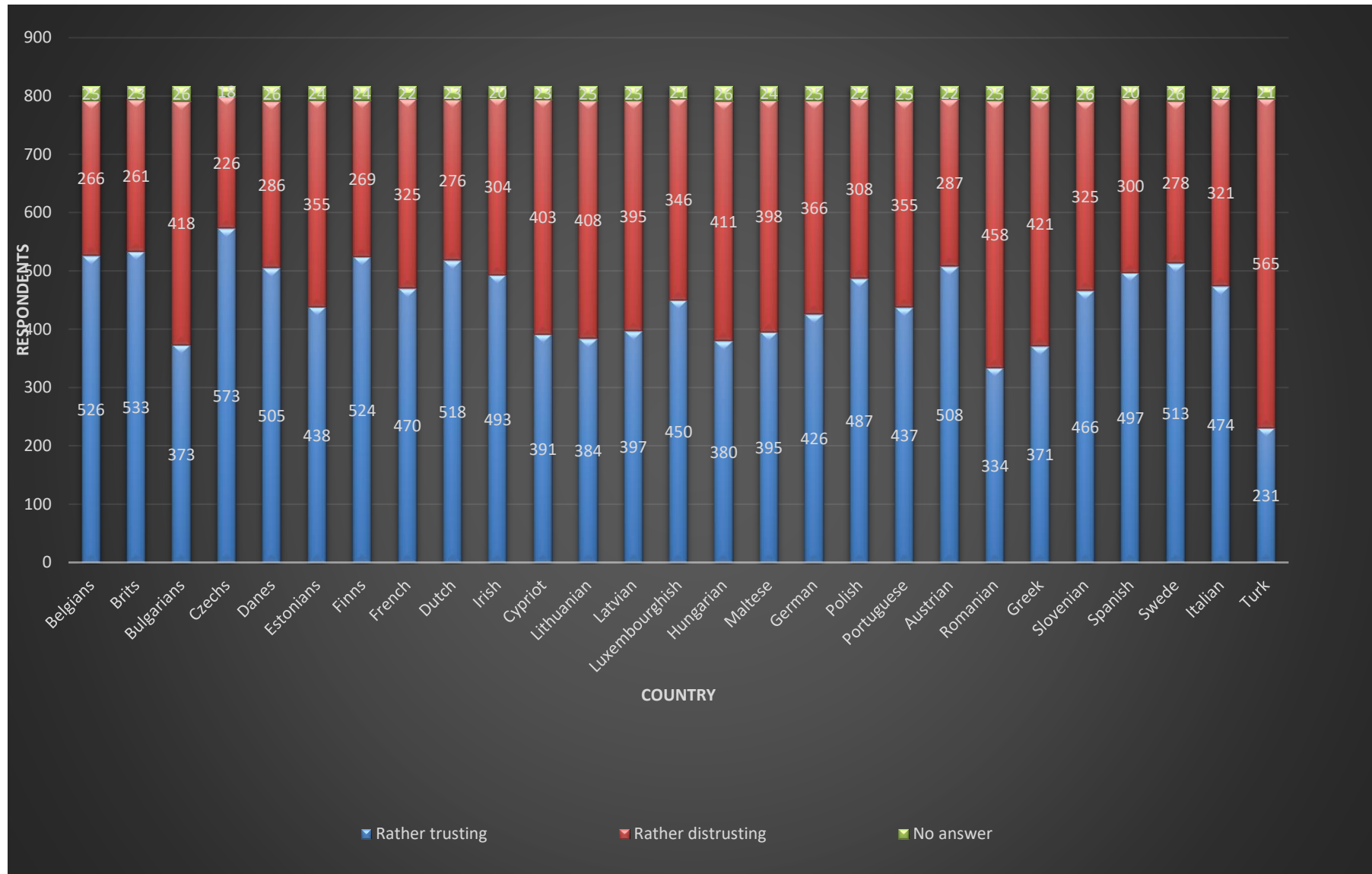


Fig. 1 – How much you trust people in their states. Can you please tell me, for each state, how do you trust their citizens? Source: own research

Research has shown that according to Slovak interviewed, the Slovak republic has the best relations with the Czech Republic, Poland and Austria.

More than $\frac{3}{4}$ of people think that relations with the Czech Republic are very well, respectively moderately good (695), 74 respondents had an opinion that they are weak or not good, while the other respondents did not respond.

More than $\frac{2}{3}$ of the people think that relations with Poland are very well, respectively moderately good (586), while the opposite opinion is 171 respondents and other respondents did not respond.

Nearly $\frac{2}{3}$ of the interviewees think relations with Austria are very well, respectively moderately good (527), while the opposite opinion is 192 respondents and other respondents did no respond.

On the contrary, the worst relations according to the interviewed Slovaks have the Slovak Republic with the Ukraine and Hungary. More than half of the respondents think that the relations with Ukraine are weak or not so good (454), opposite opinion has 265 respondents, while other did not respond.

Almost half of the respondents think that relations with Hungary are weak, or not so good (383), opposite opinion has 357 respondents, while other did not respond. For more information see graph 1.

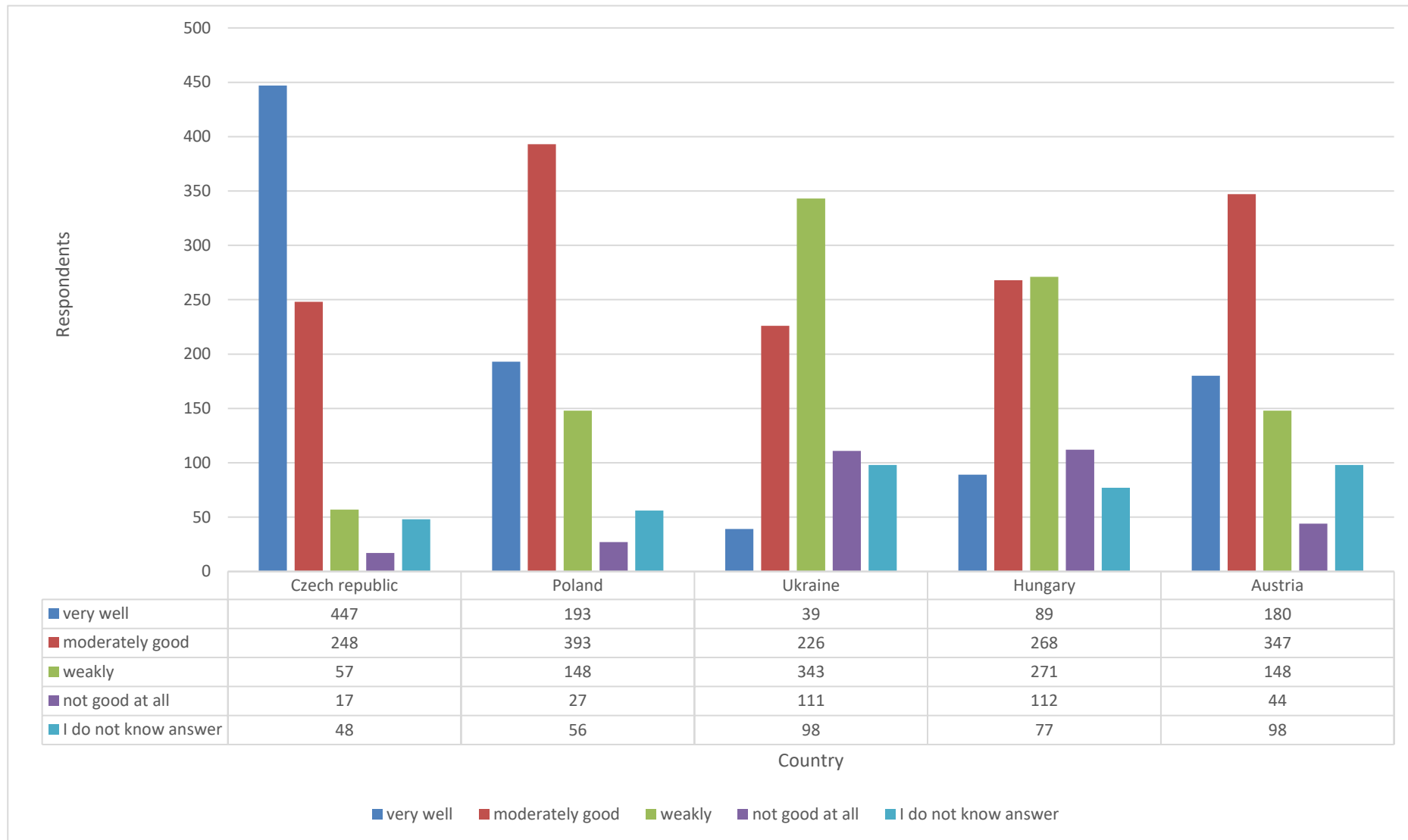


Fig. 2 – How much you trust people in their states. Can you please tell me, for each state, how do you trust their citizens? Source: own research

The analyses of education for citizenship and Europeanism in the Slovak republic

After 1989 the political forces in the Slovak Republic have started a fight over the form of youth participation on the political and citizen life and the form of youth education at schools.

Because of the previous communistic ideology values, during the first stage (until 1st of September 1993) the subject was taught in a limited degree, with a minimum amount of teaching aids and de facto without textbooks. Many teachers created their own teaching materials, enabling them to replace missing textbooks and teaching aids necessary for teaching. Some of the teachers preferred to lead the discussion clubs instead of lessons and pupils could talk about the problems they were interested in. (Macháček, Šťava, 2012, p. 24)

In 1991 the expert group was created by the Ministry of Education, Youth and Sports of the Slovak Republic authorised to form a new concept of the subject and new curricula for primary and secondary schools. The work on the new concept of civic education was finished in 1993 and the new civic curricula (of secondary schools) were approved by the act of the Ministry of Education and Science of the Slovak Republic on 14 April 1993 under number 2166/1993 - 31, with effect from 1 September 1993.

By the decision of the Ministry of Education and Science of the Slovak Republic on 19th of August 1993 the teaching of civic education at primary schools (grade 6. and 7.) was cancelled in relation to the introduction of restricted elective subject Ethical Education and Religious Education on second level of primary school. In the following four years the civic education was taught only in grade 8. and some of the classes of grade 9 of primary school. The expert commission of the Ministry of Education and Science of the Slovak Republic and The State Pedagogical Institution submitted a request to Ministry of Education and Science of the Slovak Republic to implement civic education as a compulsory subject to the primary school curricula for grade 6.-9. After considering all the facts and suggestions on the civic curricula for grade 6.-9. of primary schools the Ministry of Education and Science of the Slovak Republic

implemented this subject into the programme of study for grade 6.-9. for primary schools on 3rd of April 1997 and by assessment number 1640/1997 - 151 and approved the draft of the new curriculum with effect from 1 September 1997. (Macháček, Šťava, 2012, p. 24-25)

Civic education is a compulsory, independent subject focused on the features of citizenship education according to a national curriculum (ISCED 1, 2 a 3) on the primary and secondary level. (European Commission, 2012, p. 19)

Teaching of civic education in the Slovak schools is carried out in accordance with the concept of school reform after the year of 2008 aimed on activation of the students in lessons, introduction of innovative methods in teaching, teaching and education for practical life. The teaching of civics is formed by generally binding legal norms of the education sector. The fundamental norm is Act no.245/2008 Coll. (Law on education and on amendments to certain laws - Education Act), which defines a number of principles that underlie education in the Slovak Republic. Other norm, respectively binding instrument that regulates the teaching of civics in primary school is the National Education Programme for second level of primary school in the Slovak Republic and, of course, the framework curricula for primary schools and eight-year grammar schools, which are valid from 2011. (Kredátus, 2013, p. 6)

There is mentioned in the characteristics of the subject Civics that it contributes to the pupils' orientations in the family and school environment. "It leads them towards the knowledge of their township, region, country and the European Union. It enables to understand pupils' individuality and helps them in the process of socialisation. It teaches them to think and act democratically, learn of their rights and obligations and to defend the rights of the others." (Drozdíková, 2011, str. 2)

According to the Framework Education Programme for primary schools with Slovak as a teaching language the Civics covers 4 hours per month, respectively 12 hours per month in the alternative educational plan for primary schools with Slovak as a teaching language and with emphasis on social studies. (Kredátus, 2013, str. 12-13)

5 CONCLUSION The issue of radicalization and extremism is wide-ranging, diverse and difficult, especially for pedagogues working with youth. In addition, radicalization is a dynamic process influenced by ever-changing external conditions and behavior of actors. For example, actors from the extremist environment regularly change strategies to avoid interference with state security forces, while at the same time being able to influence as many potential enthusiasts as possible. On the other hand, especially students and youths in the formative age often change their unstable attitudes to current social issues. We agree with the views of several experts that it is necessary to work on further updated teaching aids in this area for schools.

We would like to highlight the influence of mass media in the citizenship education and their striking role in the society, because they provide their members with the important information about the world, culture, politics and socialization. Several authors emphasize the importance of the media in forming of the public opinion in the society. (Lincényi, Fabuš, Jankacká 2013, Polakevičová 2016, Szabo 2016). The media are an essential part of life of individuals in society. Mass media play a striking role in mediating the social reality and ideas to the percipients. They provide the exchange of information and knowledge in the society and spread the valid values and norms. (Lincényi, Fabuš, Jankacká 2013, p. 89) According to the opinion of several authors (Vavrečka 2016, Šramová, Džupina 2016, Bulanda 2017), in addition to the short - term impact of media it is also necessary to pay attention to the long - term impact of media content.

The above we mentioned reasons open the discussions about the possible usage of the mass media in the citizenship education. As Lincényi (2013, p. 191) mentions, the only effective prevention of false social reality is to provide people with medial education in the process of lifelong learning. Staněk (2007, p. 80) shows that the school does not have a privileged position in the implementation of the European dimension but must actively collaborate with other elements (family, peers, mass media etc.) that together with the school education influence its development. According to Gabriela Cingelová (2005, p.60) the media education becomes an important part of the

education and she recommends to use the film production in the teaching of civic education or the basis of social sciences.

The author points out that civic education is needed not only in schools, but also in the family or through mass media. One of the possibilities of making the subject of civic education more attractive could be media education in the future.

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THE ANALYSIS OF CONSEQUENCES OF THE FINANCIAL CRISIS ON THE MARKET OF DAILY PRESS IN THE SLOVAK REPUBLIC

Marcel Lincényi
Michal Fabuš

Abstract

Since 1989, daily press in Slovakia has been characteristic of its dynamic development demonstrated by, inter alia, various changes in the system, property relations, typology, content, circulation, popularity, prices, advertising volumes and the number of daily newspapers. In recent years, daily press has been influenced by legislation, economic factors (business environment, impact of the financial crisis, purchasing power of the population, etc.), but also the evolution of social habits stemming from the development of information and communication technology. A comparative analysis of variables has also proven a certain relation between one-time sold circulation of daily newspapers and the advertising volume of daily periodicals. Nowadays, despite a significant popularity of digital media, national daily press has an irreplaceable role in the system of periodical press, as it addresses hundreds of thousands percipients and thus represents a prominent impact on public opinion.

Keywords: *Slovakia; media; market; crisis; consequences*

JEL Classification: *G010; Z10*

1 INTRODUCTION Since 1989 the system of mass media in Slovakia, including daily press, has gone through several changes influencing ownership relations of these media, typology of periodicals, number of periodicals, overall and one-time average circulation of daily press, price development of daily press as well as development of advertising volume of daily press.

2 THEORETICAL BACKGROUND In recent years, daily press market evolution has been considerably affected by economic aspects (consequences of financial crisis, business environment) influencing the purchasing power of the population, etc. As Fabuš states (2010, p. 8792), shocks on financial markets and global economic recession were gradually influencing the evolution of overall flow of direct foreign investments in the year 2008 and in the first half of the year 2009 which had also an impact on Slovak media business. Habánik (2011, str. 105-113) calls attention to the fact that the world economic and financial crisis requires adequate reaction of governments and economic sector in the financial and budgetary relations which should be considerably enriched by new knowledge of the economic theory and science.

Daily press market was also influenced by legislation and technological progress that brought with them the development of communication and network technologies and new social habits of the population which may read newspapers also on the Internet. "Social marketing and social media dominate current global media trends. For the last decade they have gone through significant technological development and various innovative processes." (Bratková, 2015, p. 16). The team of authors (Švec, Olšovská, Mura, 2015) openly admits that we live in the digital society.

According to A. Aliaksandrau (2013, p. 34 - 38), both the effects of the financial recession and popularity of digital media result in the decline of the newspaper market by 17 % in European countries and North American countries. An exception is a growth of newspapers on Asian markets such as India or China, where Internet access is still insufficient. „All Western countries are facing a newspaper crisis. It is not, however, entirely obvious whether the crisis is a business model crisis for newspapers in general or only a local news crisis.“ (Wadbring, Bergstrom, 2017, p. 175) As P. Wilby states, not only the circulations of newspapers but also the number of employees is decreasing. (2010, p. 26). In Finland, for instance, the number of newspaper chains in 2010 had decreased from 24 to 19 since 2000, while the number of dailies dropped from 44 to 42 in this period. (J. Jyrkiäinen, 2012, p. 7 - 25).

Based on the aforementioned, we decided to conduct a social science research of tendencies concerning daily press market in Slovakia between 2000 and 2014, where on one side, the number of national dailies became stabilized but on the other side a long term tendencies of decrease in average overall and one-time circulation were manifesting themselves. In order to fulfil this objective, a quantitative research strategy based on recommendations of, besides others, K. F. Punch, a professor of the University of Western Australia, was selected. (Punch, K., F. 2008b, p. 12 - 15)

Research model was divided into the pre-empirical stage (field of study, topic, objectives of examination, research questions) and empirical stage (collection of data, analysis of data, answers to questions). We will deal with particular stages of quantitative research in the following chapters.

3 RESEARCH OBJECTIVE, METHODOLOGY AND DATA

The submitted quantitative examination deals with the sales numbers of the national dailies in Slovakia including determinants of overall average circulation of national dailies in Slovakia. The strategy consists in a measurement of values of independent variable (advertising volume) and dependant variable (overall one-time average circulation) and further in examination of correlations between selected variables during the period from 2001 to 2014.

The main objective of the research is to study the relation between the advertising volume as independent variable and the overall one-time average circulation of selected Slovak national dailies as dependant variable and that for the continual period from 2000 to 2014.

The secondary objective of the empirical part is the analysis of evolution of media audience of selected Slovak national daily press during the years 2000 – 2014 from the perspective of verified sold copies.

As regards further planning and preparation of research proposal, based on recommendation of Keith F. Punch (2006a, p. 29), we preferred to use the concept of research questions rather than to define research problems.

At this place, we may identify two main general research questions (GRQ) which will lead us to three possible types of studies in the conducted research:

GRQ1: How are the variables (advertising volume, overall one-time average circulation of selected Slovak national dailies) divided?

The first general question may be further divided into two specific research questions (SRQ):

SRQ1: What is the development in overall one-time average circulation of Slovak national dailies during the years 2000-2014?

Explanation SRQ1: During the years 2000-2014 we expect that the tendency of gradual decrease in overall one-time circulation as well as in average one-time circulation of Slovak national periodicals will continue, which was identified before such period in the research studies made by I. Sečík (1994, 1995, 1996) and L. Petránka (1999) but also during the analyzed period by A. Tušer (2011). The decrease on the print media market in European countries and North American countries is confirmed by several foreign authors (Aliaksandrau 2013, Wilby 2010, Jyrkiäinen 2012).

SRQ2: What is the development in the advertising volume in Slovak national dailies during the years 2000-2014?

Explanation SRQ2: We expect a moderate increase in overall advertising volume in Slovak national dailies from 2000 until the beginning of the economic crisis in 2007 from the perspective of more and more sophisticated marketing activities. Due to the end of several dailies in this period, the advertising volume may considerable increase in particular dailies. From the beginning of the economic crisis until today, we expect stagnation or even decrease in advertising volume, as the global expenses are rising only minimally while they are even decreasing in Europe. (For more details see: Brečka 2009, Stratégie 2009, Stratégie 2010, etc.)

GRQ2: What is the relation between advertising volume as independent variable and overall one-time average circulation of selected Slovak national dailies as dependant variable?

Explanation GRQ2: We assume that a correlation exists between advertising volume numbers and overall one-time sold circulation of these selected periodicals.

When conducting research, we will use several research methods: analysis of viewership, method of study of documents, comparative method and statistical average method.

4 RESULTS AND DISCUSSION McQuail (1994) mentions the term paying audience represented by those who buy newspapers, books, records etc.

With respect to analysis of verified sales numbers of dailies, we assessed at first the average verified sold circulation of Slovak national dailies during the years 2000-2014.

Based on statistics of average verified sold circulation of selected Slovak national dailies for particular years including added estimated data we could proceed to the analysis of development of overall one-time circulations and average one-time circulations of selected Slovak national dailies. In case of analysis of overall one-time average circulation, we summed up average sold circulations of all the analyzed Slovak national dailies for a particular year (more detail in graph 1). Thus, we considered as the average one-time circulation the overall one-time circulation in a particular year divided by the number of analyzed Slovak national dailies (more detail in graph 2).

