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INTRODUCTION

The **9th edition of the International Scientific Conference** entitled **IFRS: Global Rules & Local Use – Beyond the numbers was organised online jointly by** Metropolitan University Prague and Anglo-American University in Prague and on October 7 and 8, 2021.

Similarly to the last year, resulting from the prolonging pandemic crisis COVID-19, the conference was again organized fully online with the use of virtual communication techniques.
There were more than 100 visitors and participants during the conference days.

The final proceedings include contributions authored by conference participants presented during the conference days. The submissions have been reviewed and accepted by the conference editorial team and international external reviewers.

The programme was organized in two days as follows:

Day I Thursday, October 7th:
Opening ceremony
Irena Jindřichovská | Jan Vašenda | Michal Klíma (Rector MUP) | Jaroslav Miller (President AAU)

Keynote Speakers I – Chair: Irena Jindřichovská

- Welcome Chitchat | David Alexander Is the morality of sustainability? (performed by David Muir)
- Capital Markets and Financial Reporting: Real life examples | Olga Cílečková and Miroslav Šmíd, ACCA/PwC Česká republika
- Entrepreneurial Self-Efficacy, Leadership Styles and Entrepreneurial Passion with a case study from Peru | Eleftherios Thalassinos, co-author Diego Norena-Chavez
- Effect of Covid-19 on international trade among V4 countries | Erginbay Uğurlu, co-author Irena Jindřichovská

Keynote Speakers I – Discussion

Thursday sections:

- **Reporting and IFRS I** – Chairs: Irena Jindřichovská, David Muir
- **COVID-19** – Chair: Jan Vašenda
- **CSR/Integrated and Non-Financial Reporting** – Chair: Radka MacGregor Pelikánová
- **Open discussion in online Lounge Room**

Day II Friday, October 8th:
Keynote Speakers II – Chairs: Irena Jindřichovská, David Muir

- Global vs local in the field of accounting governance (regulation) | Catalin Albu, co-author Nadia Albu
- The impact of Russian agri-food import ban on EU countries | Luboš Smutka, CULS
- ESEF in 2021 – lessons learned | Aleš Králík, MFČR
- Cryptocurrency revolution and a traditional finance curriculum | Peter Lerner, AAU
- Global Positioning and strategies of the Chinese Pharmaceutical Industry | Bernadette Andreoso, University of Limerick, Ireland

Keynote Speakers II – Discussion

Friday sections:

- **Reporting and IFRS II** – Chair: Dana Kubíčková
- **Legal Aspects and International Trade** – Chair: Jaroslav Halík
- **Quantitative studies and management** – Chair: Alžběta Zíková

Closing and Official End of the Conference – Irena Jindřichovská, Jan Vašenda

Reporting and IFRS

ANALYSIS OF SLOVAK AUDIT COMPANIES OPERATING IN AUDIT NETWORKS

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Abstract
Statutory audit in Slovak Republic is performed by statutory auditors (as individuals) or audit companies. Some of audit companies are members of the audit networks. The existence and operation of the audit networks could be understood as one of the results of globalization that allows an increasing possibility of audit companies cooperation, even at global level. Accordingly, even audits of financial statements have become increasingly global. The goal is to clarify the state of Slovak key audit companies operating in the audit networks in terms of revenues from statutory audits. To achieve the goal, it was necessary to choose a purposeful work methodology and research methods, based primary on analysis of data from the list of Slovak audit companies in order to demonstrate the number of Slovak audit companies operating in audit networks. Then, in order to demonstrate revenues from statutory audits, it was necessary to analyze Transparency Reports of key audit companies as in Transparency Reports, there are disclosed relevant financial information. The results show a high market concentration of statutory audits carried out by Slovak key audit companies operating in networks.

Keywords: *Slovak audit companies, audit networks, list of Slovak audit companies, revenues from statutory audits*

1. INTRODUCTION

As the globalization (of trade and industry) continued to increase, companies have started to operate internationally. Pakšiová and Lovciová (2019, pg. 73) presented that "globalization, accompanied by rapid technological changes, has given rise to a completely new business environment". One of the reactions of audit companies for this situation was the establishment of the audit networks.

In supranational and national legislation of statutory audit, a term "Network" is defined primarily in the International Standards on Auditing issued by IAASB (known as "ISA"), International Code of Ethics for Professional Accountants issued by IFAC (known as "IFAC Code of Ethics"), Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC (known as "European Directive 2006/43"), Slovak Act No. 423/2015 Coll. on Statutory Audit and on amendments and supplements to Act No. 431/2002 Coll. on Accounting, as amended (known as "Act on Statutory Audit") and Code of Ethics for Auditors (see Table 1). We would underline that Code of Ethics for Auditors is identical to the Code of Ethics for Professional Accountants issued by IFAC in accordance with art. 2 (18) of the Act on Statutory audit. In other words, the Code of Ethics for Auditors is always amended in accordance with the current wording of IFAC Code of Ethics.

Table 1. Definitions of a term "Network"

	"Network"
ISA Glossary	A larger structure: that is aimed at cooperation, and that is clearly aimed at profit or cost-sharing or shares common ownership, control or management, common quality control policies and procedures, common business strategy, the use of a common brand name, or a significant part of professional resources
IFAC Code of Ethics Glossary	A larger structure (a) that is aimed at co-operation; and (b) that is clearly aimed at profit or cost sharing or shares common ownership, control or management, common quality control policies and procedures, common business strategy, the use of a common brand-name, or a significant part of professional resources.
European Directive 2006/43 Art. 2 (7)	The larger structure: - which is aimed at cooperation and to which a statutory auditor or an audit firm belongs; and - which is clearly aimed at profit or cost-sharing or shares common ownership, control or management, common quality-control policies and procedures, a common business strategy, the use of a common brand-name or a significant part of professional resources
Act on Statutory Audit Art. 2 (12)	A cluster aimed at cooperation and to which a statutory auditor or an audit firm belongs, and a) which is clearly aimed at profit- or cost-sharing; or b) shares common ownership, control or management, common quality-control policies and procedures, a common business strategy, the use of a common brand-name or a significant part of professional resources

Source: own processing according to ISA, IFAC Code of Ethics, European Directive 2006/43, Act on Statutory Audit

Table 1 shows, that the definitions of a term "Network" are aligned very closely. It is because these definitions reflect the long-term market response on the part of audit profession to the growing international nature of business and the increased number of professional services. However, if we focused on potential practical implementation of these definitions, we could identify some key issues as areas of concern. The above-mentioned definitions nevertheless seek to apply a principles-based approach and thus require groups themselves to consider whether they are networks. In essence, if a grouping either holds itself out as acting in concern (i.e. common brand-name) or affiliate together closely that any of them could influence the audits carried out by any other, then they should consider themselves a network.

Generally, many audit companies are members of the networks through which they affiliate with other companies for various business and client service purposes. Even in Slovakia can meet the fact that audit companies are members of the networks.

2. LITERATURE REVIEW

Most of audit networks are global in nature. A global audit network is a collection of legally separate audit companies, united by a common brand as well as common policies, practices, and technologies. Of course, the degree of standardization and integration across the member audit companies varies among networks. In this context, authors Lenz and James (2007, pg. 367) in their research describe the governance structure of international audit firm networks.

In addition, most of the audit companies operating in network currently in Slovakia do not provide services only in the field of statutory audit. They extend the services mainly with other assurance services, consulting, and even risk management services. "It is also because every enterprise may face the risk of business default" (Kováčová and Klieštik and Valášková and Ďurana and Juhászová, 2019, pg. 744). In such cases, according to authors Lenz and James (2007, pg. 368), an audit network is the network of "Professional Services", which in an interconnection of independent audit companies that choose to merge for reduction of costs effectively and provision of professional services to the clients through an organizational framework.

Current researches in the field of audit network have been carried out in terms of impact on audit fees and audit quality as well. Authors Bills, Cunningham and Myers (2016, pg. 767) investigated the issue in U.S. and found that audit fees are higher for clients of member audit companies. In case of small audit firms, the research examined that membership helps in overcoming barriers to auditing larger audit clients.

Mao, Qi, and Xu (2017, pg. 262) investigated the effects of network membership on audit fees and audit quality in China but they did not confirm that audit quality is higher for member audit companies.

In other research, carried out by Carson (2009, pg. 355), there was investigated that audit fees are consistently associated with global audit specialists.

The monitoring of the statutory audits in Slovakia is in responsibility of Auditing Oversight Authority as the only institution with information about revenues of all statutory auditors and audit companies. The Authority published the research (in Trend, 2020) in which it focused on the revenues of all audit companies carried out statutory audits only of PIEs in year 2019. According to the analyses done by the Authority, audit company PwC Slovensko achieved the highest market share of statutory audit services to PIEs in 2019.

3. METHODOLOGY AND DATA

The goal of this paper is to clarify the state of Slovak key audit companies operating in the audit networks in terms of revenues from statutory audits. In accordance with the set goal, the paper contains 2 research questions.

Research question 1: Which Slovak active audit companies are members of the audit networks and which of them are monitored by EU?

To demonstrate the number of Slovak active audit companies operating in the networks properly, it was necessary to analyze data from the list of Slovak audit companies. The list of audit companies in Slovakia is maintained in accordance with art. 11 of the Act on Statutory Audit by Auditing Oversight Authority. Auditing Oversight Authority was established on 1 January 2008 and, as of 31 March 2008, it took over the management of the lists of audit companies and the statutory auditors from the Slovak Chamber of Auditors. This list, in accordance with the requirements of the European Union, is publicly accessible register, published on the Authority´s website.

The list of audit companies maintained by Auditing Oversight Authority contains, in accordance with art. 11 (2i) of the Act on Statutory Audit, information about audit company´s membership in a network and all entities belonging to the network and affiliates of audit companies and their registered office or reference to the place where the information is available to the public.

Some of these audit companies are subject of monitoring within European Union (known as "EU"), even at network level in relation to the services provided to Public Interest Entities. Based on the list identified by the Committee of European Auditing Oversight Bodies (known as "CEAOB"), there are 10 key audit companies monitored at network level (see Table 3).

Research question 2: What revenues from statutory audits did the Slovak audit companies monitored at network level achieve?

To demonstrate this, we focused on financial information published in Transparency Reports of each audit company, especially according to art. 12 (2k) of Regulation (EU) No. 537/2014 of the European Parliament and of the Council of 16 April 2014 on specific requirements regarding statutory audit of public-interest entities and repealing Commission Decision 2005/909/EC (known as "Regulation (EU) No. 537/2014") on the total turnover of the audit company, divided into the following categories:

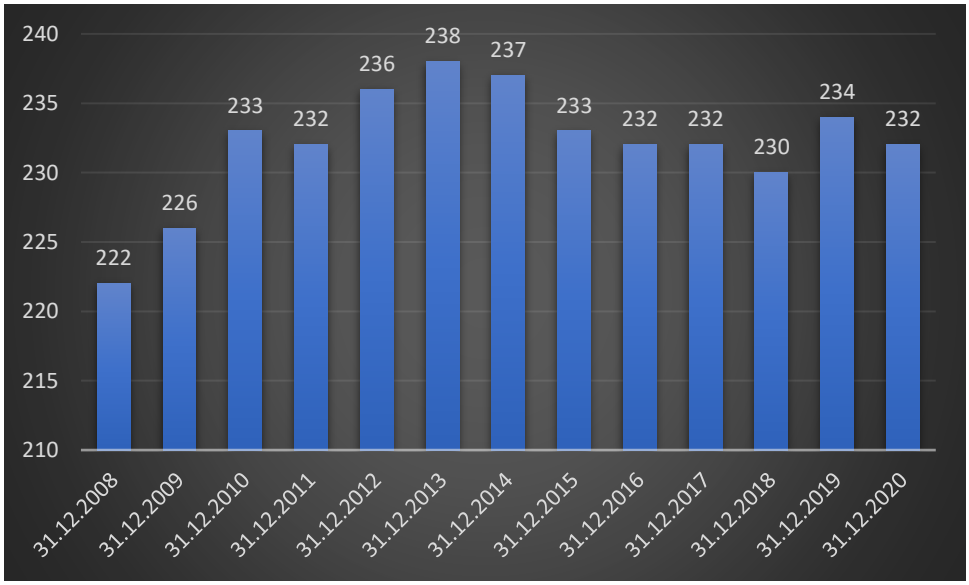
(i) Revenues from the statutory audit of annual and consolidated financial statements of PIEs and entities belonging to a group of undertakings whose parent undertaking is a PIE;

(ii) Revenues from the statutory audit of annual and consolidated financial statements of other entities.

4. RESULTS AND DISCUSSION

In Slovakia, there have been several audit companies and statutory auditors, too. As of 31 December 2020, there were 232 audit companies with an active license (see Figure 1).

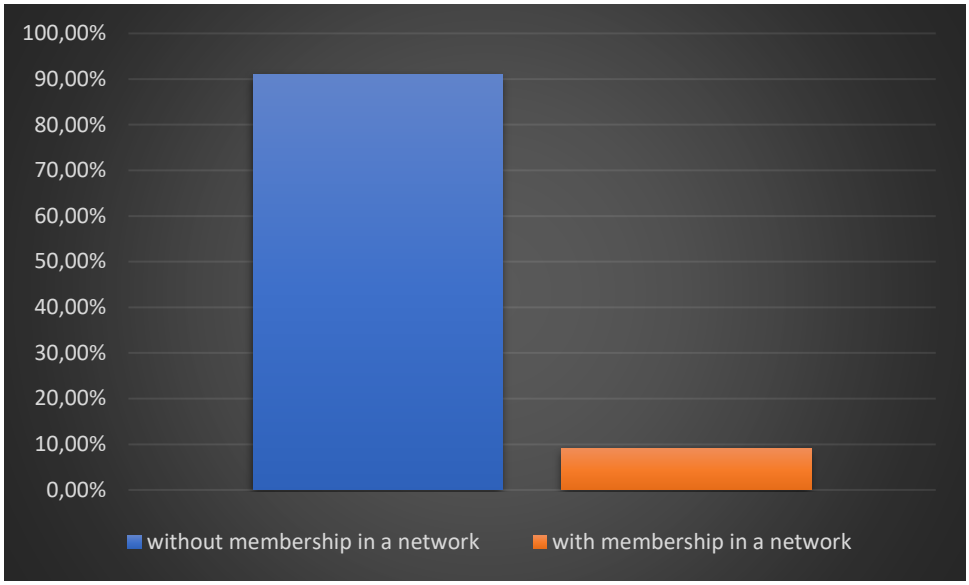
Figure 1. Audit companies with an active license in individuals years



Source: Register of Auditing Oversight Authority

Figure 1 below shows no significant change in the number of audit companies with the active license in recent years. In the list of 232 Slovak active audit companies (in year 2020), 20 audit companies which is approximately 10% are members of a network (see Figure 2). This is due to a fact that Slovak audit companies are usually smaller and medium sized, operating only on the national market. So, they do not have such a need to be integrated into a network.

Figure 2. Overview of Slovak audit companies and their membership in a network



Source: own processing

These 20 Slovak audit companies are members of 17 different audit networks (see Table 2).

Table 2. Slovak audit companies operating in audit networks

Audit Network	Slovak Audit Company
Moore Stephens International Limited	BDR Consult spol. s r.o. BDR, spol. s r.o.
Deloitte Touche Tohmatsu Limited	Deloitte Audit s.r.o.
Grant Thornton International	Grant Thornton Audit, s. r. o.
PKF International Limited	PKF Slovensko s. r. o.
ALFA AUDIT	ALFA AUDIT, s.r.o.
KPMG	KPMG Slovensko spol. s r.o.
Rödl	Rödl & Partner Audit, s.r.o.
PricewaterhouseCoopers International Ltd.	PricewaterhouseCoopers Slovensko, s.r.o.
Mazars	Mazars Slovensko, s.r.o.
LeitnerLeitner	BMB Partners s.r.o. LeitnerLeitner Audit SK s.r.o.
Consultatio	AUDÍTORSKÁ A ÚČTOVNÁ SPOLOČNOSŤ, s.r.o. A - Consultatio spol. s r.o.
Ernst & Young Global	Ernst & Young Slovakia, spol. s r.o.
Nexia International	VGD SLOVAKIA s. r. o.
HLB INTERNATIONAL	MANDAT AUDIT, s.r.o.
Baker Tilly International	TPA AUDIT, s.r.o.
BDO International	BDO Audit, spol. s r. o.
Crowe Global	Crowe Advartis Assurance s.r.o.

Source: Register of Auditing Oversight Authority

Table 3. Revenues from statutory audits of Slovak key audit companies monitored at network level

Slovak Audit Company	Membership in Audit Network	Revenues from statutory audits (year 2020, in EUR)			%
		Revenues from statutory audits related to PIEs	Revenues from statutory audits related to other entities	Total	
KPMG Slovensko spol. s r.o.	KPMG	4 828 000	5 137 000	9 965 000	26,75
		financial year ended 30 September			
Pricewaterhouse Coopers Slovensko, s.r.o.	PwC	4 074 000	4 517 000	8 591 000	23,06
Ernst & Young Slovakia, spol. s r.o.	Ernst & Young	2 531 000	5 783 000	8 314 000	22,32
		financial year ended 30 June			
Deloitte Audit s.r.o.	Deloitte	2 120 000	3 034 000	5 154 000	13,84
Mazars Slovensko, s.r.o	Mazars	672 125	690 174	1 362 299	3,65
		financial year ended 31 August			
VGD SLOVAKIA s. r. o.	Nexia	125 074 *including revenues of entities subject to oversight according to the Act on Statutory Audit, art. 2 (15f)*	968 452	1 093 526	2,94
BDR, spol. s r.o.	Moore Stephens	82 250	741 303	823 553	2,21
BDO Audit, spol. s r. o.	BDO	78 000	704 000	782 000	2,10
		financial year ended 30 September			
TPA AUDIT, s.r.o.	Baker Tilly	13 000	597 000	610 000	1,64
Grant Thornton Audit, s. r. o.	Grant Thornton	0	554 206	554 206	1,49
Σ		**14 523 449**	**22 726 135**	**37 249 584**	**100,00**

Source: own processing according to Transparency Reports

Although according to Regulation (EU) No. 537/2014, an annual Transparency Report shall make public (after the end of each financial year) only an audit company (or a statutory audit) that carries

out statutory audits of PIEs, in case of Grant Thornton the Transparency Report was published anyway, containing information that the company in financial year ended 31 December 2020 did not carry out any statutory audit of PIEs.

However, in addition to the above-mentioned audit companies, it is necessary to keep in mind the fact that, there are also other audit companies and statutory auditors carrying out statutory audits of PIEs.

Table 3 shows a high market concentration of statutory audit services provided by Slovak audit companies operating in the networks. In all mentioned statutory audits performed by audit companies in the networks, companies of "Big 4" reached a market share up to 85%. The audit company KPMG Slovensko reached the highest revenues for statutory audits directly related to PIEs and the audit company Ernst & Young Slovakia reached the highest revenues for statutory audits related to other entities.

4. CONCLUSION

In this paper, we point out Slovak audit companies operating in the network as one of the possible forms of cooperation among audit companies, especially at global level. In Slovakia, less than 10 % of all active audit companies are members of the audit network. However, most of these audit networks belong to key audit networks, which are monitored by the EU. The market with the provision of statutory audit services evolves over time. Therefore, it was necessary to analyze the market of Slovak audit companies operating in networks, particularly as regards the risks that arise from high market concentration. It is a persistent phenomenon which point out possible areas for further assessment. The above-mentioned market concentration is influenced by several factors. One of these factors is that many of audited entities (including PIEs) are large sized and specific so carrying out the statutory audit requires sufficient personnel and time capacity, as well as knowledge and experience in field of their business. All factors could be covered by the membership of audit companies in the networks.

Acknowledgement
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Regulation (EU) No. 537/2014 of the European Parliament and of the Council of 16 April 2014 on specific requirements regarding statutory audit of public-interest entities and repealing Commission Decision 2005/909/EC.

ERP SYSTEMS IN HIGHER EDUCATION. PROFESSIONAL TRAINING FOR THE FUTURE WORKFORCE

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Abstract
The interest in using and understanding Enterprise Resource Planning Systems has grown greatly over time. Today, knowing such a system is essential in the business environment for the current and future workforce. The purpose of the paper is to teach a program or course related to the use of an ERP system in higher education. This system involves various development projects and is considered the software that can essentially changes the fundamental work processes in business. The business trend of knowing and understanding this type of system has a significant impact on the careers of current and future employees. The first objective of this paper is represented by the opportunities to teach a training program related to the use of the ERP system. Generally, the programs and courses in higher education don't offer specialized support regarding the understanding of ERP system concept. An experiential course in teaching and using such a system can better prepare students to become future experienced employees. The second objective of the paper was to analyze the vision of Romanian respondents on the topic approached. Nowadays, on the Romanian market, very few graduate students possess knowledge related to the ERP and the impact that this system has on the industry / economy. The Romanian market was chosen and analyzed because it has a strong and competitive business environment and is dominated by multinationals. Therefore, the article presents a quantitative research. The analysis tool was the questionnaire. Following the responses received, the respondents' profile was sketched, and a statistical analysis was performed.

Keywords: *Enterprise Resource Planning, Higher Education, Performance, Professional Training,*

1. INTRODUCTION

The ERP system is a solution for the business environment because it offers complete functionality in an integrated way, using a single IT architecture. The ERP system changes the fundamental work processes in business, thus involving different design and development functions of the company with the help of the software. The general spirit of this paper is about the practical/ experiential learning of an integrated system in college. Therefore, this paper focuses on the idea of improving the labor market through the practical experience that students who work in a real ERP system during college can gain.

Why is this system so important and why is it so recommended and necessary to teach it in the education system? It is essential because any graduate student will be engaged in the studied field and will have to use a computer system. At the moment, there are many graduate students who do not know how to use an integrated system. In fact, most of the time, companies that use an integrated system offer training. However, individual training cannot be offered to every new employee. It would also be very useful for students to benefit from some practical training on an integrated system during college. Of course, there are certain colleges that operate this type of course during the master's program. However, this training should be done during college because most students are hired after graduation. The phenomenon of hiring a student from the college is widespread in Romania. Besides the fact that they do not know how to practice at all, they also do not know how to use computer systems.

Clearly, ERP concepts can be taught in a university environment. Exposing students to such a system type strengthens their learning experience (for example: experiential learning). It improves

their ability to understand business concepts and principles of calculation. Students are able to develop skills related to the use of the ERP system, which is an appreciation for recruiters (Watson and Schneider, 1999).

This article is structured in four parts. In its first part, we presented three important topics: the ERP system, the educational system, and higher education, based on the literature review. The research methodology is composed of four essential components: the literature review, the questionnaire, the case study, and results analysis.

The literature review focused on information about the ERP system and what it represents for companies in different fields of activity. The system is a key factor in any management decision. Of course, to respond to management needs, the employees had to adapt to new requirements and learn this type of system. Even current employees appreciate the fact that if they had practiced in college for at least a few hours in this system, it would have been easier for them to understand. At the same time, the ERP system is a necessity for future employees. A candidate who has little experience in such a system can be propelled directly to the position for which he applied.

The first question of the research was: How important is to hire experienced students during college for employers? The second question of the paper was: How effective is teaching an ERP system course during college? The last question of the research referred to: How do the respondents who activate to the Romanian market appreciate the mentioned subject?

In the second part of the article, we conducted a case study, based on the application of a questionnaire that allowed measuring the importance of implementing a course in the faculty for students to learn how to use an ERP system. At the same time, the research provided direct answers to the research questions

The paper includes a research on the companies operating on the Romanian market. Based on the results obtained, we performed a results analysis, identifying the influence of the presented topic on the vision of the respondents.

2. LITERATURE REVIEW

2.1 Important aspects about Enterprise Resource Planning (ERP)

ERP is a business management system that is usually used to organize data from all departments of the organization. ERP provides an integrated view of business processes, often in real time, using common databases maintained by database management systems. The ERP system manages commercial resources, raw materials, cash, production capacity, orders, and sales. The system shares data between different departments (procurement, accounting, sales, manufacturing, etc.) and provides key data in decision making. ERP facilitates the flow of information between business functions and manages connections with external stakeholders (Dawangan et al., 2017).

ERP system is a customized, software-based system that can handle the most important information requirements related to a company. It features a software architecture that facilitates the information flow for all company functions. The system uses a unique database and supports a certain development environment. It offers customization to companies depending on the specifics of each to support an organization’s business processes (Watson and Schneider, 1999).

Danvenport (1998) states that ERP is a transaction processing system, which is defined as a strategic business solution that integrates all business functions, including manufacturing, financial, and distribution. However, it is continuously redefined based on the organization needs.

Klaus, Rosemann and Gable (2000) describe the ERP system as a complete software solution. ERP systems can combine several areas such as production, order management, financial systems, human resources, suppliers, and customers, in a well-integrated system with visible data in real time (Chen, 2001).

The ERP system improves the business process and reduces costs (Beheshti, 2006; Nah et al., 2001). The system also facilitates the communication and coordination of administrative activities.

Improves the ability to implement new functionalities reducing the maintenance costs of the information system (Siau, 2004). A successfully implemented ERP system can be the backbone of smart business for an organization, because it provides to managers an integrated view of business processes (Nash 2000; Parr and Shanks, 2000).

2.2 ERP system in Higher Education

Higher education has been strongly influenced by global trends, in particular as a result of government demand for universities around the world to improve their performance and efficiency (Allen and Kern, 2001). Rising expectations of stakeholders (especially governments, company shareholders, managers, and students) who want marked quality performance and competitive education environments.

Due to the decrease in government support, universities around the world were pressured to adopt new strategies to improve their performance (Fisher, 2006). As a result, the higher education sector has turned to the ERP system in hopes of helping them cope with the changing environment (McCredie and Updegrove, 1999).

Therefore, existing computer and administrative systems were replaced with ERP in these institutions (Pollock and James, 2004). This implementation aimed to achieve more efficiency and accessibility for all members (especially for the students who will become future employees) and improve university performance by providing better managerial tools and well-trained students for the labor market (Kvavik et al., 2002).

Such a program provides practical and meaningful learning opportunities for both: college and students. Such a course requires practical exposure of students to a real ERP system and a repository of related resources. For example, what is the purpose of an ERP initiative and how it works (Abugabah and Sanzogni, 2010).

Although ERP systems in higher education institutions (especially master programs) today represent the largest investment in software, it is not likely to be the last. Universities intend to renew and install other systems at the level of the whole educational unit in the future, which implies research efforts in this field (Nielsen, 2002).

In response to government policy and various social and economic factors, universities have turned to the services offered by ERP traders for new strategic directions for both: student and internal university management (Anderson et al., 1996). More recently, ERP providers have responded to products tailored to this relatively new market for many universities, similar to large corporations. Some universities have even replaced old internal administrative systems with ERP solutions (Beekhuyzen et al., 2002).

According to Fisher (2006), ERP systems were originally introduced in US higher education institutions in response to the same impulses encouraged by the private sector. US higher education institutions have seen the adoption of ERP as a better way to integrate their management systems for increasingly complex operations.

An alliance between ERP merchants and universities is mandatory. Most ERP merchants offer support to universities. They give them access to this program (just by the simple idea of system advertising) at a 0 cost. Without this alliance, it is doubtful that an academic unit could offer its students access to such a system.

The main advantages that the ERP system offers to higher education institutions are: improved access to information for the planning and management of the institution, improved services for college students and employees, lower business and managerial risks due to improved efficiency of integrated technology (Rabaa'I et al., 2009).

3. METHODOLOGY

The research methodology was quantitative, based on the analysis of a questionnaire. We realized a questionnaire that could be analyzed in detail because the answers were numerical. It was made on the Survio platform, being free of charge. Then we distributed it to the respondents who operate on the Romanian market.

The questionnaire contained 18 questions and focused on the current topic. Three questions were asked about the respondent's profile and fifteen could be subjected to analysis. With the help of these questions, we were able to analyze the respondents and their vision about the presented subject. The questions focused on a single answer. The questionnaire was realized on January 2021 and was distributed to respondents by the end of the month. The respondents who filled it are people with higher education in the economic field. They work or operate on the Romanian market and are Romanian or foreign citizens (such as Chinese or Greeks).