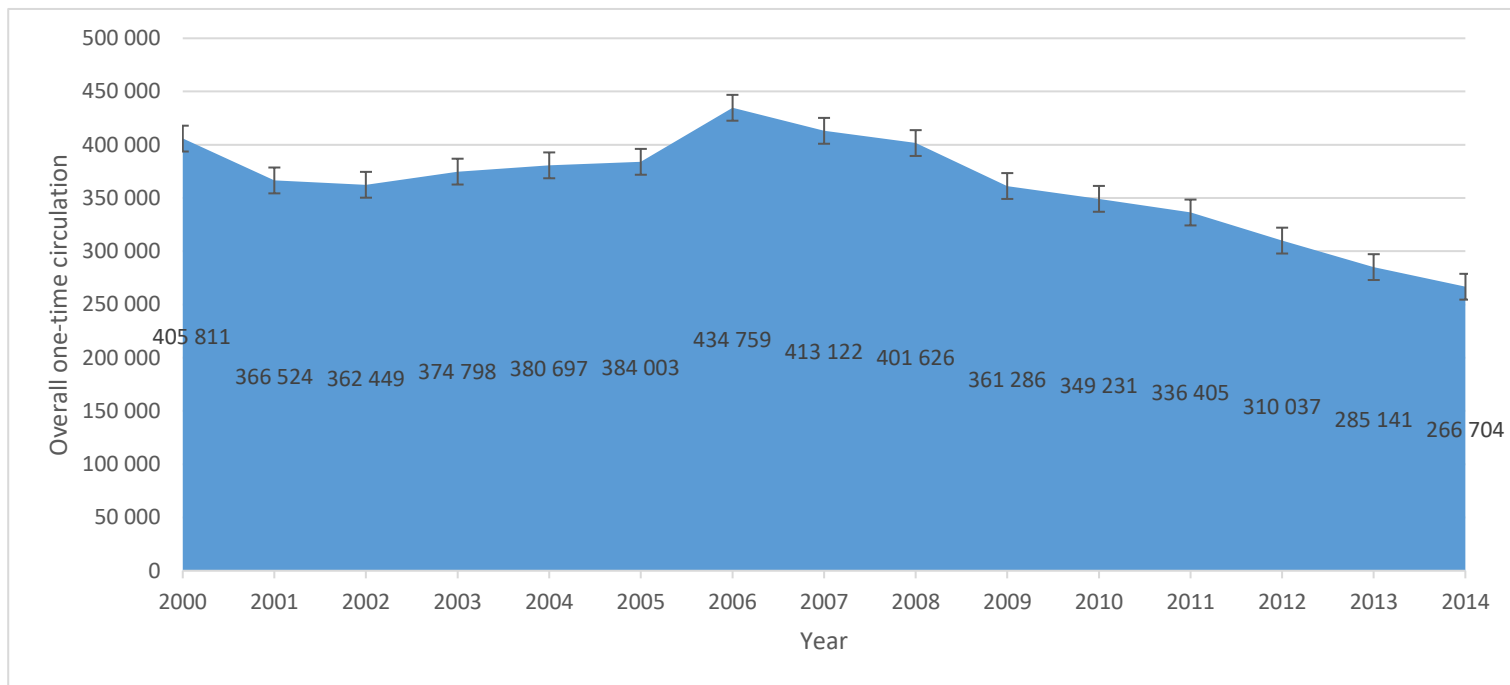


Fig. 1 – Analysis of development of overall one-time circulation of Slovak national dailies during the years 2000 – 2014. Source: own research

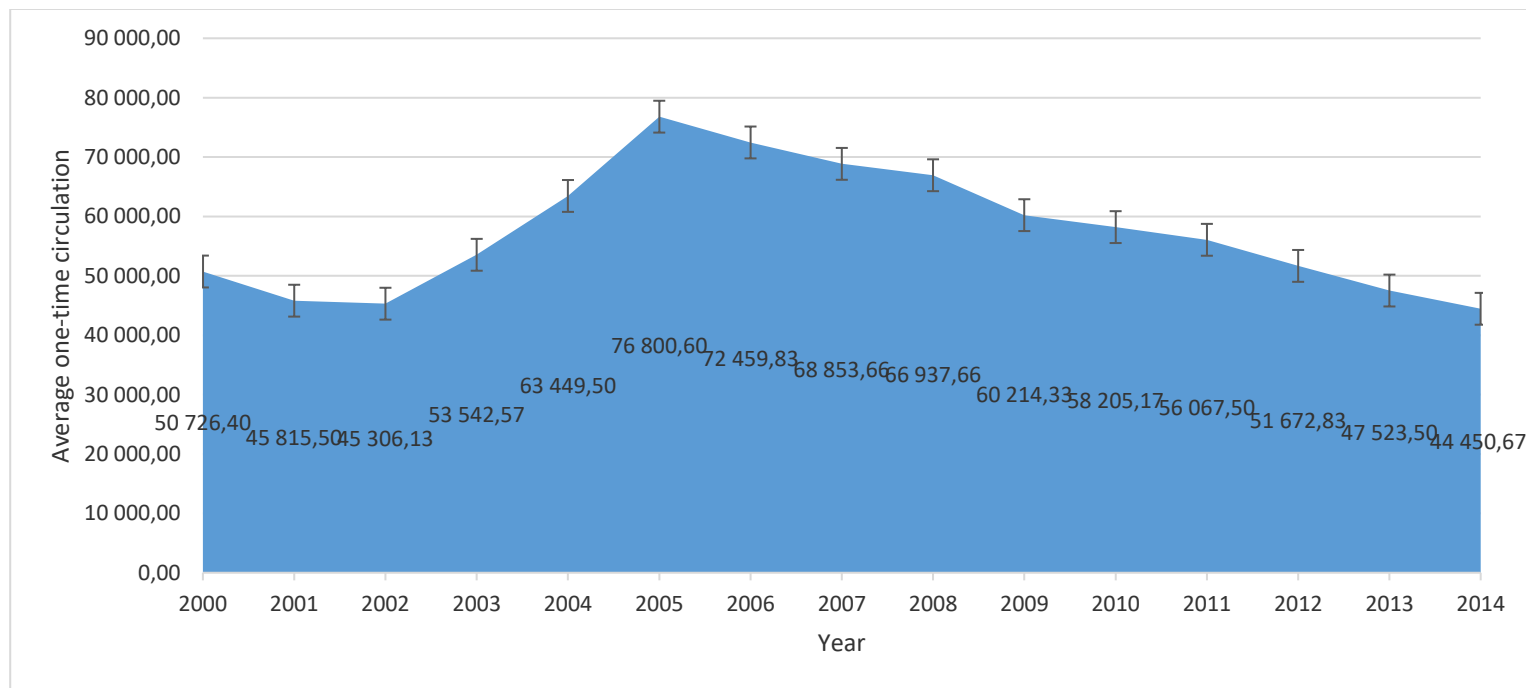


Fig. 2 – Analysis of development of average one-time circulation of Slovak national dailies during the years 2000 – 2014. Source: own research

The analysis of development of the overall advertising volumes of national dailies was based on the data provided by the TNS Slovakia, s. r. o. agency. The data concerning years 2000 - 2009 were obtained from a specialised monthly “Stratégie”, and the data concerning years 2010 - 2014 were obtained directly from the agency. According to the data provided by Rastislav Kušnier (2005) from the TNS Slovakia, s. r. o. agency, monitoring of advertising expenses applies official list prices and does not take into account barter, bonuses and agency commissions. The agency TNS Slovakia, s. r. o. is currently monitoring 140 print publications, both national and regional, 9 national television stations and 6 national radio stations, 350 second-level and third-level domains, as well as it receives advertising data from 10 marketing agencies, 2 cinema operators and one media representative covering 27 specialised television stations.

The data from the period 2000 - 2008 were first provided in the valid currency (SKK), which is converted in EUR using the conversion rate EUR 1 = SKK 30.126 and provided in brackets. Conversions of SKK to EUR are calculated to three decimal places.

The analysis of development of the overall advertising volumes of all national dailies over 2000 - 2014 could be conducted following the analysis of annual advertising volumes (SKK, EUR) of individual national dailies. Analysing the overall advertising volumes, we summed up annual advertising volumes of all analysed national dailies for a particular year (more detail in graph 3)

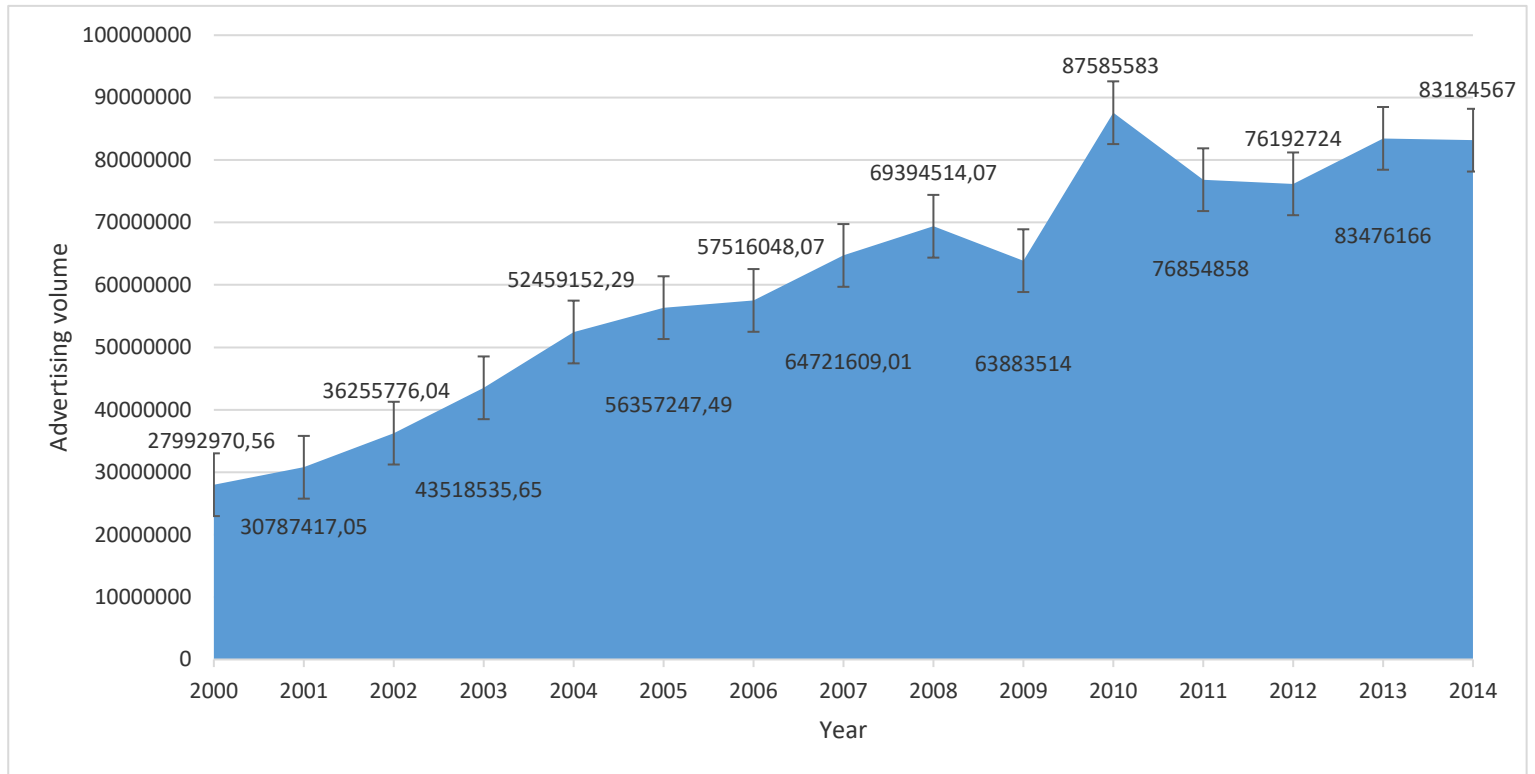


Fig. 3 – Analysis of development of overall advertising volumes of national dailies in EUR during 2000 – 2014. Source: own research

We expected that during the period from 2000 to 2014 a tendency of gradual decrease in overall one-time circulation as well as in average one-time circulation of Slovak national dailies would continue (which had been identified before such period in the research studies made by I. Sečík (1994, 1995, 1996) and L. Petránka (1999) but also during the analyzed period by A. Tušer (2011). Such hypothesis was also made taking into account the decrease on the print media market in European countries and North American countries that was confirmed by several foreign authors (Aliaksandrau 2013, Wilby 2010, Jyrkiäinen 2012). Such hypothesis was confirmed considering that the overall one-time circulation of selected Slovak national dailies in the amount of 408 811 copies in 2000 dropped to 266 704 copies in 2014 and therefore a significant trend of decrease in circulation of Slovak national dailies was identified.

It should be noted that the overall one-time circulation as well as average one-time circulation at the end of the analyzed period in 2014 was in fact lower than in the beginning of the analyzed period in 2000. However, such decrease was neither continual nor the same in both examined aspects. While the overall one-time circulation over the last fourteen years decreased by almost thirty percents (29.74%), average one-time circulation over such fourteen years decreased by more than six percents (6,31%). The decrease of overall one-time circulation stopped in 2002, then from 2003 to 2006 it was increasing and from 2007 to 2014 it was decreasing.

The development of one-time average circulation was similar but differed in an interruption of the decrease that lasted shorter as the one-time circulation during the analyzed period was increasing only during the years 2003-2005. Moreover, while the overall one-time circulation was the greatest in 2006 (434 759 copies), the greatest average one—time circulation reached 76 800.60 copies in 2005.

We expected a moderate increase in overall advertising volume in Slovak national dailies from 2000 until the beginning of the economic crisis in 2007 from the perspective of more and more sophisticated marketing activities. We assumed that due to the end of several dailies in this period, the advertising volume could have considerably increased in particular dailies.

From the beginning of the economic crisis until today, we expected stagnation or even decrease in advertising volume, as the global expenses were rising only minimally while they were even decreasing in Europe. (For more details see: Orgoňová 2013, Stratégie 2009, Stratégie 2010, etc.). Our hypothesis concerning the tendency of increase of overall advertising volume in Slovak national dailies in the analyzed period 2007-2007 and moderate stagnation at the time of the economic crisis was confirmed. However, it follows from the analysis that the increase was greater than expected, as the overall advertising volume which was 27,992,970.557 EUR in 2000 almost tripled until 2014. We could observe the greatest increase in advertising volume in the period from 2000 to 2005 and then throughout particular years. It is very interesting that the overall advertising volume increased even at the time of economic crisis in 2007 (64,721,609.009 EUR) which year is officially considered as the year of the beginning of the crisis or in 2008 (69,994,514.074 EUR). Such increase may be explained by the fact that the impacts of the economic crisis did not fully manifest themselves on Slovak media market yet. The stagnation of the increase tendency may be observed in the decrease of advertising volume during the years 2009, 2011, 2012 and 2014 when the overall advertising volume was lower than in the previous year. We observed the greatest decrease in 2011 (76 854 858 €) from 87 585 583 € in 2010 and also in 2009 (63 883 514 €) from the amount of 69 394 514,074 € in 2008. The great increase in 2010 at the time of the economic crisis and the great difference between the particular years 2010 and 2011 may be explained by the statistical data inaccuracies which could be caused by the fact that the monitoring of advertising expenses of the agency TNS Slovakia, s.r.o. applies official list prices and does not take into account barter, bonuses and agency commissions.

We assumed that the advertising volume in the analyzed period had important impact on the evolution of circulation of Slovak national daily press which assumption was made while taking into account the fact that from 1989 media market in Slovakia has been characterized mainly by free media ownership. Nowadays, any and all Slovak national dailies are in the private ownership that is based on principle of competition of private undertakings on the market aimed at reaching profit. Such hypothesis was however not confirmed - while in the analyzed period we could observe almost continual increase of total advertising volume, the opposite trend (decrease) was observed with respect to development of overall one-time sold circulation. The hypothesis of A. Šolkay (1998, p. 273) was thus confirmed that there is no direct dependence between the economic development and media development while the political impacts have to be taken into account in particular. Personally, we would add to such political impacts also technological impacts that bring with them the development of communication and information technologies and thus also gradual popularity of digital media to the detriment of print media. We are of the opinion that if we want to prove the relation between the development of advertising volume of Slovak national dailies and overall one-time sold circulation of such selected periodicals, it is necessary to take into account, besides other variables, mainly incomes from sale, costs of publication of daily press but also the development in purchasing power of the population. However, the aforementioned was not the main objective of this research.

5 CONCLUSION The following conclusions can be derived from the analysis of market trends concerning daily press in Slovakia between 2000 and 2014:

1. Decrease of both the overall and average single circulations of national dailies continued in the period 2000 - 2014, slowing down, respectively stopping between 2003 and 2006 owing to the end of several nationwide-distributed dailies, circulations of which had not been available before. Over the 14 years, the overall single circulation decreased by almost 30 % (29.74 %) and average single circulation by more than 6 %. While the single circulations of national dailies have been decreasing in the 21st century, more significant decrease has been currently recorded concerning the overall single circulation. Over the last twenty years, the overall single circulations of national dailies on the media market have decreased by almost a third (27.40 %). While average daily sold circulation of all dailies amounted to 1,040,500 in 1993, it was 310,037 in 2012. This decrease is even more significant in the period 1993 - 2014 (- 74.37 %), when the average sold circulation decreased from 1,040,500 to 266,704, representing almost three quarters of daily press circulation in the years before the foundation of the Slovak Republic.

2. A clear increasing trend of the overall advertising volumes in national dailies was recorded in the monitored period 2000 - 2014, almost tripling from EUR 27,992,970.557 in 2000 to EUR 83,184,567 in 2014. The effects of the global economic recession reflected in the Slovak newspaper market not sooner than in 2009, when the overall advertising volumes were lower than in the previous year for the first time. Mild stagnation in the overall development of advertising volumes has been observed since 2009 with slight increases in 2010 and 2013.

Daily press is a phenomenon which has more than 100-year history in Slovakia. During the last fifteen years, this subsystem of periodical press has been characteristic of continual decrease in overall and one-time average sold circulation, increase in average prices for such circulations and decrease in number of dailies. Taking into account the aforementioned negative phenomena, we are discussing about the crisis on the daily press market in Slovakia but also abroad. It has to be noted that despite the great popularity of audiovisual media in 20th century and enormous increase of digital media at the beginning of 21st century that is connected to the development of information and communication technologies, daily press still has its importance and plays an irreplaceable role in the system of periodical press. Dailies address

hundreds of thousands of readers every day while they have important impact on formation of public opinion in the Slovak society, mainly as regards political opinions and positions.

The aforementioned tendencies that may be observed on the daily press market prove that the press market in Slovakia is saturated due to unfavorable economic conditions for publishing activities (paper price, VAT, contributions, etc.), decline in the purchase power of readers and new social habits of the population related to the development of digital technologies. A reduced interest of population in print media is connected to reduction of advertisement in this sector. Persisting effects of financial and economic crises in the world have to be taken into account as well.

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ACADEMIC CAPITALISM IN HUNGARY: BUSINESS ORIENTED TRANSFORMATION OF THE HUNGARIAN HIGHER EDUCATION SYSTEM

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Dávid Nagy

Abstract

A reform of the Hungarian higher education system began in the recent past based on governmental initiatives. The most significant part of this process is the so-called Model Shift for certain institutions in the academic sphere in which entrepreneurial mindset and economic logic increasingly determine university governance. As a result, the universities participating in the pilot process acquire a more flexible financial independence and operate as autonomous actors. The aim of our paper is to point out essential effects of these changes on functions of the universities involved and their innovation ecosystems. The main methodology involves the analysis of available statistical data and strategic documents. According to our findings, the university – industry – government interactions have provided fundamental changes both in the practice of education and in the commitment of students to innovation processes. These changes are crucial for strengthening entrepreneurial attitudes and competences of students and faculty members alike. Our paper addresses the question of the comparison of traditional doctoral programs with professional doctorates by passing.

Keywords: *entrepreneurial university; triple helix; education reform, corporate experience*

JEL Classification: I23, I25

1 INTRODUCTION Our research investigates the decisive role of universities in innovation ecosystemic processes. For this understanding, a clear description of the nature and role of entrepreneurial universities need to be provided. In our conceptualization, it is of paramount importance to develop a context-specific, adaptive knowledge system based on the analyses of international tendencies (by focused literature review and international “best practice” experience) and the scientific knowledge of the history of the evolution of innovation.

In our paper analyses of positive examples of innovative developments in higher education in Hungary are presented, which are the outcomes of the current reforms initiated by the ministry responsible for HE. For the establishment of the new legal status, the governance structure and funding strategy of universities need to be redefined. In Hungary, due to the recent reform, the legal status of foundational universities has been established. The new legal and governance structure encourages the establishment of an innovation ecosystem with the co-called Regional Innovation Platforms. In our paper, we make a challenging comparison and subsequent proposal for comparing the merits and successfulness of academic-oriented PhDs and practice-oriented professional doctorates.

2 THEORETICAL BACKGROUND According to the changing role of the university and academia in general in the world in general with the emergence of the phenomenon “Academic Capitalism” (Münch, 2014, p. 250), higher education appears as an independent actor in the

economic and innovation subsystems. The functional transformation involves changes in the role of professors and researchers and transforms university management, administration, and governance as well. Actors of economic subsystems, such as venture capitals, industrial and R&D companies, are moving into campuses. Economic rationality has created globally competing universities struggling for excellence and for achieving better position on international university rankings. In addition to regional, continental and disciplinary rankings, universities can also be compared on the basis of the following significant global rankings: (Hazelkorn, 2015, p. 30)

- Academic Ranking of World Universities (ARWU)
- Webometrics
- National Taiwan University Rankings
- Leiden Ranking
- SCImago Journal and County Rank
- University Ranking by Academic Performance
- QS World University Rankings
- Times World University Rankings
- U-Multirank
- Best Global University Ranking

Struggling for global excellence is a capital-intensive activity and this is the main reason why economic logic has significantly penetrated the operation of universities. This process in the US higher education system had begun decades before the birth of university rankings quoted above. American universities (both public and private) gradually transformed into entrepreneurial universities for reasons that can be attributed to extensive innovation and business activities. The entrepreneurial progress can be traced back to the adoption of the Bayh-Dole Act at the late 1950s. (Berman Popp, 2012, p. 69), as a result of this phenomenon, the activities of universities acquiring entrepreneurial and technology transfer functions have become a focus of scientific interest. The components of academic capitalism have been defined in the literature in terms of internal and external spin-off activity conditions (Markman, B, Gianiodis, & Phan, 2005), in university-specific IP features and in innovation policy (Mustar & Wright, 2010). The connection between university knowledge transfer organizations and venture capital funds (Wright, Lockett, Clarysse, & Binks , 2006) and the role of university-linked venture capital funds (Widding & Mathisen , 2009) have become of cardinal importance. The role of governments is decisive in the establishment of entrepreneurial universities in all cases. This role is not limited to allocation of funds, but also includes the development of horizontal and vertical innovation networks defining the priorities of R&D activities. (Mazzucato, 2018, p. 47) The “Triple Helix” model, created by Henry Etzkowitz, is the optimal formula for interactions between government, industry, and university. The framework (originally built around MIT in Cambridge, MA) was successfully applied in the forming innovation ecosystem in Silicon Valley and Stanford University and then became widely used in global innovation ecosystems (and especially popular in China.) The model of Etzkowitz is differs in several points form the classical innovation system model of Christopher Freeman.

(Etzkowitz & Zhou, 2018, pp. 6-7). Triple Helix is primarily based on a collaboration in wider sense: industrial partners, governmental and university actors are collaborating in a well-defined geographical area. The center point of cooperation is the campus of the entrepreneurial university as a unique space of innovation. The actors of industrial systems are on the customer side in the traditional model of an innovation system, while the Triple Helix outlines a hybrid solution in which the customer-supplier roles are not sharply separated but form a new quality of innovation environment as an integral unit.



Fig. 1 - The OECD model for entrepreneurial universities. Source: A Guiding Framework for Entrepreneurial Universities. OECD 2012 (p. 4)

This model has been an example for the Hungarian Government (Ministry of Innovation and Technology) and the Széchenyi István University is in the process of elaborating a modified model for its own future development. From the perspective of higher education, the functions of entrepreneurial university can be functionally divided into two mutually reinforcing, complementary fields (Foss & Gibson, 2017, p. 2):

- “Academic entrepreneurship” - utilizing knowledge and scientific results into market, strengthening technology transfer processes, and building related networks.
- “Entrepreneurial education” - developing and strengthening entrepreneurial competences among university students.

3 RESEARCH OBJECTIVE, METHODOLOGY AND DATA Many studies, evaluation papers and strategic documents had turned their attention to the operation model of the Hungarian higher education system, but despite this increased interest no significant changes were to be witnessed in this field until recently. This trend was broken by the recent transformation of Corvinus University of Budapest (CUB) and the Széchenyi István University (SZE) which turned towards a market-oriented, entrepreneurial university.

3.1 Corvinus 2030 – The renewal of the Corvinus University of Budapest

Corvinus University of Budapest is one of the leading universities in Hungary in various fields of academic activity, i.e. economics, social sciences, business, and management. The renewal of the university by strengthening competitiveness in the global market aims at becoming part

of the TOP 200 universities of the world and the TOP 100 in Europe by 2030. Therefore, the immediate aims are the following: increasing the quality aspects of education and research, creating more educational programs in English and invite internationally renowned researchers. The basic, master, and doctoral courses together with international leadership training programs will be revised based on global experience and standards. Dual and joint degree programs will be available in Hungarian and in English.

As of 1 July 2019, the governance model of CUB has changed: a public benefit foundation was established by the Hungarian government to implement the Corvinus2030 strategy. As the first step, Corvinus Institute for Advanced Studies, which is an international research centre, was formed as a model of other centres. The essence of the new organizational model is a more flexible and innovation-oriented framework which provides background for more effective, global view research, via close and long-term strategies.

Although education is paid by the students, talented students will be supported by the Corvinus Scholarship Program, which will be financed by the foundation. As a part of the strategy, campus development will start: the first step is to build a fully equipped dormitory for foreign students and a creative area for education and social activities. It is foreseen that the number of foreign students will steadily increase.

3.2 Management Campus of Széchenyi István University, Győr

The predecessor institution of Széchenyi István University was founded in 1968 in Győr. The University has undergone a significant development in the recent decades. As a result, it is currently one of the most successful rural higher educational institution in Hungary with about 15 000 students. The most of its development programs are based on the regional competitiveness, the most important aim is to develop the innovation ability and RDI potential of course by raising the standard of education.

The Centre for University-Industry Cooperation (in Hungarian Felsőoktatási és Ipari Együttműködési Központ - FIEK) was established in 2016 within the framework of the Széchenyi István University supported by Economic Development and Innovation Operative Program (which is abbreviated in Hungary GINOP). The purpose of the Centre is to identify fields of potential opportunities for economic cooperation between the university and regional economic actors. As a result, it is possible to utilize knowledge, created in the university, and to ensure efficient knowledge and technology transfer, using the intellectual capacity and infrastructure which is concentrated at the university. The university intends to encourage innovation activities to strengthening the regional and international competitiveness and innovation potential of local SMEs as part of the Third Mission of universities (Lukács et al., 2020). This activity includes two processes: university-level results to market participants and, creating solutions for challenges of the market through its research activities.

The university's main aim to compile a complete service package for businesses, presenting its portfolio: product and service development, organization development and optimization, training opportunities (Vasvári et al., 2020).

The Management Campus of the University, established in January 2018 as part of the FIEK, is one of the subprogrammes of the project. The aim of the Management Campus subprogramme is to strengthen the innovation orientation of the SME-sector by using the following elements: creating case studies, pilot projects for industrial partners, building linkages between university lecturers and SMEs to develop common projects, mainly innovation activities, researcher and grant leadership trainings to develop innovation ability of

leaders of the local SMEs. The Management Campus unit is responsible for disseminating research results, assessing local needs of SEMs and large companies as well and developing relevant solutions. (Eisingerné & Rámháp , 2019) In the framework of “Innovative Workshop”, which is another subprogramme of the project, university lectures can network with local actors to find solutions their actual problems, focus on SMEs and various fields of innovation. The aim of this forum is to get to know the entrepreneurial culture, for lectures and students to gain practical experience and connections via direct ways. Education, research, training, consultation, information, building business relations, communication forms becomes available for SMEs participating to the Innovative Workshop initiative.

Tab. 1 - Entrepreneurial education activities linked to local start-up ecosystem. Source: Own research

Program Name	Objective	Expected Impact	Partners
Startup Office Hours	Develop theoretical knowledge and practical ability in startup scaling, innovation management and business planning	Acceleration of innovative startup ideas with significant potential of international market entry	HIVENTURES VC Fund, Startup Campus
Incubation Workshop	Practice-oriented special workshops with professional trainers to provide practical insights in entrepreneurship, business model building and market strategy creation	Fostering entrepreneurship skills and abilities, development of competences through practice and teamwork	Innovation managers, business angels and scaling experts from the region and from global startup ecosystems
Startup Demo Day	To offer students a possibility to increase and practice their pitch techniques in front of venture capitalists and business practitioners	Strengthening the pitch competences of students in a competitive situation	HIVENTURES VC Fund, Startup Campus
Co-Working Space	Offering privileged access to co-working offices inside the	Decreasing the operation costs of university linked startup companies and provide an inclusive and	Startup Campus, Quantum Leap Incubator

	Campus for startup companies and university-linked spin-offs	supporting environment to them inside the campus	
SZE-DUO Idea Competition	Provide a special competition for students who are looking for to develop their MVP idea	Fostering competences in business idea generation, teamwork, MVP building and testing	CEO-s and CTO-s from regional industry companies
Spin-Off Club	Monthly organized event inside the Campus with successful business practitioners to give examples of best practices in business and entrepreneurship	Fill the gap between theory and practice; foster a better understanding of leadership and entrepreneurship	CEO-s, CFO-s, and CTO-s from leading regional companies

In the next table, we analyze the match between the location's capacities and the innovation needs of the Széchenyi István University.

Tab. 2 - The match between the location's capacities and the innovation needs of the Széchenyi István University. Source: Own research

Stakeholders	Resources the University can provide the stakeholder with	Resources the stakeholder can provide the University with
Széchenyi István University	Boosting interactions between industrial partners and local startups and spin-offs. Spreading academic research findings and IP into the ecosystem. Providing supply of qualified STEM professionals. Providing partnerships to EU and national funded projects.	Channeling market demands into the curriculum. Increase the retention capacity for academic researchers by providing additional revenues. Providing internship programs in STEM and entrepreneurial education. Boosting and stimulating academic entrepreneurship.

Stakeholders	Resources the University can provide the stakeholder with	Resources the stakeholder can provide the University with
AUDI Hungaria Corp.	<p>Framing the industrial boundaries of the local ecosystem.</p> <p>Providing and contributing to global visibility.</p> <p>Transferring recent industrial demands and problems to the stakeholders.</p> <p>Contributing to the local corporate culture.</p>	<p>Access to STEM professionals.</p> <p>Participating EU and national funded projects with local partnerships.</p> <p>Perform industrial testing and evaluation projects on academic research infrastructure.</p> <p>Attract startups and spin-offs to solve industrial problems with low internal risks and costs.</p>
Tier 1, Tier 2, Tier X, AUDI supplier companies	<p>Transferring problems and demands (linked to logistics and supply chain management) into the ecosystem.</p> <p>Widening the research and development scope.</p> <p>Taking early adaptor functions to startups and spin-offs.</p>	<p>Secure the actual “T” position in the AUDI supply chain.</p> <p>Implementing cost effective and competitive methods and processes.</p> <p>Access to STEM professionals.</p>
Local SME-s with digital products (in industries like logistics, supply chain management, smart technologies, etc.)	<p>Widening the research and development scope.</p> <p>Boosting entrepreneurial mindset to startups and spin-offs.</p> <p>Contributing to transfer existing technologies to new markets and industries.</p>	<p>Access to STEM professionals.</p> <p>Creating partnerships to university-industry cooperation projects and applications.</p> <p>Taking competitive advantage through new technologies.</p>
Startup Campus/QuantumLeap Incubator	<p>Provides knowledge, infrastructure, and experience to early stage entrepreneurs.</p> <p>Provides FFF, angel and pre-seed funds to entrepreneurs.</p> <p>Contributing to network activities through SC offices in London and Berlin.</p>	<p>Access to university student and researcher talent.</p> <p>Contribute to fulfil of project indicators (in incubator-government joint projects)</p> <p>Access to the local ecosystem’s resources.</p>
Hiventures VC Fund	<p>Providing pre-seed, seed, and stage 2-3 funds to local entrepreneurs.</p> <p>Filling the gap between the ecosystems of Budapest and Western-Hungary.</p> <p>Contributes to gather experiences linked to startup activities (scaling, pitching, etc.).</p>	<p>Access to academic research infrastructure.</p> <p>Access to university student and researcher talent.</p> <p>Contribute to fulfil of project indicators (in incubator-government joint projects)</p> <p>Access to the local ecosystem’s resources.</p>

Stakeholders	Resources the University can provide the stakeholder with	Resources the stakeholder can provide the University with
Zalazone Automotive Proving Ground	Provides well-equipped test field and proving ground (infrastructure) to automotive and autonomous driving projects. Contribute to network activities within other clients of test ground.	Ensuring the utilization of infrastructure. "Opportunity to participate wider partnership in networks and digital hub projects. Widening the service portfolio of the institution.
Ministry of Innovation and Technology	Access to grants and funds of governmental programs. Contributing the global visibility through governmental media and diasporal entrepreneurship initiatives. Widening the partner network with potential stakeholders (for example: Airbus, Krauss Maffei Wegmann, and other newcomers to Hungarian economic system.)	Contributing to the achievement of economic policy objectives. Providing STEM competences to defense projects. Ensuring the effective utilization of R&D funding of EU. Improving the country's position in global innovation rankings (OECD, EU, etc.).

4 RESULTS AND DISCUSSION Monitoring and measuring the supporting functions of entrepreneurial reforms is vital for developing further programs and for getting adequate overview of demands. Significant amount of feedback has been received to improve and customize startup and spin-off incubation services (Bencsik & Filep, 2020; Makai & Vasa, 2020). Feedbacks indicates that there is a real demand for additional services which can provide real market advantages. Because of the above, in addition to classical incubation services (business planning, market research, scaling, engineering and IT support, etc.) the Management Campus attaches highlighted importance to the analysis and development of related business narratives to bolster the early stage enterprises. Narrative economics (created by the Nobel prize winner Robert J. Shiller) is a relatively new, transdisciplinary territory of economic sciences. Relatively little is understood about the interpretation and the creation of business narratives. "That is likely partly because the relationship between narratives and economic outcomes is complex and varies over time. In addition, narratives' impact on the economy is regularly mentioned in journalistic circles, but often without the academic rigor." (Shiller, 2019, p. 277) However, the impact of narratives is vital for early stage and emerging startup and spin-off companies. Due to this significance, an effective incubator is ought to broaden human capacities with professionals like linguists, cultural anthropologists, network physicists or ecologists. The effective handling of business narratives requires to involve the widest range of disciplines into startup and spin-off development process. Through transdisciplinarity, researchers and experts from different fields of science can bring added value to academic entrepreneurship, which will have a positive effect on the competitiveness of the university and the region as well.

5 CONCLUSION Building innovation ecosystems is an ambitious task. There are many old habits, administrative and financial rules have remained inside higher education institutes in Hungary from the pre-entrepreneurial university era. The contradictions between old mechanisms and new needs (which are boost innovation activities) seem insoluble and carry institutional conflict. The main opposing interests and barriers are the following:

1. Academic career vs. entrepreneurial activity

The difficulty of the current career advancement rules that these norms recognize research, publication and teaching activities and not recognize industrial collaboration or startup/spin-off activities. The promotion rules constrain scholars to spending time academic issues and reduces the desire to start or incubate a spin-off company for example. A new approach is needed in academic performance evaluation system to assure the reward of ecosystem-building. In other words, with innovation methods, scholars and academic scientists should be made interested to contribute to entrepreneurial efforts.

2. IP protection vs. exploitation

The ownership and handling of intellectual property rights are the “hottest topic” in the interface (Etzkowitz, 2018) but on the other hand it could be a nightmare to all technology transfer officer. The possible solution is to create a flexible intellectual property management policy to micro (project) and macro level.

3. Strict financial rules vs. agile process management

Some external funds (like the grants of the EU or domestic applications) have very strict and inelastic financial and accounting rules. These norms make impossible to use LEAN and other agile management techniques in practice. This environment provides a very interesting problem: how to manage innovation agile and in accordance with the rules? The solution could be the “ex-ante” agility. If a project plan already considers multiple options, then this could help handle the system inflexibilities during the project implementation phase.

The abolition of these barriers listed above could contribute to become the leading entrepreneurial university of Hungary by 2030 in the field of technological innovation.

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ON THE COST OF CLIMATE CHANGES

Andrej Rácik

Abstract

This paper is aimed to provide brief overview of theoretical approach to determination of cost of climate changes. As a basis, reference price of CO₂ emissions is determined and compared with various models from economic history, especially the DICE model of prof. William Nordhaus. Price of CO₂ emissions has been chosen as that is the main industrial pollutant, that is proven to significantly contribute to the warming of Earth's atmosphere. Further, it is subject of many economic studies analyzing its social costs. Last reason for choosing this indicator, is the existence of functioning market, that is generating prices of carbon emissions which are accepted by both business and public authority. We aim to compare the projected optimal price of CO₂ emissions from the DICE model with the market price.

Keywords: *climate change, global warming, optimal carbon price, social cost of climate changes*

JEL Classification: Q54

Climate change is being continuously present in both academical and professional discussions or research, with more and more interest put on this subject by public. In recent months, the call of (especially young) influencers are being given an high amount of acknowledgment in mainstream media. At one hand, they request the world leaders for stricter the climatic goals in order to stop damages to the economy, but on other hand, we lack in-depth discussion on implications for the economy, particularly for industry and energy sectors, with implications for business units especially in growing, industry-oriented economies like for example Slovakia is.

1 INTRODUCTION The subject of economic impact of environmental damage and climate change is long present in Economics theory. Already the Classical Economies pointed the risks of depleting natural resources as a factor limiting the economic growth. The subject is more and more discussed especially in 2nd half of 20th century, after the environmental problems attained higher on priority on international scale. We would focus on analysis of works by economists from this period.

Economic theory undoubtedly considers the mutual relationship between the economic and environmental system as a given principle. The resource base, that is formed by both non-renewable as well as renewable natural resources is feeding the economic growth. Especially Malthus (1798) stressed the fact that the natural resources will became less and less available as they would get consumed by growing economy for growing population.

Originally, economists tackled the question about sustainability of economic growth - the fact that normally every economic activity utilizing non-renewable natural resources inevitably results in less and less availability. Just by their consumption. However, as the economies grew, the worsened state of natural surroundings started to cause issues for the society. Not only consuming the resources, but further limitation of their supply by destroying the natural resources by mean of industrial pollution intensified the risks for global economic growth.

Topics of climate change started to be discussed from beginning of 20th century. Physicists observed the ability of carbon dioxide in the atmosphere to contribute to warming of the climate. Cited works of Prof. Gordon Macdonald (1968) considers various environmental disruptions as a mean to modifications of Earth's climate. He also stresses that "carbon dioxide placed in the atmosphere since the start of the industrial revolution has produced an increase in the average temperature of the lower atmosphere of a few tenths of a degree Fahrenheit" (Macdonald, 1968). Moreover, he sees the environmental changes as a possible way to alter the climate on purpose, not only in seeking one country's own economical, but even also military advantages. Empirical observations about climate warming confirm the temperature rising.

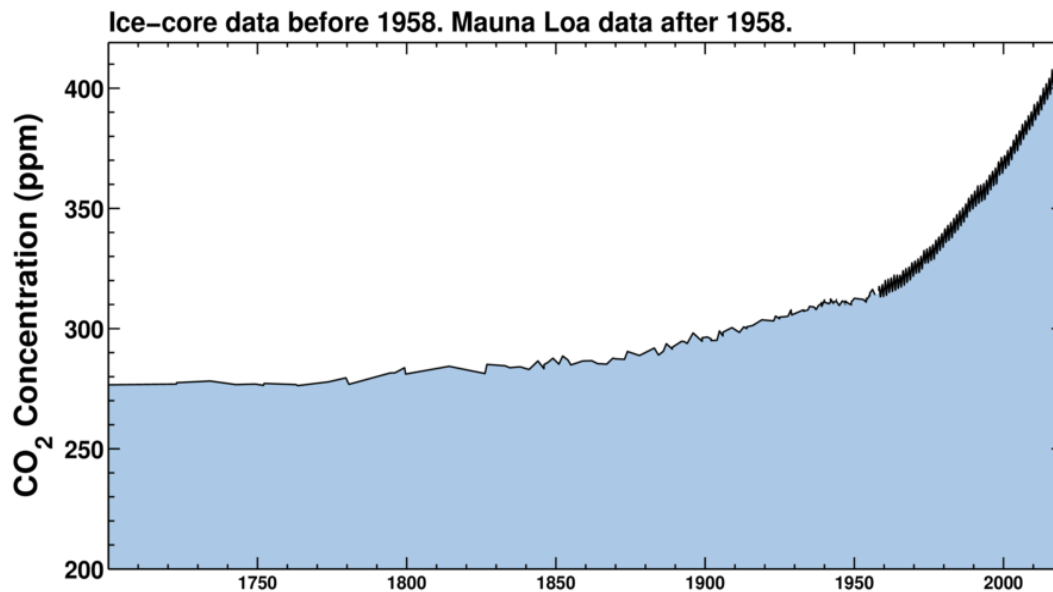


Fig. 1 – CO₂ concentration in atmosphere during industrial era. Source: Keeling (2005), updated

Projections of estimated average atmospheric temperature combining the examinations of CO₂ particles of air residues in the Arctic and Siberian permafrost, with more recent data of historical meteorological records and very exact atmospheric measurements done since 1958 by Prof. Charles Keeling are pointing on significant rise of CO₂ particles in the atmosphere after the start of the industrial era.

That is in line with another kind of atmospheric observations – evolution of average temperature.

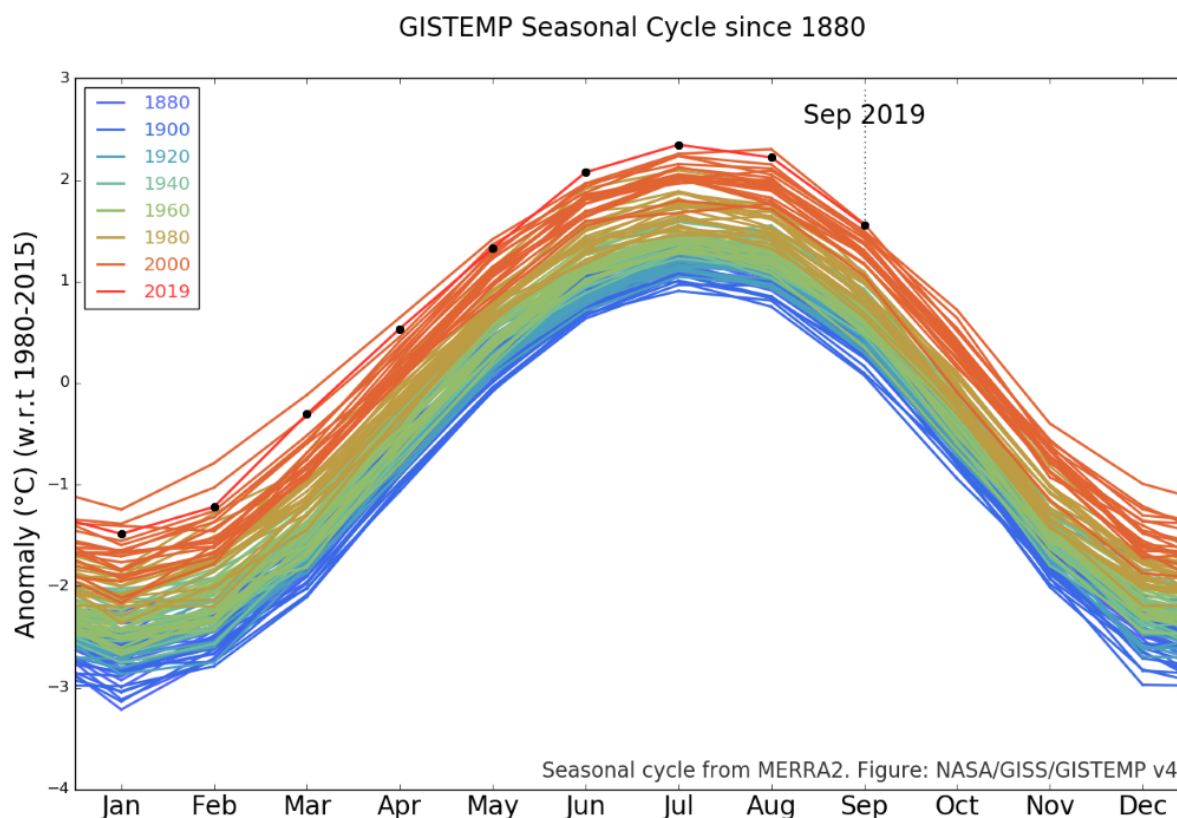


Fig. 2 – Global mean temperature increase since 1880. Source: Goddard Institute for Space Studies (2020)

Physicists of 19th century (Tyndall, 1869) already pointed to the correlation between CO₂ amount in the atmosphere and its temperature. Research by Goddard Institute of NASA shows that the average temperature over last 14 decades has risen by 2.5 °C. No more there seems a need for justifying climate change awareness, the data and measurements are convincing.

2 THEORETICAL BACKGROUND Welfare economists are studying the social cost of economic activity by describing various kinds of externalities on the society. Externalities being understood in terms of economic value, represent the costs or benefits imposed by economic activities on the third parties (Pigou, 1920). Environmental damages represent the most common form of externalities. There is an intention that ones that are causing these costs are compensating them to the society in form of taxes or payments to public schemes. However, the question about which is the right amount of these payments remains disputed among academicians. Whether it will be set by governments (Pigou, 1920) or determined by free market-oriented programs (Coase, 1968) like emissions trading, regardless of which amount, they generate loss, or inefficiency in national economies.

Prof. William Nordhaus is considering climate change and its social cost in his scientific works. With his team he is dedicated to improving the determination of the costs and benefits of actions to slow global warming. His quantitative approach is the Dynamic Integrated Climate-Economy (or DICE) model. There have been several iterations of the model published by him.

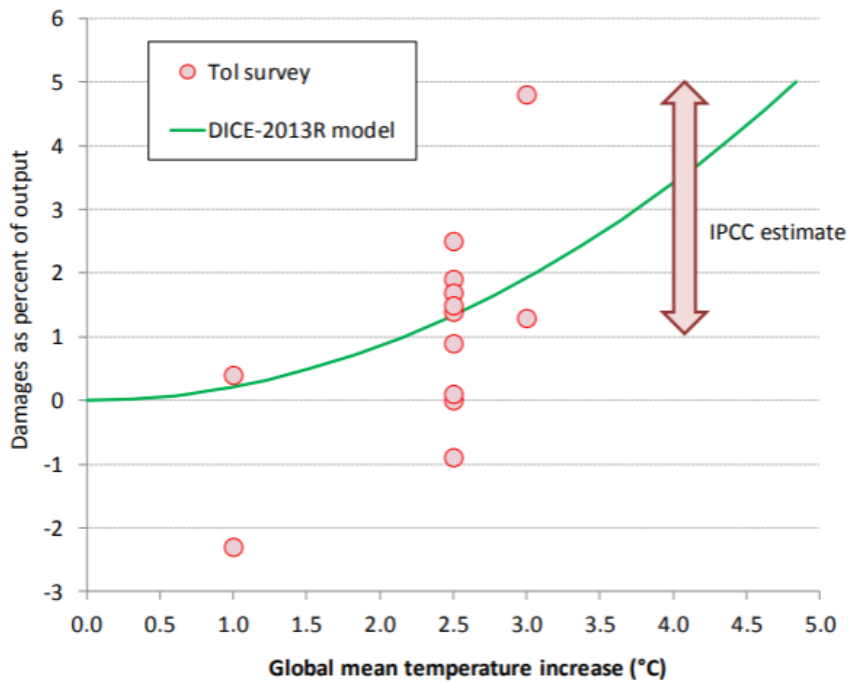


Fig. 3 – Economic value of environmental damage of global warming. Source: Nordhaus, Sztorc (2013)

Nordhaus is combining various studies estimates about environmental damages in a function of global temperature increase. He is also using outcomes of his own, and other renowned simulations of economic growth, inflation or interest rates. One of outputs his simulations are bringing is estimation of optimal carbon price.

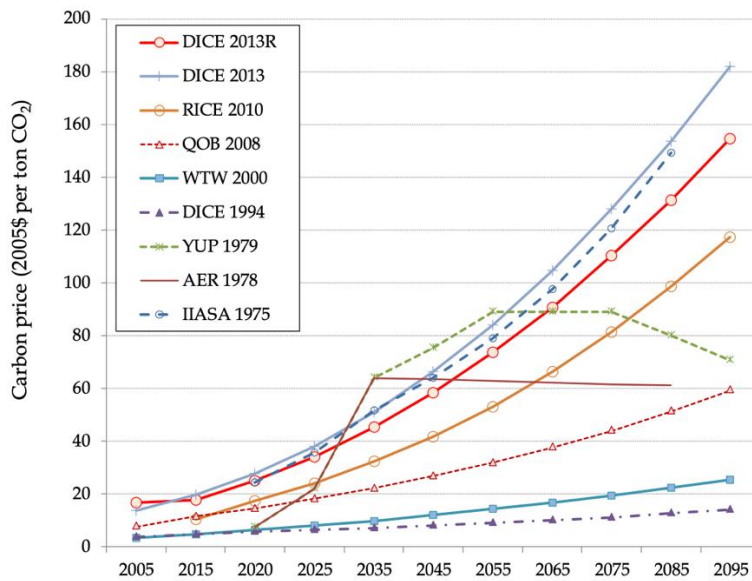


Fig. 4 – Comparison of optimal CO₂ emissions price per various models. Source: Nordhaus, Sztorc (2013)

3 RESEARCH OBJECTIVE, METHODOLOGY AND DATA In the European Union, a mandatory “cap & trade” scheme for biggest CO₂ emitters is being deployed. The system has been introduced in 2003 by the Directive 2003/87/EC and through several iterations became a fully functional emission allowance auctioning scheme, contributing to fulfillment of the CO₂ emissions reduction targets set up by EU policies. The actual emission trading via the scheme has started in 2005.

However, the initial phases were affected by creating an surplus of emissions volume allowances, that stemmed from:

- Inaccurate Estimates of emissions volume due to absence of reliable historical data
- Recessions of EU’s industry after 2008

This oversupply, combined with the fact that majority of allowances were distributed for free to organizations, expecting the actual trading would be done on secondary market, resulted in crash of the market price, which affected the price until volume correction of emissions allowances has been made in 2015. This meant funding an Market stability reserve scheme with surplus allowances from the 2008-2015 era (around 900 million allowances). This correction has turned the scheme a successful tool to contribute to CO₂ emissions reduction, in fact meeting the challenging targets set up by Europe 2020 strategy.