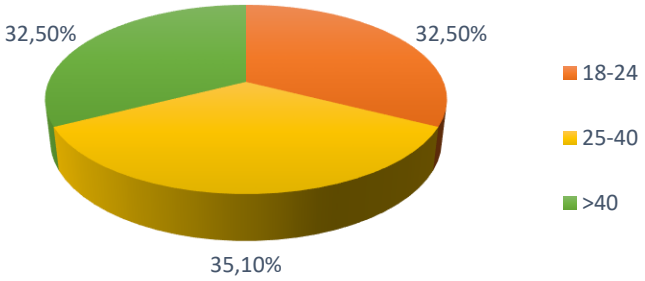
The total number of respondents who completed this questionnaire was 77 people between the ages of 18 and 60 years. A large part of them holds an executive position, while 10 people hold a management position. In principle, the respondents have a long experience with the labour market. The questionnaire was distributed online by email. All the responses received were centralized on the Survio platform and presented in the paper. Based on the graphs and tables, we also presented the topic of the questions and what they referred to.

Respondents were strategically chosen so that their responses had a significant impact on the current study. The profile of the respondents who completed this questionnaire is outlined by people with higher education, who carry out their activity or work in the public and private environment. The questionnaire was sent into the public and academic environment to professors and students. In the private environment, it was sent to managers, employees, self-employed people, and independent people who work in the economic field. These are people of Romanian, Chinese, Greek, and French nationality. These people have an important influence in society; therefore their response was relevant to the research. University professors can directly influence research in the sense of implementing such a course on the use of the ERP system. Likewise, a company's managers or those in a leadership position can influence study academies through funding to implement such a course that would help their future employees.

4. RESULTS AND DISCUSSIONS

Thus, we started by analyzing the profile of the respondents. To accomplish this task, we chose individual questions. Firstly, we started to divide them into 3 groups: the young population between 18–25 years, the middle population between 26–40, and the adult population over 40 years old. As can be seen in Figure 1, our respondents are mostly represented by the middle population (the highest percentage recorded is 35.10% by people between 25 and 40. The young and adult population has an equal percentage in our questionnaire.

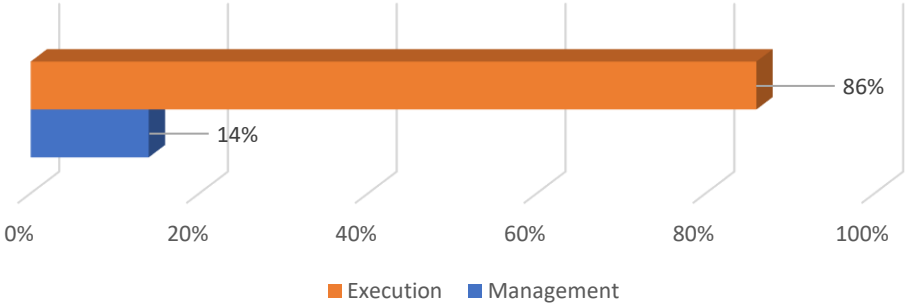
Figure 1. Age of the respondents



Source: The authors' own research. Questionnaire results.

After we chose to present the respondents by age category, we also wanted to highlight their position in the company. Through this questionnaire, we chose both people who have an executive position or a management position. We wanted to analyze the vision of both persons: those who run a company and those who work / operate in it (most often those who manage an activity have a different vision than those who execute it). Of course, the persons occupying a management position have a percentage lower, respectively, than 14% (which is normal, the population is predominated by persons with executive position). As can be seen in Figure 2, the respondents who occupy the execution function represent the highest score of 86% percent.

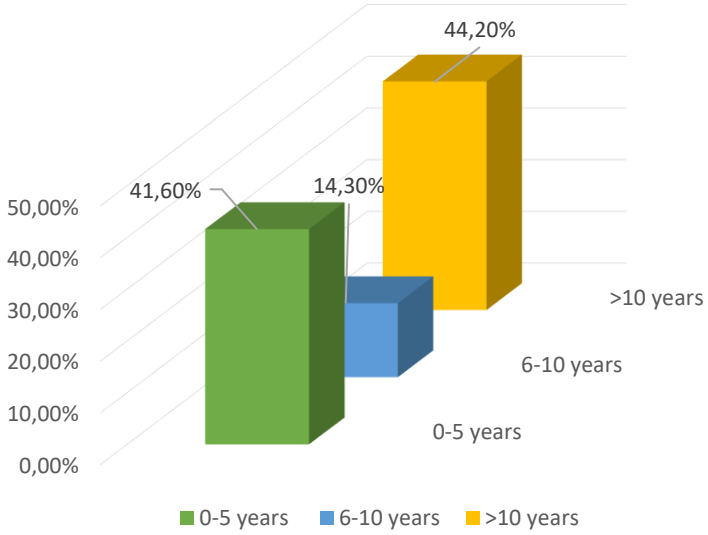
Figure 2. Function of the Respondents



Source: The authors' own research. Questionnaire results.

At the same time, we wanted to analyse the experience of the respondents in the field in which they are activated. Experience being an important factor in the labour market. Thus, we want to highlight the fact that the people who filled in this questionnaire have an overview and can appreciate exactly the problem in question. Therefore, we decided to classify their experience in 3 categories: up to 5 years, between 6 and 10 years, and over 10 years. As can be seen in Figure 3, the highest percentage of 44.2% is recorded by respondents who have over 10 years of experience in the labour market. Then, another important percentage of 41.6% is registered by respondents with an experience of up to 5 years. This percentage is normal because respondents aged between 18–25 years have an average percentage of 32.5%.

Figure 3. Respondents work experience



Source: The authors' own research. Questionnaire results.

Then, to better analyse the mentioned topic, we realized 15 numerical questions. Respondents had to choose a single option from 1 to 5. Option 1 means the least, and option 5 the most. The questions could be appreciated numerically. Of course, in order for any reader to have an accurate overview and at the same time to have a transparency on the mentioned data, we decided to highlight all questions and answers received. Please see Table 1.

Table 1. All questions

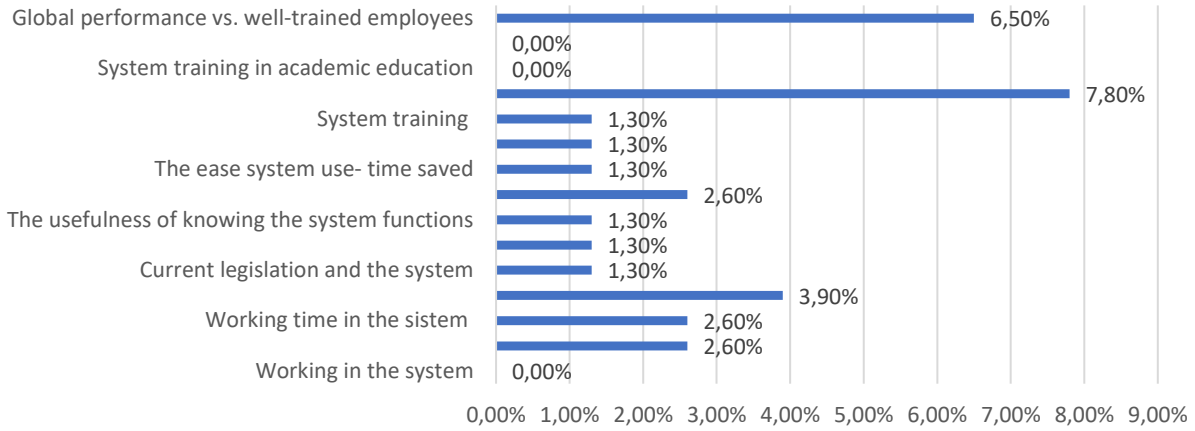
Questions	The least	Little bit	Medium	More	The most
Working in the system	0	2	10	5	60
Frequency of system use	2	0	12	6	57
Working time in the system	2	0	17	6	52
System accessibility	3	12	13	20	29
Current legislation and the system	1	1	26	18	31
The system usefulness	1	1	13	12	50
The usefulness of knowing the system functions	1	3	13	19	41
Understanding the system functions and operations	2	4	19	24	28
The ease system use- time saved	1	2	20	16	38
Employee contribution to system tasks	1	2	20	21	33
System training	1	0	13	13	50
Previous system training	6	10	10	18	33
System training in academic education	0	1	7	9	60
Training the future workforce	0	0	12	15	50
Global performance vs. well-trained employees	5	5	16	14	37

Source: The authors' own research. All questions and answers.

The idea of the questionnaire started with the research questions, which were also addressed in the questionnaire. For a more accurate understanding and to gradually introduce the respondents in the subject approached by the topic of the questionnaire, a trained student – a future good employee – performance at company level. The questions asked also try to measure the impact that this subject has on the respondents. Because any well-trained employee (both theoretically and practically) is an added value for a company and therefore leads to a global performance.

According to the questions asked, we can appreciate the fact that a very large number of respondents marked the importance of a computer system training course during college. In accordance with the large number of respondents (to the 13th question) we can answer the first research question, it is very important for any employer as well as for employees to work with trained and experienced students who know how to use a computer system. A student who participated in this course can occupy a job to the detriment of another who has not been trained. We can also appreciate the number of 50 respondents (to the 14th question) who considered the training to be very important. Thus, we can answer the second research question, a course during college is very effective for future employees.

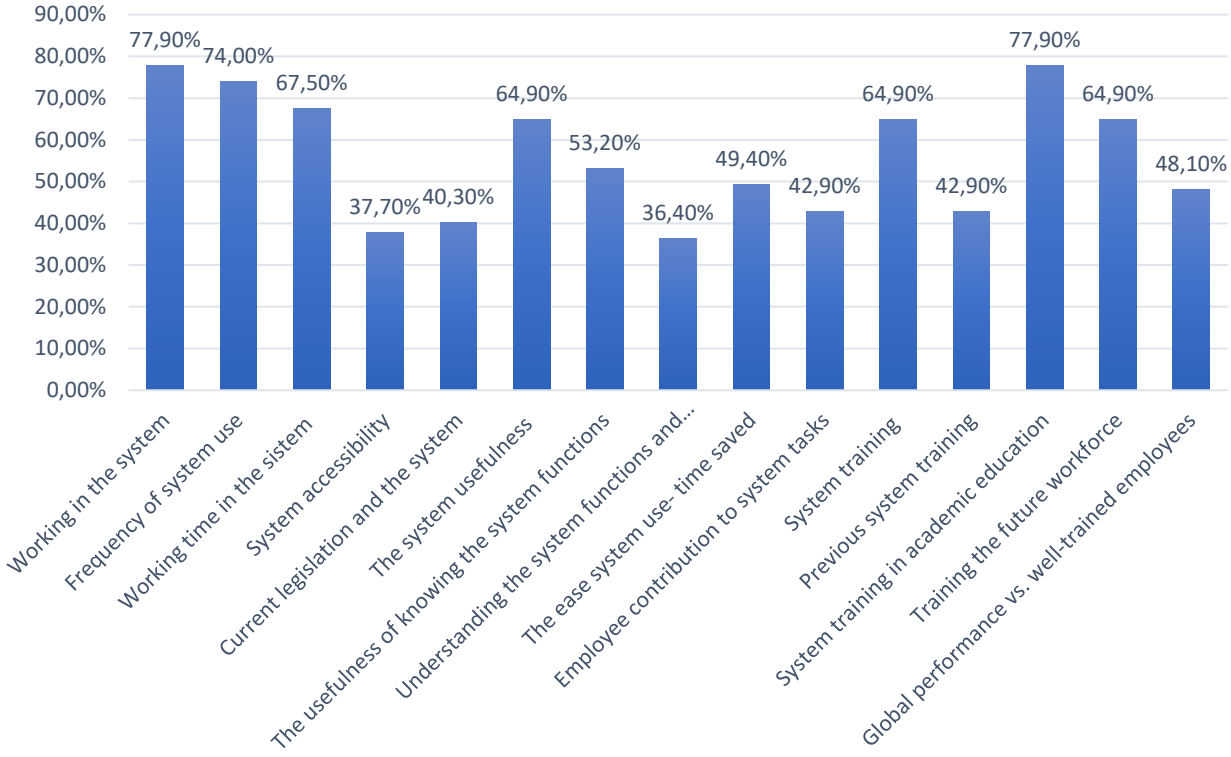
Figure 4. The least answers



Source: The authors' own research. The least answers.

Given that a large number of respondents chose "the most" as frequent answer options, and few chose "the least" answer options, we also answered to the last research question, the subject had a direct and significant impact on the respondents who completed this questionnaire. (See Figure 4 and 5.)

Figure 5. The most answers



Source: The authors' own research. The most answers.

To this questionnaire, we applied a statistical analysis based on regression. Given the fact that the respondents had to choose from 1 to 5, the model was multifactorial. To accurately understand the data presented, variable Y represented the questions asked and variable X the respondents answers.

The statistical population was represented by the variety of answers received, materialized in percentages. The statistical range was represented by the variety of questions asked. The dependent variable was represented by X (the answer depends only on the question) and the independent variable was represented by Y (question asked).

Therefore, for a more accurate understanding of the dependent and independent variables, we can appreciate the following: All the questions addressed (in Table 1) represent the independent variables.

Then the whole range of answers received (the least, little bit, medium, more, and the most) with each number represent the dependent variables. Any answer depends in accordance with the question asked and the topic it addresses (independent variable). The model presented by us is linear statistics and is represented by the results obtained from this questionnaire. Therefore, our regression is as follows:

Table 2. Summary Output

Regression Statistics	
Multiple R	0.9999
R Square	0.9999
Adjusted R Square	0.8999
Standard Error	0.0002
Observations	15

Source: The authors' own research. Statistical analysis of the questionnaire

The multiple R is the correlation coefficient. It represents the method by which a chosen variable can be predicted taking into account a linear function. It also is the correlation between the best predictions that can be calculated linearly.

The multiple R is determined by the relationship between the most favourable predictions and the variable values. These predictions are linearly calculated from the predictive variables. Statistically, Multiple R gives a direct and strong relation which, in our case, has a value that is close to the maximum value. Therefore, our value is close to the extreme and is 0.99.

R Square is the coefficient of determination. It is also considered the variation. Measures the data from the approximation of the regression line data. Its value is 0.99.

The adjusted R square is the coefficient that establishes the deviation factor. It also shows the influence between variables y and x. In our case, it is in a proportion of 89%. What remains up to 100% represent the residual elements (11%).

Standard Error is the coefficient that shows the standard deviation of the statistical sampling distribution. It also represents the dispersion of a statistical sample. The value obtained in our case is 0.02%.

Total number observation is limited to 15 points. These elements represent the addressed questions. According to these data, we can fully state that the questions had a significant impact on the respondents.

Table 3. ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	5	14.9999	2.9999	53207952.8	2.4927
Residual	10	5.6383	5.6383		
Total	15	15			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
The least	0.9971	0.0042	238.9593	4.0505	0.9878	1.0064	0.9878	1.0064
Little bit	0.9956	0.0025	394.0888	2.7229	0.9899	1.0012	0.9899	1.0012
Medium	0.9962	0.0012	821.3419	1.7613	0.9935	0.9989	0.9935	0.9989
Much	0.9999	0.0012	804.8008	2.1587	0.9971	1.0026	0.9971	1.0026
The most	1.0009	0.0002	4556.7690	6.3757	1.0004	1.0014	1.0004	1.0014

Source: The authors' own research. Statistical analysis of the questionnaire

The regression value determines the sum of the variation. The regression value in our case is 5 and the residual is 10. These values are based on a sample of 15 questions. The sum of the regression squares is 14.99. The sum of the squares of residual values is 5.64.

MS represent the mean of the squares and is the corrected scatter. In our case, it sums up to the values of 2.99 for regression (having k-freedom degrees) and 5.64 for the residual (having "n-k-1" degrees). The total degree of release is n-1. The corrected dispersion of the residual values is equal to MSE radical

Significance F is the F test for the ANOVA table. It represents both null hypothesis tests (H0: the model is not valid and the alternative hypothesis H1: the model is valid). Significance F also represents the probability that the equation does not show the variation in Y. Thus, any match would be random. Its formula is MSR/MSE. The F calculated in our case is 2.49, which is higher than 0.05 and confirms that the variable X is valid as a significant factor. The values obtained in our statistical model confirmed the fact that our multifactorial regression is valid and statistically significant.

Table 4. Residual Output

Observation	*Predicted Questions*	*Residuals*	*Standard Residuals*
1	1.0001	-0.0001	-0.5427
2	1.0000	-7.367	-0.0380
3	0.9997	0.0003	1.5587
4	0.9999	0.0001	0.7173
5	1.0000	0.0001	0.2448
6	0.9998	0.0002	0.8203
7	0.9996	0.0004	2.0495
8	1.0000	-0.0001	-0.2166
9	1.0003	-0.0003	-1.4561
10	1.0002	-0.0002	-1.0930
11	0.9999	0.0001	0.5326
12	1.0001	-0.0001	-0.3355
13	1.0003	-0.0003	-1.5707
14	1.0000	0.0001	0.1013
15	1.0001	-0.0001	-0.7690

Source: The authors' own research. Statistical analysis of the questionnaire.

In our case study, the free term is shown by the 15 questions addressed to the respondents. The chosen variable is represented by the responses received. The proposed variable is illustrated by the X values. The coefficients are: 0.9971, 0.9956, 0.9962, 0.9999, 1.0009. They explain the values for the variable Y compared to X. The current parameters show that the statistical test is significant.

The Alpha parameter is significant because H1 is 99% bigger than 95% (the value of "lower that 95%" – the left limit). Nevertheless, the Beta parameter sums the values over 99% and is also significant (the values of the "upper 95%" – right limit).

The data obtained have compliant and even high values; therefore, the model is valid, and the topic addressed by the questionnaire is validated by the dependent variables (respondents' answers). According to all the data presented, the subject had a significant influence on the respondents.

The questions had a strong impact on the answers. It directly and strongly influenced the response options chosen by the respondents.

The respondents consider that ERP is the system that reduces costs, improves the accuracy of operations, eliminates redundancies, improves planning, forecasting, budgeting, communication, and increases customer and employee satisfaction.

Therefore, being a system that leads to the performance of a company through all its specific characteristics, it is highly recommended that students, future employees to learn know and practics its particularities.

The choice of respondents was strategic for obtaining these results. In this way an attempt was made to obtain their opinion in the idea that through their influence they would help to develop an ERP course in higher education. Thus, asking them about the topic, it was possible to appreciate the fact that most of them had a positive opinion regarding the development of such a course which directly and strongly influences the present analysis.

In addition, higher education is the most representative unit that can coordinate students to learn how to operate and work in such a system. Training in higher education was also appreciated by respondents

5. CONCLUSION

In conclusion, this research validated the importance of implementing an ERP system in higher education institutions even during college. Starting from our objective to determine the opportunity to incorporate ERP knowledge in a teaching course, we performed a statistical test that validated this hypothesis. Through the variables proposed by us ERP course in college, we established the elements that had the biggest and the most important influences.

Respondents who work on the Romanian market confirmed the need for such a course because it is essential that employer's benefit from slightly more experienced and prepared students. A little experience, even during college is essential. Teaching must be interactive so that students should understand important aspects of the system. ERP has really difficult multifunctionalities for a student, and here we must also emphasize the experience of the teacher, who can teach this course in an interactive and interesting way.

These results should be appreciated by the participating respondents and also by other readers in order to apply such a course in higher education. Applying and implementing such a course would also help students prepare for the future job. It also represents an opportunity for teachers because they can offer students experimental learning and help them directly. And the most important aspect is for managers because they will benefit from a more trained workforce in the field. Experimental learning is the most efficient solution because it presents relevant aspects about the lesson, and at the same time, everything is realized in an interactive manner. The professor and his way of organizing are also very important in order to teach an experimental course that should arouse the students' interest.

However, the article has certain limitations, because the number of respondents who completed the questionnaire is not very large. Therefore, further research can be done in this regard. However, the basic idea on this topic was also demonstrated by them, and the subject has a significant impact on employees, employers, and profitability at the company level, as well as at the country level. A trained student who becomes a capable future employee represents an added value for a company, the profitability of the company is important for the people and for the country in which it operates. In the future, I will do research related to the experience of professors and their adaptability to novelty.

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TAX INFLUENCED ACCOUNTING

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Abstract
Relationship between financial accounting and taxation varies among countries. In some countries base for tax calculation is profit, in others it is required to perform financial and tax accounting alongside each other. Goal of financial accounting is to provide useful information to stakeholders, while tax accounting provides useful information to tax authorities. We study relationship between financial and tax accounting, focusing to tax motivated accounting, where tax effect is considered first before the substance of a transaction. Because of lack of International taxation standards, each country applies own tax rules what makes administrative burden for companies, especially companies performing cross border operations. This rises not only administrative burden of companies, but also tax disadvantages and tax motivated transactions. Differences in tax legislation among countries shall be eighter mitigated or unifying International taxation rules shall be released. Tax rules creators and accounting standards creators shall consider real practice of companies, market demands and trends, especially need for simplification of tax rules, need of unification of tax rules, accounting automatization, tax reporting automatization and online transaction reporting. The aim is to decrease administrative burden of both companies and regulators.

Keywords: *Accounting standards, administration burden, financial accounting, income tax, tax accounting*

1. INTRODUCTION

Each economic entity tries to maximize its profit while minimising costs. The fundamental motive for tax evasion is the contradiction between the state's interest in collecting taxes and the interest of taxpayers in minimising their own tax burden. The reasons for the existence of tax evasion must also be seen in the economic, political, legal, moral, and ethical environment of a particular country. The different reasons for tax evasion vary depending on the persons who commit such conduct. It is no secret that corporations tend to pretend tax liabilities by applying possibilities to withstand their tax obligation by moving their tax domiciles into countries with less or no income tax rates. This is just one example of how taxation rules may influence company's behaviour. Therefore, in recent years we can observe a trend of tightening tax requirements across national tax regulators and in the EU. In 2016 there was released Council Directive (EU) 2016/1164, where was clearly stated an idea that tax must be paid in the country where profit and value are generated (THE COUNCIL OF THE EUROPEAN UNION, 2016). As the idea sounds fair at first, it rises concerns regarding to proper accounting of different tax requirement in different countries. Each country within EU has its own tax rules which somehow must be covered in accountancy. In general, if a company operates in a country for more than 183 days within last 12 months or if a company has permanent place of operation in a country, it usually must register a permanent establishment in that country. Directive use term "Permanent establishment", however, in practice there must be distinguished between "permanent establishment" represented only by registration as a taxpayer or "permanent establishment" represented by a place of operation located at post address. Performance of local accounting standards and rules are required only when permanent establishment is represented by physical location of operation. This means that there could be a situation when several tax jurisdictions are applied for the similar transactions in a company, but each performed in different establishment (registration), i.e.: Posting employees abroad to work on a project to another country.

While in Slovakia accommodation expenses are regular costs of a company when employees are sent to work abroad, in Netherlands or in Slovenia accommodation expenses are considered as employee benefit and therefore are company's taxable expenses only if they are taxed to employees as natural income. This means that when an employee is sent abroad for more than 183 days, his salary is taxed in the country he is sent to, so company's accommodation expenses are becoming employee's natural taxed income. This example also shows discrepancy in labour law requirements between countries and difficulties in free move of people (labour) in EU, but it is not scope of this paper.

Tax accounting takes its information primarily from financial accounting. IAS 12 – Income taxes is dedicated to guide accounting of income taxes, but it is more focused on deferred tax obligation and liabilities and temporary differences. According to study from USA (Plesko, 2004), difference in accounting rules for financial and tax reporting may result to reporting of different income to stakeholders and to tax authorities. Because the Tax return is usually kept secret, the only information users of financial statement can get is amount of current and amount of deferred income tax written in financial statements.

As shown in this paper, tax requirements may distort financial statement reporting and may motivate companies to tax motivated behaviour. The aim of this paper is to disclose several problems between financial accounting and tax accounting and to motivate for further research in this topic to mitigate the administrative burden of both companies and tax administration.

2. DIFFERENT PURPOSE OF FINANCIAL ACCOUNTING AND TAX ACCOUNTING

The primary goal of financial accounting is to provide fair and accurate information to users of financial statements, more specifically: "The purpose of all financial accounting is to provide useful information to stakeholders" (Graham, Raedy, & Shackelford, 2012). This goal can be reached by strict application of accounting standards. While "tax accounting is a branch of accounting" (Xu, 2018), which aims to provide accurate information of the tax obligation (liability). The final output of Financial accounting are Financial statements, according to IAS 1 – Presentation of financial statements. Financial accounting also provides information to management regarding to financial and equity situation of a company. Data from financial accounting could be used for further application i.e., in management accounting (Tumpach, 2008) or in preparation of specified reports, i.e., statistical research. The primary output of tax accounting is Tax return. Presentation of Tax return is not specified in International accounting standards, so it is compiled based solely on local tax laws and jurisdiction. Despite of, presentation of tax return is not required by international financial standard and in most cases the tax return is not publicly displayed, in many cases the tax return is used alongside other financial statements in presentation of a company, for example, when applying for a loan, or when applying in a public procurement tender.

In some countries, for example, in Slovakia, the tax acceptable cost/expense must be accounted in financial accounting (Národná rada Slovenskej republiky, 2003). Such requirement of a tax law may bring distortion into financial accounting as companies may perform tax-motivated accounting to manipulate their tax obligation. Furthermore, such behaviour, in some cases, could result to different interpretations of financial statements. In some countries this distortion is solved by separation of financial accounting and tax accounting, for example, in Russia (Purina, 2015) or in China (Xu, 2018). In such case of separation of financial accounting and tax accounting, each transaction has to be booked in both financial accounting by its true value and in tax accounting by its tax recognised (tax acceptable) value. Such approach is more labour intensive but is capable to provide both financial information and tax information at any time.

In general, we can see two directions, both in a literature and in practice: 1. Trend to merge financial accounting and tax accounting with the idea that tax base shall be gathered from financial accounting; 2. Trend to separate financial accounting and tax accounting as both have different purpose, different rules, and different audience (users). (Gee, Haller, & Nobes, 2020) in their study compared influence of IFRS on taxes of two countries with strong accounting academic history

background, the UK and Germany. They conclude that relation between taxation and accounting is getting weaker over time in Germany, while in the UK had been week before, so relationship between taxes and accounting converge.

3. TAX MOTIVATED ACCOUNTING

When financial accounting has no comparable advantage, but just base for tax computation, then tax rules and requirement will dominate over accounting (Nobes, 2006). Here is a brief overview of some common tax motivated accounting manipulations or modification that companies perform. Some have no tax effect but may lead to distortion of financial statements. One of the most publicly discussed tax motivated behaviour of companies is practice of taxing their profit in so called tax heavens. Such behaviour shall be studied as relationship between taxation and law, as it has only little with accounting, so in this paper it is no more disclosed. Multinational companies may tend to move their profit to affiliates with less taxes. To prevent such behaviour, transfer pricing has been introduced. The study by (De Simone, 2016) tries to find out whether adoption of IFRS by affiliates of multinational companies may be tax motivated. The most common forms of tax motivated accounting manipulations are:

1. Tax acceptable costs/revenues vs. real costs/revenues. IAS 12 states how to deal with temporary differences caused by tax acceptance in different period than the transaction occurs. Most common example is tax acceptance after payment. The goal of the tax legislation creator is to protect small companies against insolvency, when their customer does not pay. Another goal is to prevent tax expenses that might be artificial or that company is not willing to pay at all. Tax acceptance after payment brings higher administration into recording and accounting as the company must monitor not only the accounting record but also tax record of a transaction. As the accrual principle is not used here, a company may manage payments, both paid and received to manipulate its tax obligation in certain fiscal period.

The question for further research is whether accrual principle shall be applied in income tax calculation at all. Even the term “income” states that the subject of taxation is income. If the accrual principle is used in taxation, then it is better to use term “Profit tax” as it clearly indicates that the base for tax calculation is profit gained applying accrual principle. However, companies can pay tax obligation only if they dispose with enough liquidity. Therefore, further research shall be made to compare how government tax revenue would change if income tax would be calculated based on company cash flow, not based on accrual principle. Such approach may exclude artificial and not paid expenses. This idea needs to be evaluated considering online invoice reporting to tax authorities, access of tax authorities into company’s bank accounts and forbidden of cash transaction over certain threshold, which are getting implemented across countries to prevent tax outflows.