Another significant change, made since 2013, has been shifting the scheme towards primary auction of emission allowances (instead of distribution for free), and creating the single EU market (EU-wide quota) for the auction. In fact, this represents the fullest shift to market-based approach for natural resource economics (as proposed by Coase, 1968), that is deployed in business practice, the price for right to emit is deregulated from public authorities, and purely determined by the needs of the economy (and that itself being derived from the preferences of the public choice of goods purchased).

EU authorities keep control on total amount of emissions allowed, but the allocation among industrial companies is determined by the market, via the reasonable market price reached by auction. However, there is threat of market failures:

- Reserve for emerging/expanding key sectors (innovative companies) needed.
- Risk of outbuying of the allowed quota by the strong, biggest companies from the rich member states.
- Need for financial mechanisms to fund the low-emission transformation investments in traditional industrial organizations.

4 RESULTS AND DISCUSSION As the EU emission trading system is well-working and reflecting the market-determined price of emissions, it can be interesting to compare the projections of the above-mentioned models with the real price evolution. To enable this, it is needed to transpose historical prices of the carbon emissions into the same money, being used by Nordhaus as USD of year 2005.

For our exercise, the average prices of CO₂ emissions are calculated by official auction data reported by European Energy Exchange (EEX, 2020). Average yearly exchange rates are retrieved from Eurostat (Eurostat, 2020). Each year’s average price in USD is yet adjusted to reflect CPI evolution by US Department of Labor Bureau of Labor Statistic (2020).

Tab. 1 – Adjusted average market prices of CO₂ emissions. Source: own research

Year	2013	2014	2015	2016	2017	2018	2019
Avg. price (EUR)	4,38	5,91	7,61	5,25	5,8	15,56	24,72
Ex. rate EUR/USD	1,3281	1,3285	1,1095	1,1069	1,1297	1,1810	1,1195
Avg. price (USD)	5,82	7,85	8,44	5,81	6,55	18,38	27,67
Adjusted for 2005 USD	4,88	6,48	6,95	4,73	5,22	14,3	21,14

However there further practical limitations in direct comparison, namely:

- Nordhaus data is shown for 5-year cycles.
- The EU market price varied from 7.85 EUR/t in 20015 to 24.72 EUR/t in 2019 – the earlier periods still without visible impact of MSR correction measure.

In that perspective, we could choose 2019 price (which trending to become stabilized, and not affected yet by emerging recession caused by COVID-19 pandemic), as a reference price for years 2015-2020.

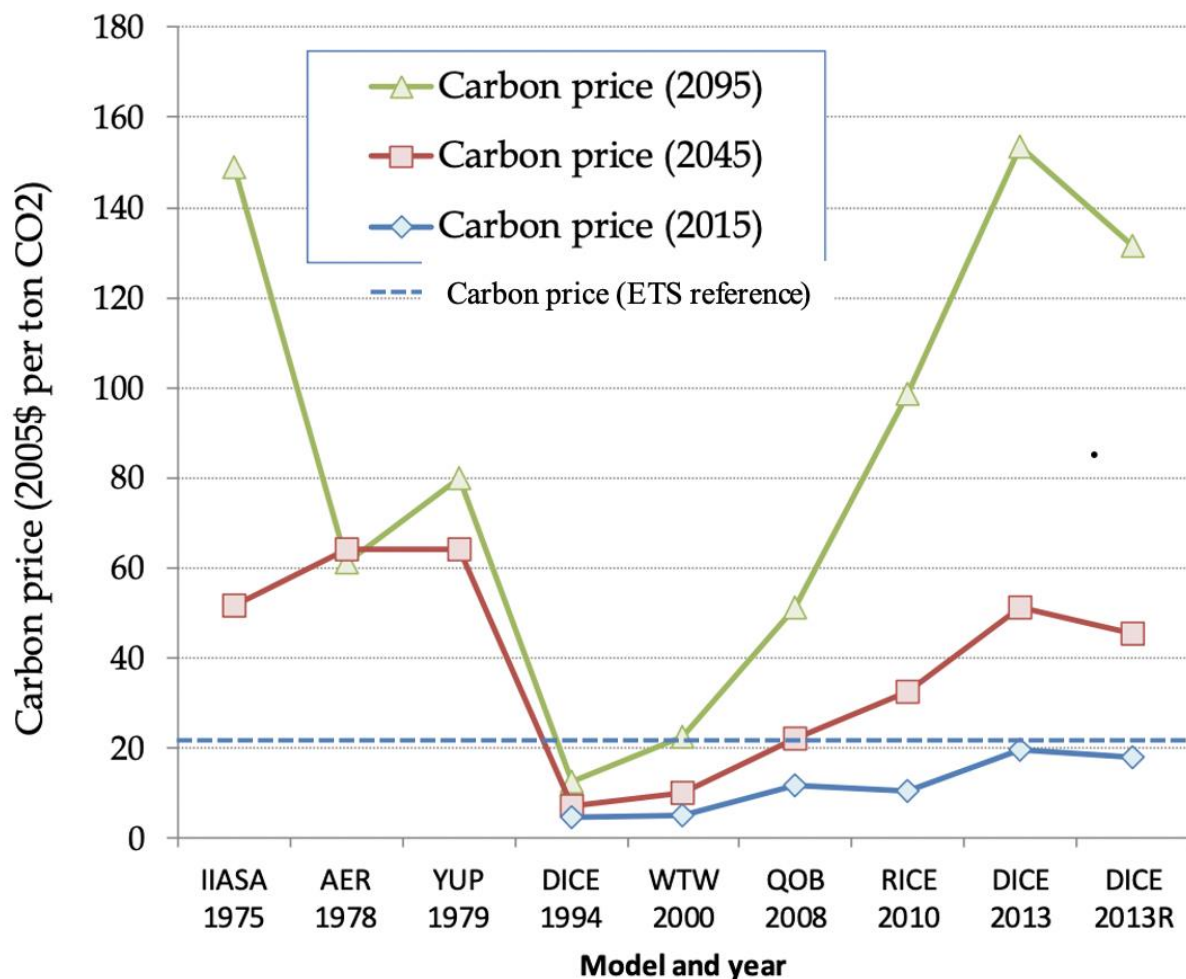


Fig. 4 – Projected optimal CO₂ emissions price compared with real market price. Source: Nordhaus, Sztorc (2013), annotated by author

Overlaying the reference price into the chart comparing 2015 carbon prices is showing that the earlier (1994-2010) models have generated underestimated price projection. But later models

(DICE after 2013) calculated the optimal price with remarkable precision, considering that the market price generated by ETS in that period was still deformed and started showing reliable prices only 5 years after.

5 CONCLUSION This very simplified approach to the analysis is indeed lacking a more comprehensive data sets and projections, but can be used to underline the fact, that the climate change will impose significant cost on economies. In recent, or more further history, the academicians have disputed the social cost of climate changes, some undermining the damage effects - they expected them to be offset by warming climate benefits like for agriculture or energy sector. But the very short period of existence of market-determined prices is stressing that the studies expecting the rising social cost (seen as CO₂ emission price) will likely be more valid. The market already starts confirming its value. It is therefore advisable, especially for governments of vulnerable economies that are still oriented heavily on industry, to allocate appropriate resources in research both of technological innovation as well as economical understanding of the social cost of climate changes.

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SUSTAINABLE DEVELOPMENT OF THE EUROPEAN BANKING SYSTEM: APPROACHES AND DIMENSIONS IN THE GLOBALIZATION CONTEXT

Mykola Sidak

Abstract

The goal of the research is the analysis of the main aspects of organization and functioning of the EU and Eastern European banking systems. In the frame of correlation of the publication topic with the European integration processes and the necessity of overcoming the consequences of the world economic crisis the author has analyzed: financial and legal category of the “banking system”; determined its aim and goals; set positive and negative different features in the organization and functioning of the banking systems in Europe and the European Union; outlined main ways of improvement of the EU banking system organization etc. Based on the comparative analysis *de lege lata* and scientific contributions of lawyers and economists, the author has elaborated a set of conclusions as well as *de lege ferenda* concerning more effective, security and sustainable functioning of banking system of the SR.

Key words: banking system, central bank, institute of supervision, bank, credit, and financial institution

JEL Classification: E52, G21, K22

1 INTRODUCTION Market economy can function properly only if the following obligatory conditions are met stability of monetary system, an extensive banking system, crediting of social needs and competitive relations on the market of financial services. To perform its functions the government should have a material basis that is necessary for the operation of organs of state power and administration, law enforcement agencies and ensuring defense and security of the country. This material basis can be created by financial activities only.

The existence of economic entities (financial institutions) is the condition of pursuing state financial policy. The combination of these subjects creates the system of institutions (the central bank and credit and financial institutions), that are established by the government in the sphere of financial activity to perform financial management, control, and government regulation.

2 RESEARCH OBJECTIVE, METHODOLOGY AND DATA The purpose of this comprehensive scientific research is to determine the *ex lege* aspects of the efficient operation of the European banking system with a focus on innovation. Based on the purpose, the authors have set the following objectives: 1) to determine economic and legal aspects organization and functioning of the European banking system, with a reflection on innovation and analysis of modern *de lege lata* trends to ensure sustainable development of the EU, 2) on the basis of scientific and practical *de lege lata* research and its application, to develop *de lege ferenda* to improve the functioning of the Slovak banking system.

In the scientific research of the issue, we used the method of legal analysis and the method of comparative analysis. As part of the legal analysis, we examined the pillars of the banking systems of the EU and European countries, and the position of the entities of the EU Banking Union. As part of the horizontal comparative analysis, we examined the central banks and financial and credit institutions of the EU, EU member states and large developed countries of the world (USA, Japan, Great Britain).

3 THEORETICAL BACKGROUND Some aspects of the organization and functioning of the European banking system were studied by Zilioli Ch., Selmayr M., Tuma Z., Babis V., Ferran E., Wymeersch E., Zavvos G., Kaltsouni S., etc.

E. Wymeersch analyzed the banking system of the EU in the context of achieving the main goals of the EU and the ESCB: ensuring sustainable, inclusive, and intellectual growth (Wymeersch, 2014). Kaltsouni and Zavvos analyzed in detail the first and second pillars of the EU Banking Union, as well as the cases and consequences of the creation of the basic rules of the EU in the banking sector (Zavvos – Kaltsouni 2014; Babis 2014). E. Ferran carried out a detailed analysis of the relationship between the institutions of the Banking Union of the European Union (Ferran 2014). Zilioli Ch. and Selmayr M. analyzed the activity of the Central Bank in the monetary sphere (Zilioli - Selmayr 2001; Hans-Werner Sinn, et. al. 2004). Tuma Z. studied the structure and functioning of the Banking Union from a legal point of view and analyzed the influence of EU institutions on the development of the monetary and banking union (Tuma 2005).

However, the following has not been carried out: 1) a comparative analysis of the organizational structure of the banking system and institute of banking supervision in the EU and EU countries; 2) analysis of the efficiency of the central banks of the EU and European countries, if the latter implements the two most important functions in cumulation: monetary (credit and financial) policy and banking supervision.

4 RESULTS AND DISCUSSION

4.1 Characteristics of the banking system, determination of sustainable, inclusive, and intelligent aspects of growth of a banking system

The financial system of the country is, according to academician prof. Voronova, a set of various spheres of financial relations, in the process of which different cash funds are formed and used (Voronova 2006, Beretta & Cencini 2020). The financial system is an integral part of the economic system. The driving force of any developed economy is the banking sector which operates if there are institutional, economic and legislative limits set by the government, in which the banking system implements its objectives on market principles as a constituent part of the financial system. Dvořák in his article writes that the banking system is a set of credit and financial institutions on a certain territory (country), their mutual obligations and commitments to third parties (Sidak 2010, Šabiková & Vicen 2018). The main characteristics of any system, including the banking system, is its integrated character that creates the quality of the system and unites its components in an internally organized structure (Wymeersch, 2014, Špaček 2018).

The association of the entities in a system as an independent structure has certain organizational and legal form and provides the following: 1) unity of legal regulation of banking activity in the country; 2) creation of a single banking reserve flow mechanism for all banks; 3) clear legislative separation of rights and obligations of each component of the system; 4) regulation of inter-bank relations and the system of corresponding relations. It should be noted that the functions and ways of banking system operation are determined on a basic level by the existing economic system in a certain country, its foundations, principles, and development. Among the relevant factors that influence the organization and operation of the banking system the following can be listed: the development of financial market, monetary stability, integration of a particular country in international organizations (institutions), the ways of regulating the activity of the banks or historical development and traditions (Ferran 2014, Čižo et. al. 2020).

Depending on the abovementioned factors, banking systems in particular countries can be organized on different principles. Hence, the main principle of the formation of banking systems in the countries of Europe – the principle of a two-level organization of the banking system. Before analyzing the organization of banking systems in the countries of Europe we should note several most important aspects of the process of the creation of the EU banking

system and the areas of the development of banking relations in the EU member states. Thus, preparation for a single internal market in the EU led to the adoption of numerous changes at the international level. In the field of banking law these changes are characterized by legal regulation of banking supervision, establishment of the European banking standards, setting the principles of the protection of investment and the interests of creditors and depositors. The content of the single internal market of the European Union is eradication of discrimination between member states and the introduction of free and fair competition in banking sector. The integration process in the EU has reached the stage of the establishment of a monetary union manifested through changes in the plane of business in the banking sector and the provision of banking services. The introduction of a currency unit enhances the capacity of credit and financial institutions. The single European market of banking services is important since it is intended to solve many problems in: a) crediting; б) structural area; в) regulation area.

4.2 Banking systems of the EU and European countries

Therefore, the EU legislation requires that the EU member states, and the associated members create institutions and conditions that will be necessary for ensuring a harmonious implementation of the EU legal norms. As for the banking sector, the key EU actions are divided into two stages. The legal norms at the first stage should implement general social legislation – the legal norms composed of the basic principles and methods in this area, as well as legal norms that would lay the foundations of the efficient functioning of the single internal market in the sphere under consideration. The legal norms at the second stage should help to complete the transition of the banks to international standards (Vozáryová 2013). It is worth to mention that in frame of the EU creation it is possible to distinguish a three stage process of organization, formation and functioning of the EU banking system: first – creation of the basis of the banking relations legal regulation in the European Communities – from 1977 to 1991; second – creation of the Economic and Currency Union, organization of ESCB, creation of ECB – from 1992 to 1998; third – functioning of the EU and EU member-states banking systems – from 1999 – till today. Let's provide a few examples of the legal regulation of the EU member-states and the Eastern European states banking systems. It is worth to mention that specific character of the central banks' regulation in the EU member-states is determined by the creation and functioning of the European Central Bank as well as formation and functioning of the European System of Central Banks. Banking system of Great Britain, for example, is formed by the Bank of England, banks, registered accounting institutions, savings banks etc. French banking system is formed by the following subjects: Credit Institutions Committee, Banking Regulation Committee, Banking Commission, the Bank of France, Central State Deposit Savings Bank, credit institutions etc. German banking system is formed by Bundesbank and other banks. Hungarian banking system is formed by Hungarian National Bank and credit institutions. Polish banking system is formed by Polish National Bank and banks. Slovakian banking system is formed by Slovakian National Bank and credit institutions. Czech banking system is formed by Czech National Bank and credit institutions. The banking system of the Russian Federation includes such institutions: The Bank of Russia, credit organizations, branch offices and representations of foreign banks. According to Article 4 of the Law of Ukraine "On Banks and Banking Activities", the banking system of Ukraine – is a combination of the National Bank of Ukraine and other banks as well as branch offices of the foreign banks which are created and conduct their activities on the territory of Ukraine according to the legislature (Zilioli - Selmayr 2001; Hans-Werner Sinn, et. al. 2004). The upper (first) level of developed European countries, as a rule, is formed by the central bank and other state financial institutions which means that in the basis of a two-level banking system of developed foreign countries is the principle of "inhibition and counterbalance" and the principle of national bank independence. These principles fasten differentiation of functions and authorities of the competent organs. With such system functions of supervision and control of the credit institutions activities are placed by the

state on one or several specially created for these institutions. Besides, central bank is not authorized by the supervision functions (Sweden, Denmark, Finland, Ireland, Great Britain, Austria, France etc.) or shares supervision obligations with other state institutions (Germany) which is based on the principle of the upper level poly subject nature. The principle of the upper level of banking system poly subject nature determines differentiation and fixation of the banking system upper level authorities. The nature of this principle is that one and the same body (central bank) cannot possess normative, control, supervisory, regulation functions and be the household subject at the same time (McKnight 2008). Improvement of the state regulation and self-regulation within the banking system depends on which variant of the system creation is chosen by the legislator. There are two scenarios of the events' development: the first variant – central bank remains the only subject at the upper level of the banking system with the same or renewed management functions. Therefore, central bank authorities in the sphere of banking activities regulation remain unlimited. Having focused all the functions – registration and granting of licenses, re-registration, determination of economic norms, supervision of banking activities, application of sanctions and termination of banking activities, emission of money (central bank is and will remain the only management banking organ in the country) (Tuma 2005, Hajnišová 2005). In this case, the legislator must consequently set the boundaries of its influence on the credit institutions that conduct banking operations. In this way the laws concerning central banks, banks and their activities in the Russian Federation, Ukraine, Italy, Czech Republic (starting from 2008), Slovakia (starting from 2006) and other countries are elaborated. This variant of banking legislature development does not consider any substantial changes in the structure and functions of the banking system subjects and objects and is aimed at the improvement of the existing management system only. the second variant is more progressive and perspective. Its realization will let to avoid constant conflicts between the two levels of banking systems and legislatively set the system of management in the hands of one subject which, in our opinion, is extremely important. Finally, a division of state management and self-management in the banking system functions will take place which will help to provide its self-regulation and self-management better. The idea of reformation of the existing banking system into a complicated two-level banking system oversees the division of functions which are conducted by the central bank. Thus, registration of banks, giving licenses for conducting banking activities, conduction of monetary and credit policy as well as control and supervisory functions are the forms of public interest realization in the banking sphere. In majority of the countries this interest is realized by the central banks and other authorized state bodies. For example, in Germany giving licenses for conducting banking activities and realization of control and supervisory functions is carried out by the independent federal body – Federal department of credit activities supervision which is inferior to the Federal Ministry of Finances. Having conducted generalization of French legislature, it is possible to distinguish more complicated, many-sided, various banking system. Analyzing the, in our opinion, functions concerning banks' registration, giving licenses for conduction banking activities, realization of control and supervisory functions have to be put on the independent state body. The lower level of banking system in the European countries is formed by the credit institutions. An important step which has altered the activities of the subjects of the lower level of the European countries banking systems, is the creation of the single internal market of the EU countries on the basis of the passed by the European Communities (in 1985) White Book and the Act of the United Europe. In this frame, it is worth to make a conclusion that from this moment and on the normative activities of the European Union, EU member-states and candidates for the EU membership has begun. It is aimed at the legislature harmonization, under the chairmanship of the European Union institutions. It is not worth to forget that the peculiarity of the EU member-states systems is the fact that they are a part of the European Union banking system. A two-level banking system is characterized by the interrelations between banks both vertically and

horizontally. Vertically the relations sub ordinance between central bank (or other financial institutions), horizontally the relations are based on the principal of equal partnership between any banks and credit institutions (Vojtech, F. et. al. 2019). Therefore, there are two subsystems in the banking system: one conducts management functions and the other is an object of the regulatory impact. It is predetermined by the fact that for each system self-regulation is natural which means purposeful management impacts on the system in general and within it. It is worth to state that development of banking system in crisis conditions depends on the correct determination of: aim, goals, functions, organization of banking system effective structure, adequate measures, aimed at stabilization (Hajnišová & Královič 2013) of the banking system etc.

4.3 The goals of a modern banking system

According to the Article 282 of the Agreement on European Union Functioning, the main aim of the European System of Central Banks and the European Central Bank (national central banks of the EU member-states), is maintenance of the price stability. The *goals* of a modern banking system of the market type include (Babis 2014): 1) creation of financially stable banking system, which would be able to function effectively in the current conditions when the country has to increase its economic potential; 2) fixation of the financial stability and strengthening of purchasing capabilities of the national currency by means of restricting inflation; 3) conduction of the quantitative control of the dynamics of monetary supply which coincides with the real change of GDP; 4) provision of purchasing capabilities of the national currency which would assist in balancing interests both of the state and non-state subjects of national economy; 5) support of the short-term bank liquidity by the central banks; 6) stimulation of the process of increasing of the population's deposits with the increase of their return guarantees and banks' orientation at determination of real deposit percentage rate including the inflation rate; 7) increase of banks' activeness with the aim of the subjects of the economy credit support growth; 8) stimulation of banks' investment orientation by means of the increase of long-term credits volumes; 9) formation and preservation of the currency reserves in the volumes necessary for the maintenance of the national currency purchasing capabilities; 10) reduction of cash flow in the circulation; 11) coverage of the budget deficit by means of non-emission financial sources through further development of the market of state securities and external borrowings; 12) increase of internal and external stability of the national currency; 13) regulation of the currency limitations and economic normative systems; 14) provision of the normal functioning of the national currency system, balance of payments, harmonization of exporters and importers interests; 15) assistance in cooperation with international financial organizations and investments enlisting with the aim of stability program and economy structural reformation fulfillment; 16) conduction of integration into world financial and banking systems processes; 17) banking institutions capital growth; 18) stimulation of the foreign capital enlistment; 19) improvement of legislature which regulates banking systems' activities (Hajnišová et. al. 2016).

4.4 The functions of the banking systems of the European countries

In frame of the goals set, banking systems of the European countries fulfill the *following functions*: 1) creation of money and regulation of the monetary volume. The banking system operatively changes monetary volume in the circulation by means of it increasing or decreasing according to the changes of demand for money. This function is carried out by all links of the banking system; 2) transformational. By mobilizing free finances of one part of the household subjects and giving them to the other banks have the opportunity to change (transform) sizes and terms of money capitals and financial risks; 3) stabilizing. Provides stability of banking activities and monetary market. While the characteristic feature of the banks' activities is risks presence, banking system always elaborates principles, methods, and mechanisms to avoid or

decrease the number of risks. Besides, banking system (and its subjects) initiates passing of the normative acts which regulate activities of all the links of the economic system – from the central bank to the narrowly specialized commercial banks and creates an effective mechanism of state control and supervision as to the observance of laws and banks' activities in general (Revenda 2001, Hajnišová 2006).

4.6 Recent developments in the European banking system

On March 21, 2019, the European Parliament and member states agreed on the main element's European supervision reform in the areas of EU financial markets. The agreement, which is an important step towards a fully functioning capital-markets union, strengthens the role and competence of European supervisors, including the European Banking Authority, by strengthening its role in the fight against money laundering. On 18 December 2019, the European Parliament and Council adopted Regulation (EU) 2019/2175 which addresses the authority, management, and financing of the ESAs. On that day, the legislature also improved the institutions SolvencyII, MiFIDII and the fight against money laundering with Directive (EU) 2019/2177 (which extends the powers of EIOPA, EBA and ESMA) (Hajnišová & Sidak 2012).

We are now in the final stages of rolling out the Basel III reforms. These measures have certainly made banks safer and sounder. Yet, as the memory of the crisis fades, some banks are seeking to undo the reforms, arguing that tighter rules are weighing on their profits and hindering their ability to finance the real economy. In fact, we see evidence to the contrary: banks that have been quicker to adjust to the Basel standards are generally in a better position to support their customers. So I will take this opportunity to reiterate how important it is that we implement Basel III faithfully, consistently and in good time. These internationally agreed standards are crucial for global financial markets to function smoothly (Tvaronavičienė 2019, Golian et. al. 2014).

Besides, analysis of organization and functioning of the banking systems of European countries in the crisis period (2009-2013) gives the opportunity to determine the following circle of problems: 1) absence of the specific state organ which would supervise banks and other credit institutions in the Slovak republic; 2) large amounts of non-banking operations; 3) tendencies to the decrease of the clients base as a result of the production decrease; 4) imperfect competition in banking activities; 5) imperfect banking supervision; 6) concentration of banks on obtaining of the speculative income; 7) general economic problems etc. (Revenda 2001, Lankauskienė, T. & Tvaronavičienė M. 2012).

5 CONCLUSION Therefore, analyzing the aforementioned and based on *de lege lata* as well as contributions of the European scholars, the author has elaborated *de lege ferenda* and concluded the following:

1) banking system is legislatively set and structured aggregate of the upper level subjects (central banks and other authorized state financial bodies) as well as the subjects of the lower level (credit institutions) which activities are aimed at fulfillment of the goals according to the principles stated in normative and legal acts of the state; achievement of the price stability aim; 2) according to the aforementioned and existence in the European countries (Germany, Sweden, Luxemburg, Denmark, Finland, Ireland, Great Britain etc.) of the complicated central two-level banking system where the Central Bank as well as other financial institutions take the first level, aimed at the improvement of the state regulation of the banking system, the necessity of realization of the “inhibition and counterbalance” principle in regulation of the county's banking system is crucial. With this aim it is necessary to divide central bank's plenary powers. Slovakia is between a few institutions: central bank (which should have fastened the function of monetary policy conduction (with the aim of the price stability)) and State Commission of control and supervision of credit and financial institutions.

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EFFECTIVENESS OF INSTRUCTORS PERFORMANCE APPRAISAL PROCESS IN WOLDIA UNIVERSITY (A CASE OF MAIN CAMPUS)

Mohammed Nuru Siraj
István Zsombor Hügen

Abstract

Right from its establishment, Woldia University has been implementing instructors' performance appraisal process whereby peers, students and heads of departments evaluate instructors' performance. Therefore, the overriding objective of this study was to evaluate Effectiveness of appraised process on the performance of instructors (case of Woldia University). The study employed cross sectional survey design. Sample respondents were selected using proportionate stratified random sampling. Moreover, focus group discussion with students & instructors and semi structured interview with heads of departments were conducted to supplement data collected through questionnaire. The result shows that instructors' performance appraisal process is ineffective because of poor qualities of evaluation criteria, bias practices of appraisers, ineffective performance feedback system, & less attention given for formative purposes of the appraisal. Finally, to enhance effectiveness of the appraisal, the researcher recommended the university to: redesign the evaluation criteria in consultation with instructors; train appraisers and appraisees; and focus on formative purposes.

Key Words: Appraisal Criteria, Effectiveness of Performance Appraisal, Performance Feedback

JEL Classification: I20

1 INTRODUCTION Research has great advantages for different things. Particularly, the research conducted on instructor's performance appraisal gives an insight for decision makers about the benefits of effectiveness of performance appraisal on instructors.

1.1 Background of the Study

The human resource management plays a pivotal role in any organization. Quality and commitment of human resource in any organization determines its success. In an attempt to ensure sustained efficiency and effectiveness of employees, each organization must do employee performance appraisal from time to time (Nyaoga 2010).

Similar to any organization, universities appraise its employees/instructors performance for effective human resource management. Although both academic and non-academic staffs in universities play a vital role in escalating universities' performance, yet major onus comes upon academic staffs (instructors) who are the source of student's knowledge, learning and growth (Rasheed 2011). To achieve world class standards, effective instructors' performance appraisal is always major concern in any university.

Woldia University (WDU) is one of public sector higher education institutions operating in Ethiopia. The university is engaged in teaching, research, and consultancy services in order to achieve its vision of being one of the top ten selected universities in Africa in 2020 E.C. To ensure the quality of education, the university has been implementing; among other things, instructors performance appraisal. To this end, the performance of instructor has been evaluated semi-annually (usually at the end of each semester). The university has designed performance appraisal where peers, students, and department heads are the appraisers of the instructors'

performance. However, in spite of implementing such an appraisal, little attempt has been given to evaluate its effectiveness. Hence, this study is intended to evaluate effectiveness of appraised process on the instructors' performance in Woldia University.

1.2 Statement of the Problem

In higher education institutions, instructors constitute a particular group of knowledge-based workers whose commitment plays pivotal role in successful operation of their institutions. It is the responsibility of managers in higher education to design and implement performance appraisal that both motivate instructors and align their efforts to organizational objectives (Simmons & Iles 2010). In order to reap benefits from performance appraisal process, it is imperative to develop it in a more effective manner.

On the other hand, based on the assumption that effective performance appraisal process would result in those desirable behavioural outcomes (such as increased employee motivation, reduced employee turnover, etc), many studies also focus on key factors in the process itself to evaluate effectiveness of performance appraisal process. For instance, studies (Ellett et al., 1996; Kyriakides 2006; Monyatsi et al. 2006; Danial 2011) emphasized on four factors, namely; the sources for collecting relevant data, the appraisal purpose, the appraisal criteria and the feedback system as main aspects that need to be considered in developing effective instructors' performance appraisal.

Besides the paucity of research in the field, instructors' tendency of frustrations with the appraisal process was a motivational force for the current researcher to conduct a comprehensive study on effectiveness of instructors' performance appraisal process. Moreover, though the university has been implementing performance appraisal, to the best knowledge of the researcher, no systematic study has attempted to evaluate effectiveness of the appraisal process. Hence, this study is intended to evaluate effectiveness of appraised process on instructors' performance in Woldia University.

1.3 Research Questions

Based on the above stated problem, this study was attempt to provide answers for the following research questions.

1. Do instructors' performance appraisal criteria have necessary qualities?
2. What are potential practices of the appraisers in instructors' performance appraisal process?
3. To what extent do instructors and students understand purposes of instructors' performance appraisal process?

1.4 Objectives of the Study

The overall objective of the study was to evaluate Effectiveness of Instructors Performance Appraisal Process in Woldia University.

1.5 Scope of the Study

The study was delimited spatially, conceptually and methodologically. Despite the fact that, the researcher has recognized the need to cover all the faculties in the university; resource limitation coupled with unmanageable population size (students and instructors) forced the study to focus on the four faculties in the university.

Conceptually, the study is confined to assessing effectiveness of the appraisal process in terms of the four factors stated in conceptual framework & in the process itself only. Methodologically, the study employed cross sectional survey design where more relevant data was obtained from instructors, department heads, and Regular Graduating Class Students (RGCS).

2 LITERATURE BACKGROUND

2.1 Performance appraisal: an overview:

The term performance appraisal has been defined by many scholars in different ways, though the concepts are closely related to each other. Evancevich (2004) defined performance appraisal as the human resource management activity that is used to determine the extent to which an employee is performing the job effectively. Jacobs et al. (1980) defined performance appraisal as a systematic attempt to distinguish the more efficient workers from the less efficient workers and to discriminate among strengths and weaknesses an individual has across various job elements. According to Rasheed (2011) performance appraisal is a continuous process through which performance of employees is identified, measured and improved in the organization.

2.2 The purpose of performance appraisal

Performance appraisals are needed to justify a wide range of human resource decisions such as salary increase, promotions, demotions, terminations, training need assessment. The performance appraisal also allows the organization to tell the employee something about their rates of growth, their competencies, and their potentials (Longenecker & Fink 1999; Evancevich 2004). According to Morris (2005) the above purposes of performance appraisal can be clustered under the headings of administrative purposes and developmental purposes. Furthermore, Morris (2005) noted that appraisal can serve individual development purposes through: feedback on their strengths and weaknesses and how to improve future performance, helping career planning and development and providing inputs for personal remedial interventions. Organisational development purposes may include: specifying performance levels and suggesting overall training need; providing essential information for affirmative action programmes, job redesign efforts, multi skilling programmes; and promoting effective communication within the organisation through on going interaction between appraisers and appraisees.

2.3 Conceptual Framework

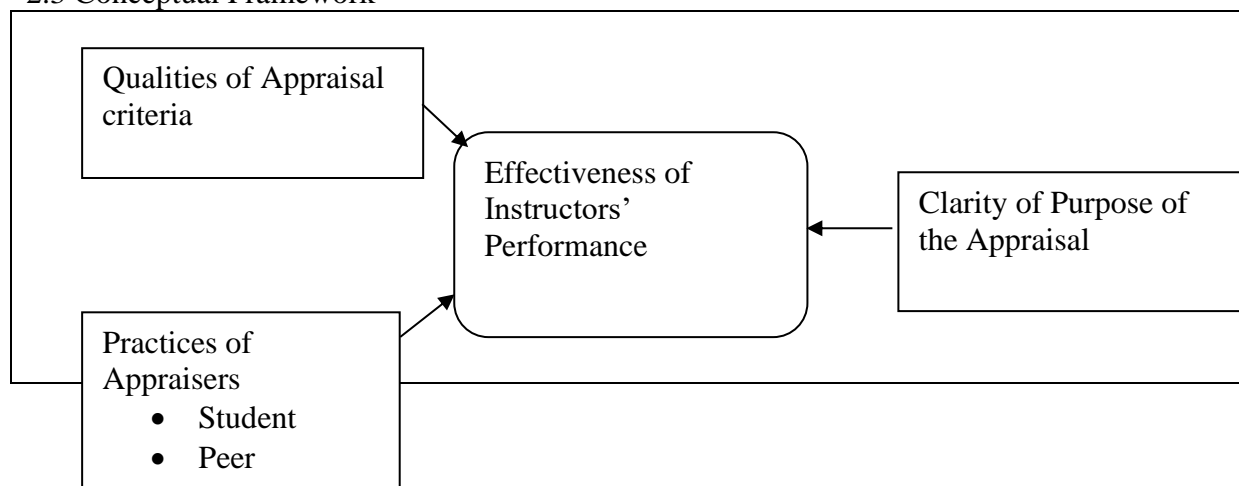


Fig.1 - Conceptual framework. Source: Researcher's own design based on literature review

3 METHODOLOGY OF THE STUDY the study employed cross sectional survey design and is descriptive in nature. The study employed both quantitative and qualitative data that was collected from both primary and secondary data sources. The sample sizes were determined based on the following simplified formula proposed by Vamane (1967) (as cited in Israel 2003).

$$n = \frac{N}{1+N(e)^2} \qquad n = \frac{1124}{1+1124(0.05)^2} \qquad \underline{n= 295}$$

Where, n is sample size, N is the population size and e is the level of precision. A 95% confidence level and $e = 0.05$, were assumed for the purpose of determining sample size for this study. Even though 81 semi-structured questionnaires to instructors and 214 structured questionnaires to students were distributed, only 74(91.3%) and 191(89.2%) were returned and analysed from the former and the latter, respectively. Sample respondents were selected using proportionate stratified random sampling. Moreover, focus group discussion with students & instructors and semi structured interview with heads of departments were conducted to supplement data collected using questionnaire. Data collected through focus group discussion and interviews were analysed qualitatively; whereas data collected through questionnaires were analysed quantitatively using descriptive statistics with the help of SPSS version 20.

4 RESULTS AND DISCUSSIONS

4.1 Qualities of appraisal criteria

Establishing appraisal criteria is the first step in performance appraisal process. In order to generate criteria for instructors' performance appraisal it is acknowledged that potential sources including the instructors' opinions, the instructors' job descriptions and/or the professional code could guide the development of such criteria (Kyriakides, et al. 2006). To this end, some ideal characteristics that effective appraisal criteria must possess were identified and the instructors were asked whether their appraisal criteria possess those identified characteristics.

4.2 Instructors awareness of their appraisal criteria

According to Khan (2007) performance appraisal should be based on job description for the position employee holds. This is vital in helping every employees of the organization know exactly what is expected of them, and the yardsticks by which their performance will be evaluated. To this end, instructors were asked to express their agreement/disagreement on the statement 'Up on employment at Woldia University, Every instructor will be given job description specifying his/her duties'.

Tab. 1 - Existence of Job Description Specifying Instructors Job Duties. Source: Own Research

		Frequency	Percent
Responses	Strongly disagree	29	39.2
	Disagree	24	32.4
	Neutral	7	9.5
	Agree	10	13.5
	Strongly agree	4	5.4
	Total	74	100.0

Table 1 shows that 39.2% strongly disagreed, 32.4% disagreed, 9.5% neither agreed nor disagreed, 13.5% agreed and 5.4% strongly agreed with the above statement. This means that majority (71.6%) of instructors do not believe that job description is given for instructors up on employment. The implication is that in the absence of job description specifying duties and responsibilities of individual instructors, instructors may hardly know their performance expectations.

Logically in addition to giving job description up on employment, providing training for employees (instructors) about the criteria of appraisal may serve the purpose of clarifying the performance expectations. To this end, the following bar chart indicates the instructors' opinion on whether instructors were formally trained about their appraisal criteria.

4.3 Relevance of appraisal criteria

As noted earlier in literature review part of this paper, for the appraisal criteria to be effective it must be relevant, reliable, and realistic. Therefore, let's take a look at whether the instructors' performance appraisal criteria in the university fulfil these and some other characteristics. According to Noe et al. (1996) relevance of appraisal criterion is defined as the extent to which the performance measure assesses all relevant – and only the relevant aspects of performance. Based on this definition, two aspects of relevance of appraisal criteria are identified. That is the phrases 'all relevant' and 'only relevant' refer to the completeness of the criteria and the relevance of all criteria to job duties, respectively. In line with this, table 2 displays responses of instructors regarding whether their appraisal criteria satisfy those aspects of relevance.

Tab. 2 - Relevance of Appraisal Criteria. Source: Own Research

Description	Responses											
	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Total	
	N	%	N	%	N	%	N	%	n	%	N	%
All appraisal criteria are relevant to tasks in my job	28	37.8	8	10.8	13	17.6	13	17.6	12	16.2	74	100
All my duties are measured in appraisal criteria	20	27.0	28	37.8	10	13.5	11	14.9	5	6.8	74	100

Table 2 reveals that when instructors were asked to express their opinion on the statement 'All appraisal criteria are relevant to tasks in my job', 48.6% (37.8% disagree plus 10.8% strongly disagree) opposed the statement. On the other wing, 33.8 % of instructors were for the statement i.e. 17.6% strongly agrees plus 16.2% agree. The remaining 17.6% of instructors neither agree nor disagree with the statement. Furthermore, responding to open ended question, one assistant professor stated that "The appraisal form contains relevant and irrelevant factors. For example, out of 25-30 criteria on teaching appraisal form (completed by students), the relevant criteria are not more than eight. Therefore, it needs revision to select best yardsticks that evaluate instructors' work-related performance."

Table 2 also indicates the instructors' responses to the statement 'All my duties are measured in appraisal criteria'. In other words, instructors were asked whether the appraisal criteria are comprehensive enough to measure all relevant tasks of their job. Accordingly, 64.8% of instructors were against the statement i.e. 27.0% strongly disagree and 37.8% disagree. On the other hand, around 21.7% (14.9 agree plus 6.8% strongly agree) of instructors believe that their appraisal criteria measure all their job relevant duties. The remaining 13.5% of instructors asserted that they are neither for nor against the statement.

Generally, table 2 reveals that majority of instructors never view that all their appraisal criteria are relevant to their job, and they also believe that some of their job duties that should have been measured by appraisal criteria were not included in current appraisal form. Therefore, it can be concluded that instructors had reservation on relevance and completeness of their appraisal criteria.

4.4 Characteristics of the performance feedback system

Feedback is an essential facet of effective performance appraisal process. In the absence of feedback, employees are unable to make adjustments in job performance or receive positive reinforcement for effective job behavior (Roberts 2003). However, the acceptance of feedback is the catalyst to behavioral change. Feedback provides individual motivation, if the employee is ready to accept it (Alexander, 2006). Generally, recognizing the central role of feedback system in performance appraisal process, the present study had made endeavor to assess characteristics of instructors' performance feedback system. In this context, feedback system refers to the process by which instructors are informed of their performance after and/or before appraisal period.

4.5 Clarity of purpose of instructors' performance appraisal

As it has been discussed in the earlier section of this paper, organizations (including universities) conduct performance appraisal for various purposes. Kyriakides (2006) suggested that purpose of performance appraisal is one of a number of situational or contextual variables that affects the appraisal process. According to Monyatsi, et al. (2006), if performance appraisal is to be effective; the users (both the appraisers and the appraised) must understand and accept the purposes of the appraisal scheme. The authors also added that, if users are not aware or convinced of their performance appraisal; they become anxious and suspicious of the whole process. To this end, the instructors' and the students' understanding of the purpose of instructors' performance appraisal was evaluated.

Tab. 3 - Instructors' understanding of the purpose of their performance appraisal. Source: Own Research

Level of Purpose understanding	Frequency	Percent	Mean
Very low	4	5.4	3.55
Low	5	6.8	
Medium	26	35.1	
High	24	32.4	
Very high	15	20.3	
Total	74	100.0	

The instructors were asked the question 'What is your level of understanding about the purpose of instructors' performance appraisal in your University?' Out of the 74 instructors who responded to the question, 35.1% of them stated that they had medium level of understanding about purpose of their performance appraisal, while 32.4% and 20.3% of them asserted that their understanding is high and low, respectively. However, the remaining 12.2% (5.4% very low plus 6.8% low) asserted that they lacked understanding of why the appraisal is in place. Generally, it can be said that for majority of instructors the purpose of their performance appraisal is clear. The overall mean of 3.55 could be an evidence of this scenario.

Moreover, to evaluate students' understanding of purpose(s) of instructors' performance appraisal, students were asked to express their agreement/disagreement on the statement 'I know the purpose(s) of instructors' performance appraisal.' Accordingly, the following table 4 displays summary of students' response to the statement.

Tab. 4 - Students Understanding of Purpose of Instructors' Performance Appraisal. Source: Own Research

Responses	Frequency	Percent	Mean
Strongly disagree	59	30.9	2.43
Disagree	61	31.9	
Neutral	23	12.0	
Agree	26	13.6	
Strongly agree	22	11.5	
Total	191	100.0	

As indicated in table 4, of 191 students who responded to the above statement, 30.9% were strongly disagreed and 31.9% were disagreed, making 62.8% disagreement rate. On the other hand, 13.6% were agreed and 11.1% were strongly agreed, adding up to 24.7% agreement rate with the statement. Moreover, the mean score of students' responses is 2.43, signifying that majority of students lacked understanding of purpose of instructors' performance appraisal. When mean scores of instructors (3.55) and students (2.43) were compared, instructors were at better position than students regarding the clarity of the appraisal purpose. It was identified during FGD with students that they were not given any training about instructors' performance appraisal and this is perhaps a reason why students lacked clear understanding of the purpose of the appraisal. On the other wing, instructors were at vantage probably because they have higher stake than students since appraisal result is used for making some personnel decisions on instructors.

Furthermore, instructors were asked the actual purpose(s) of instructors' performance appraisal in their university. In order to know the main purposes of instructors' performance appraisal as applicable in the university, respondents (instructors) were given lists of some ideal purposes of performance appraisal. And they were asked to rate each purpose independently by expressing their agreement/disagreement level on five points scale.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Under normal situation prior to conducting performance appraisal, the appraisees must be informed of the appraisal criteria against which his/her performance is going to be evaluated. This could be done through providing training/orientation and/or providing detailed job description that clarifies performance expectations. However, at the outset instructors were given neither job description nor training that clarifies their role perception. Consequently, instructors may hardly understand what is expected of them as instructor in the university. Because they do not know their performance expectation, it was identified that majority of instructors do what they feel right in the attempt to keep their performance up to standard. Therefore, the absence of job description and training on appraisal criteria revealed that instructors' performance appraisal process has lacked proper foundation.

Majority of instructors perceived their current appraisal criteria as deficient of essential qualities that effective appraisal criteria must possess. Among other things, instructors perceived that appraisal criteria were falling short of the following qualities: instructors' participation in its design, relevance & completeness, consideration of practical difficulty, reliability and ability to measure instructors' contribution to student learning.

The attempt was also made to evaluate the clarity of purpose of instructors' performance appraisal. The analysis indicated that instructors had high level of understanding of why instructors' performance appraisal is in place; however, students lacked this understanding. The

actual purposes of the appraisal are to make promotion and scholarship decisions. This shows that some ideal purposes of the appraisal; for instance, training need assessments and identifying strength and weaknesses were missing. Therefore, at least it can be dictated that utility of instructors' performance appraisal process in improving instructors' performance is minimal.

To sum up, the instructors performance appraisal process is not effective because of 1) poor qualities of appraisal criteria; 2) Bias practices of appraisers; 3) Ineffective performance feedback system; and 4) Appraisers (students) lacked awareness on the appraisal purpose and the appraisal is not serving formative purpose.

5.2 Recommendations

It is obvious that preparing appraisal criteria is the foremost step in performance appraisal process. This study disclosed that the appraisal criteria used for appraising performance of instructors had lacked indispensable features. Therefore, it is recommended that the appraisal criteria should be urgently redesigned.

In the course of establishing the appraisal criteria, full participation of instructors must be obtained. The participation helps establish realistic, relevant, complete and reliable targets. In addition, if appraisal criteria are prepared in consultation with instructors, it is highly likely that the criteria get acceptance among instructors; thereby enhancing effectiveness of the appraisal process. To further enhance quality of appraisal criteria, it is better, if best experiences of other universities are benchmarked and necessary adjustments be affected. Finally, the job description and the detailed appraisal criteria must be communicated to instructors in order to clarify their role perception. The university must also reconsider the kind, quality and quantity of resources available for instructors to achieve the established criteria.

The result of the study indicated that peer's appraisal was subject to leniency bias because the appraisal score is used for making promotion and scholarship decisions. To overcome this problem, the principal purpose of instructors' performance appraisal must be for improving performance of instructors rather than for the conventional administrative purposes. The instructors must act in professional manner and view the appraisal as part and parcel of their organizational responsibility. This value system must be cultivated in their mind through different training sessions, workshops and seminars that could be conducted as in-house training programs. The training must focus on the appraisal purpose, how to give effective feedback and the appraisal criteria.

Head of departments must try all their bests to obtain information on performance of departmental instructors and where necessary they should also keep necessary records on instructors' performance. In addition to evaluating instructors' performance, heads must also play the role of coach and facilitator so that instructors become better performers. In addition, heads must be given interpersonal skill-based training so that they will be equipped with communication, coaching, and counseling skills. These skills are essential to ensure the performance appraisal is a pleasant experience for both the instructors and the heads. More importantly, heads themselves must be evaluated on how effectively they evaluate instructors' performance and play all necessary roles in enhancing performance of instructors. This is needed to amplify the value that heads may associate with instructors' performance appraisal process.

Performance feedback plays a pivotal role in improving performance of instructors.

After all the above-mentioned adjustments are affected in instructors' performance appraisal process, the appraisal must be used for all ideal purposes (both formative and summative). For instance, best performers must be recognized & rewarded (summative), and poor performers must identify and trained (formative), etc.

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THE ROLE OF BIG DATA AND ANALYTICS TO SUPPORT DECISION MAKING IN BUSINESS

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Abstract

Big Data and Analytics are two separate domain. Big Data is not just a term to describe the data boom that happened over the last two decades, in today's world it also refers to a set of technological solutions and database management techniques. Analytics on the other hand is a set of statistical tools paired with business acumen to understand and resolve real world problems and result in Data Driven Decision Making. With the IoT sector growing and the data complexity increasing, it's an inevitable outcome for the Analytics domain to start accommodating Big Data tools and NoSQL solutions. Decision making will be most likely come with an underlying data cluster managing Big Data and cross-functional management. Fostering an organizational culture that is data driven will most likely be just as important as having the right tools in place to achieve results with these systems.

Keywords: *Big Data, Analytics, Hadoop, NoSQL, Business Data*

JEL Classification: O3

1 INTRODUCTION Over the last decades, Information Technology and the largescale reforming of how and when we store data has been one of the hot topics across multiple domains, Business Analytics being one of them. There are a variety of research papers either from a technology solution or real life application point of views trying to fill the gap between cutting edge technologies and enterprise decision aiding systems.

As per Erevlleses et al (2016), technology helps to capture rich and plentiful data in real time related to customers, with unprecedented volume, velocity, and a high variety of primary data, along with Big Data. This data can be used to enhance adaptive capabilities by gaining faster and a more detailed insight into customer needs.

With such promising features, the question arises in many: what is Big Data really and how it can be used to enhance Analytics capabilities of businesses therefore bettering their decision-making capabilities?

Zikopoulos & Eaton (2011) described Big Data as a new era in data exploration and utilization. Their paper describes how IBM leverages open source Big Data technologies to create a robust, secure and highly available enterprise-class Big Data platform. They define Big Data characteristics as high volume, high variety and high velocity data flows. IBM uses one of the market leading open source systems named Hadoop, which we'll also reference in this paper.