Another idea is to merge financial accounting with tax accounting as much as possible. This approach requires tighten accounting rules as the companies might be willing to manipulate accounting to prevent taxation. Despite higher education requirements, further research needs to be performed of how government revenues would change, considering that Tax administration investigations would change to investigation of proper accounting, which is partly done also by audit. Such approach might in the end decrease administration expenses both in companies and in tax administration, but research made on data is needed first to either prove or discard such idea.

2. Deferred taxes. IAS 12 requires reporting deferred liabilities as assets in statement of financial position (balance sheet). In literature there is a criticism over this requirement (Brouwer & Naarding, 2018) especially when there is not clear when in the future the tax liability would be applicable. This brings some uncertainty for users of accounting statements. Example from Japan (Skinner, 2008) show that in financial year 1998 when deferred tax accounting was introduced in Japan, Japanese

banks recognised approx. $55 billion tax liability, what prevent many from insolvency during financial crisis.

3. Depreciations. Accounting depreciation plan is set up based on life cycle, nature and expected use of an asset. Tax depreciation plan is usually given by tax rules. According to IAS 36 – Impairment of Assets, accounting depreciations of assets cannot be interrupted (Dvořáková, 2017). Accounting depreciations can be finished either by disposing of an asset or by reclassifying an asset as asset held for sale according to IFRS 5 – Non-current Assets Held for Sale and Discontinued Operations. Tax legislation allows tax depreciation only when the asset is used in the fiscal period to gain taxable revenue. Some legislation, for example in Slovakia, allows companies to interrupt tax depreciation in a fiscal period, if they are willing to. This allows companies to optimise their tax obligation in case of low profit or in case of loss. When tax depreciations are interrupted, tax depreciation plan is prolonged of a period of interruption.

Accounting depreciation plan is set up by company itself. Here is a space for manipulation when managers set up depreciation plan incorrectly. Company performs its accountancy using going concern principle, but managers may stay in the company only for certain period. Too long depreciation plan or too low depreciation increase profit what may be a motivation for earning management. This kind of manipulation has no effect on taxation but only on profit.

4. Provisions. IAS 37 – Provisions, Contingent Liabilities and Contingent Assets states conditions of creating and including provisions into financial statements. Based on IAS 37 "a provision shall be recognised when: (a) an entity has a present obligation (legal or constructive) as a result of a past event; (b) it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation; and (c) a reliable estimate can be made of the amount of the obligation." (The Commission of the European Communities, 2008). One of the most recognised provision in Czech Republic, according to Czech accounting standards, is provision for repairs of long-term tangliable assets. This is due to tax acceptance of this provision. However, according to IAS 37 such provision cannot be recognised as there is no reliable estimate of the amount of the obligation. (Dvořáková, 2017). This example shows how application of international accounting standards is not compliant with national taxation rules. Application of international accounting standards are usually obligated for publicly traded companies and such tax disadvantages may demotivate companies to voluntarily adopt International accounting standards. Local Tax legislation makers and local accounting standards makers shall converge the legislative rules to remove any disadvantages between standards.

Recognising and accounting of provisions is not compliant with tax acceptation of provisions. For example, in Slovakia provisions (except few exceptions) are not tax acceptable. Their recognition decreases profit but does not decrease tax obligation. Therefore, despite of recognising of provision is required by both local and international standards, companies may be resistant to their recognition due to not willing to decrease profit. In the other hand, when provisions were tax acceptable, companies created provisions to decrease their taxes.

5. Asset leasing. Previous standard IAS 17 distinguished between financial leasing and operational leasing. This had significant impact on taxation as operational leasing was recognised as service and therefore was tax income for renter and tax expense for tenant in the period of rent payment and in amount of rent payment. Financial leasing was recognised as asset purchase and therefore was shown in balance sheet of tenant + tenant had right for accounting and tax depreciations. This approach led to either thin line between financial and operational leasing for some cases, or it led to tax optimizations. This article is focused on accounting an income tax, but, when companies dealt with leasing, they also take into consideration VAT obligation. In operational leasing VAT was part of each leasing payment while in financial leasing VAT was deductible all at the time of the asset purchase (beginning of leasing). 1st January 2019 new IFRS 16 standard was first applicable, and it replaced former IAS 17. IFRS 16 – Leases solved the problem with operational leasing and financial leasing recognition. Asset used by company, no matter if it is purchased by operational or financial

leasing is depreciated by tenant and is shown in balance sheet of a tenant together with long-term obligation. IFRS 16 standard describes lease: "A contract is a lease if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration". This attitude also affect taxation significantly. As operational leasing was considered as service, the leasing payment was tax acceptable. Now when tenant must depreciate, it must distinguish between accounting depreciation and tax depreciation – see IAS 36. New IFRS 16 therefore brought unity in reporting leases in financial statements and made financial statements fairer in displaying assets purchase via leasing, but IFRS 16 also brought tax disadvantage for some tenants compared to IAS 17. New IFRS 16 will be valid in EU countries when it will be recognised by Commission regulation 1126/2008, where still old IAS 17 is stated among accepted accounting standards.

6. Earning management and taxes. Role of Accounting for income taxes in Earning management is studied by (Graham, Raedy, & Shackelford, 2012). Earning management is widely studied in literature. The idea of earning management is to manipulate financial statements to report higher profits than really gained. Motivation of management to perform earning management is due to reward/bonus managers are awarded based on the profit of the company. Study of (Mensah, 2020) performed in Ghana on companies listed in stock exchange shows decrease of earning management across companies after adoption of IFRS accounting standards. It is not clear whether decrease of earning management is caused by IFRS requirements or decrease is caused by not adapting of company managements to new rules. Study from Malaysia (Khoo & Ahmad-Zaluki, 2015) also shows reduction of earning management after adoption of IFRS, however, the results remain questionable. Some tools used for earning management are accruals, overproduction, depreciations, provisions, etc. As the management is motivated to report higher profit than gained the further studies need to be performed how to avoid such motivation. A solution may be to reward managers not solely/mostly based on profit, but to set up also other measurements. The tax legislation does not reflect economic reality, nor performance of a company. Higher tax obligation may look like it indicates higher profitability of a company, but this might not be true as costs/expenses are tax acceptable differently to their accounting value. An example are research and development (R&D) expenses, which might not be tax acceptable at full amount or might be tax acceptable when product of research starts to produce revenue, or if government wants to increase research, the R&D expenses can be tax acceptable in amount higher than 100% of its value, for example, in Slovakia R&D expenses can be tax acceptable up to 200% of their value (Národná rada Slovenskej republiky, 2003).

4. REDUCTION OF ADMINISTRATION BURDEN

All accounting and taxation rules, principles and standards shall be written considering practical processes in companies and perspective trends of the future. Such trends are accounting automatization or automatic or online information exchange, both Business to government (B2G) and business to business (B2B). The trend of recent years is to complicate national tax legislation adding more and more exceptions and special cases into the taxation rules. By complicating tax legislation, the legislation creators react to special cases or speculative transactions of taxpayers. This is in contrast with the market demand requiring simplification and reduction of administrative burden. European Commission actively works on simplification of tax administration burden caused by differences in local tax codes by proposing Common Consolidated Corporate Tax Base (CCCTB). The aim of CCCTB is "to provide companies with a single set of corporate tax rules for doing business across the internal market" (European Commission, 2016). CCCTB will be mandatory for cross border big companies and optional for others. CCCTB allows offset profits gained in one country with loses gained in another country; consolidated profit tax will be shared proportionally across countries, etc. Unless this proposal will be turned into regulation, cross border companies must carry tax administration burden of each country they operate in. This burden is more difficult for smaller companies with less administrative cadre capacity. Remaining question is whether International

accounting standards could be a good tax base for taxation, namely for CCCTB. The study whether IFRS/IAS is proper base for CCCTB was performed by (Martinez, 2019), who conclude that financial accounting and tax accounting shall be separated as some accounting standards are not suitable for taxation purposes; according to him, tax accounting shall be based on strict rules rather than on principles.

The trend of Tax outflow prevention across the countries is to report taxable transactions online to tax authorities, where both buyer and seller are recognised. This trend is practically implemented in online till transaction reporting, for example: in Italy, Slovenia, Slovakia, Czech, etc. In till transaction only seller is recognised as he online reports transactions to tax administration. This trend is also implemented in online reporting of issued invoices, where both seller and buyer are reported to tax administration, for example, in Italy or in Slovenia. In Slovenia, Tax authority has access to bank account of companies so it can match payments with issued invoices. This shall prevent money laundering and tax outflows.

Simplification of tax accounting via merging with financial accounting can be seen in example from Finland, where foreign companies who have income tax establishment in Finland just submit simplified balance sheet and P&L statement on prescribed 6U form. If everything is filled correctly, Finnish tax administration issue income tax return within few seconds after submitting 6U form (balance sheet + P&L statement). If there is something unclear in submitted 6U form, the case is evaluated by a person at tax administration who then issue tax return or ask company for an additional information. This example just shows that income tax return can be easily compiled based on data from financial statements, which radically decrease company's administration burden.

Income tax return is not the only source of information for Tax administration regarding to tax obligation. As mentioned before, online reporting of transactions can provide an overview of company's business activities. When these data are compared with similar companies in industry, tax administration can get strong information which can be used to highlight suspicious behaviour and reduce tax investigation only to such transaction and companies. Trend of complicating tax legislation to prevent tax outflow shall then be reverted to simplification of tax legislation. Tax administration would be able to evaluate transaction data online and would be capable to act much faster to possible threats. There shall also be change in tax administration attitude towards taxpayers who shall be treated as clients rather than crocks.

One of the worst administration burdens in European countries regarding to taxes and accounting is strong sticking to formal requirements of transaction and documents rather than to a substance of transaction, i.e., tax deduction is possible only when accompanying documents contain all required formalities, no matter how and when the subject of transaction was performed (purchased); or transaction needs to be performed in certain way to be tax acceptable. Extreme focus on formal requirements is mostly seen on VAT rather than on profit tax. This is due to VAT settlement usually on monthly bases compared to profit tax settlement based on yearly basses. Sticking on formal requirements as an obligatory condition for taxation contrasts with accounting, where substance over form shall be applied. Because of lack of unifying tax directive and because each country has own taxation rules there might become a tax disadvantage in cross-border transactions, which result from strictly sticking on local formal requirements rather to a substance, for example: when Slovakian company purchases an asset from Slovenian company and part of the price is paid by Slovakian leasing company directly to the seller. Standard leasing contract is signed between Slovakian buyer and Slovakian leasing company according to usual manners and best practices; in leasing general rights & conditions is written that leasing company pays for the asset directly to seller, based on shown invoice issued from seller to buyer. Problem is that seller receive money from someone else than written in issued invoice, what local Slovenian tax authority recognise as unjustified income and requires recognition of such income as taxable revenue. In Slovenia it is common to write separate cession contract between leasing company, buyer, and seller, where leasing company overtakes buyer's obligation to pay to seller. However, such cession contract is not standardized solution in Slovakia as cession is mentioned in leasing general terms & conditions and a leasing company is not willing to sign any, for them, unnecessary contract. Such real example just showed that if tax

authorities would consider substance over form, such required double taxation resulting from just different best practices in different countries would not be possible.

When discussing of decreasing of administrative burden, there shall be decrease of administrative requirements of accounting standards for small companies. IASB reacted to this market demand and released simplified IFRS standard for SME's. To apply this standard within EU it is necessary to implement this standard into regulation 1126/2008 (The Commission of the European Communities, 2008). In some countries, for example in Slovakia, the accounting profit is base for tax calculation. In case the company apply International accounting standards, profit recognised based on international accounting standards is used as base for tax calculation (Národná rada Slovenskej republiky, 2003). In Slovakia, only companies who meet specified criteria are permitted to apply International accounting standards. Others must account and report financial statements based on local accounting standards. This regulation makes higher administrative burden for small companies who do not qualify for International accounting standards, but who are part of consolidated group. These companies must prepare two sets of financial statements: 1st based on local accounting rules, which are used also for local tax calculations; 2nd based on international accounting standards used for consolidation of accounts (Adebayo, 2018). Companies have two possibilities, neither is legal (compliant with legislation): 1st Performing accounting based on local accounting standards and in the end of the fiscal period count adjustment to provide financial statements according to IAS 1; 2nd performed dual accounting: based on local standards and based on international standards. Slovakian accounting act forbids to account outside accounting books. When company accounts based on local standards and makes adjustments, accounting of closing operations must be calculated and counted outside the accounting books, otherwise they would change statements made on local standards. Performing dual accounting is also illegal as IFRS accounting performed alongside Slovak standards accounting is accounting performed outside standard accounting books. This example just showed outdated legislative requirement that were created with the best interest but does not reflect reality anymore and makes higher administrative burden. The question (rather joke) for such company is that when they know they breach accounting act, they shall create provision for fines for breach of accounting act, which can be up to 3 mil. € or 2% of total asset value.

In the ideal world, companies shall fully focus on the matter of their business and, as much as possible, transactions shall be accounted automatically applying modern automatization tools. Such attitude not only decrease operational risk of human errors while performing accountancy, but also provides better encouragement of accounting outputs. Therefore, national standards shall retreat of administrative requirements that has no justification and prevent of accountancy automatization, for example in Slovakia, Slovakian accounting code requires 2 signatures on each accounting document (Národná rada Slovenskej republiky, 2002), what was recognised as obstacle to accounting digitalization. Tax administration would ideally want, so called "one clicks solution" when companies would be able easily provide information of their tax obligation at any time. This is not impossible task, but it requires either simplification of tax requirements with aim to merge tax accounting with financial accounting, or recording taxable transaction separately form financial accounting and having two separate systems: First Financial accounting and second Tax accounting.

5. CONCLUSION

When tax legislation put requirements and rules into accountancy, there is always risk of distortion of accounting caused by tax legal requirements. For example, Slovakian legislation requires from accountancy to be able to always show each type of tax obligation; or all tax recognized deductions (expenses) must be accounted. Such requirements provide motivation of companies to tax motivated accounting, such as accounting considering tax impact rather than substance of transaction. This is shown mostly in incorrectly recognized provisions, depreciations, manipulating of accruals (earning management), etc. Merging tax accounting and financial accounting to decrease administration

burden shall be done by gathering tax information form financial accounting. In countries where financial accounting and tax accounting are already separated, decrease of administrative burden shall be made by simplification of tax codes and converging with financial accounting. The goal is to achieve as much automatization of accounting, both financial accounting and tax accounting, as possible to either decrease operational risk of human errors and decrease possibilities to manipulate accounting. Both, tax legislation makers and accounting standards makers must take into consideration trend of accounting automatization, and they shall cancel all legal requirements which have no justification, and which original purpose can be achieved by automatic solutions. Further studies must be done regarding financial accounting and tax accounting relationship, as this relationship varies across countries. The aim of these studies shall be, among others, to achieve decrease of administration burden for companies and for tax administrations.

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VOLUNTARY IFRS ADOPTION IN THE SLOVAK REPUBLIC – MYTH OR REAL OPTION?

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Abstract
*This paper studies possibilities for voluntary IFRS adoption by accounting entities in the Slovak Republic. To a small group of entities is given an option to choose between voluntary IFRS adoption instead of national accounting regulations. Some entities of this small group are even recognized as public interest entities. We try to find out if there is any entity that choose to adopt IFRS on a voluntary basis in country where only some 150 entities present IFRS financial statements. Accounting and reporting rules in the Slovak Republic are government-prescribed by very detailed way, e.g.***,** *annual financial statements has requisite forms for the balance sheet (145 line entries) and also for the profit and lost statement (65 lines entries), total length of 12 pages (!), but in the other hand, the form of presentation of financial statements prepared in accordance with IFRS is at the discretion of each accounting entity. The purpose of the contribution is to confirm or refute the hypothesis of voluntary IFRS adoption.*

Keywords: *accounting regulation, financial reporting, IFRS adoption*

1. INTRODUCTION

The main objective of any accounting system is to provide information; this goal is achieved by presenting financial statements of an accounting entity which should provide information about the financial position, performance and changes in financial position of that entity which is useful to a wide range of users in their decision-making process. The accounting rules in the Slovak Republic are set in a very detailed way by the legislation – Act no. 431/2002 Coll. on Accounting as amended (later referred as "Act on Accounting") and related regulations. IFRS were formally adopted in the Slovak Republic in year 2004 by implementation of the Regulation (EC) 1606/2002 of the European Parliament and of the Council of 19. July 2002 on the application of international accounting standards into Slovak Act on Accounting. All consolidated financial statements shall be prepared in accordance with IAS/IFRS since 2005; application on individual financial statements of selected accounting entities is mandatory since 2006. This paper deal with individual financial statements, so expression used later in the text "financial statements" shall refers to the individual financial statements.

Positive effects of IFRS adoption are generally known, for example according to Ball (2006) IFRS adoption provide accurate and comprehensive information on the financial statements; Daske & Gebhardt, (2006) emphasize significant incensement in disclosure quality. Some authors show slightly different approach due to many factors related to IFRS adoption, for example Brown (2011) finds IFRS rather positive but also shows some skepticism due different environments of each country and different expectations from each user/adopter.

However, Soderstrom & Sun (2007) argue that IFRS implementation will not eliminate all cross-country differences in accounting quality because accounting quality is determined by many factors, beginning at the legal and political system of the country where IFRS are adopted to internal firms' factors. This issue may be a part of the IFRS adoption story in the Slovak Republic. Tumpach (2006) acknowledge the quality of IFRS standards that could improve quality of presented information but arise doubts in proper implementation in the Slovak Republic due missing proper translation into Slovak language at that time. More authors are rather skeptical about proper implementation of IFRS in Slovakia. According to Kubaščíková & Pakšiová (2015) the results of

financial analysis are significantly influenced by choosing IFRS accounting framework instead of local, Slovak regulations due to differences in accounting policies. Tumpach, Máziková & Kuceková (2015) found evidence that boilerplate compiling of notes to the IFRS financial statements is rather common in the Slovak Republic even thought all financial statements prepared in accordance with IFRS are audited on mandatory basis. Flaws of IFRS adoption in the Slovak Republic were also published in study by Tumpach (2016) conducted on 148 companies which were obliged to present financial statements in accordance with IFRS (note: probably the whole population of IFRS financial statements in Slovakia of selected reporting period was used). Research of Pakšiová & Lovciová (2018) propose that better comparability of financial statements within EU could be achieved by introduction of uniform rules for Member states. Research by Juhászová, Kubaščíková & Tumpach (2019) on disclosure of information on the application of IFRS in the financial statements prepared by commercial insurance companies in the Slovak Republic shows correlation between methods of drawing up accounts in accordance with IFRS and choice of audit firm.

2. OVERVIEW OF ACCOUNTING REGULATION IN THE SLOVAK REPUBLIC

Accounting system in the Slovak Republic is regulated in very detailed way which has its roots in a former central planned state economy. Introduction of 'free market economy' concept in early 1990s changed the philosophy of the accounting but did not fully integrated accounting policies recognized in other countries but stick to rigid rules issued by the state regulators. This issue is addressed by Šlosárová & Šlosár (2005) because one of the leading paradigm of the contemporary accounting is to provide the transparent and comparable information in the financial statements. It requires a rigid application of the true a fair principles, which was not applicable in Slovakia due to strict legislative regulations at that time. Blahušiaková (2017) points out that most of post-2002 changes in accounting legislation and regulation in the Slovak Republic was done by the adoption of EU regulations.

According to the Act on Accounting, business accounting entities are divided into groups according to the size criteria which has an influence on entity's reporting. Business accounting entireties as recognized by the Commercial Code in the Slovak Republic are: a general commercial partnership (in Slovak 'verejná obchodná spoločnosť, v.o.s.'), a limited partnership (in Slovak 'komanditná spoločnosť, k.s.'), a limited liability company (in Slovak 'spoločnosť s ručením obmedzeným, s.r.o.'), a joint stock company (in Slovak 'akciová spoločnosť, a.s.'). Based on maximum entity's size laid down in the Table 1 business accounting entities are classified into size groups as of the date to which the financial statements for the given accounting period are issued where the accounting entity shall consider the fulfilment two of conditions also for the immediately preceding accounting period. The accounting entity is obliged to change its classification into a different size group from the following accounting period after two immediately and consecutive accounting periods in which it exceeds or no longer fulfils the conditions with exception only for Micro Accounting Entity which may choose to report as Small Accounting Entity. On the other hand, once IFRS reporting criteria were met but the accounting entity would no be longer fulfilling the IFRS reporting conditions in the future, the obligation to draw IFRS financial statements persist.

Table 1. Accounting entities size criteria

	Micro Accounting Entity	**Small Accounting Entity**	**Large Accounting Entity**	**IFRS Reporting***
Total Assets in Euro	350 000	4 000 000	4 000 000 +	170 000 000 +
Total Turnover in Euro	700 000	8 000 000	8 000 000 +	170 000 000 +
Employees headcount	10	50	50 +	2 000 +

* IFRS Total Assets value is in historical, non-adjusted value, local regulation Total assets in net value

Source: author, based on Act on Accounting

IFRS reporting according to the size criteria is mandatory only for business accounting entities, as mentioned above. Other entities beside business entities, such as natural persons with trade license, State-owned companies or others shall not apply IFRS.

Common perception of IFRS adoption in the Slovak Republic is that all publicly traded entities and public interest entities are obligated to draw their financial statement in accordance with IFRS, but the story is a little bit more complicated. The detailed review if this subject is necessary to better understand our local regulations set by the Act on Accounting. All accounting entities based in Slovakia must follow Act on Accounting, however according to this act some entities use IFRS on mandatory or voluntary basis and do not follow some parts of accounting regulations set by this Act. Moreover, all publicly traded entities are recognized by the Act on Accounting as public interest entities, but not all public interest entities are obliged to use IFRS, but some may do so on the voluntary basis. Detailed layout of public interest entities and their obligation to present IFRS financial statements is presented in Table 2.

Table 2. Obligations to adopt IFRS by subjects of public interest in SR

Subjects of public interest with mandatory IFRS adoption	**Subjects of public interest with obligatory IFRS adoption***	**Subjects of public interest without obligation to adopt IFRS***
bank, branch of a foreign bank, a branch office of a foreign financial institution,	payment institution, electronic money institution	Export-Import Bank of the Slovak Republic
insurance company (except health insurance company), a branch office of a foreign insurance company, reinsurance company, a branch office of a foreign reinsurance company	securities trader	health insurance company
asset management company, a branch office of a foreign asset management company, pension asset management company, supplementary pension asset management company	an accounting entity that has issued securities admitted to trading on a regulated market in any Member State of the European Union	pension fund, collective investment entity
stock exchange		central securities depository
Business accounting entities that has meet at least 2 IFRS reporting criteria specified at *Table 1* for 2 or more successive accounting periods		

* with/without obligation to adopt IFRS for business entities if not at least 2 IFRS reporting criteria specified at Table 1 were met for at least two successive accounting periods

Source: authors own, based on Ondrušová & Kňažková (2017)

Subjects of public interest which do not apply IFRS shall comply with local accounting regulation (Act on Accounting) and Ordinances issued by the Ministry of Finance of the Slovak Republic providing details concerning accounting procedures and the structure and designation of items in the individual financial statements for such entities.

Beside the subjects of public interest some other accounting entity may choose to adopt IFRS: a newly established subsidiary accounting entity meeting IFRS-reporting size criteria if its parent

company prepare individual IFRS financial statements; Societas Europaea or Societas cooperativa Europaea or European economic interest grouping with registered office in the Slovak Republic if presented IFRS statements before the transfer its registered office to the Slovak Republic. (Ondrušová, 2016)

Based on size criteria described in Table 1, each business accounting entities shall present its financial statement (balance sheet + profit and loss statement) using a mandatory, pre-designed set of table-chart statements; no strick design for the notes, which are mandatory part of any financial statements. To illustrate the ridiculous unnecessary complexity required by the regulator the total length of obligatory financial statements for small/large business entities is 206-line entries of total 11 pages A4 format, not including the notes to the financial statements. Research by Tumpach & Baštincová (2014) address the issue of relevance of such accounting regulation where many entities report zero balances in such detailed financial statements and question of cost-efficiency arise. Also, evidence that some of data are irrelevant is not a proof of the relevance of the rest. Today's reporting is most likely done by electronic submission but the pre-designed format of financial statements still persist even though many line entries has zero balances. The so-called 'problem' for our accounting regulators was the introduction of IFRS because IFRS financial statements do not provide obligatory design for financial statements, hence new regulation was introduced as a reaction on IFRS adoption – an Overview report of IFRS based data with mandatory presentation by each entity presenting its IFRS financial statements in the Slovak Republic. Issues of usefulness of financial information presented in IFRS financial statements were addressed in research from Baksaas and Stenheim (2019) and Tasáryová and Pakšiová (2020), so not only Slovak authorities has difficulties understanding IFRS financial statements, because usefulness of presented financial information depends not only on the quality of reporting and valuation, but mainly on their classification and presentation. To better understand national accounting regulation a comparison of the length of financial statements is presented in *Table 3*.

Table 3. Comparison of financial statements length

	Balance sheet			**Statement of profit or loss**		
	Micro Entity	**Small / Large Entity**	**Overview of IFRS data**	**Micro Entity**	**Small / Large Entity**	**Overview of IFRS data**
line entries	45	145	36	38	61	37
group total lines	9	24	6	9	14	7
page count	2	8	1	2	3	2

Source: author

Aspects of relevance of the accounting system based on such strict legislative regulations, where the legislator setter (government) is one of the parties interested in information provided by financial statements were discussed by Tumpach, Manová & Meluchová (2014). Their results addressing the issue of prescribed such detailed financial reporting where 99 % of same type entities has no entries or zero value entries on 20-line entries of the balance sheet designed for small or large entity are alarming and propose simplification of financial reporting in Slovakia. Another local authors, Šlosárová & Blahušiaková (2017), argues that aggregated form of financial statements designed for micro entities does not provide enough data for financial analysis, which is in contradiction for example with IAS 1 where minimum requirements for balance sheet is set to minimum 18 entries (if applicable by entity, otherwise zero balances should be eliminated).

Based on the information provided about IFRS adoption in the Slovak Republic the paper examine following hypothesis:

H1: There is an evidence to confirm voluntary IFRS adoption by accounting entities in the Slovak Republic.
H1.1: Entities in the Slovak Republic with possibility to choose reporting framework prefer IFRS adoption.

3. METHODOLOGY AND DATA

For the purpose of this research, due to the fact that 2020 financial data could have been presented in a later date then the date of this research, a database of year 2019 financial statements was extracted from the national Register of financial statements which is operated under the authority of the Ministry of Finance of the Slovak Republic (MF SR) and provide financial statements of all accounting entities based in the Slovak Republic. This database is available for general public and has a public API, providing data free of charge, but provide only information that identifies an accounting entity, accounting period and financial data from balance sheet and statement of profit or loss, the rest of information (notes and other submissions) are available only as an unstructured format text/picture format for download. For the purpose of this research financial statements reported by accounting entities using financial year with end of accounting period within the year 2019 were considered as 2019 financial statements. Extracted database length was 228 719 entities which represent almost 100% of all Slovak companies (due to obvious reasons, e.g., incorrect data submission by an entity or not presenting financial statements according to the regulation we consider 228 719 as whole population of 2019). After data extraction, the test sample was created. The main purpose of this research is to determine if voluntary IFRS adoption exist, so only data of accounting entities with obligatory IFRS adoption set by the Act on accounting were selected as mentioned in Table 2, representing:

- payment institution or electronic money institution or securities trader (which were not recognized as a bank or a branch of a foreign bank or an asset management company or a branch office of a foreign asset management company),
- accounting entities that have issued securities admitted to trading on a regulated market in any Member State of the European Union,
- entities with legal status of Societas Europaea or Societas cooperativa Europaea or European economic interest grouping with registered office in the Slovak Republic.