With that being said, it seems like the term Big Data is not a unified system or an out of box solution. There's a blurry line between large-scale enterprise systems handling large amounts of data and Big Data. Let's take a couple of facts from White (2012) to help visualize the amount of data in question:

- The New York Stock Exchange generates about 1 Terabyte of data every day that needs to be processed as close to real time as possible,

- Facebook hosts about 10 billion photos, that would be around a petabyte of data, continuously growing,
- The Internet Archive stores roughly 2 petabytes of data, growing at 20 terabytes per month.

As said earlier, there's no clear line all the time between Big Data systems and more traditional enterprise systems, on the other hand, we'll try to find a couple of ways to distinguish these and draw a line in the sand. Also, we'll see how these systems might outperform traditional relational database structure for business decision making.

2 THEORETICAL BACKGROUND, DEFINING BIG DATA AND RELATIONAL DATABASES Running a business involves making optimal decisions day to day, and to make the best out of the situation each business requires lots of data. For small size enterprises, this data is available to the owner as common knowledge and experience, but as the enterprise gets bigger, the amount of data to be processed grows too. At this point, an enterprise would most likely set up some sort of relational database management systems (RDBMS) such as the Oracle Business Suite or SAP's equivalent product. But what happens if the organization hits the limitations of its RDBMS?

Chickerur et al (2015) did a deep-dive to compare Relational Databases with Document-Oriented Database (MongoDB) for Big Data Applications. They found that RDBMS are still the best for simplicity, robustness, flexibility, performance, scalability and compatibility but they are not able to satisfy the present-day users and applications. On the contrary, non-relational or NoSQL databases are able to scale out any needs today's applications might have. The main characteristics of these databases are being:

- Schema-free,
- No-join,
- Non-relational,
- Easy to replicate (for example, having a server to fall over to in case of a system melt-down to ensure business continuity),
- API-friendly,
- Consistent.

For anyone interested learning more on business continuity insurance and how a robust database design, be it Big Data or RDBMS needs to balance between availability performance and consistency, I suggest doing a little read on the CAP theorem, but for now, the way Gilbert & Lynch (2012) described it should be sufficient: it's basically how tradeoff between safety and liveness in unreliable systems. We'll not focus on the CAP theorem's limitations in this paper as either Big Data or RDBMS solutions could emphasize either reliability or consistency.

Building on this, a Big Data warehouse would be something that:

- Able to process data on basically any scale, in an aggregated format if required,
- has a cluster of servers,
- some sort of resource negotiator to allocate resources across clusters,
- is in a non-relational format.

Now that we have drawn the line in the sand and differentiated between RDBMSs and Big Data solutions, we should be able to appropriately define the scope and objectives of the research paper in a way that translates to real world scenarios.

3 OBJECTIVES AND TYING DECISION-MAKING TO BIG DATA AND DATA DRIVEN DECISION MAKING (DDDM) So far, we've covered the fundamental terminologies of Big Data and RDBMS. These two are essential to understand the scope of this research, but are technological solutions that can be used across any domains starting from stock exchanges, social media through medicine or social sciences. With that being said, let's further refine our scope and cover what decision making is about.

Businesses need to make decisions on a daily basis and manage constraints resources in an always-changing environment, there's nothing new about it – therefore let's reach back into an older literature. Herbert (1979) said that economics is an ordinary business of life, and closely connected with the attainment and with the material requisites of wellbeing. He states this defines someone's life significantly, and the goods produced by someone and the day-to-day work of any person bears an utmost importance on our ways of life.

I tend to agree with Herbert, we all need to make decisions and those decisions would eventually alter our day-to-day works, the output we create and the value of compensation we can ask for in exchange. With that being said, these sorts of decisions are more on the intellectual side, not necessarily based on data that can be found on hard-drives. On the other hand, an organization needs to make similar decisions to make sure the goods it's producing are up to speed with the market and it can finance its operations in a way that'll get it closer to its goals. The collection, aggregation and digestion of this data, and finally making a decision as quantitatively as possible is what results in making data-driven decisions resulting in DDBMs.

DDBMs are a vivid area of research due to their capability to alter how a business functions, how accurately it reacts to changes and how quick its reaction time is. As per Hartmann, P. et al. (2014), these systems are be particularly helpful to companies already using 'big data' for their businesses or are planning to do so. They identified a couple of business models for companies to help creating a Data Driven Business Models (DDBMs) and tried to generalize the characteristics to scale out the DDBM blueprint. They've found that:

- about 73% of the businesses used external data sources,
- 16% used internal and external data sources at the same time,
- 11% used only internal data,
- 76% of the companies highlighted Analytics as one of their main activities,
- Only 22% used predictive analysis,
- 6% used prescriptive analysis.

The above numbers are already signaling a significant trend: almost every company is using analytics, therefore it's added value are supposedly either high or essential to keep the business competitive.

Sorescu (2017) looked into the business models of a couple of recent successful startups such as Uber or Airbnb. More precisely, the research paper provides a couple of insights into how companies are leveraging both internal and external data sources to find the most suitable business models, linking Big Data to business model innovation.

In today's business environment, where digitalization is accelerating as we go so does the need for designing systems that can help businesses harness the power of data and support them in making the right decisions, definitely establishing a link between Big Data and business processes. On the other hand, implementing these systems and hiring the right staff to run them also requires significant efforts in some cases.

Adrian et al (2016) looked into a variety of DDBMs and differentiated between users and non-users in terms of data usage and created a map that – amongst many other things, can help companies decide whether their DDBM will be data heavy and hard to maintain or not. Figure 1 below shows 8 categories, rolling down from the 2 majors' groups being the non-user and user datasets, and helps to determine the level of technological effort required to implement such systems.

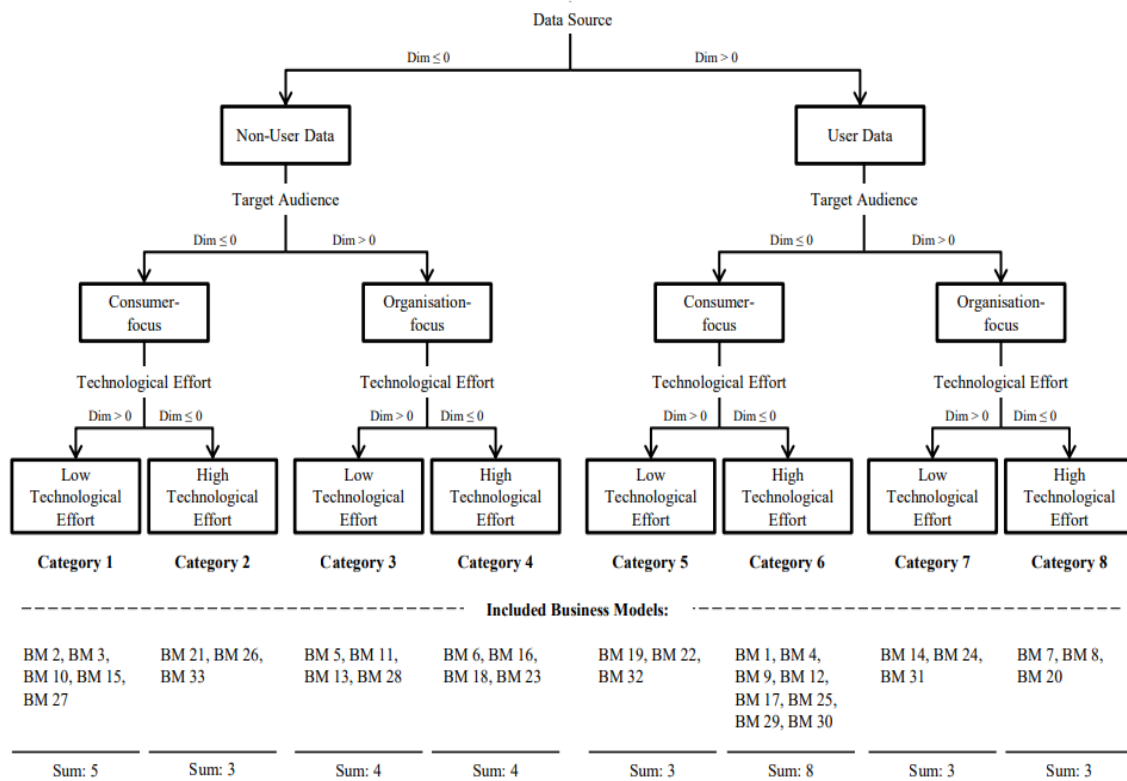


Fig. 1 – Proposed taxonomy of data-driven business models illustrated using a decision tree.
Source: Adrian et al (2016)

Considering the information gathered so far and the different levels shown on Figure 1, it's relatively safe to assume these systems require different levels of staffing to run them with different expertise, depending on the decision-making capabilities, amounts of data processed and overall functionality requirements businesses expect to get out of them. In the next session, we'll investigate why companies keep investing into DDDM solutions. Once understanding this, this paper will aim to help tying these systems to real world scenarios while keeping the previously defined differentiations between RDBMSs and Big Data systems in mind. We'll also investigate what's needed for a successful system implementation.

4 RESULTS AND ADVANTAGES OF ADVANCED ANALYTICS FOR CORPORATIONS Provost & Fawcett (2013) conducted research on a similar topic already, and defined Data Science and Data-Driven Decision Making as a practice that includes automated analysis of business scenarios with the ultimate goal of improving the decision-making process. As per their paper, data-driven decision making is the process of basing decisions on analyzing data instead of any sort of intuition solely. The paper also states that the advantages of building these decisions on data has been demonstrated throughout a variety of cases ranging from repeated decisions being automated to new findings.

Figure 2 demonstrates the process explained in their paper, and even though in this research Big Data is a little bit outside of the Data Science process, it definitely feeds decision making and its automation in the drawn process. It also highlights faster processing one of the advantages that can be associated with Big Data Tools. Further to this, it not only highlights Big Data as being advantageous for businesses, but also shows how Data Science, Big Data and Decision-making overlap.

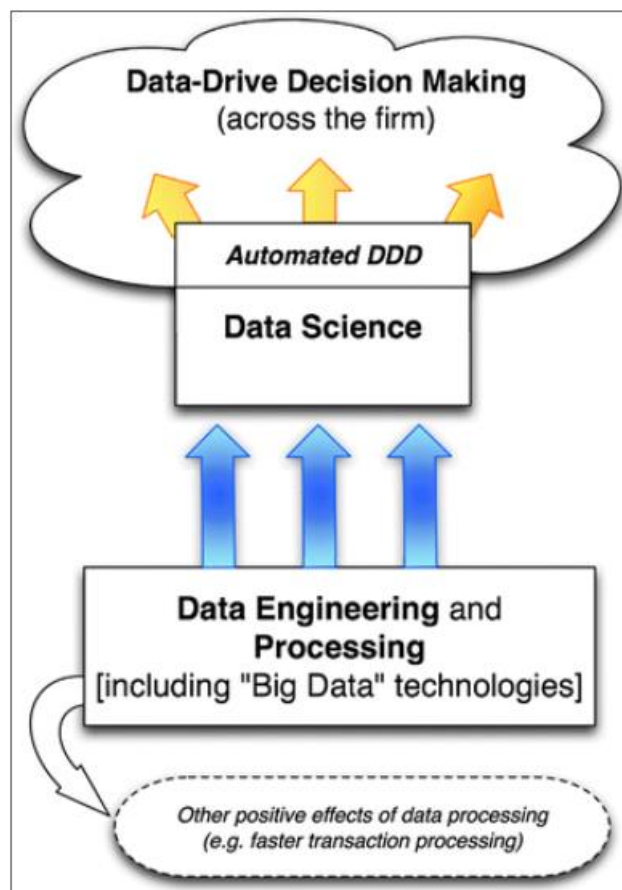


Fig. 2 – Data science in the context of closely related processes in the organization. Source: Provost&Fawcett (2013)

To avoid causing any confusion though, not every kind of data processing is Big Data, in fact, I suspect at this time most of the data processing practices are more relational-based. On the other hand, I'm not sure if we would be able to say the same let's say 20 years out, especially if the amount of data being produced around the world keeps growing at current rates.

Data Science is represented in Figure 2 and also can't be fully separated from Big Data when talking about making decisions on the back of that data. The usage of Data Science from the above is a somewhat pioneering field when it comes to management level decision making, and contains a technology that closely ties to actionizing data driven decision making. That is because data Science is often associated with Machine Learning, which is how computers can derive conclusions similar to how the human mind works. Suhajda (2020) explains in a research paper how a specific type of Machine Learning algorithms, Artificial Neural Networks work by basically learning a task by optimizing the weights of a set of inputs throughout a definite number of iterations. This is similar to how a human would learn things when trying to repeat a task gradually getting better, but on the back of data on the hard-drive.

With that being said, there's a reason why companies are using these systems – as the complexity increases, it becomes harder and less reliable to forecast the outcomes of any scenarios just based on intuition. At the same time, there's an ongoing revolution in terms of how we process and analyze data, and that makes the more hard-fact, quantitative approach appealing to drive businesses.

Getting ready for a Data-Driven Business Culture

We've reviewed past research and separated Big Data from regular data warehousing techniques and also found that many of today's star start-ups on the market emphasize data over instinct when it comes to higher management decisions. On the other hand, if we take a look at the job market or at many companies, we'll notice many are still struggling to run management systems at scale in a customized way. So how can companies get ready for the future and facilitate moving the corporate world towards this new bureaucracy with all its cons and pros?

As per Carillo (2017), the development of cutting-edge data skills shouldn't be restricted to Data Scientists or IT personnel only – people in management should also be well-acquainted with wrangling data and corporations should strive to build an organization culture that is data-driven by nature. In this culture, managers would not only have business knowledge, but should possess skills in all of the below domains:

- data management,
- analytics techniques,
- modeling skills,
- data tools,
- business.

Carillo also states that the multi-domain or multidisciplinary field of Big Data Analytics or Data Science potentially collides with the mindset business schools tend to represent, which favors deep knowledge in a single domain over building more horizontal skillsets.

A different research by Daniel (2008) suggested the importance of IT staff and managers having an understanding of data driven decision making support systems. The paper, similar to this one, discusses the concepts without looking into a rigid or overly specific implementation of these systems, and states that these systems can vary on a large spectrum depending on the implementation, therefore the evaluation of the systems would require evaluation criteria to be well-understood.

To add further granularity to the different layers of data, I'll refer to a study published by Julie A. et al (2006) related to educational topics. They recognized multiple data types: inputs, outputs, processes and satisfaction data, and concluded that having the right data in place will not guarantee the usage of those datasets in an effective way. Therefore, having the right practices in terms of collecting data are important, but in itself is most likely not enough in itself. To build well-performing systems, the effort a company puts into collecting data throughout multiple systems and times is just as important as the efforts going into analyzing that data.

Seems like multiple literatures from a variety of domains are backing up the theory of DDDM is important for companies that they would like to achieve, but it requires a wider range of tools to be in place to be successfully implemented.

5 CONCLUSIONS With more data available than ever, multiple companies regardless of their field of operations are looking for opportunities to take advantage of this trend, which we could either skeptically label as the new era of bureaucracy or the dawn of a more effective economy.

There's truth most likely in both of these approaches, and there's plenty of research on the ethical use of Machine Learning, Data Science or Big Data. Whatever we might think, there's no question computation capacity is on the hike and most likely computers and Big Data technologies will keep playing a not just significant, but also increasing role in how large corporations make decisions, given their size in many cases already exceeded the capabilities of manual analytics.

Looking through the literature review we can say it is, for most companies, out of questions whether they need to hire either data scientists, big data professionals or staff that is data savvy and can help operate those systems in a way that'll help facilitating a culture where decisions are made based on data. With that being said, it's far from transparent what Big Data or Data Driven Decisions Making is. Big Data for example, is often used to refer to the 4th industrial revolution and would be used to pretty much anything that's not a RDBMS throughout Big Data to Internet of Things (IoT) solutions. In this article, we've defined a practical way to refine the scope when it comes to Big Data, and defined it as a clustered, multi-server or cloud-based framework where data processing can be done in batches and the system has the capability to handle any failures by failing over to a back-up server on the same cluster of servers.

We've also concluded that having either RDBMS or Big Data systems will in themselves not guarantee successful decision making, it's just a tool that require the appropriate level of Staffing and understanding of those systems. Just having the right tools and data in place can still be not enough. Establishing industry-wide frameworks could potentially help facilitating these changes across different corporations of industries. Such change could be potentially promoted on a regulatory level.

Finally, it's not enough for companies to only have the right tools in place, but gathering data, analyzing data and having the right company culture are all equally important to build a successful data-driven decision-making process, which role is to stay in the business long term by enhancing a company's capability to react to changes in a timely manner and therefore retain its market share.

And with that being said, we concluded our paper which did seek and provide answers to how to differentiate between data and Big Data, and also covered what criteria needs to be fulfilled in order to allow a company meeting its expectations for data driven decision making. This of course, comes with the need of keeping organization and scenario specific attributes in mind, as noted down throughout the paper.

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SUSTAINABILITY OF THE PENSION SYSTEM IN SLOVAK REPUBLIC - FOCUS ON RETIREMENT AGE, LIFE EXPECTANCY AND AGE DEPENDENCY RATIO

Katarína Švejnová Höesová

Abstract

The main objective of this paper is to analyze retirement age with focus on relationship between age dependency ratio and life expectancy. Proper retirement age is a question that has become more resonant in society in recent years around all countries in the world. The long-term trend of demographic change, the prolongation of life and low birth rates or replacement rate, pose huge challenges to the sustainability of pension systems. The article discusses different approach of countries of the OECD and European Union to the retirement age question with focus on the retirement age in the Slovak republic. In the last part of the paper we will analyze retirement age growth and current situation in selected countries in the Europe. Based on this analysis we will propose our recommendations to increase the sustainability of the first tier in the Slovak pension system. The paper will focus on the main pension system indicators, such as population demography, retirement age and pension indexation regard to retirement – income adequacy

Keywords: *pension system, retirement age, life expectancy, age dependency ratio*

JEL Classification: J26, J11

1 INTRODUCTION The public pension system is a societal measure that provides income support to the members of society against the risks of old age, disability and survivorship. As a means to achieve this, it essentially relies on the intergenerational income transfer enforced by law. For a defined-benefit pay-as-you-go pension system, there are in principle two ways to restore its financial balance: reduce benefit expenditure by modifying the pension formula, raising the pensionable age, and changing the indexation method, whilst minimizing administrative expenses; increase revenues by increasing the contribution rate, or by extending the contributory base through improved compliance with the law and efficient contribution collection. Economic growth will help increase the size of the contributory base. (Hirose, 2011)

Although changes in pension systems have typically been studied from the point of view of their labor supply consequences, there are several reasons why adjustments in retirement age can also affect firm behavior and labor demand. For instance, firms may offer incentive schemes in which wages are below productivity when workers start their careers, and then gradually increase at a faster pace than productivity (Lazear 1979). In the context of these incentive pay structures, an ex post increase in the mandatory retirement age would be detrimental to firms' profitability, particularly in a context of downward wage rigidity or strict employment protection legislation. (Martins et al,2009)

The main goal of the paper is to analyze and compare current retirement age settlement with focus on economic impact to the sustainability of public finance. The work will rely on both empirical and theoretical research methods. Basic analytical methods as analysis and comparison will be used prepare a comparison of the retirement age in the OECD and European

Union countries with focus on Slovak republic. Based on this analysis we will propose our recommendations to increase the sustainability of the first tier in the Slovak pension system.

2 THEORETICAL BACKGROUND Pension systems have traditionally been characterized based on the original reasons for their introduction. Two systems can broadly speaking be distinguished in this historical respect: the Beveridgean and the Bismarckian systems. Under the Beveridgean system, social security benefits ensure for each citizen (resident) a basic income, a flat-rate pension (potentially means-tested) independent of his or her profession and earnings during active employment. (Kolmar, 2017)

Citizens are free to supplement this income with occupational provisions as part of a contract with an employer or through collective bargaining. This system was put in place in Denmark, Ireland, the Netherlands, and the United Kingdom in various forms. It largely corresponds today to a system of a flat rate or social allowance for PAYG systems complemented by an important, often mandatory or semi-mandatory, occupational scheme and a voluntary savings part. The Bismarckian system assumes that people have a right to social security benefits only insofar as they acquire that right by work. The pension benefits are earnings-related and profession-related, generally subject to maximum limits. This system has been followed in Germany, Belgium, Sweden, France and the southern European countries, but also originally in most of the eastern European Member States (with much lower benefit levels). (Eurostat 2017)

The Bismarckian system is often supplemented with a minimum pension guarantee for people who have had only weak attachment to the labor force. This system generally speaking corresponds today to a more differentiated formula for the basic PAYG scheme with a correspondingly lower role for funded occupational schemes. However, even this Bismarckian/Beveridgean distinction is to some extent arbitrary, as both systems have evolved differently within national contexts and have gone through reforms. One example of this is that funded occupational pension schemes often exist within the Bismarckian system and have expanded recently. (Lannoo, Barslund, Chmelar, von Werder, 2014) (Krebs,2010)

The construction of a pension system can serve as a litmus paper for the responsibility degree of political power in the singular countries of the world. Addressing the issue of adequate retirement life is an issue that has been increasingly resonating in recent years, and the concept of silver economy is gaining more and more profound contours. The long-term trend of demographic change, especially the prolongation of life expectancy and the low birth rate, or the sustainability of pension systems, is the tip of the giant's huge accumulated problems. (Mariano, 2008).

In recent years, almost every European state has undergone a significant change in its pension system; increasing life expectancy and widely falling birth rates have increased, or are about to increase, the share of the population dependent on public pension schemes. At the same time, the growing importance given to austerity and balancing budgets has aggravated the situation and many states seemed to be running the risk of straining their pension systems. The national ways to deal with this challenge are as diverse as the highly variable national preconditions. Finland, for example, is among the European countries currently ageing the fastest. It had therefore already reformed its pension system significantly in 2005, virtually abolishing a binding retirement age, launching a discourse-shifting campaign on the value of experienced workers for the economy, and assigning generous pension accrual rates on work years taken above the age of 62. Nevertheless, the actual behavior of its people did not change much and further reforms followed in 2010 and 2011, while the country-specific recommendations of the

European Semester 2013 already call for further reform effort. (Lannoo, Barslund, Chmelár, von Werder, 2014)

Average effective age of retirement can be thought of as the average age of all persons withdrawing from the labor force in a given period, whether during the course of any particular year or over any five-year period. The average age of retirement (AAR) is thus simply the sum of each year of age weighted by the proportion of all withdrawals from the labor force occurring at that year of age. (OECD, 2019)

3 RESEARCH OBJECTIVE, METHODOLOGY AND DATA The aim of the work is to determine the magnitude of the influence on the rates of dependence on the average life expectancy. The work is based on theoretical and empirical research methods, namely the comparative method, mathematical-statistical methods, the method of synthesis, deduction, and expert estimation. For the analysis of life expectancy and dependency ratio, basic analytical methods are used, which are based on data obtained from the World Bank database in the years 1960 to 2017. Subsequently, the data were subjected to regression analysis from which conclusions were drawn.

The null hypothesis is based on the assertion that the age dependency ratio of the elderly population will not be affected by life expectancy in Slovak Republic.

Model:

$$Y = \beta_0 + \beta_1 X_1 + e$$

Y - is a dependent variable – Age dependency ratio

X_1 – Life expectancy at birth

e – random component

Life expectancy

The quality of the environment, respectively the impact of water, soil, noise and air pollution are quantities that directly affect the health of the population (Kampa, Castanas 2008) If we look only at air pollution, which is estimated to remain one of the main environmental risk factors, the impact of 5.5 million deaths per year worldwide (Forouzanfar and coll. 2013) All the mentioned factors affect the average life expectancy, which, however, increases despite all the negative factors.

Life expectancy affects the financing of pensions. Between 2015 and 20, women aged 65 could, on average, expect to live another 21.3 years, which is expected to increase to 25.5 years by 2065-65. Men of the same age could expect to live in another in the years 2015 - 20 they will live another 18.2 years, while the increase of the project by 4.5 years by 2060 - 65 will reach 22.8 years. Gender gaps in the longevity of older people are expected to narrow slightly over the next 45 years (from 3.1 to 2.7 years on average in OECD countries) (OECD 2017).