To fulfil the goal of this research a database of subjects of financial sector was obtained from the National Bank of Slovakia (NBS) which serves as a financial market supervision authority. Also, database of registered and publicly traded securities was secured from the Bratislava Stock Exchange (XBRA) to cross-reference collected data. As a unique identifier a company ID was used to prevent possible multiple counting if the entity meets more than one characteristic. Manual correction to XBRA database was performed due to some improper reporting of company IDs. If an IFRS-reporting entity meeting criteria specified above was identified a size criteria test was performed to reject mandatory IFRS adoption due to entities size and to confirm voluntary IFRS adoption.

Obtaining a data sample for research of possible voluntary IFRS adoption by Societas Europaea or Societas cooperativa Europaea or European economic interest grouping with registered office in the Slovak Republic was more complicated, because voluntary IFRS adoption is available as an option only if entity presented IFRS statements before the transfer its registered office to the Slovak Republic. Extracted database of all Slovak companies does not provide information whether there was a transfer of registered office of any company (only as a part of non-financial data if an entity provided that information in the Notes to the financial statements), so the reverse approach was used. First, all financial statements of mentioned accounting entities were selected and then test to identify IFRS financial statements was performed. If an IFRS financial statement would be found a further testing would be carried out to rule out the mandatory IFRS adoption (size criteria test). Automated contextual analysis of notes to the financial statements or annual reports (if presented by

an entity) was considered, but due to possible differences of data type of submitted financial statements/annual reports (text or picture) and due to linguistics difficulties as mentioned in the research by Kubaščíková et al. (2019) this research method was abandoned.

4. RESULTS AND DISCUSSION

Many authors try to determine factors leading to voluntary IFRS adoption. Andrzejewski, Kedzior & Kedzior (2017) summarized main aspects: Size, Auditor's reputation, Indebtedness, Profitability, Growth possibilities, Capital intensity, Foreign investor. The following Table 4 shows results of carried out analysis on 228 719 financial statements for the accounting period 2019. For the purpose of the testing of voluntary IFRS adoption, entities recognized as financial institutions with mandatory IFRS adoption (banks, insurance companies, asset management companies) were not taken into count, so figures presented in Table 4 represent the count of entities with possibility to choose IFRS reporting.

Table 4. Identified entities with possible IFRS reporting

Type of entity	Number of recognized entities	IFRS reporting	Voluntary IFRS reporting
Payment institutions	10	3	3
Electronic money institution	1	1	1
Securities traders	27	6	6
Entities that has issued securities	79	9	4*
SE, SCE, EEIG	160	0	0

Source: Own processing

After completion of analysis, H1 hypothesis was confirmed. As for the payment institutions, 30% choose to voluntary adopt IFRS, non of these entities fall into mandatory IFRS adoption based on size criteria test. Only 1 entity was recognized as an electronic money institution, which also adopted IFRS on voluntary basis. 27 Securities traders were identified, out of which 22% adopts IFRS, all passed size criteria test with negative outcome, so the conclusion is that all 6 IFRS adopters out of 27 securities traders were on voluntary basis. Currently there are 79 entities that has issued securities which are admitted to trading on a regulated market in any Member State of the European Union (with exception of banks and insurance companies which were excluded from the sample due to mandatory IFRS adoption). This shows that Capital market in Slovakia is very limited. To better understand limitation of Slovak capital market 24 entities out of 79 with enlisted securities has International Securities Identification Number (ISIN) with Czechoslovakia country code (CS) – those entities probably represent the remnant of public Coupon privatization in 1990s (approx.. 500 entities were enlisted in 1990s). Analysis shows that 9 out of 79 entities adopted IFRS reporting, but only 4 counts of voluntary IFRS adoption was confirmed. The rest, 6 entities were recognized by size criteria test as a mandatory IFRS adopters, however only 1 out of 6 entities met the size criteria in 2019, the rest met the size criteria in the past, but has to continue to draw up accounts in accordance with IFRS. Almost 12% of public interest entities with the option to choose IFRS adoption did that on voluntary basis.

These results support findings published by André, Walton & Yang (2012) in their research conducted on 8 417 UK unlisted companies showing that only 3,41% of the companies used IFRS. The issues related to voluntary IFRS adoption providing conflicting evidence within the same categories of economic consequences (financial reporting effects, capital market effects) were addressed by Brüggemann, Hitz & Sellhorn (2013). However, some similarities of presented results could be found in a research published by Tuzarová & Mejzlík (2017). They conducted a survey made

on publicly traded companies in the Czech Republic – their results are partially applicable in the Slovak Republic due to similarities in legal and accounting systems. In fact, 3 out of 5 entities founded in or after year 2017 which issued publicly tradeable bonds voluntarily implemented IFRS – all 3 entities have foreign investors that prepare consolidated financial statements in accordance with IFRS which is in line with the above listed research of Andrzejewski, Kedzior & Kedzior (2017). These finding partially supports the H1.1 hypothesis, but the research sample was too small to draw conclusion that entities in the Slovak Republic with possibility to choose reporting framework prefer IFRS adoption or not.

The last group of entities with possible voluntary IFRS adoption were companies with legal status of Societas Europaea or Societas cooperativa Europaea or European economic interest grouping with registered office in the Slovak Republic if presented IFRS statements before the transfer of its registered office to the Slovak Republic. 160 entities of specified companies were identified, non of which applied IFRS, so further testing was abandoned.

5. CONCLUSION

Most authors (Ball, 2016; Brown, 2011; Soderstrom & Sun, 2007; Tumpach, 2006; and others) agreed that IFRS introduction has positive effects and improve reporting quality. However, IFRS are designed for big, publicly traded companies and financial institutions. Foreign studies on IFRS adoption are usually performed from the perspective of stock market investors with results tested on stock prices. This approach in not applicable in the Slovak Republic due to very limited capital market as discussed in the article. Introduction of IFRS regulations in a country where accounting system was prescribed in very detailed way by the government for past decades could cause some issues. The effect of reporting quality improvements by IFRS adoption in the Slovak Republic was questioned in the study by Tumpach, Máziková & Kuceková (2015) with evidence that boilerplate compiling of notes to the IFRS financial statements was present which contradict the improved reporting quality assumption. This paper complements previous research by contributing to the literature investigating the determinants of voluntary IFRS adoption by accounting entities in the Slovak Republic. The aim is to understand the issues arising by the decision to voluntary adopt this specific set of standards instead of using national accounting regulation and try to identify if there is any evidence of voluntary IFRS adoption. The Slovak Republic is a small country, where only some 150 accounting entities prepare their financial statements in accordance with IFRS. The evidence supporting hypothesis of voluntary IFRS adoption was found, but the results on determinants of voluntary adoption were inconclusive due to the limitations of the whole IFRS adopters population in the Slovak Republic – only 14 entities with voluntary IFRS adoption were identified; this result does not allow a deeper analysis of causes and consequences of voluntary IFRS adoption in the Slovak Republic. At this point probably the cost factor and unclear benefits for an entity are the main issues for voluntary IFRS adoption, so further on we focus on theoretical consideration of this issue in Slovakia.

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TIGHTNESS DEPENDENCE OF PROFIT CATEGORIES IN AGRICULTURAL ENTERPRISES

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Abstract:
Own research focuses mainly on the economic result, the category of profit and profitability because profit can be considered one of the most important indicators of a company's performance. Based on the database, containing information on hundreds of agricultural holdings, including the calculation of individual profit categories, the links between the individual calculated profit categories were assessed. First, the tightness of the dependence between individual profits is assessed using the correlation coefficient, this dependence is proved to be strong between all categories. Then the share of two categories of profit in the net turnover of companies is calculated and subsequently the share of other operating income in the profit before taxes because most of the received subsidies are accounted for here. These links are assessed for groups of companies divided by size of the entity. In the case of the share of profit in the turnover, the best results are demonstrated for small entities, and in the case of the share of other income in the profit, the medium-sized entity achieves the best result. Finally, the profitability of individual companies is assessed again concerning for to their size. Return on equity and assets came out best for large entities, while return on sales came out best for small and medium-sized entities.

Keywords: *EAT, EBT, EBIT, EBITDA*

1. INTRODUCTION

Profit can be considered the most important indicator of a company's performance. Its amount defines the success of the company for internal and external users or stakeholders. The higher the profit a company has, the more successful it is. It is divided into several categories according to the level of taxation and items affecting profit. Determining individual categories of profit is very important, especially for managers who, based on the resulting values, make decisions that affect the operation of the entire company.

The objective of this paper is to assess the tightness of the dependence between the profit categories of particular agricultural holdings. We also wanted to answer the question of whether there are differences between companies broken down by entity size in the share of profit (in the form of EAT and EBITDA) in the net turnover of companies or the share of other operating income in profit before tax - because most subsidies are accounted here and it is the subsidies that are typical for agricultural companies, resp. for agricultural companies, they contribute significantly to their profitability.

2. LITERARY RESEARCHCHAPTER

Profit (in many forms) is always implemented as an indicator into sustainable performance methodologies (e.g. Hinke, Zborkova & Cerna, 2014) and its amount is examined from various perspectives. Pritee (2021) points to risk factors affecting the profitability of agricultural companies. Pritee (2021) recommends having a set of scenarios ready to mitigate the impact of risk factors on profit.

The profitability of agricultural holdings is affected by several factors. For example, the specifics of the profitability of cattle farms have been investigated by Trejo, Bruhin, Boyer & Smith

(2021). In the published study, they are given herd size impacts on profitability. Their dynamic cattle growth model was developed to capture expanding and maintaining the desired herd size. Discounted cash flow (DCF) models over a 15-years were calculated to estimate net present value (NPV), modified internal rate of return, and cash flow deficit to keep the business operating and service debt. Malak-Rawlikowska et al. (2021) examined factors affecting the sustainability of the pig farming business and the profitability of this business. The authors of this study point to factors influencing the long-term sustainability and profitability of agricultural production. The results showed that closed-cycle farms do have advantages in terms of raising healthy animals and having slightly better overall resilience of resources, however specialized breeding and finishing farms appeared to be more sustainable in the areas of profitability, risk management, and reproductive efficiency.

Chekmam, Maza-Rubio & Pardos (2021) dealt with profitability and sheep breeding. In their study was analyzed the possible relationship between the economic results of a sample of sheep meat farms located in Aragon (Spain) and certain structural indicators. Previously a typification was done to study their variability. The sample was made up of 126 Aragonese meat sheep farms. They concluded that the optimization of the number of ewes per total labor unit and per hectare of the used agricultural area are aspects to be considered when improving the profitability and viability of sheep meat farms.

The profitability of cereal cultivation is influenced, among other things, by the quality of seed breeding. This issue resolves Bancic et al. (2021). Intercrop breeding programs using genomic selection can produce faster genetic gain than intercrop breeding programs using phenotypic selection. They suggest a genomic selection strategy that combines monocrop and intercrop trait information to predict general intercropping ability to increase selection accuracy in the early stages of a breeding program and to minimize the generation interval.

Ovechkin et al. (2021) denote non-balance sheet resources as the intellectual capital (IC). Ovechkin et al. (2021) in their research concluded that the efficiency of structural capital usage and the stock of human capital has the biggest impact on the profitability level of the agricultural businesses among employed measures of IC.

Gangwar et al. (2021) recommend sharing information between farms. Information sharing with the farmers about their land holdings, cultivated crops, irrigation facilities, used fertilizers, input cost, net income, use of digital technologies, farming apps, socioeconomic background, and their educational qualification was found helpful in improving their productivity and profitability. The conducted assessment contributed to the generalized management of agroecological resources toward highly optimized, intelligent, individualized, and anticipatory farm management practices.

Mighty & Granco (2021) state factors affecting geospatial profitability. Mighty & Granco (2021) show the impact of these factors on the coffee production sector. However, generalizing postulates applicable to other types of agricultural production can be found in their article.

Klima et al. (2020) also point to the diversity of soil conditions and water availability in different geographical areas of the Earth and the impact of these climatic conditions on farm profitability. Klima et al. (2020) examine the impact of subsidies provided to farmers in mountain areas on their profitability. The EU is aware of the need to maintain rural and mountainous settlements, so in some cases, subsidies artificially increase the profitability of farms.

Orefice et al. (2019) describe the possibilities of increasing the profitability of agricultural enterprises by expanding the land used for growing plants. Orefice et al. (2019) discussed the possibility of using forest land for plant growing purposes. They conclude that forage production in silvopasture can be competitive with that in open pastures on sites with a similar, forested, starting condition.

Cortignani, Dell'Unto & Dono (2021) demonstrate the impact of climate change on the profitability of Italian farms. Using mathematical modeling, they then demonstrate the impact of climate change and adaptation scenarios on the profitability of farms. Climate change requires Mediterranean farms to maintain adequate profitability while adapting to the increase in water needs of crops, the growth of water demand for non-agricultural users, and the reduction of resource

availability. Crop farms adapt by reducing labor use in less profitable activities, which boosts family hourly wages but increases unemployment.

Perez-Pons et al. (2021) point to the impact of technology on farm profitability. In particular, they focus on IoT usage in agriculture. Perez-Pons et al. (2021) declare a significant impact of the use of information technology to increase the profitability of farms. Perez-Pons et al. (2021) state "Globalization has led to a new paradigm where the traditional industries, such as agriculture, employ vanguard technologies to broaden its possibilities into what is known as smart farming and the agri-food industry 4.0. This industry needs to adapt to the current market through efficient use of resources while being environmentally friendly".

Furthermore, Creedon et al. (2019) describe the application of technologies to increase the profitability of agricultural enterprises.

Zoller & Romich (2020) emphasize the impact of energy costs on farm profitability. Zoller and Romich (2020) emphasize the importance of educating farmers in energy consumption and energy savings. In general, education and information on the costs of production factors are key determinants of profitability.

Differences in common profitability measures are analyzed in accrual-based accounted farms in 10 European countries in a study by Beyer & Hinke (2020). This analysis shows that Czech agricultural companies achieve the highest RoS, Polish agricultural enterprises the highest RoCE, and the highest RoE is in Austrian farms.

These authors also examined individual profitability factors in a larger sample of companies in a sectoral comparison (Beyer & Hinke, 2018), which showed that the advantage of Czech companies is a lower wage burden and a lower level of corporate taxation. These factors contribute to Czech companies increasing their profitability, in contrast to, for example, German companies, which are burdened with higher labor costs and taxes but are able to eliminate these negatives with a lower level of purchased services.

3. MATERIALS AND METHODS

As part of our research, a database of 100 agricultural enterprises was created from publicly available sources (from the official website of the Czech judiciary www.justice.cz). Selected values from the financial statements and annual reports as of 31. 12. 2019 were entered into this database. Only entities accounting in accordance with Czech accounting standards were included in the sample of companies. The companies in the database were ranked from the most profitable to the most loss-making.

Subsequently, various profit categories (EAT, EBT, EBIT, and EBITDA) were calculated for individual companies from the database. We also used the correlation coefficient to look for the tightness of the dependence between the particulars profit categories. The share of profit in the total net turnover of companies and the share of other operating income in profit before tax were also calculated. Other pre-tax income includes income from subsidies - i.e. typical income for agricultural holdings.

The companies were divided into 4 groups: 1. micro entities, 2. small entities, 3. medium entities, and 4. large entities. The key to cutting the rules contained in the Czech Accounting Act. For individual group companies were subsequently calculated profitability indicators.

Subsequently, we examined the degree of dependence between the various categories of profit. The statistical program SPSS was used for these calculations. The tightness of the dependence was determined based on the calculation of correlation coefficients between the given profit categories. First, it was tested whether the data had a normal distribution using two normality tests (Kolmogorov-Smirnov test and Shapiro-Wilk test).

Based on these tests, it was found that the data do not have a normal distribution and can thus be used to calculate the pair tightness of the dependence. The Spearman correlation coefficient was used for this purpose.

The calculation of individual profit categories differs depending on the approach of different authors. The most common are the four basic categories, which are EAT, EBT, EBIT, and EBITDA. Jiří Strouhal (2016) lists an additional category, which he calls the abbreviation EBITDAR (table 1). In our research, the values for the profit categories listed in table 1 were calculated.

Table 1. The Profit categories

Category name	**Abbreviation**	**Usability**	**Information potential**
Earnings After Taxes	EAT	Significant for owners, investors, banks, and suppliers.	Intended for distribution, it is a source of financing for the company.
Earnings Before Taxes	EBT	Significant for the CFO.	It is used to compare the performance of companies for different periods.
Earnings Before Interest and Taxes	EBIT	Significant for investors, owners, and directors in the need to quantify profits without affecting the method of taxation and financing.	It provides information for assessing operational performance, focusing on revenue growth and cost management.
E. B. I., T., Depreciation and Amortization	EBITDA	Significant for the CFO in financial analysis in the interpretation of ratios.	It enables international comparison of companies' profitability; it simply forms an indicator for measuring cash flow.
E. B. I., T., D., A. and Rent	EBITDAR	Significant for shops, restaurants, and large trading companies.	It is used to compare performance when rent is a significant part of the total cost.

Source: Own processing according to (Strouhal, 2016); (Knápková, Pavelková, & Šteker, 2013)

4. RESULTS

Spearman's correlation coefficient proved a strong dependence between all categories of profit. The specific results of the correlation coefficients are given in the following table.

Table 2. The tightness of the dependence expressed by the Spearman correlation coefficient, File size (N) = 100, P-value (sig.) = 0,000

		Profit category			
		EAT	EBT	EBIT	EBITDA
The value of the Spearman correlation coefficient	EAT	1,000	0,998	0,982	0,912
	EBT	0,998	1,000	0,985	0,915
	EBIT	0,982	0,985	1,000	0,942
	EBITDA	0,912	0,915	0,942	1,000

Source: Own processing

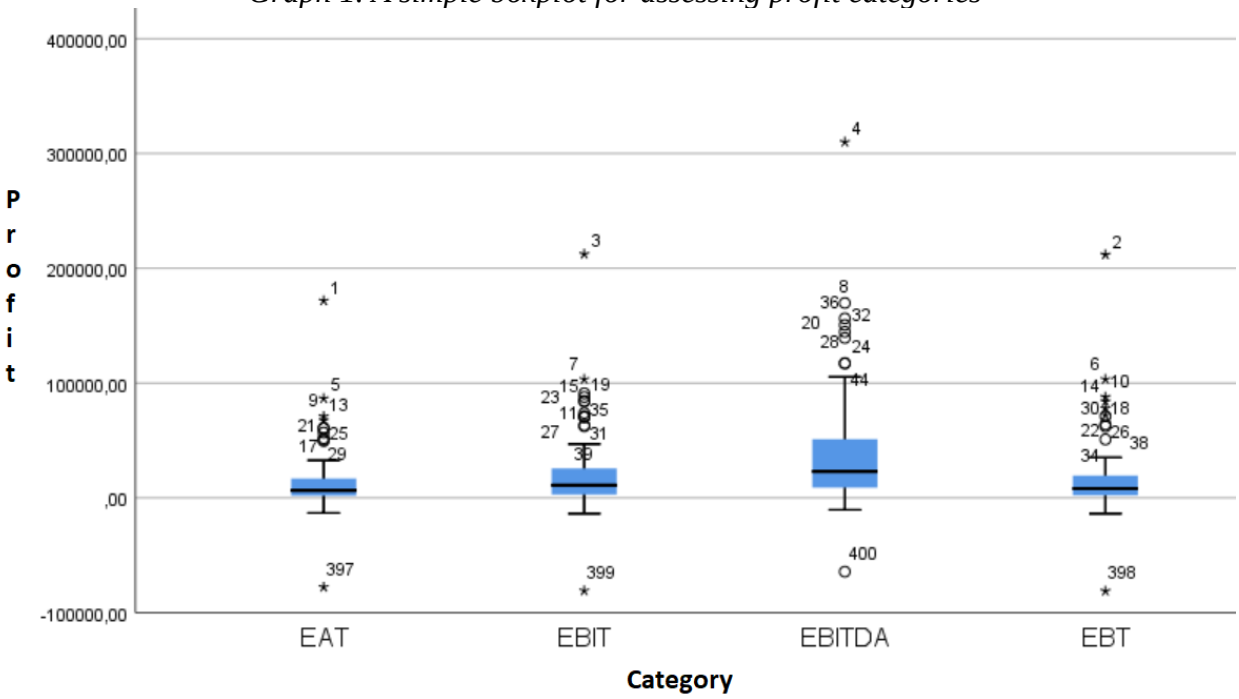
From table 2 created in the SPSS application, it is clear that the dependence is very strong between all the profit categories. The value of the correlation coefficient of all categories exceeds 0.9. It can also be deduced from the table that the correlation coefficient decreases with the increasing items included in the profit calculation.

In the first row, which measures EAT and other profit categories, the smallest dependency tightness is EBITDA, for which the value of the correlation coefficient is 0.912. EBT and EBIT also have the least dependence on EBITDA. EBITDA has the lowest value of the correlation coefficient against EAT, again at 0.912, which confirms the statement from the first row.

For all profit categories, the output from the SPSS application also contains the data of the P-value or significant value used for statistical testing of hypotheses. This value is equal to 0 for all profit categories. The designation N expresses the number of items in the set or its range, in this case, it is 100 farms.

We also present a boxplot graph - i.e. a "box graph" for assessing the profit according to individual categories. This graph is an expression of numerical data. The graph allows you to assess selected data using quartiles. The box plot captures minimum, maximum, and median. The graph is divided into four quartiles, each of which contains 25% of the data.

Graph 1. A simple boxplot for assessing profit categories



Source: Own processing

Points with the numerical around express outliers. Based of the above box graph 1, it is possible to assess, according to the numerically marked points, which companies are furthest from the median values and thus form the most significant outliers.

Graph 1 indicates that the dispersion in EBITDA is higher than in all other profit measures. Unfortunately, we do not have the necessary data to analyze the causes of this phenomenon. EBIT is higher than EBITDA by the value of depreciation. One of the possible causes of the phenomenon described above may be a higher amount of depreciation for the surveyed companies. We will examine the causes of this difference in future research.

5. DISCUSSION

Text Nyvltova (2016) points to the effects of creative accounting on the financial statements and the calculated profit indicators. Risks and the explanatory power of the financial health assessment through bankruptcy and credibility models are a very hot topics. Results of the financial health assessment are affected by values in the financial statements. Creative accounting can lead to the distortion of these values. Additionally, the success of models is also not absolute, and it may happen

that the result of this assessment will affect negatively the decision of investors, owners, and other users of this information. Due to globalization, the International Financial Reporting Standards are used as the accounting system. This accounting system has some advantages in the financial health assessment compared with Czech regulations. Differences in the accounting of subsidies, the valuation at fair value, or the classification of biological assets in fixed assets reduce the use of creative accounting compared with our system. Thus, financial statements are not affected so much. Nyvltova (2016) evaluates models IN05, Guroik index, CH – index, and Rezbova OP model' for the Operational Programme Rural Development are evaluated. Nyvltova (2016) states that absolute and relative indicators that are most correlated with the actual position of the company, are identified. According to a summary, the most important seems to be EBIT and cash flow. The ratios are statistically significant the return on assets and the total debt. According to these results, it would be useful to replace the suggestible indicator income with the indicator of cash flow, which is not affected by the accounting methods.

Goral & Soliwoda (2021) examined various determinants of the profitability of Polish farms. To answer this question, they employed a unique panel of 78 entities. They found that subsidies hurt harmedon profitability of large farms. Moreover, they did not detect a significant impact of variables related to farm operator. Financial surplus to liabilities had a positive impact on both ROS and ROA. Moreover, the significance of using the risk management tools and shaping the ratio of rented land to total land are underlined as important managerial implications. Diagnostics of the model indicated the advantage of the models with fixed effects (FE) over the models with random effects (RE).

6. CONCLUSION

All profit categories were calculated based on a database containing 100 agricultural holdings. The data were obtained from the financial statements and annual reports for 2019 and included only companies that account in accordance with Czech accounting standards, for which all the necessary data could be traced. Subsequently, other databases were created containing the data needed for further calculations.

First, the statistical program SPSS was used to assess the tightness of the dependence between the individual profit categories based on the calculation of the Spearman correlation coefficient, which was proved to be strong in all tested pairs, as the value of the correlation coefficient was always higher than 0.9. Based on the created box graph, the extreme outliers in the examined sample of companies were further assessed.

For further investigation, the companies were divided into 4 categories according to the size of the entity. When assessing the share of EAT's net profit in net turnover and the EBITDA profit category, which is the farthest from EAT items, it was found that it contributes many times more to EBITDA turnover. The shares in both categories were the highest for small entities (when micro-entities were excluded due to the minimum representation in the group). EBITD's share of turnover was 19.02%, while EAT's share was only 5.82%. It turned out that the differences in the values of different profit categories are therefore relatively significant.

Our next intention was to assess the extent to which the item of the Profit and Loss Statement entitled “other operating income” contributes to the pre-tax profit of EBT for individual groups, again separately for groups according to the size of entities. The largest share was proved in medium-sized accounting entities, where it amounted to 4.1612 thous. CZK.

To assess the profitability of companies, profitability indicators were calculated for the average and median values of groups of companies, again divided by size. Specifically, the return on equity, assets, and sales indicators were calculated. For the indicators of return on equity and assets, it was found that the highest profitability in this ratio is achieved by large entities. The ROE was 5.39% for the median values of large entities and 5.43% for the average values. The ROA was 5.67% for the median of large entities and 4.39% for the average. In contrast to the previous indicators, the profitability of sales was the highest in the median values for medium-sized entities, namely 4.77%.

For average values, it performed best for small entities, namely 8.15%, which was the highest achieved value of profitability for these indicators.

In our research, we also looked at other operating revenues (OOR). The average value of OOR for the entities analyzed by us is 129 219,9091 ths. CZK. The average value of EBT is 73 516,3636 ths. CZK. The share of OOR in the value of profit before tax for large accounting units is 1,7577 ths. for average values CZK.

Medium-sized entities, of which there are 39 in the database, have an average value of OOR 64 500,9744 ths. CZK. Profit after tax is on average value 15 500,5128 ths. CZK. The share of OOR to profit after tax is 4,1612 ths. CZK. OOR in medium-sized entities contributes several times more to profit than in large entities.

Small entities represent almost half of all companies in the database. The average value of OOR is 20 513,8936 ths. CZK and the average value of profit before tax is 5 525,7447 ths. CZK. The share of other operating revenue in profit before tax is 3,7124 ths. CZK. OOP also contributes very significantly to the profit of small entities.

There are only 3 micro-entities in the database, 2 of which are loss-making. The share would therefore be negative in the amount of -1,9981 ths. CZK. If only the profitable micro-accounting unit is considered, i.e. the company ZOS Běsno s. r. o., whose OOP amounts is 46 ths. CZK and EBT is 80 ths. CZK, the share of other operating revenue in the profit is 0,575 ths. CZK.

Thus, medium-sized entities have the highest share of OOR in profit before tax and based on this finding it can be assumed that they receive the most agricultural subsidies of all categories of entities. Micro-entities have the lowest share of OOR in EBT, but their representation in the sample is minimal and the figure may therefore be skewed. Therefore, if micro-entities are not included, enterprises in the category of large entities have the smallest share of OOR in EBT.

The results of our research clearly illustrate the relationship between the size of the entity and the various categories of profit. The tightness of the dependence between the examined profit categories is also influenced by the fact that part of the same variables enters into the calculation of all profit categories. Farm profitability is also affected for some profitable categories assigned subsidies.

Unfortunately, our research did not provide data to determine the factors affecting the profitability of the surveyed companies (for example the challenges in distribution of products in domestic and foreign markets, input factors of production, such as machinery and labor, and the level of integration into global supply-demand networks). These are inspiring and important topics for our future research.

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CLARITY AND COMPREHENSIBILITY OF TAX DOCUMENTS FOR USERS WITHOUT ECONOMIC EDUCATION

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Abstract
The aim of the paper was to find out, through a questionnaire survey, the extent to which people without economic education (ordinary users) are familiar with tax documents, i.e. how they evaluate the comprehensibility, clarity and location of individual items (particulars) of the most common tax documents (represented by an invoice in the paper) and what are their preferences. Although a tax document is a basic evidence for a business transaction and the related value added tax and its particulars are mandatory by law in the Czech Republic, its visual form and the location of the items on the document are not standardized or established by any legal regulation or standard. The results of the questionnaire survey could contribute to increasing the clarity and comprehensibility of tax documents for ordinary users. The preferences of the respondents were compared to the usual business practice in form of a sample of invoices actually issued and conclusions were drawn for the optimal look of documents. The questionnaire survey revealed that for users there is uncertainty related to the date of the taxable supply (performance), as well as difficulties in finding important information such as price, date of due payment, account number and variable symbol. Most users suggest unifying the look of the documents, listing individual items according to the principles of administrative techniques and listing the most important items in bold or significantly larger letters, using different colors or frame them in a box.

Keywords: *clarity of tax documents, comprehensibility of tax documents, particulars of tax documents, tax documents, visual appearance of tax documents*

1. INTRODUCTION

The paper deals with the particulars of tax documents which are important not only for entrepreneurs during their business activities but also for non-entrepreneurs (non-business entities) which receive a document as a proof of transaction in their everyday life. Therefore, this is an important topic as everyone encounters it. For the aim of this paper the most commonly used tax document, the invoice, had been chosen. Although it is a common term and is used in the ordinary course of trade, it is not defined as such in any legislation.

Entrepreneurs (legal entities, individual natural persons) which issue invoices are free to use any visual look for their invoices and how to locate the legal requirements on their tax documents. Some entrepreneurs use accounting programs with an already present template to compile invoices, others issue them using Excel or Word or otherwise. If the document has the particulars of a tax document, it can also be handwritten. Based on the tax document, the recipient of the invoice pays the performance and claims the goods or services. If the document is visually confusing, it is time-consuming to find the requirements stipulated by law on the document and also there may be errors – for example, it can be overlooked that it is an advance invoice or confusing the variable symbol with the registration number of the tax document.

The aim of the paper is to find out to what extent users with no economic education (ordinary users) are familiar with tax documents, i.e. how they evaluate the style and location of individual items of common tax documents and what would contribute to increasing the clarity and comprehensibility regarding the visuals of these documents. Another aim is to compare the findings

with a sample of actually issued invoices (150 invoices issued by different business entities for several recipients) and draw conclusions for the optimal look of these type of documents.

To meet the aims of the paper, a mixed research was conducted using a questionnaire survey. The questionnaire was created using a web-based questionnaire on the Survio site and distributed using a hyperlink on the social network Facebook, and the link was also forwarded to potential respondents via e-mail. A total of 122 questionnaires were completed, of which 20 respondents completed the questionnaire in the pilot phase. For questions dealing with the distribution of the particulars on a tax document (location of items such as the date of issue, due date of payment, tax base, name of the supplier or customer, etc) the division of the tax document form into 6 sections was used for visual presentation – see Table 1. This division to sections is used in the chapter Results.

Table 1. Division of the look of a tax document form into sections

A	**B**
C	**D**
E	**F**

Source: own processing, 2021

2. LITERATURE RESEARCH

In the Czech Republic, the Law on Accounting No 563/1991 Coll. defines the basic requisites of the accounting documents (particularly for evidencing the business activity of the accounting units) determining six core requisites such as the name of the accounting document; the content of the accounting case and its participants; monetary amount or information on the price per unit of measure and expression of quantity; then the date of issuing the accounting document; the date of realization of the accounting case, if it is not identical with the previous date; signature record of the person responsible for the accounting case and signature of the person responsible for its recording. For tax documents, the Value added tax Act No 235/2004 Coll. is way more demanding as to the required content and it stipulates the following particulars: the designation of the person carrying out the transaction; tax identification number of the person who performs the transaction; name of the person for whom the transaction takes place; tax identification number of the person for whom the transaction takes place; registration number of the tax document; scope and subject of performance; date of issue of the tax document; date of performance of the transaction or the date of receipt of the consideration, if the obligation arose on the date of receipt of the consideration to declare tax or to declare the transaction if it differs from the date of issue of the tax document; unit price, net of tax and discount, if not included in the unit price; tax base; tax rate; amount of tax where this tax is denominated in Czech currency (Hinke et al., 2020). A tax document may also contain a reference to the relevant provision of the Act, a provision of a European Union regulation or other indication stating that the transaction is exempt if the transaction is exempt; ‘tax shall be paid by the customer’ where the person liable is the person liable for the tax.

An ordinary citizen most often encounters a tax document of the type of an invoice or a simplified tax document, i.e. receipt. A tax document can be considered simplified if the total amount of the document does not exceed CZK 10,000, including tax. It does not have to contain data about the buyer, tax identification number of the buyer, unit price without tax and discount, if it is not included in the unit price, tax base and amount of tax (Act on the Value added tax, § 30 art. 2). Only rarely in everyday life can we encounter other so-called special types of tax documents, such as a repayment calendar, a summary tax document, proof of use or confirmation at auction or sale outside the auction (Víchová, 2021).

Documents as a primary evidence of the executed business transaction is the cornerstone of all accounting systems and, as Zborková & Hinke (2011) states, this fact has not changed even with the ongoing harmonization of financial reporting and the convergence of accounting systems. Although accounting or tax documents are basic evidence, its visual form is not standardized or established by any legal regulation or standard. Zadorozhnyi & Muravskyi (2020) argue that the visuals of accounting documents are related to the communication technologies through which they are distributed. Kostyanyk (2009) dealt with the visuals of the accounting documents and tried to define the key characteristics of the documents and find the optimal section for their location in the documents – but for the corporate sector, not for ordinary users.

Many authors emphasize the role of tax documents in the fight against tax evasion. Moravec, Hinke & Kaňka (2018) discuss the influence of the registration of individual documents in the control statements for the collection of value added tax. Other authors like Matulovic, Yu, Paschoal, et al. (2015) or Wilks, Cruz and Sousa (2019) report that many governments encourage customers when making cash payments at retail stores to require documents as a proof of value added tax paid by refunding to customers a percentage of the tax paid in the store or by practicing a prize lottery for valuable prizes.

Horák, Bokšová & Strouhal (2020) deal with the modern trend in the field of documents, which is Electronic invoicing (e-Invoicing). The use of the electronic invoicing process increases the transparency of business transactions and interconnects accounting systems between suppliers and customers in real time. It can be assumed that the benefits of electronic invoicing include better debt collection, reduced printing and postage costs, and cheaper and faster processing of invoice payments. The electronic invoicing system is already anchored in the European Union by Directive 2014/55 / EU on public electronic invoicing and public procurement. This trend is also confirmed by other authors outside the European Union – e.g. Liu & Liu (2018) or Matus et al. (2017). However – whether the tax document is issued and distributed physically or electronically, for its recipient (for an ordinary user with no economic education) the clarity of individual items and comprehensibility of data on the document will always be crucial, which is the reason for conducting the following questionnaire survey.

3. RESULTS

The questionnaire survey determined the frequency of use of individual types of tax documents. Not surprisingly, respondents most often encounter a simplified tax document (85 responses) and an invoice (78 responses), and a much lower frequency was recorded for the payment receipt (33 responses) and the corrective tax document (16 responses). Respondents did not encounter other special types of tax documents.

Regarding the clarity and comprehensibility of the documents, the following facts were ascertained by the questionnaire:

1) Data (particulars presented on the invoice document) which are not clear to the ordinary users, or they do not understand what they mean

   The respondents (except for 6) mentioned in the first place the date of the taxable supply (date of performance the transaction of the consideration), which is a very vague concept for them. It would be appropriate to indicate a reference to a note with explanation (for example in the bottom of the document) for non-business entities (ordinary users without Identification number).

   The respondents also found not comprehensible the difference between the date of issue and date of taxable supply. However, for ordinary users it is not a necessity for their payment and because these two dates are either the same or are very close time-wise, it does not affect the warranty time considerably.

Comprehensibility is also compromised by the frequently used name of the document "Invoice – tax document". Users are confused if its a duplicity or if there is an invoice which is not a tax document.

2) The average time of document processing (time needed to obtain all the data from the document that an ordinary user needs to make a payment) – this time was determined as average by the respondents and was in most cases in the interval of 3–5 minutes.
3) Other findings are related to the invoice items (particulars) and their location on the document. Table 2 shows which of the mandatory requirements of the invoice their recipients are looking for and use the most (they are therefore interested in their search).

Table 2. Searched data on an invoice by ordinary users

Options	Number of responses
Total price	121
Bank account number	102
Due date of payment	78
Variable symbol	48
Date of the issue	33
Subject of performance	29
Tax base, amount of value added tax	27
Name of the customer	22
Date of taxable supply	16
Registration number of the tax document	14
Other	0

Source: own processing, 2021

The most frequently searched information on the invoice is the total price. The second most frequently sought-after information is the due date of payment, followed by the search for the account number and the variable symbol. All four of this most frequently searched information is used to pay the invoice for the purchased supply and that is why these data are most often searched by respondents. Less searched information includes the date of the issue, subject of performance (subject of supply), tax base, amount of tax, name of the customer, date of taxable supply (date of performance) and the registration number of the tax document. This information is important, for example, for determining the date of purchase, identifying the exact type of goods, the date when the warranty period begins, etc.

Approximately the same distribution of responses was also noted for the question, which found out which data would be good to report differently (colour, size or otherwise) from the rest of the text to increase clarity. The first four most preferred answers were total price, due date, account number and variable symbol.

Interesting are also the responses to the question regarding in what way the reporting of these significant data should be highlighted on the invoice for better clarity. Table 3 shows the number of each preferred way to present the most important data on the invoice by respondents.

Table 3. Preferred ways to increase clarity of presented data on the invoice

Odpověď Options	Number of responses
Significant items indicated in bold letters	84
Significant items indicated in larger letters	27
Significant items indicated in a framed box	20
Significant items indicated by a different color	19
Significant items indicated by a different font of letters	4
Other	0

Source: own processing, 2021

According to the vast majority of respondents, the presentation of significant items (total price, account number, due date of payment and the variable symbol) in bold letters would increase the clarity of the reported data. In the second place according to the preferences, it is important to state significant items in larger letters. Table 4 shows the occurrence of these preferences in the monitored sample of real issued invoices.

Table 4. Methods of presenting significant items in the sample of real invoices (in %)

Significant item	Bold letters	Larger letters	Framed in box	Different by colour	Different by font
Price	97	59	86	11	19
Account number	91	38	46	7	4
Due date of payment	67	22	58	4	13
Variable symbol	54	14	44	2	4

Source: own processing 2021

By comparing the data from Tables 3 and 4, it can be stated that the preference of ordinary users for bold letters for significant data is met (with a few exceptions), also the framed box method is common. However, the situation is different with the preference for a larger font, which prevails only for the price (it occurs with much less intensity for the account number, due date of payment and the variable symbol), and also for a different font. The preference for the colour differentiation is the least met which is related to the fact that many traders issue or distribute invoices in black and white.

Further questions focused on the placement of individual items on the invoice. Table 5 shows the percentages of respondents according to their idea of optimal visual placement (based on the sections introduced in the chapter Introduction, Table 1).

Table 5. Optimal visual location of particular items on the invoice preferred by ordinary users (in %)

Items on the invoice / Section	Section A	Section B	Section C	Section D	Section E	Section F
Date of issue, date of due payment, date of taxable supply	45	22	13	12	3	5
Name of the supplier	54	34	8	2	1	1
Name of the customer	12	43	25	10	4	6
Account number	15	8	39	19	17	2
Total price	2	2	1	17	9	69
Tax recapitulation – price without VAT, VAT rate, amount of VAT	4	1	6	24	34	31
Variable symbol	15	20	32	16	13	4
Number of the tax document	27	51	8	4	7	3
Subject of performance	22	12	66	0	0	0

Source: own processing, 2021

According to the results shown in Table 5, the majority of respondents would prefer the information about the date of issue, the due date of payment and the date of taxable supply in sector A, followed by the preference of information presented in sector B which is visually on the same level as sector A but on the other side (see Table 1 for reference). More than a half of respondents would find helpful to show the name of the supplier in section A and the name of the customer in section B, at the same level of visibility, next to each other. It is possible that this kind of preference has roots in the common administrative techniques and rules of letter writing.

Most respondents would prefer to see the bank account number (for the payment) in section C, right under the name of supplier. More than half of the respondents would find useful for the price to be shown in section F and the tax recapitulation (price without VAT, VAT rates and the amount of

VAT) in section E which shows the preference of the respondents to see the tax recapitulation before the total price is presented (in sense of reading the text from left to right).

Most respondents would place the variable symbol in section C, i.e. next or under to the bank account number. More than half of the respondents would find helpful to place the identification number of the invoice in section B, eventually in section A.

Table 6 shows the comparison between the preferences of respondents for the location of the items and the most frequently used location in the sample of real invoices.

Table 6. Comparison of the location of the items according to the respondents´ preferences and the sample of real issued invoices

Item of the invoice/Method of presentation	Prevailing section according to the questionnaire survey	Prevailing section according to the sample of real invoices
Date of the issue, Due date of payment, Date of taxable supply	**A**	**B**
Name of the supplier	A	A
Name of the customer	B	B
Account number	**C**	**D**
Total price	F	F
Tax recapitulation – price without VAT, VAT rate, amount of VAT	**E**	**F**
Variable symbol	**C**	**D**
Number of the tax document	B	B
Subject of performance	C	C

Source: own processing, 2021

Table 6 shows in bold letters the differences in the placement of individual items according to the sample of actually issued invoices from the prevailing opinion of respondents on the optimal preferred placement of items. Differences can be seen in the indication of the dates of issue, due date of payment and the date of the taxable supply, the location of which most respondents would like at the top left of the document. This fact is probably related to the style of reading documents from left to right. Other difference is related to the location of the bank account number which the respondents would prefer to see optimally together with the variable symbol and the subject of performance in sector C. However, the account number in most of the invoices is placed under the dates (dates of issue, due dates of payment, date of supply) on the right part of the document, in section D. The respondents would prefer to have the tax recapitulation in section E, i.e. at the same level with the price but mentioned earlier in the reading direction (i.e. to the left of the total price). Most of the respondents would prefer to see the variable symbol in section C, i.e.. together with the account number as it is needed for the payment. However, by observing the sample of actually issued real invoices, this information is located at the same level but on the right side of the document.

4. CONCLUSION

The requirements for tax documents in the Czech Republic are set out in Act No. 235/2004 Coll., on Value Added Tax. However, what this law does not prescribe is the visual form of tax documents, which causes time-consuming search for data needed to pay, determine the warranty period, etc. Unlike business entities, which already intensively deal with electronic invoicing and many already have the means to extract data from tax documents, the average user still manually processes individual documents. For this reason, the aim of the article was to find out, through a questionnaire

survey, the extent to which users without economic education (ordinary users) are familiar with tax documents, i.e. how they evaluate the style and location of individual items of current tax documents and to further compare the findings with a sample of actually issued real invoices to draw conclusions about the optimal appearance of documents.

Based on the questionnaire survey, the incomprehensibility is related to the term "date of the taxable supply", also there is an ambiguity between the terms the date of issue of the document and the date of the taxable supply and ambiguity between the terms invoice and tax document is not clear for the ordinary users. According to the vast majority of respondents, the presentation of significant items (price, account number, due date of payment and variable symbol) in bold letters or larger letters (than the rest of the data) would increase the clarity of the reported data, some respondents would also consider the significant data framed in the box or indicated by different colour or by different font. By comparing the preferences of respondents from the questionnaire survey and from the analysis of a sample of 150 actually issued real invoices, it can be stated that the preference of ordinary users for bold letters is met (with some exceptions), also the indication of important information framed in the box is a common custom. However, the situation is different regarding the preference for larger letters and also for a different font. The least met preference is the colour differentiation, which is related to the fact that many traders issue or distribute invoices in black and white.

The comparison between the optimal distribution of items (location of the items on the invoice) according to the respondents and according to the sample of real invoices shows the difference in the dates of issue, due date of payment and taxable performance, the location of which most respondents would like at the top left of the form. This fact is probably related to the style of reading documents from left to right. There is also a difference in the location of the account number, which the respondents would optimally see together with the variable symbol and the subject of performance in sector C. The tax recapitulation should be available to the respondents optimally in sector E, i.e. at the same level as the total price but mentioned earlier in the reading direction (i.e. to the left of the total price). The variable symbol is preferred by most respondents to be seen in section C, i.e. together with the account number, as this information is required for the payment.

The results of the questionnaire survey could contribute to increasing the clarity and comprehensibility of tax documents for ordinary users. Further research will focus on the possible ways to unify the particulars on the tax documents for users by approaching other related parties.

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PFIZER SELF-PRESENTATION ABOUT SUSTAINABILITY AND CSR – THE MESSAGE FROM ITS 2020 REPORTS

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Abstract
Today's global society is increasingly interested in the issue of sustainability and this leads to expectations about the responsible behaviour of all stakeholders, especially those able to afford to do so. The pharmaceutical industry is among those industries expected to exhibit a strong corporate social responsibility (CSR), and multinational pharmaceutical corporations such as Pfizer have engaged in both financial and non-financial reporting. COVID-19 brought new dynamics in this setting and Pfizer was seen by a section of the public as a corporation exclusively focusing on profit maximization and denying CSR, while for others it is a prime example of an effectively and efficiently operating, pro-CSR business. Logically, the assessment of the role and function of Pfizer, above and beyond the Pfizer–BioNTech COVID-19 vaccine, vis-à-vis sustainability and CSR, begins with a critical Meta-Analysis of their most recently e-published CSR report – Environmental, Social & Governance Report 2020 (ESG Report 2020) along with the general Pfizer 2020 Annual Review. The holistic exploration of this Report, based on the 6 CSR categories, leads to pioneering revelations about the inside perception and self-presentation regarding CSR. These revelations are complemented and refreshed by Socratic questioning and glossing and culminate in conclusions casting a new light on Pfizer Inc.

Keywords: *Corporate Social Responsibility (CSR), Environmental, Social & Governance Report 2020 (ESG), Pfizer, Sustainability.*

1. INTRODUCTION

The development of the concept of sustainability and of Corporate Social Responsibility ("CSR") was promulgated by Germans, see the Hanseatic history and the concept of Nachhaltigkeit based on the sectorial long-term responsibility (Schüz, 2012). Progressively, the concepts of sustainability and CSR have acquired a global dimension with the development of multi-stakeholder initiatives led by large multinational companies and corporations, especially if they operate in sensitive and/or highly profitable industries (Horváth et al., 2017; Sroka & Szántó, 2018; Vveinhardt & Sroka, 2020; Streimikiene & Ahmed, 2021). Indeed, there is evidence from around the world regarding the increasing importance and impact of CSR and its reporting (Porter & Kramer, 2002). Namely, since modern businesses are understood as doing and generating both "good and evil", they need to deliver not only benefits to their internal stakeholders but as well deliver social and environmental benefits to offset any adverse consequences of their behavior (Dropper & Bennett, 2015). Naturally, businesses are at different points in their recognition, integration, and implementation of CSR (Dropper & Bennett, 2015) and nonfinancial reporting is well known for its conceptual and terminological heterogeneity (Stolowy & Paugam, 2018). Undoubtedly, the pharmaceutical industry is well advanced in this respect, especially its leaders, such as Pfizer Inc. (Dropper & Bennett, 2015). Interestingly, Pfizer has a strong German background, has developed in a particular manner and for decades its impact on many levels and aspects has been discussed.

In 2020, the global COVID-19 pandemic spread through the entire world and impacted basically all industries (Pardal, et al., 2020; Kufel, 2020; Bernardelli, et al. 2021; Liu, et al. 2021). For the majority it was, and remains, more a threat than an opportunity, but for some it is clearly a great opportunity to improve their financial results and maybe even more. Businesswise, Pfizer Inc.

has not remained idle and partnered with BioNTech to study and develop the COVID-19 mRNA vaccine. This endeavour successfully resulted in the authorization and massive commercialization of the vaccine branded "Comirnaty" in the EU.

Consequently, Pfizer Inc. has become perceived by some as an evil and predatory business taking unfair advantage of Intellectual property ("IP") law, operating merely for its profit maximization, and totally denying social and environmental aspects. However, by many others, Pfizer Inc. is a pro-sustainability and pro-CSR leader which has taken on the role of the 'savior' of the world's population and of the entire planet. Well, the last judgment about the devil or good Samaritan role will be revealed in the future, but already, here and now, one can and should study the attitude and approach of Pfizer Inc. The starting point is obvious – internal self-declarations about the reach and commitment. The source par excellence for that is the Environmental, Social & Governance Report 2020 issued by Pfizer Inc. ("ESG Report 2020") along with the general Pfizer 2020 Annual Review. In order to appreciate to what extent Pfizer Inc. is (at least via a self-declaration) pro-sustainability and pro-CSR inclined, after this Introduction (1.) a review of the theoretical and historical background needs to be presented (2.). Based on a properly selected data and method (3.) a critical study leading to pioneering revelations is to be performed (4.) and culminate in conclusions (5.).

2. THEORETICAL AND HISTORICAL BACKGROUND

The desire for continuous prosperity has millennial roots. The roots of the modern concept of sustainability rests in the context of the Hanseatic league, *Hanse,* a successful cooperation of Geman towns and their traders pragmatically desiring to establish and achieve mutual interests in a durable and ongoing manner. The era of *Hanse* spread from the 12th to 17th centuries and shortly after its end the modern concept of sustainability, *Nachhaltigkeit* was expressed and published. Namely, in 1713 the Sachsen top mining administrator, Hans Carl von Carlowitz included it in his influential book *Sylvicultura Oeconomica*. Carlowitz was the pupil of the famous French minister of finance, Jean Baptiste Colbert, who brought France's economy back from bankruptcy by supporting manufacturing, equal taxing, inventors' protections, etc. (MacGregor Pelikánová et al., 2021).

In 1832, Emil André published, in Prague, his book, *Einfachste den höch-sten Ertrag und die Nachhaltigkeit ganz sicher stellende Forstwirthschafts-Methode,* in which he emphasized the significance of long-term responsibility in dealing with resources. When this important German book about the sustainability of the forest and wood industry was published, two young German cousins were attending the elementary school in Württemberg, Germany. They were Charles Pfizer, by then 8 years old, and his cousin Charles Erhart, 11 years old, and they may already have had interests and ambitions in both science and business. In 1848 they basically *crossed the Rubicon* by sailing across the Atlantic Ocean, immigrating to the U.S. The next year, in 1849, they took out a loan from their family and founded a corporation, Pfizer Inc., in New York, which produced antiparasitics as well as citric acid. Pfizer Inc. has grown, adjusted to circumstances, and seized opportunities generated by crises, see its new products and innovations during the 1st and 2nd World Wars.

In 1948, the United Nations ("UN") presented its reaction to the disaster of the 2nd World War by issuing the Universal Declaration of Human Rights from 1948, which made the concept of sustainability global, and progressively more focused on a value judgement about the reconciliation of the needs of the current generation and the ability of future generations to meet their needs (Meadows et al., 1972). At its own end, Pfizer Inc., has worked as well for sustainability, but in kind of a different manner. Namely, after the decline of profits from penicillin, Pfizer Inc. searched for new alternative antibiotics and in 1950 its R&D efforts led to the invention of oxytetracycline, an antibiotic. This success changed the entire setting and Pfizer Inc. transformed from a national manufacturer of fine chemicals to an international research-based pharmaceutical company with offices and branches all over the world. Pfizer Inc. has become a private investor in a global manner deserving protection (Dixon, 2013: 283) but as well exposed to high responsibility expectations, see

Pfizer, Inc. v. Government of India (Cameron, 2015: 426). Especially, Pfizer Inc. is a challenge for the IP regime world-wide (Trebilcock, 2015:138).

The foundation stone of the current IP kingdom was laid down, expansion and takeovers followed. Detroit based Parke-Davis, which built the world's first modern pharmaceutical lab, was America's oldest Drug company and for years the largest in the world. It employed Dr. Jonas Salk and helped finance his cure for Polio (Salk granted sole rights to manufacture the vaccine to Parke-Davis, as it met the extremely stringent manufacturing standards that Salk demanded. Unfortunately, the US Dept. of Health reneged on the deal, five other companies were allowed to also manufacture it, otherwise today Pfizer would probably be a subsidiary of Parke-Davis). One of the five other companies, by the way, Cutter labs in California, made faulty doses of the vaccine which led to 40,000 NEW cases of polio. The author, born and bred in Ann Arbor, Michigan, was a toddler when Salk made his historic, world-wide announcement of the cure for polio in Ann Arbor in 1955 (too late for the author's cousin, John, who was already crippled by polio). Another company, Upjohn, which created the 'friable' pill (one that could be crushed easily, like most today) was headquartered in Kalamazoo, Michigan, and its plant there is where the majority of Pfizer's anti-Covid vaccines are manufactured. Following various takeovers, many more new patented medical discoveries followed, see Viagra, Zolofit, and Lipitor, the latter a huge financial success, with 13 Billion Dollars in revenue in 2006 alone, which Pfizer obtained by it's hostile takeover of Warner-Lambert.

In the 1960s, a reinforced interest in the social dimension values emerged along with "communitarianism" and in the 1970s this was superseded by the individualist focus marked by a set of world crises (Balcerzak & MacGregor Pelikánová, 2020). A general move from government spending Keynesian economic theory to the minimized state neoliberal market-oriented theory has partially shifted attention from the social dimension to the ecologic aka environmental protection dimension. Regarding a moral philosophy, Kantianism with a deontological theory judging the morality of an action not based on its consequences, but based on motivation and duty, has been confronted with the consequentialism including both egoism (promoting the good of an individual) and Bentham utilitarianism, opting for results and promoting the good of society (Schwartz & Carroll, 2003; Shim & Kim, 2019). The idea that large companies that impact society carry a social responsibility, see the Carroll pyramid (Carroll, 2016), has not been accepted by all, see the remaining conventional approach believing in only one key task for a business – profit maximization for its shareholders (Friedman, 2007). This call might be particularly strong, mainly for corporations historically controlled by one or two families, such as Pfizer Inc. At the same time, regardless of the type of business, there is an increasing call for providing not only traditional financial statement information but as well non-financial information regarding governance and social impact, CSR (Hertz Rupley et al., 2017), because modern stakeholders want to be informed in a multi-spectral manner, regardless how much they really support--or don't care for-- sustainability and CSR. Pfizer Inc. has been understanding this trend and its reporting manner testifies to that (Hertz Rupley et al., 2017).

In 1987, the UN took action through the well-known proclamation "Our Common Future—A Global Agenda for Change", which was prepared by the Brundtland Commission and published in 1987 as the (UN) Annex to document A/42/427 ("Brundtland Report") (Balcerzak & MacGregor Pelikánová, 2020). The Brundtland Report cemented the foundation of the concept of sustainability on three pillars: economic (profit), environmental (planet), and social (people) (MacGregor Pelikánová et al., 2021; Turečková & Nevima, 2018). Pfizer Inc. was aware about this development, but seemed more preoccupied with its own successful developments, takeovers, and with related competition and IP issues, such as charges for aggressive pharmaceutical marketing, illegal marketing, etc. Despite these legal issues and other problems, Pfizer Inc. eventually followed the Brundtland Report call and, since 2000, has been implementing environmental protection and social projects.

In 2015, the UN issued the UN Resolution A/RES/71/1 "Transforming our World: The 2030 Agenda for Sustainable Development ("UN Agenda 2030") with its 17 Sustainable Development Goals (SDGs) and 169 associated targets (MacGregor et al., 2020), based on the five Ps—an aspirational plan of action for people, planet, prosperity, peace, and partnership. The UN Agenda 2030 has confirmed the recognition of sustainability as the key concept, not only on the international

level but as well on the state level and has led to the introduction of the multi-stakeholder model (Van Tulder, 2017) and cross-sector partnership (Van Tulder et al., 2016). This leads to expectations that businesses, especially multinational businesses from sensitive industries, will commit themselves to the concept of sustainability by strongly engaging in CSR and establish their business model accordingly (Schaltegger et al. 2018; Razminiene 2019). Businesses such as Pfizer Inc. are under a strong ethical, if not legal, duty to engage in multi-stakeholder initiatives and cross-sector partnerships (Van Tulder et al., 2016; Van Tulder & Keen, 2018) and expand their targets beyond mere profit maximization. In sum, regardless of the exact wording of the applicable positive law, Pfizer Inc. should behave in a pro-CSR manner and make it known to the outside world. Official non-financial statements to be included in annual reports and/or special CSR reports are platforms wherein these efforts can be proclaimed. And this Pfizer Inc. does, via its ESG Report 2020, which Pfizer Inc. proudly displays on its Website on its domain Pfizer.com.