In the Slovak Republic, the average life expectancy at birth in the Slovak Republic has increased by more than three years since 2000 and reached 76.7 years in 2015. However, the average life expectancy of the population of Slovakia is still almost four years shorter than the EU average. A significant difference persists in life expectancy between men and women: life expectancy at birth for Slovak men (73.1 years) is more than seven years shorter than for women (80.2 years). (Eurostat 2018)

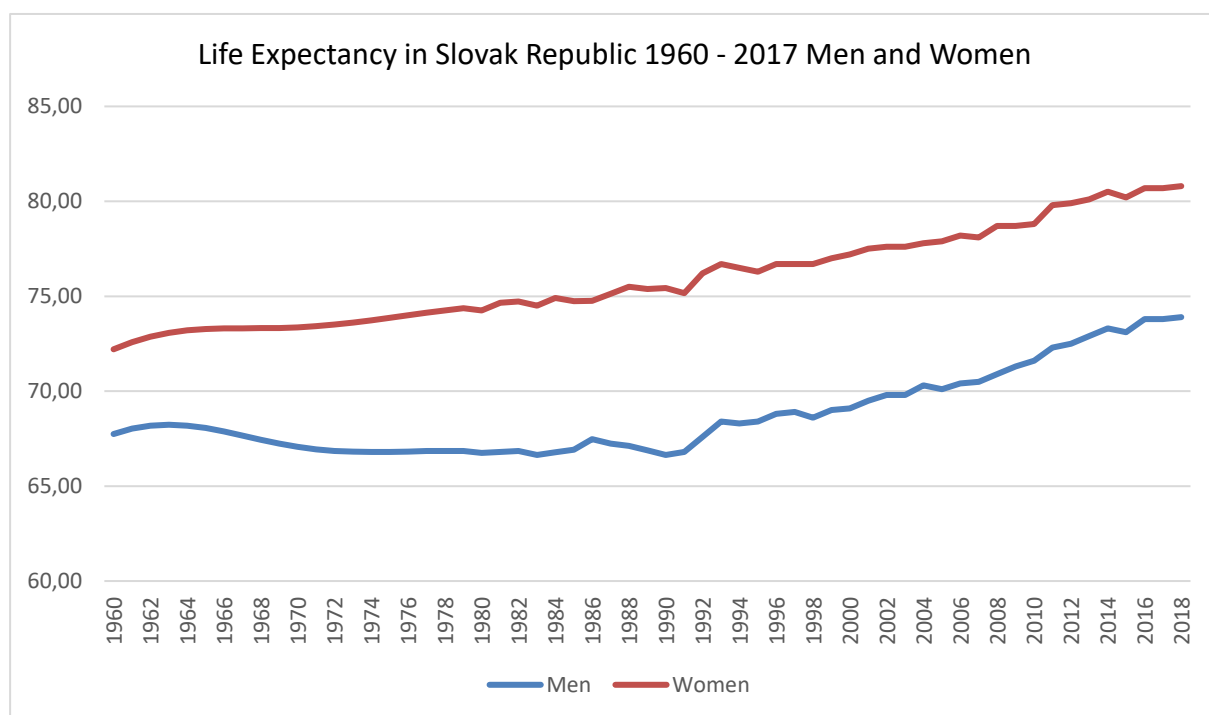


Fig. 1 – Life Expectancy in Slovak Republic 1960 - 2017 Men and Women. Source: World Bank

Fig 1 shows changes in Life expectancy of men and women In Slovak Republic during years 1960 to 2017. We can see the huge gap between life expectancy of the men and women. In 1960 value of life expectancy represent 67,5 for men and 72,21 for woman. After 57 years late the value of life expectancy increases to 73,9 for men and 80,80 form women.

Retirement age

Eligibility criteria for entitlement to old age pension

To be entitled to an old age pension, an insured person, must

- 1) achieve at least 15 years of the pension insurance period and
- 2) reach a pensionable age.

In the event that the insured person reaches the pensionable age during the period between January 1, 2004 and December 31, 2007, he/she is entitled to the old age pension after achieving at least 10 years of pension insurance period. An insured person will not be entitled to old age pension if he/she reaches a pensionable age and achieved 10 years of the pension insurance period and, reached the age required for entitlement to an old age pension or a proportional old age pension before January 1, 2004, but until then had not fulfilled the eligibility criteria for the entitlement to this pension. (he/she did not achieve the required period of employment and did not have permanent residence on the territory of the Slovak Republic), was granted an early old age pension. As of January 1, 2020, the legal regulation of the pensionable age is changed. The pensionable age is determined to all insured persons. The pensionable age valid after December

31, 2019 is stated in a tabular overview (annexed to the Act on Social Insurance) (Social Insurance Agency in Slovakia, 2020)

The retirement age in Slovak Republic was capped at the age of 64, according to constitutional law from March 2019. Women are able to retire earlier if they have raised a child. Women who raised one child, would be able to retire at the age of 63.5, while those with two children at the age of 63 and those with three or more children at the age of 62.5. Unfortunately, it is a change that significantly worsens the sustainability of public finances. Due to the increase in the number of pensioners and lower economic performance, it would be necessary to cover up find additional income for higher pension expenditure.

Age Dependency Ratio

The dependency index of the old population (population 65 and over) expresses the relationship to the productive age group (population aged 15-64). They refer to the number of individuals who are likely to be "dependent" on supporting other people in their daily lives - for young people and the elderly - with the number of individuals who are able to provide such support to the OECD.(OECD 2017)

On the Fig. 2 we can see the change in Age Dependency Ratio and percentage of population above 65 years old from 1960 to 2017. The graph shows an increasing number of people of retirement age from 6.76% in 1960 to 15,08% in 2017.

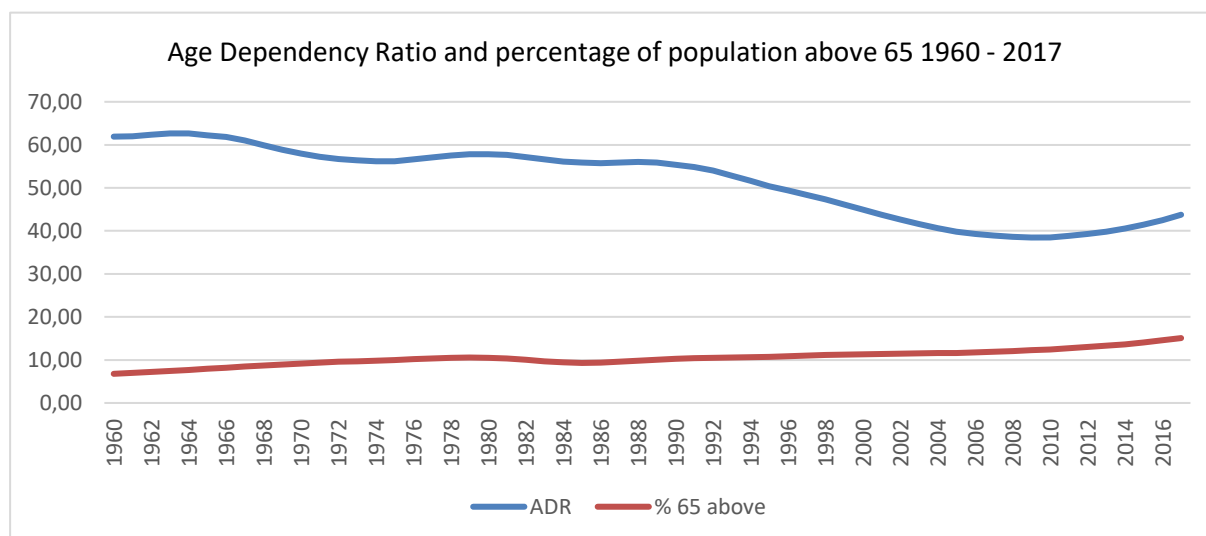


Fig. 2 – Age Dependency Ratio and percentage of population above 65 1960 – 2017. Source: World Bank and Eurostat

4 RESULTS AND DISCUSSION Our research question was to determine the degree of influence between the average life expectancy and the dependency index of the elderly population. Dependent variable Y (explained) index of dependence of the old population. X (explanatory) represents life expectancy. In our example, we assume that the more the addiction rate increases, the higher the average life expectancy.

Tab. 1 – Results of the regression (STATA). Source: own research

	Coef.	Standard error	P Value	Koeficient determinácie	Korelačný koeficient
Life Expectancy	.7296491	.0761438	0.000 ***	0.6212	0.6144
Const.	-36.88394	5.499073	0.000 ***		

The above results show that the regression function for the Slovak Republic

$$y = -36,88 + 0,73X_1 + e$$

The regression function can be interpreted as follows:

The value $x = 0.73$ says that if the average life expectancy increases, the dependency rate will increase by 0.73%.

Quality and living standards are parameters that must be built on if we mean the general good of the human population. Prolonging life expectancy can certainly be seen positively in the context of improving quality of life. However, this increase has the effect of increasing the expenditure side of the budgets of funded pension schemes. And caring for part of the retired population is, in a way, a litmus test for the social level of society. It is for this reason that we must approach the issue of adequate pensions, as seriously as possible, and at the same time we must look to the future with respect for the well-being of future pensioners. The analysis clearly showed a correlation between life expectancy and dependency.

5 CONCLUSION Country pension schemes are not only different but complicated in their fundamental nature. At work we touched only the surface of a complex problem, namely the basic structure. Anyway, the strength of the individual parts of the system has a high predicative value to the orientation of the economic policies of the states. The degree of empathy for the sustainability of the system directly reflects the direction of the social policy of the authorities. The countries of the world have undergone various forms of reforms over the past two decades, the resulting structure of which has affected the current situation in the countries. Percentage of GDP is different for stable systems than for systems financed on an ongoing basis. It expresses the financial demands or dependence of the system on the state.

Increasing pressure to fund pension systems will have an impact on setting the retirement age in the near future. To increase the sustainability of pension systems, it is necessary to reconsider the retirement age in the context of increasing life expectancy. The most advantageous setting turns out to be the so-called an automaton that automatically adjusts the retirement age to changes in average life expectancy

The Slovak Republic is one of the European countries most at risk of aging, but the sustainability of the pension system will change dramatically as a result of the constitutional law on retirement age 64 to March 2019. In addition to retirement age, we also have a life expectancy of 65, retirement and retirement. We analysed the impact of retirement age determination and stated that setting this limit is a significant interference with the sustainability of the pension system. This arrangement will threaten the stability of public finances and reduce pensions for future pensioners. The analysis showed that the only possible solution for

retirement age is linking retirement age to life expectancy which is the best alternative to the sustainability of the pension system.

The struggle for retirement age has put people and economists against each other, but the problem of retirement age needs to be seen in the long run. By 2050, sixty-two and older are expected to be two billion. It is obvious that not all people will live to retire in good health and indeed there are huge differences in socio-economic groups. Demographic change is inherently linked to changes in the economic structure and organization of economic activities. The sustainability of a pension system must be a top priority for each country.

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FDI AND COMPETITIVENESS

Serzhena Tcyrempilova

Abstract

In time of changes and in the process of globalization of the world economy, foreign direct investment plays an important role in economic growth and development of a country. To facilitate the development of competitiveness countries usually intervene through different measures and instruments. The article examines the changes in the flows and directions of global direct investment that occur in the world in the post-crisis period and tries to determine the effect of those changes on the competitiveness of countries based on UNCTAD's World Investment Reports. A study reveals that the existing model of movement of foreign direct investments is undergoing certain changes. It is associated with general economic and technological changes as well as geopolitical and institutional changes in recent years.

Keywords: *foreign direct investment, post-crisis trends, competitiveness, UNCTAD*

JEL Classification: F21; F23; O50

1 INTRODUCTION The role of foreign direct investment (FDI) in the country development has been debated by scholars and policy makers for many years. To answer such question is difficult, not only because of different existing ideological dogmas, but also because of evolution of basic characteristics of cross-border investment through the time. The FDI model has changed significantly over the past decades. Traditionally, FDI has been considered as the movement of capital mainly exercised by multinational corporations (MNCs) from developed countries to developing ones that traditionally seeking to exploit natural resources in the latter (Echandi et al, 2015).

According to Echandi et al (2015) such model has been changed. Nowadays FDI is connected not only with capital, but also with technology and know-how. They move not only from developed countries to developing, but also between developing as well as from developing states to developed. FDI is currently executed not only by large MNEs, but also by relatively small companies from developing countries that invest in countries outside theirs.

Also, FDI is viewed as a source of competitiveness as it represents a capital flow that transfers technology and knowledge from the country of origin to the host country. Thus, in time of changes it becomes important to understand recent FDI trends and their influence on competitiveness of the country. To define the recent trends of FDI World Investment Reports of UNCTAD were examined. The paper is organized as follows: the first part consists of some studies in the literature describing the role of FDI and its effect on competitiveness. The second part describes the methodology used to assess the recent trends in foreign direct investment and presents and discusses the results. The last part contains some concluding remarks.

2 THEORETICAL BACKGROUND Foreign direct investment is widely regarded as an important catalyst for economic development. Policymakers and economists believe that FDI can improve the technological potential and management style in the host countries, both in companies receiving FDI and in companies operating in the same industry or upstream industries. To reinforce these positive spillovers, governments in many developing countries and countries with economies in transition introduce special policies aimed to attract FDI (Liebscher et al, 2007).

The importance of the causes and consequences of FDI allowed the development of a number of theories that try to explain why MNCs choose one country in preference to another and why they choose a specific entry mode. Among all, Dunning's eclectic paradigm is considered to be a common framework for analysis of multinational companies' international business (Nha, 2013).

To summarize the arguments on FDI, Dunning came to an eclectic paradigm to give a more adequate explanation of the establishment and development of FDI. Dunning distinguishes three conditions that must be met in order for a company to be engaged in the process of foreign direct investment:

- Ownership-specific advantages (O-advantages)
- Location-specific advantages (L-advantages)
- Internalization advantages (I-advantages).

Two types of Ownership-specific advantages are identified by Dunning (1993). The first type of advantages contains the privileged ownership of assets by the firm (Oa). It includes, first of all, intangible assets, such as special technology which only this firm has. These advantages enable the company to create new assets, thus increasing their competitiveness. Another type of Ownership advantage derives from the joint management of existing assets (Ot) and additional assets that may arise from cross-border activities. It includes the advantages of branches of existing companies over new ones. These branches' advantages compared to new firms stem from its affiliation to the larger and more influential parent company. This gives to branches market knowledge, access to cheaper resources, low marginal R&D costs, etc. Thus, a company operating in many countries is in a better position than a local company.

In contrast to the advantages of ownership, which are internal to the firm, the advantages of location play the role of an external factor. The country to which FDI is directed should have special advantages in terms of location, which can be used with other advantages. Location advantages include proximity to consumers, cost advantages in terms of production in the host country markets, government incentives, appropriate economic structure, infrastructure, etc.

To explain the activities of companies across national boundaries, Dunning added the notion of advantages of Internalization that are related to the way firms organize the use of the existing advantages of Ownership and Location. The advantages of internalization are tightly related to the Ownership advantages. According to Dunning, internationalization helps businesses to enlarge and acquire those assets that give them the Ownership advantages. The scholar distinguishes between the advantages of ownership that a firm owned before it became multinational and the advantages that grow as a result of the direct participation of firms in international production.

Nowadays, FDI became the largest source of external financing in many developing countries. Achieving sustainable development goals will require a huge increase in capital flows to those countries on a scale that only private sector investment can provide. FDI supports development in ways other than providing capital. This helps emerging economies integrate into international markets. It also stimulates productivity growth through increased competition and the spread of knowledge across borders (World Bank, 2018).

The standard model states that foreign direct investment creates direct benefits, such as new capital and jobs, which, in turn, increase revenues from taxes and foreign exchange. However, the real impact of FDI on economic development is due to the indirect benefits, such as the

transfer of new technologies, labor skills, managerial and organizational practices, and the promotion of competition and innovation (Hornberger, 2011).

However, analysis by Carkovic and Levine (2005), that cited by Liebscher et al (2007), concluded that the exogenous component of foreign direct investment does not induce a robust, positive influence on economic growth and that there is no solid cross-country empirical evidence supporting the claim that FDI expedite economic growth. The researchers found that joint ventures produced positive upstream spillovers to suppliers whereas wholly owned foreign firms produced negative upstream spillovers. The reason can be that joint ventures tended to continue long-standing relationships with suppliers whereas wholly owned foreign firms required more sophisticated suppliers from abroad.

Gonzalez A. (2017) claims that over the past two decades, FDI from developing countries has grown twenty times and in 2017 represents almost one fifth of the global FDI flows. While large developing countries account for most of these outward flows, in 9 out of 10 developing countries there are companies that have opened foreign affiliates. OFDI helps firms from developing countries gain access to technology, capital, and markets. OFDI tends to flow into large growing economies that are geographically close and culturally similar to the investor's homeland.

There is growing evidence that outward foreign direct investment can increase the country's investment competitiveness, which is crucial for long-term sustainable growth. Thus, some countries use OFDI as a channel for new developments and catch-up strategies in order to acquire knowledge and technologies, modernize production processes, increase competitiveness, improve managerial skills and access to distribution networks (Stephenson and Perea, 2018).

3 RESEARCH METHODOLOGY The analysis is focused on the World Investment Reports published by UNCTAD annually. The paper attempts to define trends in FDI post-crisis period and their impact of competitiveness of the countries.

The fundamental idea behind international capital flows is that short-term flows can be easily reversed, while long-term flows are more stable. Crises are associated with withdrawals of short-term capital flows and an increase in foreign direct investment flows. Thus, it is generally accepted that foreign direct investment is least subject to cyclical fluctuations and is sufficiently resistant to crises. However, in recent years, despite the background of relatively stable growth of the world economy, there has been a drop in FDI.

4 RESULTS AND DISCUSSION Following the financial crisis in 2008, the flow of world FDI declined by more than 20% for two consecutive years and dropped from a record nearly \$ 2 trillion to \$ 1.19 trillion according to specialists of UNCTAD. The subsequent recovery growth in 2010–2011 again gave way to a fall in 2012 and 2014 (Table 1). The reduction in investments during this period fell on developed countries, mainly the United States and the EU.

Tab. 1 – Growth rates of GDP, trade, GFCF and FDI, 2010-2019 (%). Source: compiled based on UNCTAD’s World Investment Reports 2009-2020 and IMF’s World Economic Outlook Reports 2016-2020

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
GDP	4.0	2.8	2.3	2.5	2.6	3.5	3.4	3.8	3.6	3.3
Trade	12.5	5.9	2.6	3.6	3.4	2.6	2.5	4.7	3.7	1.0
Gross fixed capital formation (GFCF)	5.6	4.8	3.7	3.1	2.9	2.2	2.8	4.1	4.0	3.7
FDI	5	17.3	-18.2	4.6	-16.3	44	-3	-23	-13	3
FDI (projection)	16	22	9.6	3.6	17.1	11.4	-11	5	1-10	5-15

After crisis years significant outflow of FDI has been from developing and emerging countries. BRICS (Brazil, Russia, India, China and South Africa) has started to play an important role in the global investment pattern. According UNCTAD (2013b), as for FDI outflows, they account for almost one-tenth of the total outflow of investments. The growth of FDI outflow began somewhat later than the inflow. Moreover, BRICS investors were resilient to the crisis, while the outflow decreased only by 26% in 2009 compared with 41% for the world at large. Thus, the role of BRICS as investors has increased significantly. The lion's share of flows falls on China and Russia. A significant part of BRICS outward stock goes to developed countries. Mostly these investments have market-seeking motives (UNCTAD, 2013b).

However, over the past decade, bilateral FDI between the BRICS countries has grown rapidly. Outward FDI can play an important role in improving the global competitiveness of companies from developing countries. It provides access to strategic assets, skills, technology, natural resources, and markets. Investment flows among developing countries contribute enhancement of South-South cooperation. For example, according UNCTAD (2013b) Russian MNCs found their way to the BRICS countries, increasing their stock to \$1,1 billion. The goals of Russian MNCs are to ensure the supply of raw materials to the country and also to expand control over the value chains of their own natural resources. It would create sustainable competitive advantages and reinforce their market position in key developing countries.

Emerging multinational companies conduct their domestic activities in difficult conditions. It usually characterized by ineffective or absent market mechanisms. For example, the Russian companies encounter with adverse investment climate, administrative barriers and corruption which are more problematic than in other counties of BRICS. Moreover, a high level of political uncertainty in Russia remained, partly due to geopolitical factors. However, that drawback can switch to an advantage, since the ability of emerging multinational companies to “float” in such an environment makes them stronger than other companies in terms of investment in countries that have the same conditions. However, underdeveloped institutions in home country prevent companies from finding resources, including skilled labor and knowledge. Despite that, this experience helps emerging multinational companies to develop concrete capabilities that allow them to be more successful than companies from developed market in such conditions.

The after-crisis maximum of world FDI was reached in 2015 and amounted to \$ 1.76 billion, which was not much less than in 2007. The main factor behind the global recovery, as is commonly believed, was the sharp increase in the number of cross border mergers and acquisitions (M&A) that related to corporate finance restructuring. Such operations were especially intensive in the United States and Europe and were accompanied by the transfer of taxpayers of MNCs to jurisdictions with a lower corporate tax rate. At the end of the year, FDI inflows to developed countries doubled, which increased their share in world FDI inflows to 55%.

After a two-year downturn, the outward FDI from developed countries increased and Europe topped that list in 2015 (Table 2). After a sharp spike in investment in 2015, the 3% drop in global flows in 2016 did not look so dramatic. Investment in developed countries continued to grow and the decline in FDI in Europe was offset by an inflow to North America and other developed countries. After two years of decline, capital inflows to transition economies increased significantly, while developing countries were weakening their positions (Table 2).

Tab. 2 – FDI flows 2013–2019 (billions of dollars). Source: compiled based on UNCTAD's World Investment Reports 2018-2020

	FDI inflows							FDI outflows						
	2013	2014	2015	2016	2017	2018	2019	2013	2014	2015	2016	2017	2018	2019
World	1425	1404	2042	1983	1700	1495	1540	1381	1367	1708	1543	1601	986	1314
Developed economies	693	670	1274	1265	950	761	800	890	848	1276	1104	1095	534	917
Europe	350	330	720	675	570	364	429	388	301	806	572	539	419	475
United Kingdom	52	25	39	259	101	65	59	40	-151	-67	-38	118	41	31
United States	201	202	468	472	277	254	246	303	333	264	289	300	-91	125
Japan	2	12	3	19	11	10	15	136	131	136	156	165	143	227
Developing economies	649	677	730	652	701	699	685	415	446	400	414	467	415	373
China and Hong Kong	198	242	310	251	247	243	210	188	247	217	256	245	225	176
Transition economies	84	57	37	66	50	35	55	76	72	32	25	38	38	24
Russia	53	29	12	37	26	13	32	71	64	27	27	34	36	22

Contrary to the 5% growth in global direct investment projected in 2017 (to \$ 1.8 trillion), their volume declined by 23% (Table 1). Both M&A deals (-22%) and investments in new projects (-14%) contributed to the decline in investment. The decline in investment was observed in all sectors: the reduction in M&A affected the primary sector, industry, and services. The sharp fall in FDI in that year was in opposition to other capital flows. According to UNCTAD, total capital inflows in 2017 increased from 5.6 to 6.9% of GDP due to an increase in portfolio and other investments, represented mainly by bank loans.

While FDI flows to developing countries remained flat, developed countries lost 37% of their capital. Thus, the upward trend in FDI in 2015 and 2016 ended, when the annual inflow of investments to developed countries exceeded USD 1 trillion (Table 2). Key roles in this process were played by the United Kingdom, in which foreign direct investment declined after exceptionally large-scale mergers and acquisitions in 2016, and the United States, where the authorities took measures to combat tax evasion. Outflows of FDI from developed countries remained at the level of 2016. Due to an uncertain geopolitical situation and sluggish investment activity in the primary sector, investments in transition economies fell by 24% in 2017.

For 2018, UNCTAD again predicted an unstable growth of global investments by 10%, however, in 2018, international statistics recorded their fall by almost 13%. As a result, the aggregate volume of investments dropped to the minimum values of the 2008–2009 crisis period, and for Europe, where the inflow of investments fell by 73%, it returned to the level of the 90s (UNCTAD, 2019). Transition economies also continued to fall, while developing countries stayed stable in terms of investment inflows. The trend of fall in FDI is associated with geopolitical and foreign trade risks. The global climate for international trade and

investment is no longer as favorable as it was before, when the world economy was growing thanks to the export of goods and services as it was noted by UNCTAD experts.