In 2020, the COVID-19, aka SARS Covid 2, virus caused the current global pandemic (Armani et al, 2020; Zinecker et al., 2021). The COVID-19 pandemic brought, so far, almost 5 million deaths, the worst economic crisis since the 1930´s, a dramatic loss of revenue and a general economic decline (Jindřichovská & Uğurlu, 2021; MacGregor Pelikánová et al., 2021). The negative impacts of such an unprecedented global crisis (Finestone & Kingston, 2021) have become global, dramatic and enlarging previous inequalities and issues (Ashford et al., 2020; Cvik & MacGregor Pelikánová, 2021). The latter includes disruption of supply chains, emergence of dramatic shortages and an increase of prices at the edge of, or even beyond, ethical limits (Korzeb & Niedziółka, 2020; Finestone & Kingston, 2021; Svabova, et al., 2021), see e.g. the discussion about the price of vaccines, including Comirnaty.

Allegedly, a crisis magnifies differences, bringing about both threats and opportunities and potentially accelerates trends (D´Adamo & Lupi, 2021). Well, the COVID-19 pandemic has certainly influenced the understanding of the (un)sustainable growth and the ephemerality of the CSR and its application (Cvik & MacGregor Pelikánová, 2021; MacGregor Pelikánová & Hála, 2021). So, regarding the economic pillar, Pfizer Inc. lands in the higher expectation zone perfectly by re-organizing its Research & Development, by engaging in a partnership with BioNTech and ultimately by moving from the invention to innovation (MacGregor Pelikánová, 2019), i.e. by obtaining licenses and health department approvals for its vaccine against COVID-19 and by commercializing it world-wide, e.g. Comirnaty in the EU. However, what about the environmental and social pillars? Pharmaceutical companies are special cases because their business decisions directly impact human health and potentially lead to IP empires and massive income waves, making CSR endeavors particularly important (Droppert & Bennett, 2015) and expected.

Indeed, the year 2020 was a year of multitudinous preparations and finalizations by Pfizer Inc. as it concerns IP. However, what about CSR? A business's behavior should match up with its core values and beliefs (Shen & Kim, 2012), and such values are realized through its actions (Freeman & Auster, 2011). What about Pfizer's CSR authenticity – is Pfizer Inc. truthfully, transparently and consistently pro-sustainability and pro-CSR (Shim & Kim, 2019)? Hence, were Pfizer's eager business and IP endeavors and efforts matched by genuinely zealous activities regarding the remaining two sustainability pillars: environmental and social and all six CSR categories, not only R&D? A properly methodologically explored ESG Report 2020, along with the Pfizer 2020 Annual Review, brings an interesting message.

3. DATA AND METHODS

The most recent and relevant data about the internal perspective and self-presentation of Pfizer Inc. about its sustainability and CSR attitude is included in Pfizer's own report about that, i.e. in the ESG Report 2020 and complemented by the general Pfizer 2020 Annual Review. Pfizer Inc. firmly believes in, and stands behind, the ESG Report 2020 plus the general Pfizer 2020 Annual Review and keeps them posted at its own Website place on its domain Pfizer.com

(https://annualreview.pfizer.com/). This is the internal source of data benefiting by being signed off by KPMG from March 12, 2021, encompassing 52 pages for a thorough critical and comparative exploration to be completed by Meta-Analysis to delve into implied suggestions (Silverman, 2013).

The collected data was subjected to an advanced content analysis (Vourvachis & Woodward, 2015) while employing the quantitative method with scanning and calculating the total number of the appearances of pre-set key words in the given source, i.e. the absolute frequency (frq) However, in order to maintain transparency, the above indicated rather mechanical quantitative approach regarding the absolute number was selected. It was refined by the careful selection of a battery of pre-set key words and by comparing the absolute frequency of these pre-set key words in both official and unofficial reports. A qualitative method of a keyword search had been performed earlier for major multinationals in mining and in agri-businesses, which have a big impact on the environment and sustainability of communities using officially published reports (Jindřichovská et al., 2019 & 2020).

The key words were selected as the obvious label for two rather encompassing synthesis categories (sustainability and CSR) and for six rather analytic CSR categories established in the academic press (MacGregor et al., 2021):

- environment protection → "environment" (all words including "environment" to be included, e.g. "environmental");
- employee matters → "employee" (all words including "employee", e.g. "employees", while excluding linguistically similar but for CSR misleading words missing the e duality "ee", i.e. excluding "employment");
- social matters and community concerns → "social" (all words including "social" to be included, e.g. "social projects");
- respect for human rights → "human rights" (strictly considering only "human right" and "human rights", i.e. not considering merely "human" or "rights");
- anti-corruption and bribery matters → "corruption" or "bribery" (exactly these two terms due to their exclusive relevancy);
- "R&D activities → "research" (only "research" due to its prima relevancy and a mere auxilliarity and a misleading potential of the term "development").

The calculation of these 2 key words (sustainability, CSR) + 6 key words for the mentioned 2 + 6 categories for ESG Report 2020 and Pfizer 2020 Annual Review allows for a holistic exploration summarized in a highly illustrative comparative table and leads to pioneering revelations about the inside perception and self-presentation regarding CSR. These revelations are complemented and refreshed by Socratic questioning and glossing and culminate in conclusions casting a new light on Pfizer.

4. RESULTS AND DISCUSSION

Large pharmaceutical companies have been criticized for competition behavior patterns, such as maintaining high prices, sluggishness in responding to demands for life saving products, unethical R&D endeavors and IP policies, and ultimately using CSR just to repair or defend their compromised reputations and reverse public perceptions about their endeavors being unethical (Droppert & Bennett, 2015). Therefore, pharmaceutical companies face a challenge to convey, in convincing terms, a message about their commitment to all three sustainability pillars. Since Pfizer Inc. is one of the four leading global pharmaceutical companies, along with Novartis, Merck, and Abbott (Shim & Kim, 2019), it should not come as a surprise that Pfizer Inc. engages in financial and non-financial reporting and that Pfizer's integrated reports go back to 2011 (Hertz Rupley et al., 2017). The holistic exploration of the ESG Report 2020 starts with the finding and downloading of the ESG Report 2020 from Pfizer's Internet domain and with the automatic calculation of the absolute frequency (frq) of 2+6 key words which are well established and consistently used for the study of the sustainability and CSR of businesses. Table 1, below, summarizes the results of this automatic counting regarding those 52 pages of the ESG Report.

Table 1. The total number of key words (frq) for sustainability/CSR categories in ESG Report 2020

	CSR in General		6 CSR categories						Total
Business	Sustain	CSR	Environment	Employee	Social	Human rights	corruption	Research	
Pfizer Inc.	53	1	81	22	170	22	3	43	395

Source: Own processing by the author based on the ESG Report 2020 obtained from www.pfizer.com

Table 1 reveals that Pfizer is paying a lot of attention to social matters in its ESG Report 2020 and that the focus on social matters overshadows the focus on the environment protection and economic setting. They extensively report on employment of women and minorities and their 99.8 percent parity in pay between U.S. minorities versus non-minorities and the fact that women make up 38% of their VPs world-wide. One and a quarter billion dollars committed to social and environmental initiatives, and a 19% reduction in withdrawals of water since 2012 are just some of the issues attested to. Even more proactively, embedding environmental sustainability criteria within contracts with vendors has helped lead to 75% of their suppliers making advances on reducing greenhouse emissions. In R&D, time to market (from initial in-human testing to approval cycle) for new molecular entities being reduced from 9.4 years in 2017 to 8.4 years in 2020 is a highlight. It is most surprising, the underplay of proclamations regarding R&D with respect to environment and especially social concerns. This is highly unexpected and demands citations, their exploration and assessment.

Regarding general key words, for "sustainability", the most typical use is in the context of mentioning the operation of the Governance & Sustainability Committee of the Board of Directors, and even SDGs and the Sustainability Bond. Manifestly, Pfizer took a very institutionalized approach to sustainability and entrusted decisions and strategies in this respect to experts. In contrast, CSR is mentioned only once and this is in the context of proper information for Directors, as ESG (for environmental, Social & Governance) is the ne plus ultra term used in the reports, their substitute for CSR.

Regarding special key words, for "social" the social performance metrics and social performance dominate, while for "environment" the presentation is primed towards two – climate (change) and sustainable medicine. "Research" is mentioned almost in an auxiliary manner and often in the context of governance, ethics or development.

As a result, it can be argued that Pfizer uses its ESG Report 2020 as an institutionalized revelation about, firstly, its social and secondly, environmental dimension, i.e. the main focus goes to two sustainability pillars. Kantianism and deontological theory win out here over Bentham utilitarianism and teleological theory (Shim & Kim, 2019).

Regarding CSRs and its 6 categories, the ESG Report is slightly less developed. This preliminary proposition can be comparatively tested in the light of the 68 pages long, Pfizer 2020 Annual Review, see Table 2.

Table 2. The total number of key words (frq) for sustainability/CSR categories in Pfizer 2020 Annual Report

	CSR in General		6 CSR categories						Total
Business	Sustain	CSR	Environment	Employee	Social	Human rights	corruption	Research	
Pfizer Inc.	3	0	12	1	12	0	0	29	57

Source: Own processing by the author based on the Pfizer 2020 Annual Review obtained from www.pfizer.com

Pfizer's 2020 Annual Review has a much lower absolute frequency of pre-set key words and considering its longer length compared to the ESG Report 2020, their concentration is even lower. Naturally, even a cursory overview shows that it is heavily loaded down with illustrations, photos of different places and happy people. Nevertheless, both quantitatively, based on frequency, and qualitatively, based on a cursory reading, it is clear that Pfizer's 2020 Annual Review is dramatically different from an ESG Report. Its basic focus and target are the economic pillar of sustainability, which is occasionally presented as pro-CSR and pro-environment and pro-social. Further, in contrast to the Report 2020, social and environmental dimensions are considered with a similar intensity, i.e. social pillars does not supersede the environmental pillar. Finally, in the Pfizer 2020 Annual Review, Bentham utilitarianism and teleological theory prevails here over the Kantianism and deontological theory (Shim & Kim, 2019).

These results and findings strongly litigate towards the recognition of a high institutionalization and segregation of reports and their targets by Pfizer Inc. To put it differently, Pfizer Inc. prepares professionally each of its reports for a particular audience and does not attempt to combine its reports. This approach differs strongly from other businesses (Jindřichovská et al., 2021 & 2020; MacGregor et al., 2020; MacGregor Pelikánová et al., 2021) and may be explained by the particular history of Pfizer Inc., including scandals, and by the specificity of its products. So how is the Pfizer self-Presentation about Sustainability and CSR? The holistic exploration indicates that Pfizer Inc. is aware about the importance of sustainability and CSR and about their marketing and other impacts and carefully acts to boost its image in the eyes of the pertinent audience. However, what is under the surface of this perfunctory and perfectionist approach remains unknown. After all, Pfizer Inc. was founded and led by German (-Americans) and perhaps the clichés about technical, cold and hard-working engineers are not totally detached from reality in this situation.

5. CONCLUSIONS

The holistic exploration of pivotal and recently e-published reports of Pfizer Inc., ESG Report 2020 and Pfizer 2020 Annual Review, confirms that Pfizer Inc. is aware about the importance of sustainability and CSR and about their marketing and other impacts and carefully acts to boost its image in the eyes of the target audience. However, these statements are not based upon the same moral philosophy foundation, their genuineness remains to be verified and, unlike other businesses, cannot be at all extracted or implied from reports.

Boldly, Pfizer Inc. is highly professional and successful, both in its research and pharmaceutical endeavors and its marketing activities. Its roots and history predetermine it strongly and increased field observations and report studies, along with interviews should be completed in order to fully discover and appreciate the inside perception, perhaps even motivation, of Pfizer Inc. Therefore, further longitudinal studies are needed in order to better understand and appreciate the internal perspective and motivation of Pfizer Inc., and so to enhance awareness and to take advantage of Pfizer Inc.'s genuine conviction and commitment in order to, ultimately, effectively and efficiently stimulate its pro-sustainability endeavors.

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COVID-19

VIZUALIZED DICHOTOMY OF OFFICIAL AND UNOFFICIAL CSR REPORTING BY TOP CZECH COMPANIES IN THE COVID-19 ERA

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Abstract
Certain large European companies have a legal duty to officially disclose the information about how they address social and environmental aspects of sustainability, i.e. to do official non-financial aka Corporate Social Responsibility (CSR). Considering COVID-19's impact and the demand for the multi-stakeholder initiatives, the CSR has growing importance and the pre-requirement of its effective and efficient satisfaction is the reporting about it. Do large companies inform officially and unofficially about their CSR and do they do it in a consistent manner? The top twenty Czech companies met their legal duty and provided official CSR reports via eJustice. In addition, they inform about their CSR on their Websites placed on their Internet domains. However, the visualization of the classification and assessment of these official and unofficial CSR reports reveal a deep dichotomy. The finding of such an inconsistency is highly worrisome and undermines international and national sustainability strategies, as well as the perception of such companies by stakeholders.

Keywords: *Corporate Social Responsibility (CSR), official and unofficial reporting, sustainability.*

1. INTRODUCTION

The concept of sustainability and its projection into Corporate Social Responsibility (CSR) have been undergoing an acid test during the last decade (Vveinhardt & Sroka, 2020; Streimikiene & Ahmed, 2021). On the international level, the concept of sustainability became the focus of a critically important strategy for 2015–2030, while on the regional level the duty to officially report about CSR via non-financial statements published in the e-Justice portal was brought forth by the EU Directive 2014/95/EU amending the Accounting Directive 2013/34/EU. On the Czech national level, this was transposed and consequently large companies (and not only them) have the legal duty to do their official CSR reporting via the e-Justice portal. In addition, they are expected to provide CSR information through other channels, such as their Websites posted on their domains. Ideally, they should include sustainability in company strategy (Peter et al., 2021), be committed to CSR, consistently informing about it via official and unofficial reports and hence inherently and fully immersed in multi-stakeholder initiatives for sustainability.

Arguably, a crisis magnifies differences, bringing both threats and opportunities and potentially accelerates trends (D´Adamo & Lupi, 2021). Certainly, the current global unprecedented crisis caused by COVID-19 represents both a tremendous challenge and opportunity for sustainability and CSR (Jindřichovská & Uğurlu, 2021). How do businesses react to it? Do they consistently report about their genuine CSR and thus demonstrate that they are effectively and efficiently overcoming threats for them and even for the entire society caused by the COVID-19 pandemic?

Considering the Czech applicable legal framework, the top Czech companies based on their annual revenues in 2019 have to prepare official non-financial statements, i.e. official CSR reports, and should (but do not need to) prepare unofficial CSR reports and post them on their Websites placed on their domains. This leads to two critical research questions – (i) do these companies publish both their official and unofficial CSR reports and, if yes, (ii) do they do it in a consistent manner? Positive answers to these two questions are a pre-requirement for the establishment of a truly committed CSR as expected by the EU. In order to get these two critically important answers, after this Introduction (1.), there needs to be provided a solid theoretical background review (2). and a proper methodology

indicated (3.). Then, the results about this official and unofficial CSR reporting need to be assessed, visualized and discussed (4.), so highly relevant and, at the same time surprising, conclusions about fragmentation, discrepancies and contradictions can be presented (5.).

2. THEORETICAL BACKGROUND

The desire for continuous prosperity has millennial roots and since the 18th century is embodied in the concept of *Nachhaltigkeit* as expressed for the mining industry by Hans Carl von Carlowitz and, for the forest and wood industry, by Emil André (MacGregor Pelikánová et al., 2021). In the 20th century, the concept of the *Nachhaltigkeit* based on the sectorial long-term responsibility evolved into the modern concept of sustainability based on the eternal responsibility towards the entire society (Schüz, 2012). Under the auspices of the United Nations ("UN") and their Universal Declaration of Human Rights from 1948, the modern concept of sustainability has turned its focus on a value judgement about the reconciliation of the needs of the current generation and the ability of future generations to meet their needs (Meadows et al., 1972). This foundation was cemented by the Report of the World Commission on Environment and Development Report: Our Common Future prepared by the Brundtland Commission and published as the UN Annex to document A/42/427 in 1987 ("Brundtland Report 1987") which placed the modern concept of sustainability on three pillars: economic (profit), environmental (planet), and social (people) (MacGregor Pelikánová et al., 2021; Turečková & Nevima, 2018). Currently, the leading document is the Resolution made during a historic UN Summit in September 2015, entitled Transforming our world: The 2030 Agenda for Sustainable development ("UN Agenda 2030"), which brought with it its 17 Sustainable Development Goals (SDGs) and 169 associated targets (MacGregor et al., 2020). A successful materialization of such a concept of sustainability and meeting of SDGs requires the support by all stakeholders, including businesses. Namely each and every business should engage in multi-stakeholder initiatives and cross-sector partnerships (Van Tulder et al., 2016; Van Tulder & Keen, 2018) and expand its operation beyond a mere profit maximization, i.e. to embrace Corporate social responsibility (CSR).

Sustainability is governed by the International law and represents a non-enforceable commitment of states and international organizations, while CSR is covered by national laws which opt rather to inducement than to ordering its imposition upon businesses (Lu et al., 2020; MacGregor Pelikánová et al., 2021). To put it differently, generally the law does not cross the Rubicon and leaves sustainability and CSR as mere responsibilities and does not push them toward the legal liability statues, i.e. toward enforceability by the state machinery (MacGregor Pelikánová & Hála, 2021). Currently, the EU and EU member states are at the intersection and attempt to induce and motivate businesses to go for CSR and even beyond (MacGregor Pelikánová et al., 2021). The legislative instrument par excellence for this is the updated Directive 2013/34/EU, which requires large public-interest entities with more than 500 employees to include in their management report a non-financial statement linked to CSR, while Directive (EU) 2017/1132 and Regulation 2015/884 deal with the e-publication on the e-Justice portal (MacGregor Pelikánová et al., 2021). Therefore, certain large companies have to do both financial and non-financial reporting, i.e. to prepare annual reports with the management report including a non-financial statement about the company´s development, performance, position and impact on environmental, social and employee matters, etc., or even to issue a special CSR report.

Although neither detailed regulation of this reporting duty is provided nor a sanction mechanism implemented, still EU member states transpose this duty in their national legal systems and businesses, at least to a minimal extent, respect it. Naturally, there are differences between jurisdictions, sectors, industries, etc. There are studies about the CSR reporting progress at the global level (Stolowy & Paugam, 2018) as well as, in particular, in central Europe (Pakšiová, 2017), pointing out the synergetic effect of business ethics, CSR and business performance (Sroka & Szantó, 2018) as well as showing that ineffective, inefficient, illegitimate and/or misreported CSR leads to an

"information overload" (Stolowy & Paugam, 2018) and becomes ultimately a waste of time (MacGregor Pelikánová et al., 2021). Indeed, the multi-stakeholder initiatives and Carroll´s pyramid prevail, but do not dominate the scenery and conventional voices for the priority, perhaps even the exclusivity, of profit maximization are still to be heard (Friedman 2007). This is even projected in corporate sustainability reporting with graphs and charts about the CSR. This is a style of reporting that is often more about fostering positive public relations than about providing a meaningful accounting of the social and environmental impacts of the firm, see impression management trends (Cho et al., 2012).

The year 2020 brought out a massive challenge to this European sustainability and CSR scenery (Zinecker et al., 2021). The COVID-19 pandemic, with over 4 million confirmed deaths, not only caused a dramatic loss of revenue and a general economic decline (Kufel, 2020; Korzeb & Niedziółka, 2020; Liu et al., 2021; Malkina, 2021), but as well magnified pre-existing issues such as the demand for the (un)sustainable growth, the ephemerality of the CSR and its application (MacGregor Pelikánová & Hála, 2021) as well as the complexity of the development of entrepreneurial activities, including job creation (Dvouletý, 2019). The EU, especially the EU Commission, made it clear that the COVID-19 pandemic should be an opportunity to make the EU more competitive, modern, digitalized and green (MacGregor Pelikánová et al., 2021). To put it differently, the EU firmly believes in sustainability and CSR and trusts that businesses will engage in value creation and sharing, will report about it and ultimately will be rewarded for it by their business success. However, do businesses share this perspective? Namely, do top Czech companies go ahead with such a CSR reporting in a consistent manner?

3. DATA AND METHODS

Manifestly, there are two sets of data regarding internal CSR reporting – official statements included in annual reports and e-published on e-Justice portal and/or directly CSR reports and unofficial statements included as various statements on the Internet side of the domain of the particular businesses. A holistic and empirical approach suggests the use of a case study in order to compare how this official and unofficial reporting is done and of the Meta-Analysis to explore implied suggestions (Silverman, 2013). Qualitative method of keyword search has been performed earlier for major multinationals in mining and in agri-business, which has great impact on environment and sustainability of communities using officially published reports (Jindřichovská et al., 2019 & 2020).

Logically, this comparison should be done regarding the same period, ideally the current period – the COVID era, and regarding a group of businesses doing such reporting and sharing at least some features. From this perspective, the obvious choice is the selection of the largest companies from one jurisdiction which have English Websites. Among the 37 Czech companies with the highest revenues based on the newest data, i.e. for 2019, exactly 20 provide annual reports and/or CSR reports in English and operate as well Websites with information in English. The largest of them is ŠKODA AUTO a.s. with annual revenues of CZK 459 billion in 2019 and the smallest is Inventec (Czech), s.r.o. with annual revenues of CZK 22 million in 2019.

The official and unofficial reporting of these 20 companies is explored by juxtaposing their annual reports, or possibly CSR reports, and their posting in English on their Websites. This data was collected in March 2021 and included only the text, i.e. pictures, images and audio-visual parts of reports were not considered. The collected data was subjected to the advanced content analysis (Vourvachis & Woodward, 2015) while employing the quantitative method with scanning and calculating the total number of the appearances of pre-set key words in the given source, i.e. the absolute frequency (frq). For an advanced text analysis, the Latent Dirichlet Allocation ("LDA"), i.e. a generative statistical model linked to the machine learning toolbox and to artificial intelligence toolbox, could be employed (Blei, 2003) along with the use of sustainability indices and indexes. At the global level, they include especially the DJSI World Index launched by Sustainable Asset Management in 1999 (now named RobecoSAM), FTSE4Good sustainability index launched in the

UK in 2001, the CSRHub/ESG Index and S&P Dow Jones Indices, a leading provider of stock indices (Stolowy & Paugam, 2018). At the regional level, they include DJSI North America created in 2005, the DJSI Europe crated in 2010 and the DJSI Emerging Markets created in 2013 (Stolowy & Paugam, 2018). However, in order to maintain the independency and transparency, the above indicated rather mechanic quantitative approach regarding the absolute was selected. It was refined by the careful selection of a battery of pre-set key words and by comparing the absolute frequency of these pre-set key words in both official and unofficial reports.

The key words were selected as the obvious label for two rather encompassing synthesis categories ("sustainability" and "CSR") and for six rather analytic CSR categories established in the academic press while considering Directive 2013/34/EU and the business practice (MacGregor et al., 2021) as well as prior synthesis academic studies about non-financial reporting (Stolowy & Paugam, 2018):

- environment protection → "environment" (all words including "environment" to be included, e.g. "environmental");
- employee matters → "employee" (all words including "employee", e.g. "employees", while excluding linguistically similar but for CSR misleading words missing the e duality "ee", i.e. excluding "employment");
- social matters and community concerns → "social" (all words including "social" to be included, e.g. "social projects");
- respect for human rights → "human rights" (strictly considering only "human right" and "human rights", i.e. not considering merely "human" or "rights");
- anti-corruption and bribery matters → "corruption" or "bribery" (exactly these two terms due to their exclusive relevancy);
- R&D activities → "research" (only "research" due to its prima relevancy and a mere auxiliary and a misleading potential of the term "development").

The calculation of these 2 + 6 key words for the mentioned 2 + 6 categories for each business and for both official and unofficial reports could lead to binary data allowing for the logistic regression (Sobol method/indexes) and to more variable data allowing for the analysis of variance ANOVA. However, as indicated above, in order to provide a transparent and obvious comparison, the focus remained on the absolute frequency for all categories. Taking advantage of techniques recently advanced by impressive management with respect to corporate sustainability reporting (Cho et al., 2012), the visualization of data and results appears highly relevant in this context. Indeed, the juxtaposition of results were visualized in two manners – via detailed tables (Table 1 and Table 2) and a summary chart (Figure 1). The key point is that such a visualization of mechanically calculated absolute frequency of key words for categories has the potential to be strongly trend indicative. Hence, instead of the typical over-complex coefficient graph and chart presentation, a simple visualization is offered.

Therefore, this prima facia quantitative approach can, as a result of the qualitative improvement by categories and key words selection and the visualized juxtaposition, answer both research questions:

1. Do top Czech companies provide official and unofficial reporting?
2. Is this reporting consistent?

Once these burning questions are empirically addressed and the mentioned data collection and visualization and modelling of results is done, highly surprising results emerge and call for a discussion.

4. RESULTS AND DISCUSSION

The search regarding 37 Czech companies with the highest revenue in 2019 revealed that 20 of them have both annual reports and/or CSR reports in English and English Websites placed at their domains.

Naturally, even higher numbers would be achieved if the Czech language would be considered. However, due to the methodology and the academic establishment of the pre-set key words as labels for the mentioned 2+6 categories, it is necessary to eliminate from the research sample companies not providing both annual/CSR reports and Websites in English.

The resulting pool of top 20 companies is sufficiently homogenous and at the same time representative, because it includes only companies with the highest revenues, while these companies are from a myriad of industries.

Nevertheless, the availability of such data in English does not imply, per se, that these top companies do both official and unofficial reporting in English and that these reports are consistent. Instead, they need to be considered in a categorized manner, i.e. how many key words are included in their annual and/or CSR reports (Table 1) and on their internal Websites (Table 2).

Table 1. The total number of key words (frq) for sustainability/CSR categories in EN (official reports)

	CSR in General		6 CSR categories						Total
Business	Sustain	CSR	Environment protection	Employ matters	Social	Human rights	xcorruption	R&D	
ŠKODA AUTO a.s.	174	13	221	181	179	15	7	17	807
EPH, a.s.	55	0	224	149	104	5	3	0	540
ČEZ, a. s.	173	4	160	248	52	2	3	0	642
AGROFERT, a.s.	2	3	48	66	56	0	2	0	177
UNIPETROL, a.s.	1	0	54	17	5	0	0	2	79
Alpiq Energy SE	0	0	0	0	8	0	0	0	8
MORAVIA STEEL, a.s.	1	3	39	64	30	2	0	0	139
Continental Barum s.r.o.	244	0	62	150	23	20	17	8	524
BOSCH GROUP ČR	160	14	104	10	76	13	3	0	380
MOL ČR, s.r.o.	115	0	70	39	23	9	1	5	262
Metrostav a.s.	1	0	24	16	18	0	1	1	60
Třinecké železárny, a. s.	1	3	39	64	30	2	0	0	139
Penny Market s.r.o.(REWE)	8	0	1	2	0	0	0	0	11
OTE, a.s.	96	5	261	388	109	48	12	0	919
O2 Czech Republic a.s.	4	0	22	62	18	5	2	0	113
Siemens, s.r.o.	9	2	37	5	43	9	137	0	242
ČEPS, a.s.	0	0	25	17	2	0	0	0	44
METALIMEX a. s.	0	0	2	14	4	0	0	0	20
BOSCH DIESEL s.r.o.	7	0	22	2	9	0	0	0	40
Inventec	44	0	230	118	226	8	14	14	654

Source: Own processing by the authors based on the Internet search of the Top CZ businesses by Revenue

Table 1 reveals that there are dramatic differences in the content of annual and/or CSR reports in English of these top companies. The total absence of pre-set key words for all or a majority of indicated 2 + 6

categories suggests that these companies are not providing genuine official reports about their sustainability and CSR. These weak official CSR reporters are Alpiq, Penny, BOSCH DIESEL and Čeps. In contrast, the strongest CSR reporters are Ote, Škoda, Inventec and ČEZ. Strong discrepancies between categories can be observed by ČEZ, Unipetrol, BOSCH Group and Třinecké železárny.

Table 2. The total number of key words (frq) for sustainability/CSR categories in EN (unofficial reports)

	CSR in General		6 CSR categories						Total
Business	Sustain	CSR	Environment protection	Employ matters	Social	Human rights	xcorruption	R&D	
ŠKODA AUTO a.s.	18	10	54	16	7	0	0	0	105
EPH, a.s.	3	0	10	8	2	0	0	0	23
ČEZ, a. s.	14	2	581	240	27	0	0	1	865
AGROFERT, a.s.	1	19	15	47	3	0	0	0	85
UNIPETROL, a.s.	6	19	54	27	4	4	15	0	129
Alpiq Energy SE	18	1	235	102	13	0	0	0	369
MORAVIA STEEL, a.s.	1	7	78	67	15	3	0	0	171
Continental Barum s.r.o.	206	1	391	350	68	15	13	2	1046
BOSCH GROUP ČR	28	15	166	23	17	0	0	2	251
MOL ČR, s.r.o.	44	0	36	16	21	14	3	0	134
Metrostav a.s.	15	11	45	36	11	0	3	0	121
Třinecké železárny, a. s.	1	7	78	67	15	3	0	0	171
Penny Market s.r.o.(REWE)	37	24	31	35	31	14	1	0	173
OTE, a.s.	68	3	138	104	37	36	1	6	393
O2 Czech Republic a.s.	26	62	109	181	57	3	1	0	439
Siemens, s.r.o.	88	2	214	168	48	52	123	3	698
ČEPS, a.s.	2	4	83	89	11	0	0	0	189
METALIMEX a. s.	0	0	0	3	0	0	0	0	3
BOSCH DIESEL s.r.o.	9	1	25	15	18	0	1	3	72
Inventec	4	19	43	12	19	5	2	1	105

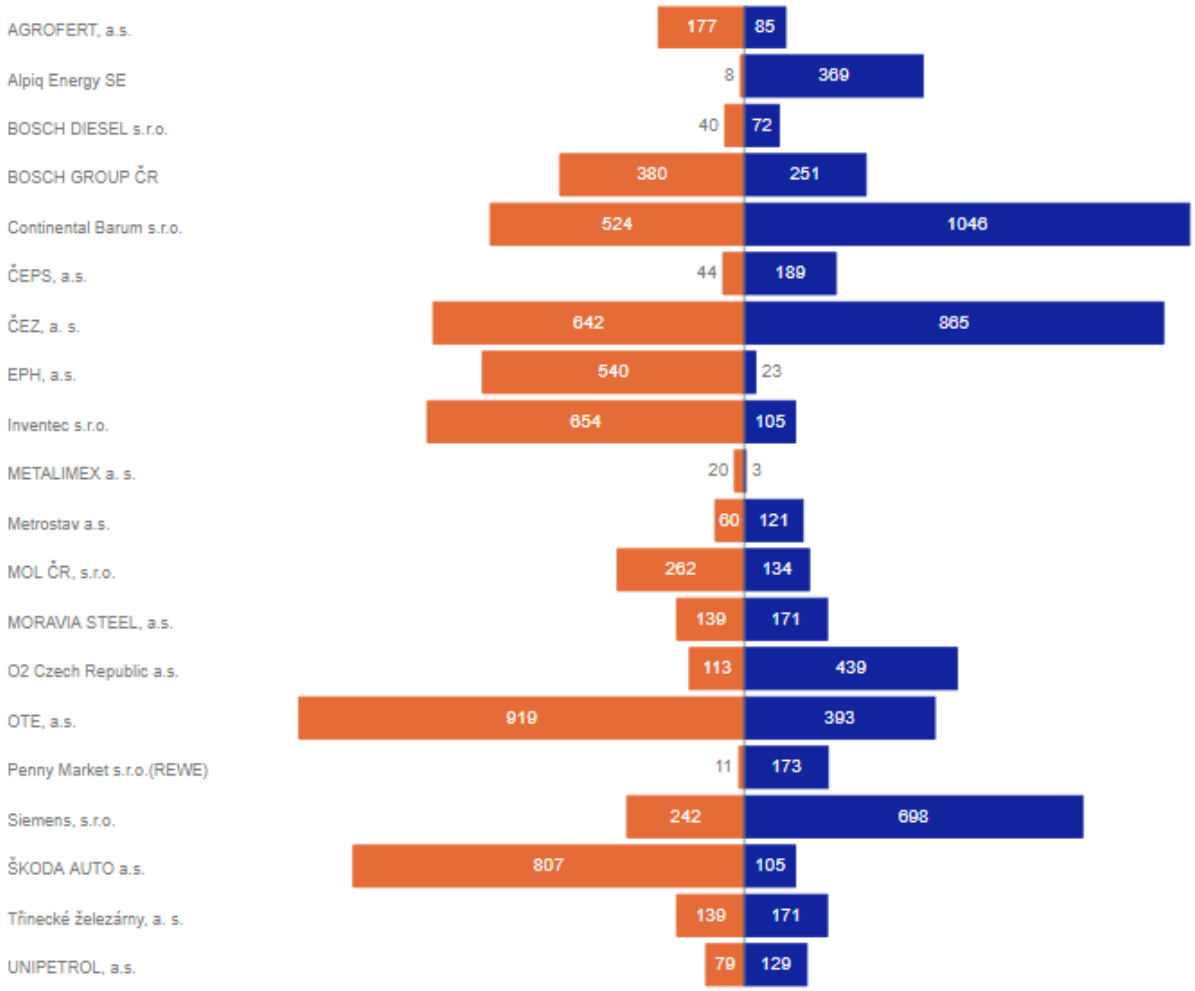
Source: Own processing by the authors based on the Internet search of the Top CZ businesses by Revenue

Table 2 reveals that there are dramatic differences in the content of the Websites on their own domains in English of these top companies. The total absence of pre-set key words for all or a majority of indicated 2 + 6 categories suggests that these companies are not providing genuine official reports about their sustainability and CSR. These weak official CSR reporters are METALIMEX, EPH, BOSCH DIESEL and AGROFERT. In contrast, the strongest CSR reporters are Continental Barum, ČEZ, Siemens and O2 Czech Republic. Strong discrepancies between categories can be observed by ČEZ, Unipetrol, BOSH Group and Třinecké železárny.

Regarding the 1st research question, the review provided by Table 1 and Table 2 suggests that top Czech companies do provide both official and unofficial reporting, and this even in English. However, it must be underlined that both official and unofficial reporting appears rather heterogenous, and often even shallow, fragmented and lacking gentility. The biggest issues are the overlooking of critical sustainability and CSR categories and the setting of priorities, which is hardly reconcilable with the sustainability demands of the 21st century, in particular during the COVID-19 pandemic, see the overemphasis in re the employee matters and underemphasis of R&D. Even the more light shed on this rather grim and surprising setting brings the visualization of their juxtaposition.

Regarding the 2nd research question, i.e. whether official and unofficial reporting is consistent for each of these companies and for all companies combined, a rather revolutionary methodological approach is selected – a plain absolute frequency comparison via one simple chart, see Figure 1.

Figure 1. Comparison of the frq of all key words for official and unofficial CSR reporting in EN



Source: Prepared by Authors based on their case study using justice.cz and own domains of businesses

Well, the comparative vitalization speaks for itself, see Figure 1. Namely, basically each and every company has a strong preference for either official or unofficial reporting, i.e. none of the top observed companies takes a balanced approach and reports with the same determination officially via annual/CSR reports in English and unofficially via their Websites in English. Some companies strongly prefer official reporting while passing on unofficial reporting (Škoda, EPH, etc.). Other companies prefer unofficial reporting while passing on official reporting (Penny Market, ČEPs) and this is highly surprising considering the current legislative framework. Similarly surprising is the fact

that, even the size of the company, i.e. its annual revenues, does not guarantee strong official or unofficial reporting, see Agrofert.

5. CONCLUSIONS

Reporting about non-financial performance, in particular about social and environmental aspects of business conduct, is a pre-requirement of the operation of multi-stakeholder initiatives and general engagement in common endeavors towards sustainability. This is legislatively expected of large European companies. The performed case study revealed that top Czech companies provide official and unofficial reporting, i.e. definitely satisfy their legal duty. However, this satisfaction seems rather superficial. Indeed, the official and unofficial reporting is inconsistent, both across companies and categories. This suggests that the CSR commitment, at least via reporting in English, is rather immature and that even the size and alleged reputation of a company does not guarantee high quality committed CSR reporting.

These pioneering conclusions should be perceived rather as a proposition for future discussions and verification because the performed case study has inherent limitations which should be addressed by future studies. They should expand the observed sample (more companies), add multi-jurisdictionality (companies from more EU member states) and longitudinality (information about reports from several years).

Acknowledgment
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COVID-19 CONFIRMS LIMITS OF THE MAGIC QUADRANGLE BEING USED FOR THE ASSESSMENT OF GOVERNMENT MACROECONOMIC POLICY

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Abstract
The *Magic quadrangle*[1] *is used as a complex indicator intended to measure the success of government macroeconomic policy. The decisive criterion for such assessment is the size of the area of the quadrangle amidst the values of 4 macroeconomic indicators entered, namely economic growth, price level, unemployment and current account balance. The larger area of the quadrangle should reflect an overall more successful policy and the construction of the Magic quadrangle serves this purpose. Historical examples show that the assessment of government macroeconomic policy based on the Magic quadrangle has limits and the situation caused by COVID-19 confirms that the whole concept may be misleading or even wrong.*

Keywords: *COVID-19, government macroeconomic policy, magic quadrangle*
JEL Classification: *B22, E01, E60*

1. INTRODUCTION

The application of the Magic quadrangle (MQ) for the assessment of government macroeconomic policy is limited by two facts: First, the graphs follow and assess primarily either maximal (economic growth) or minimal (inflation and unemployment) values. For macroeconomic indicators, however, optimal values matter. Rapid economic growth may lead to overheating of the economy, while low inflation (disinflation) or low rate of unemployment (under the natural rate of unemployment) may result in a recession. Second, four indicators included in the magic quadrangle should be supplemented by additional indicators from the sphere of public finance, namely government budget deficit and government budget debt.

The aim of our paper is therefore to answer the research question: "Should the original magic quadrangle be considered a valid concept to assess the government economic policy as a whole?" We presume that the two shortages listed above, and possibly others, will prove the MQ an unreliable tool, especially in the light of the current situation of the biological, social and political crisis caused by the COVID-19. Such presumption is furthermore consistent with the findings and outcomes of a pre-COVID-19 paper presented by Ambrožová (2014).

We find our research especially relevant in the current situation. Assessing any government policy is always a process associated with political interests and unsupported opinions. Constant evaluation of the validity of the tools used, such as the MQ, is, therefore, a necessary component of the scientific methodology. The method of our paper is analytical-synthetic.

[1] We may find other expressions like "Magic Square" (Picek, 2017) or "Diamond" (Ambrozova, 2014).

2. MAGIC QUADRANGLE INDICATORS: IDENTIFICATION OF INDICATORS, MUTUAL RELATIONS OF INDICATORS AND EXAMPLES OF MQ

2.1 Identification of indicators in the Magic quadrangle

The assessment of indicators in the MQ for specific countries and years presumes the precise definition and way of construction of each of them. The assessment of respective values should be based on the knowledge of their optimal values and mutual relations. Indicators in the MQ[2] are usually constructed for yearly data.

1. G (economic growth) is measured as the percentage change in the value of real GDP (GDP in constant prices or GDP in prices of the base year) year over year. The growth may be positive or negative (or 0).[3]
2. P (price level) shows the percentage change in the price of a constant consumer basket usually in one year, often in one month. Positive numbers reflect an increase in prices (inflation), negative numbers reflect a decrease in prices (deflation).
3. U (unemployment) shows the percentage of unemployed persons in the total labour force (computed as the number of unemployed persons over the size of the labour force). It represents the most important indicator in the labour market that strongly influences the performance of the economy of any country.
4. B (the current account balance) is expressed as the percentage of the nominal GDP of surplus (positive number) or deficit (negative number) of the current account balance.

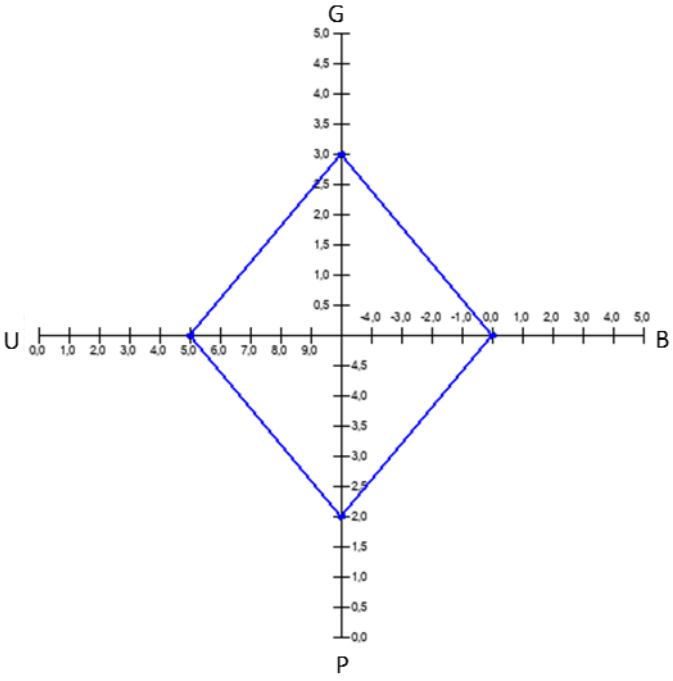
2.2 Construction of the Magic quadrangle

Construction of the Magic quadrangle follows the aim that the larger area is the sign of more successful government macroeconomic policy and the location of numbers in each of four axes reflects it. G is located on the upper part of the vertical axis and starts usually with a value 0 in the intersection of axes.[4] P is located on the lower part of the vertical axis and U on the left part of the horizontal axis, both with zero far from the midpoint. B is a complicated indicator on the right part of the horizontal axis with a value of zero at some distance from the midpoint[5]. Figure 1 demonstrates the MQ with optimal values, G = 3, B = 0, P = 2 and U = 5.

All Magic quadrangles in this paper are drawn with the use of the MQ generator available from Générateur de carrés magiques (2021).

[2] First attempts of the construction of a complex indicator of this kind focused on three indicators – G, P and U (e.g. Welsch, 2011). We may find attempts of the construction of complex indicators including six, eight or even more indicators.
[3] Picek (2017) prefers the growth of real GDP per capita.
[4] The GDP growth may be positive or negative. Negative values should be placed on the vertical axis under the intersection of axes and it would deform the whole quadrangle. To avoid that economists, place zero over the intersect of axes and in the intersection of axes there is the lowest value (highest negative number) of G located.
[5] On the left side from zero there are negative numbers (current account balance deficit) and on the right-side positive numbers (the current account balance surplus).

Figure 1. Model of the Magic quadrangle



Source: Authors' work

2.3 Mutual relations of indicators in the Magic quadrangle

Four indicators in the MQ represent four fields or four spheres where the activity of the government of a country is directed. Usually, any government is interested in the promotion of economic growth, stabilization of price level, keeping the rate of unemployment close to the natural rate of unemployment and promoting surplus of the current account balance[6].

The large area of an MQ reached with high G, low P, low U and high positive value of current account balance is a theoretical assumption.

In reality, any government often faces different trade-offs. Activities promoting positive result of one indicator may lead to worsening the situation of another one. For example, more rapid economic growth usually leads to a decrease in unemployment but may speed up the growth of prices. A very high G may be the sign of the economy overheating and will lead the central bank to take steps in monetary policy that may cool the economic growth. On the contrary, the low G often results from deflation[7] when the decrease of prices increases the area of the quadrangle and the situation is, in fact, negative. The current account balance surplus or deficit, both may have a positive or negative impact on three other indicators of the magic quadrangle, i.e., economic growth, price level or labour market.

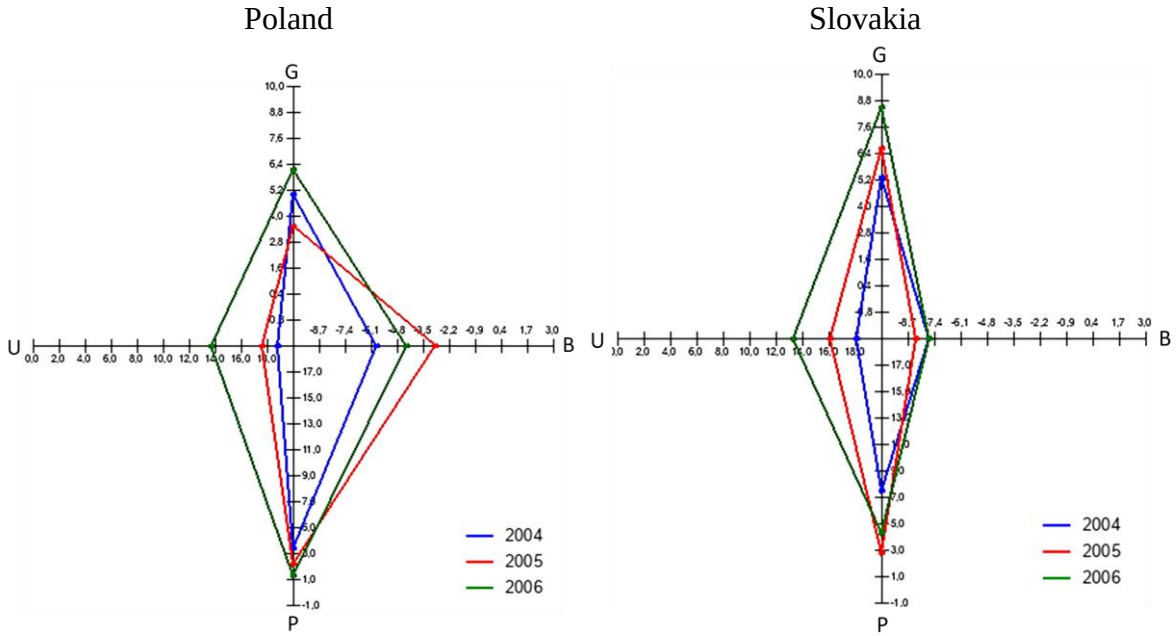
[6] In the chapter 4.1 of this paper the critical comment to this reduction of goals in macroeconomic policy of a government is presented.

[7] When decrease of inflation from numbers over 2% is assessed as positive factor, deflation is considered to have negative impact on the economy. It is caused mainly by behaviour of consumers who expect decrease of prices, postpone purchases and by decreasing spending influences the output depicted by the growth of GDP.

2.4 Historical examples of Magic quadrangles

To show the practical use of MQ for the assessment of the macroeconomic policy of the government of a country four examples of countries were taken from two different periods not influenced by extraordinary factors as Great Depression in 2007-2009 or COVID-19 that started in 2019[8].

Figure 2. Magic quadrangle, Poland, Slovakia, 2004–2006



Source: Authors' work based on data from the OECD Economic Outlook No 109 – May 2021, available from https://stats.oecd.org/index.aspx?DataSetCode=EO

Table 1. Magic quadrangle area – Poland and Slovakia, 2004–2006

	Poland	Slovakia
2004	60,1	39,9
2005	105,5	69,0
2006	153,9	114,0

Source: Authors' work based on data from the OECD Economic Outlook No 109 – May 2021, available from https://stats.oecd.org/index.aspx?DataSetCode=EO

Figure 2 shows the MQ of Poland and Slovakia. These two countries show similar features in their geographic position, history and economic system. As to the number of the population, they differ fundamentally but this indicator may be omitted when using MQ for the analysis. The graphical presentation by MQ shows some similarities and some differences in year over year changes in the period under analysis.

The conclusions we may make when comparing MQ of both countries in the period 2004–2006 are as follows:

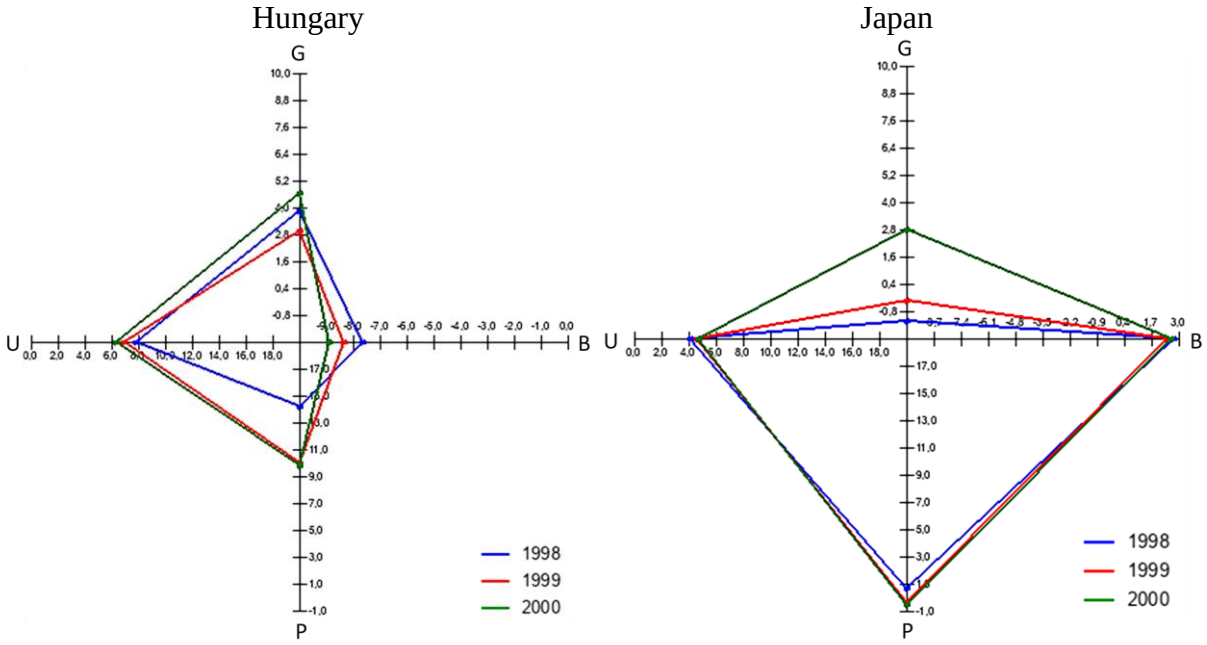
- Both countries show negative values in B, higher numbers can be seen in Slovakia. Changes in individual years are different. B is the main indicator influencing the total area of MQ. That of Slovakia is owing to B significantly smaller.

[8] We can hardly find any year or period where the economy develops according the theoretical scheme. Government macroeconomic policy has to face irregularities and the development of main indicators is influenced by the respective phase of the business cycle. Analysis of macroeconomic indicators influenced by events like Great Depression or COVID-19 desire completely different approach to the assessment of government macroeconomic policy.

- The area of MQ is increasing year over year in both countries at a very similar and high rate. The change over 2 years makes +160% in Poland and +180% in Slovakia.
- Unemployment in both countries in all years is very high and decreases slightly year over year.
- The price level in both countries changed differently. In Slovakia, prices were growing much faster, namely in the years 2004 and 2006. In Poland, the rate of growth was much lower and decreasing year by year.

The comparison of MQ of Poland and Slovakia has some rationale. The government macroeconomic policy may be assessed as more or less successful in indicators under analysis.

Figure 3. Magic quadrangle, Hungary, Japan, 1998–2000



Source: Authors' work based on data from the OECD Economic Outlook No 109 – May 2021, available from https://stats.oecd.org/index.aspx?DataSetCode=EO

Table 2. Magic quadrangle area – Hungary and Japan, 1998–2000

	Hungary	Japan
1998	77,8	273,5
1999	102,6	292,0
2000	116,8	339,1

Source: Authors' work based on data from the OECD Economic Outlook No 109 – May 2021, available from https://stats.oecd.org/index.aspx?DataSetCode=EO

Two countries chosen as examples in Figure 3 are Hungary and Japan. They belong to the group of developed market economies. They differ in geographic, demographic and economic indicators fundamentally[9,10]. Looking at both quadrangles we could assess Japan macroeconomic situation in the period under analysis as more successful than that of Hungary. But the indicators do not confirm it. It is obvious that we cannot compare areas of MQ of these two countries but have to pay attention only to changes in the area of the MQ for each country in individual years separately.

[9] Later in this article we will argue that very seldom we may compare MQ of different countries and this is a good example of it. The rational approach leads to the comparison of numbers of just one country in different years.

[10] With these two countries we touched also a critical problem of comparisons of countries when drawing the MQ. G may be negative number and its location on the vertical axis with zero in the intersection of axes would deform the quadrangle. It is solved usually by locating the respective negative number (not zero) in the intersection of axes.

The conclusions we may make when comparing MQ of both countries in the period 1998–2000 are very limited:

- The size of total areas of MQ in Hungary is done by positive values of G, P and U, while B with negative values decreases it. In Japan, the total area of MQ seems to be large but it is caused by modification of the axis for G when numbers are in two years negative.
- Japan shows lower values in U and better results in B in comparison to Hungary in all 3 years.
- The large area of the Japanese quadrangle caused by P is a negative factor[11].
- In the three years under analysis, the area of MQ of both countries was increasing.

The comparison of MQ of Hungary and Japan may lead to wrong conclusions. The government macroeconomic policy cannot be assesses using indicators covered by MQ.

3. MAGIC QUADRANGLE INDICATORS FOR SELECTED OECD COUNTRIES IN THE PERIOD 2019–2021

3.1 Total areas of MQs of selected countries[12]

A simple assessment of the macroeconomic situation in countries under analysis is based on the comparison of total areas of MQs. We will follow the comparison of total areas of MQs of selected countries and changes in total areas of MQ, as well, for each country in three years – 2019, 2020 and 2021 (forecast). The data source is the OECD Economic Outlook from May 2021 (OECD, 2021). The authors believe that this selection provides the necessary comparative context to evaluate our local (Czech) situation and still serves the purpose of this paper (answering the RQ).

Table 3. Magic quadrangle area of selected countries, 2019–2021[13]

	2019	2020	2021
Czech Republic	89	47	125
Estonia	100	43	46
France	37	12	27
Germany	129	80	136
Italy	55	27	67
Japan	109	74	129
Mexico	58	20	76
Portugal	68	23	49
USA	62	15	44

Source: Authors' work based on data from the OECD Economic Outlook No 109 – May 2021, available from https://stats.oecd.org/index.aspx?DataSetCode=EO

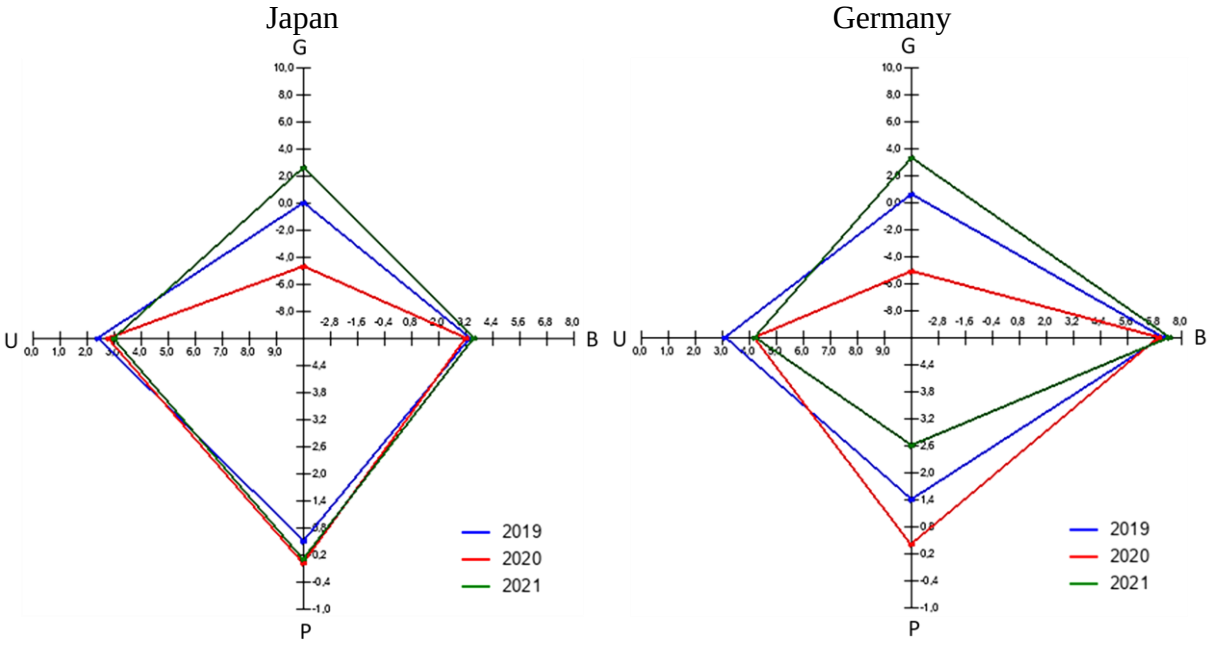
The largest area of MQs in the whole period is seen in two countries: Japan and Germany.