The tax reform of US President Donald Trump, which stimulates the repatriation of foreign American capital to the country, also had a significant impact on the redistribution of global capital flows in 2018. The Tax Cuts and New Jobs Act, signed in the end of 2017, has made major amendments to the US tax code. This affected the investment activity of American multinational corporations and their foreign subsidiaries, and, possibly, intensified the development of returning of production capacity to the country.

In addition, protectionist tendencies have intensified. If in 2003 only 10% of the measures used by the countries limited foreign investment, now it is 34%, while two-thirds of the restrictive measures in 2018 were taken by developed countries. In total, national regulators banned \$ 153 billion in international mergers and acquisitions in 2018, double the number in 2017, under the guise of national security or antitrust concerns. The United States, Germany and a number of other European countries have become more cautious about foreign, especially Chinese, investments, fearing that foreigners will gain access to important technologies and assets. As a result, in the spring of 2019, the European Commission adopted a regulation to check FDI inflow to the EU.

In 2018, the above-mentioned negative factors most of all affected the developed countries, especially Europe, and FDI flows in this group of states decreased by 27% to \$ 557 billion, and their share in global capital flows fell to 43%. However, developed countries continue to determine the main trends in the global investment process (Figure 1). FDI inflows to developing countries were able to remain stable and increased to \$ 706 billion. As a result, the share of developing countries increased to 54% of global flows, compared to 46% in 2017. Some of this investment was generated by MNCs from developed countries operating in local markets.

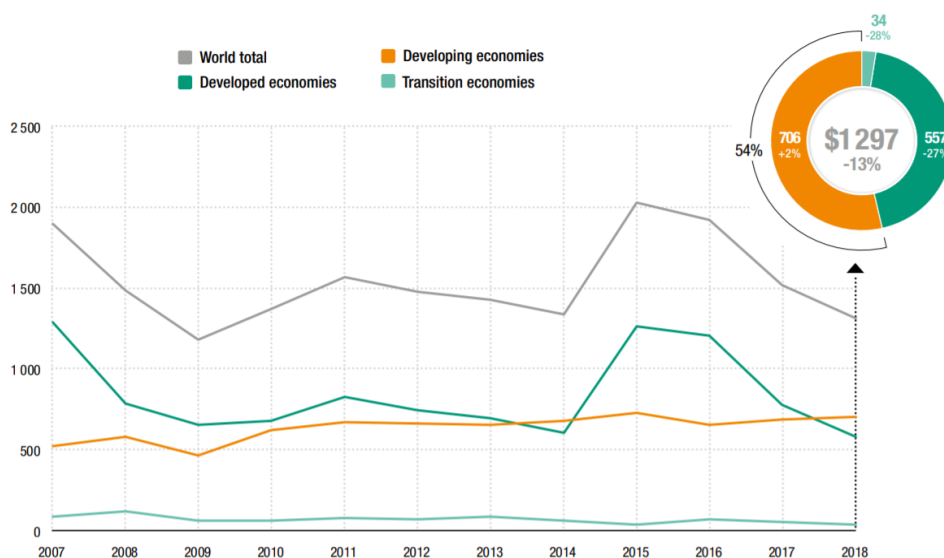


Fig. 1 – FDI inflows, global and by economic group, 2007–2018 (Billions of dollars and %).
Source: UNCTAD, World Investment Reports 2019

The dynamically developing states of Asia mainly tried to stimulate the inflow of investments. Investments in Vietnam, India, Indonesia, Thailand, as well as other countries of Southeast Asia have increased, since some companies are gradually moving production there from China due to the rise in the cost of labor in the country and the trade conflict with the United States.

However, these host states lack the appropriate infrastructure, so it is difficult to count on a steady increase in such investments in the region. In countries with transition economies FDI inflows fell by 28%, and their share in total flows was only 2.6%. This was mainly due to a two-fold drop in FDI volumes to Russia and, in part, to Kazakhstan (-18.3%) and Ukraine (-9.5%).

Although investments in assets in the United States in 2018 decreased by 9% to \$ 252 billion, the country is still confidently leading the list of FDI recipient countries, ahead of China by almost two times. The third and fourth places in the UNCTAD ranking are occupied by Hong Kong (China) and Singapore (Figure 2).

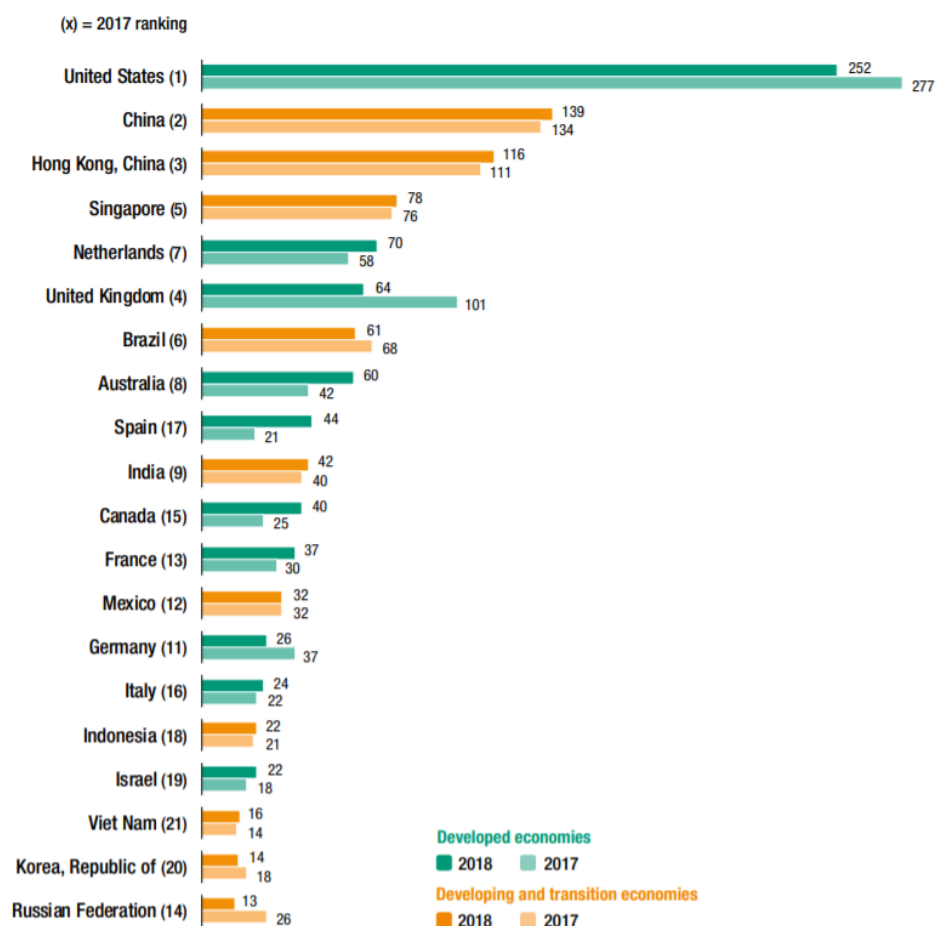


Fig. 2 – FDI inflows, top 20 host economies, 2017 and 2018 (Billions of dollars). Source: UNCTAD, World Investment Reports 2019

In 2018 Japan topped the FDI outflow rankings, followed by China and France (Figure 3). In turn, the Chinese authorities are trying to limit the outflow of investments abroad in order to expand domestic investment, due to which the inflows of FDI from the country to abroad decreased for the second year in a row, by 18% - to \$ 130 billion. In this list, one third of countries are also represented by Asian states. Particular attention should be paid to the recovery in 2018 of the positions of Switzerland and Ireland after a massive outflow of capital from those countries in the previous year. If the new tax model is successfully applied, these countries can turn into centers of attraction for capital, including those of Russian origin.

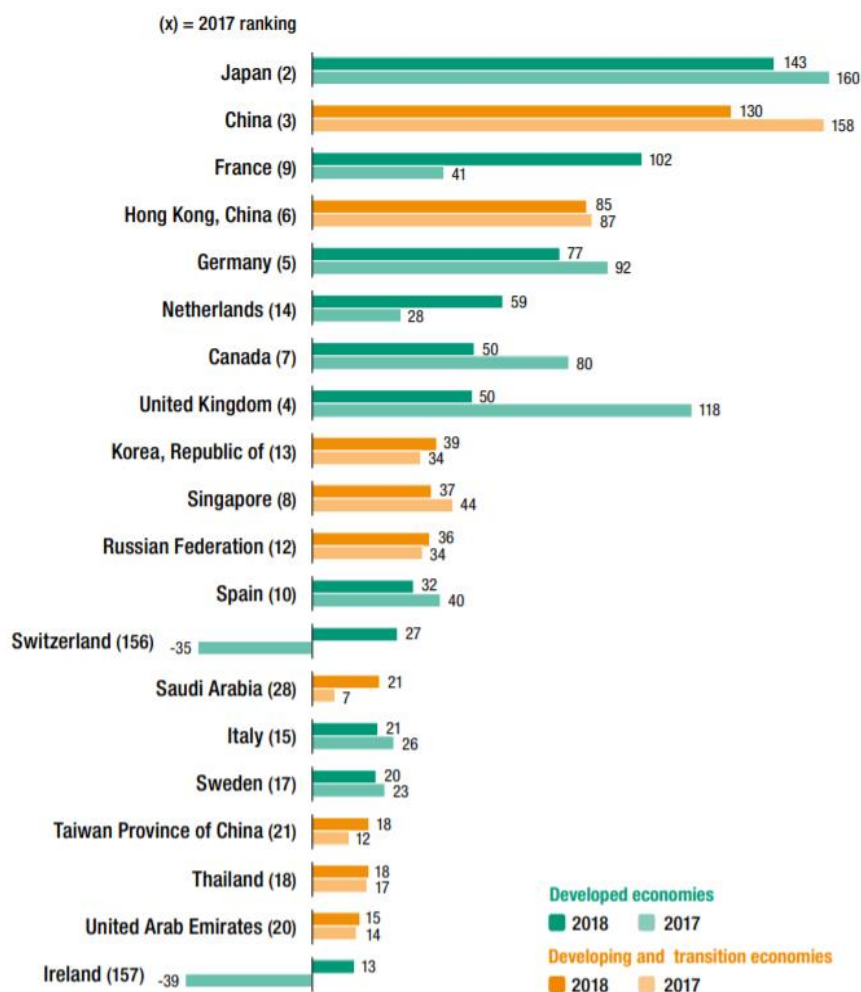


Fig. 3 – FDI outflows, top 20 home economies, 2017 and 2018 (Billions of dollars). Source: UNCTAD, World Investment Reports 2019

The decline in the dynamics of global investment is associated with structural changes in international business. It should be noted that a significant part of the ongoing expansion of international production is due to non-equity or intangible assets. In particular, the rating of the 100 largest MNCs by the size of foreign assets in 2018 shows a decrease in the number of industrial companies in it. The assimilation of innovative technologies and digital transformation in general have had a significant impact on global production. This contributed to an increase in the share of intangible methods of international production, since when the efficiency of cross-border operations is achieved, the need for tangible assets decreases. The increase in the share of intangible assets leads to a decrease in FDI, a slowdown in world trade in goods, an acceleration in trade in services (Figure 4). International investment in R&D is also on the rise. It should be noted that foreign value added in exports is a standard indicator of the importance of global value chains (GVC). Thus, the share of GVCs in trade gradually increased until 2010, but over the past eight years this indicator has also continued to decline for the reasons indicated above.

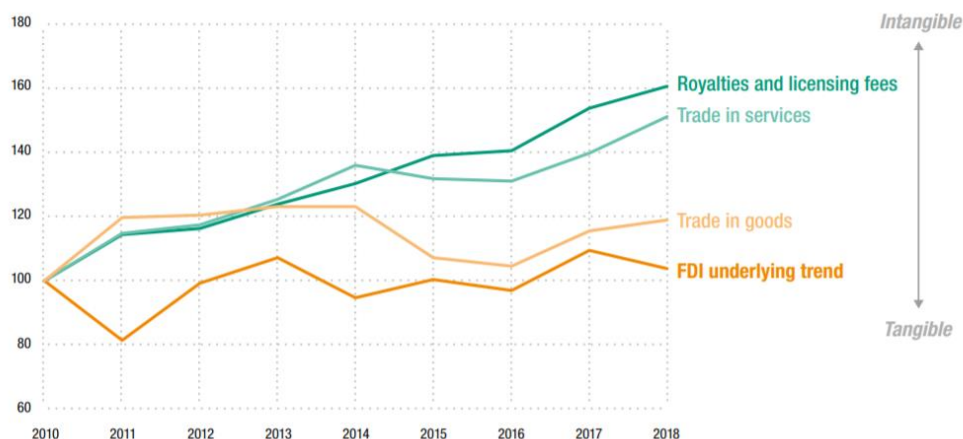


Fig. 4 – Indicators of international production, tangible and intangible, 2010–2018 (Indexed, 2010 = 100). Source: UNCTAD, World Investment Reports 2019

According UNCTAD’s (2020) calculations global foreign direct investment totaled US\$1.39 trillion in 2019. In terms of inward FDI, the United States remained the largest recipient of FDI in 2019, attracting \$251 billion in inflows. It followed by China with flows of \$140 billion and Singapore with \$110 billion.

UNCTAD found that flows to developed economies as a group fell by 6% to an estimated \$643 billion. It is only half of the recorded peak amount in 2007. Flows to developing economies in 2019 remained unchanged at an estimated \$695 billion which means that these countries continued to absorb more than half of global FDI.

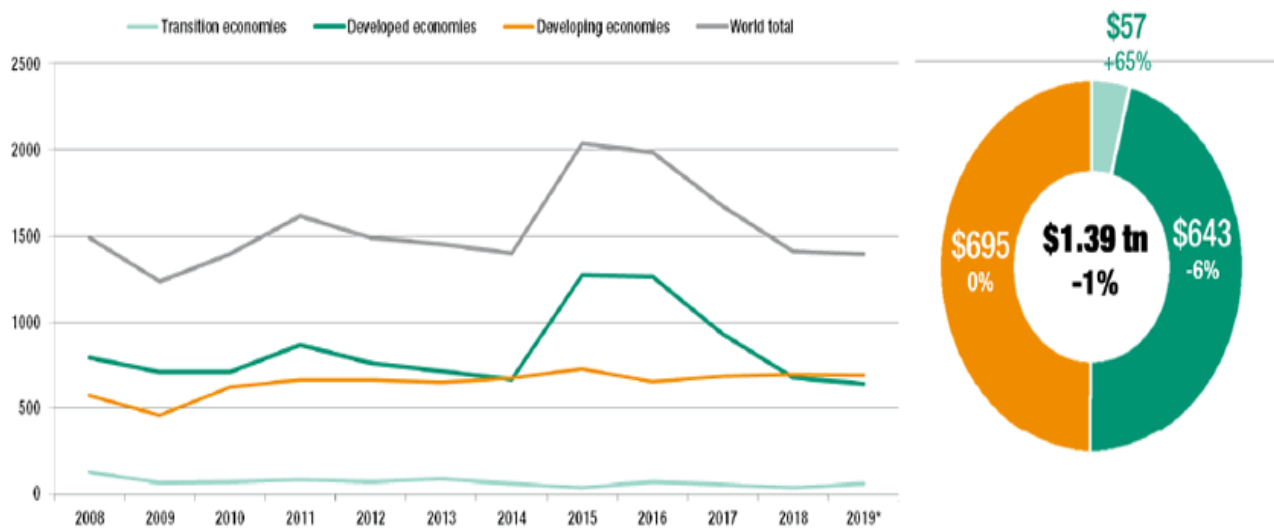


Fig. 5 – FDI inflows: global and by group of economies, 2008–2019* (Billions of US dollars). Source: UNCTAD (2020)

Thus, the trend of 2018 has stayed at place in 2019. However, following was highlighted by the UNCTAD (2020):

- The UK FDI fell 6% with the deployment of Brexit.
- Hong Kong, China hardship causes a 48% FDI decline.
- Singapore grew 42% in a buoyant region of the Association of Southeast Asian Nations.
- Zero flow growth to both the United States and China.

- Inflows to Russia more than doubled to \$33 billion.
- Brazil up 26% at the start of a privatization program.
- Inflows into Germany triple as multinational enterprises provide loans to foreign affiliates in a year of slow growth.
- Cross-border mergers and acquisitions (M&A) declined by 40% in 2019 to \$490 billion. The fall in the services sector was deepest.

It can be stated that in the current decade, flows of foreign direct investment have been subject to unusually strong fluctuations. Such volatility is not typical for other macroeconomic indicators, in particular, for GDP growth, Gross fixed capital formation, and growth rate of trade. Almost all forecast values of foreign direct investment, as seen from table 1, differ several times from the actual results, and in some cases even have the opposite directional vector. In this regard, the assumption arises that the existing model of movement of foreign direct investments is undergoing certain changes.

This process might occur due to a number of factors. The first group of factors is associated with the ongoing economic and technological transformation in the world. The fourth industrial revolution (Industry 4.0) is already having an impact on foreign economic relations and is making changes in the processes of globalization. The decision to invest in a particular country in the 90s and early 2000s was largely based on the cost of labor, especially when it came to labor-intensive industries and services. Large-scale and versatile robotization solves this issue and is one of the reasons for the transfer of foreign industries of MNCs to the home countries. The second group of factors is associated with the institutional changes that have taken place in the last decade. Despite the declared course of the G20 countries to reduce protectionism in trade policy, in reality from 2008 to 2016 the number of protectionist practices three times exceeded the number of liberalization measures (Kheifets, 2018).

5 CONCLUSION The processes of the world economy globalization form new trends in the cross-border movement of capital. Investment plays a crucial role both at the macro and micro level. As international experience shows, investment is one of the most important factors in the economic prosperity of any country. In fact, they determine the future of the country as a whole, of a separate business entity and are a driving force in the development of the economy (Chaudhuri and Mukhopadhyay, 2014).

Thus, it can be noted that during the post-crisis period, despite the rather favorable macroeconomic conditions, the global flows of FDI experience serious fluctuations. They mostly affected developed countries and countries with economies in transition. The volatility of cross-border capital movements is based on both objective factors caused by the economic and technological transformation, and subjective factors associated with institutional constraints and geopolitical features.

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Conference Program

13:00	CONFERENCE OPENING	prof. Dr. Robert Magda
13:15	ACADEMIC CAPITALISM IN HUNGARY: BUSINESS ORIENTED TRANSFORMATION OF THE HUNGARIAN HIGHER EDUCATION SYSTEM	Atilla Makai
13:30	ROLE OF BIG DATA TECHNOLOGIES IN BUSINESS ANALYTICS	Adam Suhajda
13:45	FDI AND THE COMPETITIVENESS	Tcyrempilova Serzhena
14:00	EFFECTIVENESS OF INSTRUCTORS PERFORMANCE APPRAISAL PROCESS IN WOLDIA UNIVERSITY: A CASE OF MAIN CAMPUS	Mohammed Nuru Siraj
14:15	EVOLUTION OF MAIN IDEAS ABOUT SOCIAL RESPONSIBILITY	Pavol Križo
14:30	DISCUSSION + BREAK	
15:00	ONE OF THE MAJOR CHALLENGES OF THE 21 st CENTURY: THE RISKS OF DIGITALIZATION	Edina Erdei
15:15	CORPORATE FINANCIAL INDICATORS ACCORDING TO NACE, PROCESSING, AND APPLICATIONS – CASE SLOVAKIA	Ladislav Kabát
15:30	ANALYSIS OF THE OPPORTUNITIES TO PREVENT EXTREMISM AND OTHER FORMS OF INTOLERANCE MORE EFFECTIVELY AGAINST MIGRANTS IN THE EUROPEAN UNION	Marcel Lincényi
15:45	BLOCKCHAIN: REVOLUTIONIZING THE AGRI-FOOD SUPPLY CHAIN BY BUILDING TRUST AND TRANSPARENCY	Aleksandra Angeloska
16:00	SUSTAINABLE DEVELOPMENT OF THE EUROPEAN BANKING SYSTEM: APPROACHES AND DIMENSIONS IN THE GLOBALIZATION CONTEXT	Mykola Sidak
16:15	SUSTAINABILITY OF THE PENSION SYSTEM IN SLOVAK REPUBLIC - FOCUS ON RETIREMENT AGE, LIFON THE COST OF CLIMATE CHANGESE EXPECTANCY AND AGE DEPENDENCY RATIO	Katarína Švejnová
16:30	DISCUSSION + BREAK	
17:00	MODELLING OF THE TENDENCIES OF FUNDING HEALTHCARE IN THE EU COUNTRIES	Nadiya Dubrovina
17:15	INTERNATIONAL TRADE OF THE SLOVAK REPUBLIC IN TIMES OF SARS-COV-2 PANDEMIC	Michal Fabuš
17:30	STARTUP BUSINESS IN THE EUROPEAN UNION: LEGAL ASPECTS	Edita Hajnišová
17:45	THE ANALYSIS OF CONSEQUENCES OF THE FINANCIAL CRISIS ON THE MARKET OF DAILY PRESS IN THE SLOVAK REPUBLIC	Marcel Lincényi
18:00	ON THE COST OF CLIMATE CHANGES	Andrej Rácik
18:15	ON ORGANIZATIONAL ASPECTS OF ECONOMIC DIPLOMACY	Marek Csabay
18:30	CONFERENCE CLOSURE	

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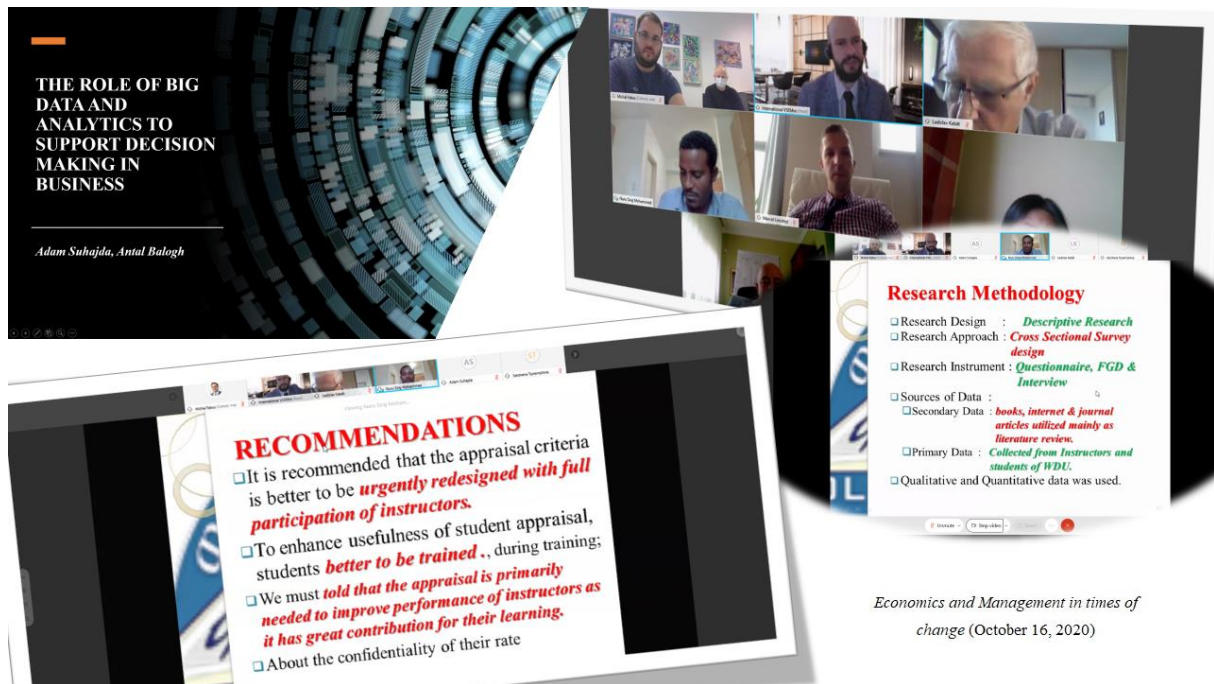
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Conference Gallery



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