[11] See comment 4 in the chapter 2.3 of this article.

[12] 9 countries were selected as examples of different level and changes in the period 2019–2021 in four indicators included in the MQ. There might be some other interesting values and their changes found in other countries indicators. As the aim of the article is not the analysis of quadrangles of many countries but evaluation of the MQ as a tool of the assessment of government macroeconomic policy of countries, data of the selected countries give sufficient evidence for it.

[13] MQ areas can only be compared within this group of countries for this time period due to the different scale used for the area calculation.

Figure 4. Magic quadrangle, Japan, Germany, 2019–2021

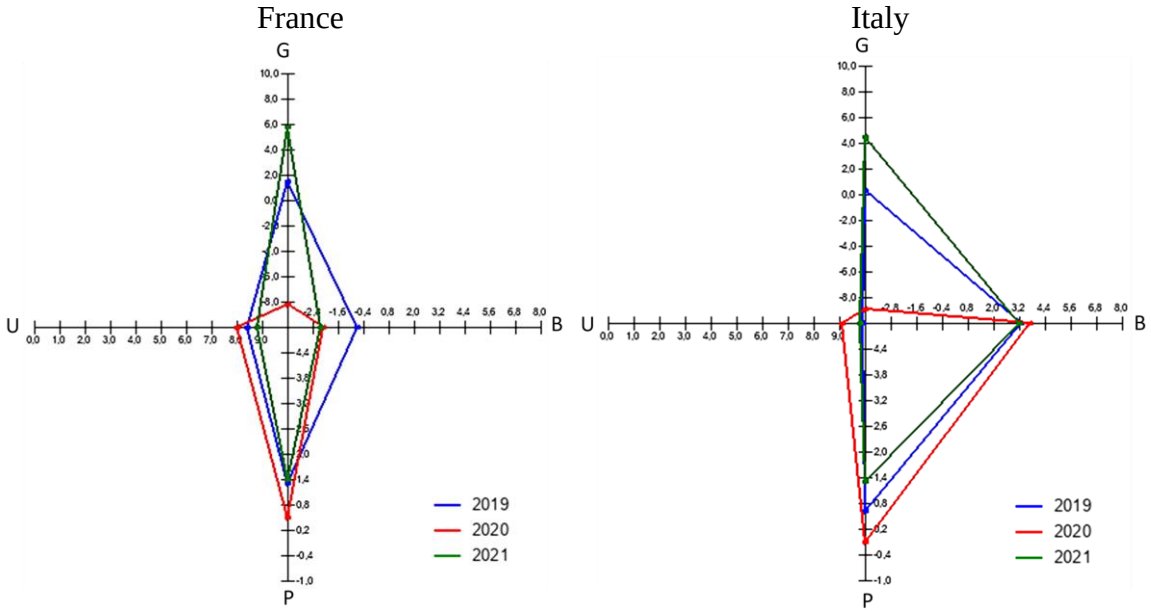


Source: Authors' work based on data from the OECD Economic Outlook No 109 – May 2021, available from https://stats.oecd.org/index.aspx?DataSetCode=EO

The area of MQs of both countries is influenced by the values of all 4 indicators. In the three years under analysis Japan shows the decrease in the year 2020 and increase in the year 2021 only in G, changes in the other three indicators are very small. Germany shows changes in G very similar to those of Japan but also changes in P[14].

The smallest area of MQs in the whole period shows France but may be declared also for Italy. The reason for considering the area of MQ of Italy not as very small is the problematic role of B)[15].

Figure 5. Magic quadrangle, France, Italy, 2019–2021



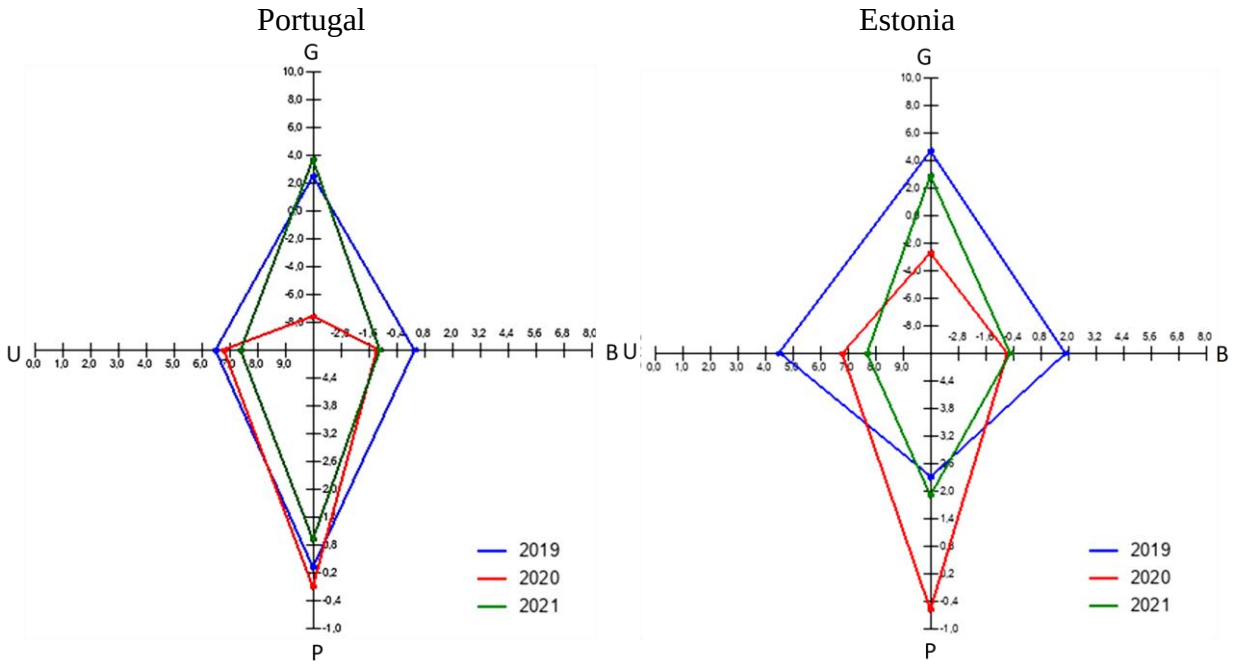
Source: Authors' work based on data from the OECD Economic Outlook No 109 – May 2021, available from https://stats.oecd.org/index.aspx?DataSetCode=EO

[14] We can see here situation confirming conclusions of macroeconomic theory. With lower growth of GDP prices growth slows down, too, and with higher growth of GDP prices are growing faster. The whole quadrangle shifts down and up.
[15] See Chapter 4.2 of this article.

The situation covered by MQ in these two countries contributes to a critical opinion on MQ[16] being used in economic analyses. The positive values of G and P are devaluated when U and B values reach the axes intersection.

Total areas of MQs of all countries decreased in the year 2020 in comparison to the year 2019. The year 2021 is forecasted as the year of recovery but Portugal and Estonia seem not to be able to make up.

Figure 6. Magic quadrangle, Portugal, Estonia, 2019–2021



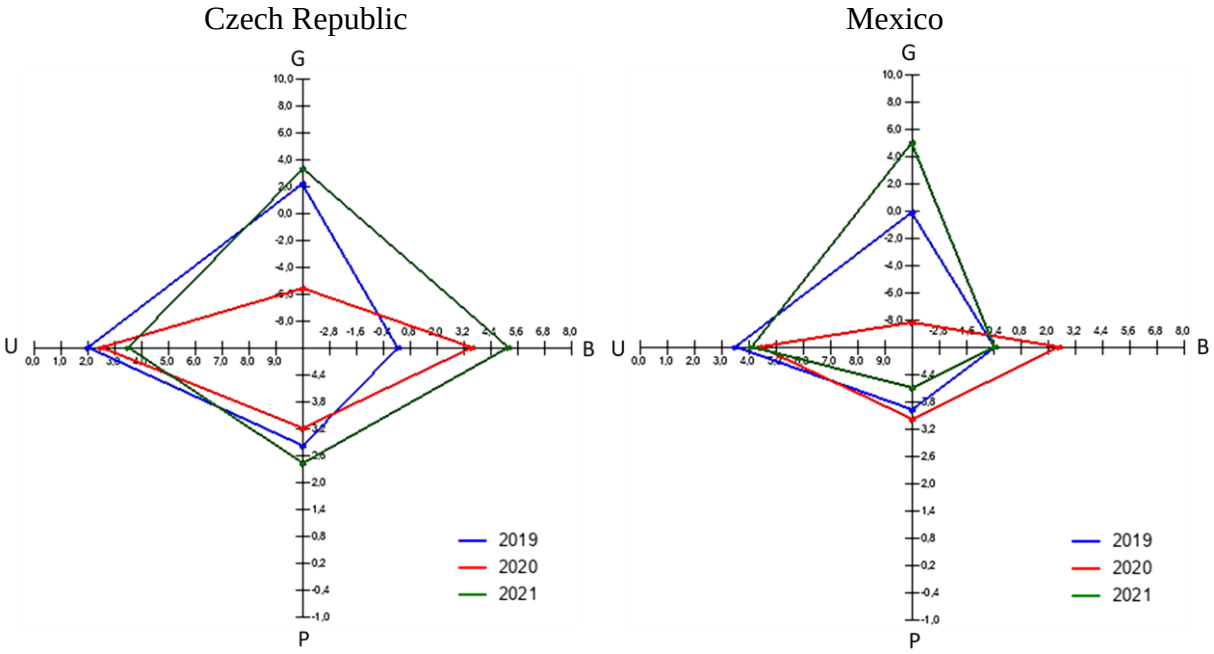
Source: Authors' work based on data from the OECD Economic Outlook No 109 – May 2021, available from https://stats.oecd.org/index.aspx?DataSetCode=EO

The forecast for the area of MQ of Estonia is very gloomy. In 2021 it is supposed to be similar to that in 2020. The decrease in 2020 was bad as the area was less than a half of that in 2019 but it was by far not the worst in comparison to other countries (e.g., in France, Mexico and Portugal it decreased to one third and in the USA to less than one quarter). But only in Estonia, no change in 2021 is forecasted. In the graph, we may see a distinct shift of the MQ up. Higher G is joined with higher P but incredibly also with higher U).

Total areas of MQs in 2021 are expected to be significantly larger in comparison to the year 2019 in Germany and Japan (see Fig. 4), Italy (see Fig. 5) and the Czech Republic and Mexico.

[16] See chapter 4.2 of this article.

Figure 7. Magic quadrangle, Czech Republic, Mexico, 2019–2021



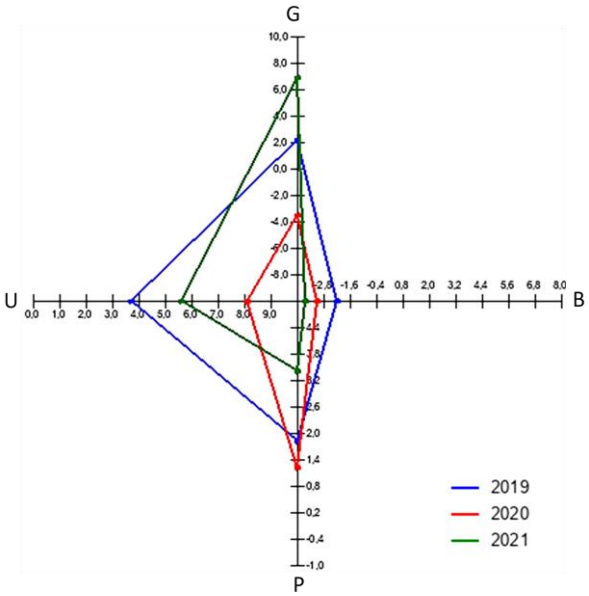
Source: Authors' work based on data from the OECD Economic Outlook No 109 – May 2021, available from https://stats.oecd.org/index.aspx?DataSetCode=EO

Mexico shows a high increase in GDP with a slow increase in prices. Czech Republic is successful mainly in the growth of GDP combined with slowing down inflation and increasing surplus in the current account balance.

Selected countries show main changes in the period 2019–2021 in the shift of the whole MQ down and up on the vertical axis. The exception can be seen in the MQ of the Czech Republic (see Figure 7).

Special attention deserves MQ of the United States (see Figure 8).

Figure 8. Magic quadrangle, USA, 2019–2021



Source: Authors' work based on data from the OECD Economic Outlook No 109 – May 2021, available from https://stats.oecd.org/index.aspx?DataSetCode=EO

The area of MQ in 2020 went sharply down. It decreased to less than one-quarter of that in 2019. The decrease was the largest among all countries in this analysis. The improvement forecasted in 2021 is

expected mainly in the growth of the GDP. The rapid growth of GDP should be combined with increasing inflation. The unemployment rate went up in 2020 and is supposed to go down in 2021 but it is expected to be in 2021 still higher than in 2019[17].

3.2 Four indicators of the MQ

The Magical quadrangle presents four macroeconomic indicators depicting four 4 spheres of the economy of a country, namely economic growth, changes in the price level, rate of unemployment and relation of the current account balance to the GDP, in one graphical unit. Let us pay attention to each of these indicators in the group of countries followed in this article in the period 2019–2021. The way of presentation of each of these indicators plays a decisive role in the critical comments of MQ.

1. G (economic growth) – presented as the year over the year percentage change in the value of real GDP
   - 2019: GDP in all countries was growing but the rate of growth in most OECD countries was moderate reaching 1 -3%. A few countries showed higher numbers: Lithuania 4,34%, Hungary 4,64%, Poland 4,74%, Estonia 4,75% and Ireland 5,92%. Large market economies show lower growth rates: Japan 0,01%, Italy 0,28%, Germany 0,59, France 1,49. A higher number can be found in the USA -2,16%.
   - 2020: negative numbers in all countries: Germany -5,13%, France -8,16%, Greece -8,25%, Italy -8,93%, United Kingdom -9,85% and Spain -10,84%.
   - Exceptions were Turkey (+1,76%) and Ireland (+2,48%).
   - 2021: forecasted positive numbers in all countries but not high enough to make up the fall in 2020 in Belgium, Italy, France, Germany, Spain, United Kingdom and the USA.
2. P (price level) – presented as the year over the year percentage change in the price of a constant consumer basket.
   - 2019: Price level in most countries grew at a moderate rate between 1 and 2%. Lower growth can be seen in Denmark, Ireland, Italy, Japan, Spain and Portugal. On the contrary, Turkey suffered its galloping inflation (15,18%).
   - 2020: Growth of prices slowed down except for Poland and the Czech Republic. In Estonia, Greece, Ireland, Israel, Italy, Japan, Portugal, Spain and Switzerland we can see deflation.
   - 2021: Prices in all countries are expected to have moderate growth. In the Czech Republic P slowing down from 3,16 to 2,37 and in Turkey, it increases back to 16%.
3. U (rate of unemployment) – presented as the percentage of unemployed persons in the total labour force at a particular point in time[18].
   - 2019: In most countries, the rate of unemployment was a 1-digit number except for Greece (17,31%), Spain (14,10%) and Turkey (13,72%). In the Czech Republic, it was the lowest rate (2%) among all OECD countries.
   - 2020: The rate of unemployment increased in most countries only slightly except for Greece (16,3%), Spain (14,1%) and Turkey (13,14%). High value was reported in the USA (8,06%) and France (8,01%). The Czech Republic published 5,64%.
   - 2021: Nearly in all countries, the rate of unemployment is expected not to rise. Exceptions are Belgium (6,40%) and the Czech Republic (3,47).
4. B (the current account balance) – presented as the percentage of surplus (positive number) or deficit (negative number) of the current account balance of the nominal GDP.

[17] The situation in the labour market in some countries and the forecasted rate of unemployment in the USA in the year of recovery confirms the situation marked as „jobless recovery". It is a new phenomenon when growing GDP is no more combined with declining unemployment. Reasons are high cost of labour and the substitution of labour by capital.
[18] Number relates to the specific month or year and are published to a standard date.

- 2019: Countries with a high surplus in the current account balance were Denmark, Germany, Iceland, Netherlands and Switzerland. The high deficit showed Ireland, United Kingdom, Slovakia and the USA.
- 2020: The relation of the current account balance to GDP in most countries showed no changes. The surplus increased significantly in the Czech Republic and Poland, decreased in Switzerland.
- 2021: An increase in the surplus of the current account balance is predicted in Ireland and Norway. Slovakia might change the deficit in surplus. The deficit of the current account balance of the USA might be higher.

Each of the four indicators of MQs of respected countries covers a part of the macroeconomy of these countries. All indicators together give a draft of the performance of the economy of a country. To assess the performance of a country (or as often mentioned the success of the government in its macroeconomic policy) in the respective year as good or bad, even excellent or catastrophic, by using the MQ is always an adventure. It may show some successes or failures, but it may lead to fully wrong conclusions.

Each country is unique. Many indicators might be easily compared: area, size of population and other demographic indicators, values of output, consumption etc. per capita, transportation – this could be a long list of terms. The comparison of macroeconomic data is complicated, difficult and very often impossible when it should show a realistic picture of the respective field.

Specific values of four indicators in an MQ have limited significance and should be used with this respect.

4. THE MAGIC QUADRANGLE AS A TOOL FOR THE ASSESSMENT OF GOVERNMENT MACROECONOMIC POLICY

According to the title of this article, the MQ as a tool for the assessment of government macroeconomic policy has limits in nonstandard (extreme) situations in the economy of a country[19]. Data used in this article for the assessment of the situation in several selected countries influenced by COVID-19 give evidence about it.

Other critical comments should be mentioned about the MQ as a tool for macroeconomic analyses.

4.1 Selection of indicators in the MQ

The presentation of government macroeconomic policy by 4 indicators is not sufficient. [20]The main realistic scope of government activity is concentrated in the government budget. Collecting and spending money is the basis for influencing all industries output and investment, labour market and private consumption of the population. Fiscal policy is completely ignored by the MQ concept. The monetary policy of the Central bank is not adequately represented either. It is however true that the impact of monetary policy can be seen from inflation (indicator P) and last but not least from the G influenced by monetary policy indirectly, too.

[19] It is difficult to find a standard situation in the economy of any country as the development of the economy of each country is influenced by the phase of the business cycle and each cycle is a unique one. As "standard" we understand fluctuations of main macroeconomic indicators within some limits that can be observed in the long run. Situations that break these limits desire special analysis and special tools for the recovery of the economy. In the history of 20. century we can mention both world wars, Great Depression and Crude Oil crisis, in first two decades of the 21. century in was Great Recession and the contemporary COVID-19 pandemic.

[20] We may find attempts of the construction of complex indicators including six, eight or even more indicators. These are individual opinions of economists that have not become generally applied.

4.2 Construction of the MQ

The meaning of MQ from the point of view of assessing the higher or lower success of the government of the country in its macroeconomic policy may be interpreted very carefully.

Even when we consider the general goals of this policy and exclude extraordinary situations, we cannot ignore optimal values. Higher growth measured by G may lead to "overheating of the economy" (inflationary gap). A decrease in the general price level causes deflation and stagnation of G. Unemployment under the natural rate of unemployment may cause inflation and slowdown of G[21]. The current account balance surplus is preferred by most countries, but the deficit may bring many advantages[22]. We have seen in MQ for Japan wrong interpretation of government failure like increasing area of MQ.

There is one fundamental wrong general aspect of the construction of MQ. Theoretically, the area of MQ depends on the values of all 4 indicators. When values on both sides of the horizontal axis (U and B) reach values corresponding to the intersection of axes the MQ disappears (the area is zero) regardless of values of G and P (and vice versa). It is enough when values are close to the intersection and the area of MQ becomes very small.[23]

4.3 Characteristics of indicators in the MQ as a flow or a stock

Out of four indicators two are indicators of the flow and two are indicators of the stock. The value of indicators of the flow is measured over an interval of time and depends on its length. Indicators for a longer period may be summed up. The value of indicators of the stock is related to one particular point in time[24]. They cannot be summarized. In the MQ U and B are indicators of the stock, G and P are indicators of the flow[25].

4.4 Assessment of specific values of indicators

Values of indicators set on either axis lead in some cases to the wrong assessment of the positive or negative impact on the performance of the economy of the country.[26] Macroeconomic indicators are assessed in mutual dependence and government macroeconomic policy aims to bring them to optimal values (Mankiw, 2017). Optimal values are not identical for all times and all countries. They are long-run values and may be changed owing to special events or the impact of unusual factors.

Generally, optimal values, in the long run, are for developed market economies set for 3 main indicators as follows:

1. G: 2–3%
2. P: 2% (derived from goals of central banks' monetary policies)
3. U: 5–6% (usually identical to the natural rate of unemployment corresponding to OKUN´s law).
4. B: the general opinion prefers either 0 or the surplus in the current account balance (not the deficit).

[21] By adding the unemployment rate to the inflation rate so called Misery index is calculated. The first misery index was created by Arthur Okun. The higher the index, the greater the misery felt by average citizens.

[22] The current account balance surplus results from higher value of exports over imports. It is preferred by countries especially with regard to the labour market: higher exports mean higher output and higher employment. The theory of comparative advantage explains the problem.

[23] We can see that in Figure 5 showing MQ of Italy and France.

[24] See Comment 14.

[25] We would like to point out a frequent mistake made in comparing rates of growth values reflecting ups and downs. Percent's result from different basis. For example, decrease of the indicator of 50% in one year needs the increase of 100% to reach the original value.

[26] The assessment of macroeconomic indicators differs fundamentally from the assessment of microeconomic indicators. Microeconomic indicators are usually aiming at maximal or minimal values (highest profit, lowest average cost, Frank, & Bernanke, 2004),

5. CONCLUSION

The assessment of the macroeconomic policy of a government is a hard and complicated task. Some economists use MQ depicting graphically four main macroeconomic indicators as a simple tool, it is also a traditional element in economic education. Examples show that this indicator must be used very carefully, for example when comparing changes in economic indicators in individual years of some period for one country. The comparison of economic indicators for different countries must include a detailed explanation of all indicators and can hardly show a rational result. MQ should not be used for the analysis covering periods of special events like wars, depressions and crises – for example, the crisis caused by COVID-19.

The answer to our research question can therefore be only this: the original magic quadrangle may not be considered a valid concept to assess the government economic policy as a whole, especially in times of external shocks such as the current COVID-19 pandemic. It does not provide a useful tool for transversal or longitudinal comparison. Detailed analysis of causal relations between all available macroeconomic indicators remains the task for competent economists, knowing that the complexity makes situations unique, the chosen policies are one-directional, alternative routes remain speculative, comparisons are limited, and the "what if" factor remains the burden of any responsible decision.

Problems caused by COVID-19 are much deeper and broader than basic indicators in MQ may cover. With COVID-19 these issues became the topic for economists, scientists and politicians and have been broadly discussed and analyzed. Debates on the sustainability of economic growth and environmental problems seem to be enriched by the new factor (Ibn-Mohammed, T., et. al., 2021). Institutions will play a more active role protecting the population and private producers (Boettke & Powell, 2021). The crisis caused by COVID-19 is considered to be the worst threat to the economic prosperity and well-being of the population in the USA since the Great Depression in 1929–32. Economists like Cutler & Summers (2020) pay attention also to the cost associated with the recovery and think that they are equal to the cost associated with global climate change. On the other hand, economists think also of benefits, both short-run and long run. This may be a topic for the next article.

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TAX BURDENS ON THE FINANCIAL RESULT OF LISTED COMPANIES IN POLAND BASED ON THE EXAMPLE OF FABRYKA FARB I LAKIERÓW ŚNIEŻKA S. A.

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Abstract
Listed companies in Poland are an important element in the national economy. These are public companies that are required to keep accounting records in accordance with the principles of international accounting standards and international financial reporting standards. Domestically, they must also take into account tax legislation. This article briefly characterizes the joint stock companies, which are listed on the Warsaw Stock Exchange S. A. It also draws attention to the taxation of income with corporate income tax. It also touches upon the issue of net profit distribution for dividends and its taxation with the tax applicable to natural persons making capital gains. The theoretical content is complemented by a practical example related to Fabryka Farb i Lakierów Śnieżka S. A., which has been listed on the Warsaw Stock Exchange since 2003. A brief description of the Company has been made, including the development of the Company's share price and the volume of share sales over the last year, i.e. until July 2021. The empirical part of the article also presents data characterizing the financial results for 2019 and 2020 taking into account the corporate income tax burden.

Keywords: *shares, corporate income tax, stock exchange*

1. INTRODUCTION

The subject of income taxation of joint-stock companies is important from the point of view of their operation. The burden affects not only the joint-stock company itself, but also the shareholders who receive dividend payments after the end of the financial year. Shareholders need to be aware of the tax burden they have to pay on dividends collected. On the pages of this article, we decided to check the financial results of a randomly selected joint-stock company, which is a public company and lists its shares on the Warsaw Stock Exchange, and the level of tax burden in relation to the obtained financial result. The topic is very important in terms of the impact of the COVID-19 pandemic on financial performance. The article decided to verify the hypothesis: Pandemic COVID-19 had an impact on the decline in financial results and income tax paid. In order to verify the hypothesis, Fabryka Farb i Lakierów Śnieżka S. A. was randomly selected to analyse its share prices during the pandemic and its financial results. Data was obtained directly from reports submitted by FF and L Śnieżka S. A. A descriptive method was used for data analysis.

2. CHARACTERISTICS OF LISTED COMPANIES

The structure of the financial market includes the capital market, where, by means of primary and secondary trading, financial flows take place between the companies issuing the securities and the investors willing to purchase them. Investors who place their money in securities expect their capital to be multiplied by the increase in profits of the invested company. When a company makes a profit it periodically pays a salary to its shareholders called a dividend. For the state's economy, the capital market is a very important issue because it is where the mobilization and transformation of capital takes place, which is, among other things, the driving force for companies raising funds for

development through the issuance of shares and bonds. Rational allocation of capital, called the optimized allocation, involves the flow of funds to the most efficient enterprises, which translates into the growth of the company and consequently contribute to economic growth. Before this happens, however, a company that meets a number of requirements must debut on the stock exchange floor through the admission of securities to the issue, i.e. making it available through the capital market for investors to purchase securities of a given company. This involves a number of formal steps based on the rules governing the process. Regardless of the industry, a dynamically growing joint stock company wishing to raise new capital for development may apply for admission of shares to stock exchange trading. In the case of the Main Market at the Warsaw Stock Exchange (WSE), the process begins with the adoption by the General Meeting of a resolution on a public offering of shares, their dematerialisation and admission to trading on the market regulated. After receiving a favourable decision, a prospectus should be drawn up, which is an information document regarding the issuer[27] and its securities, development plans or financial situation, and the company must cooperate with an entity offering to conduct an initial public offering, known as an Initial Public Offering (IPO). All detailed guidelines concerning formalities and legal acts are available in Polish and English on the official website of the Polish Financial Supervision Authority[28].

The next stage is divided into two parts: premarketing and offer marketing. Premarketing consists in presenting the issuer's analytical reports, while marketing consists in presenting the company and its management representatives to potential shareholders. In further proceedings, research should be conducted on the demand for the shares of the company in question. The results of this research are very important, as they are the basis for determining the issue price of a security, as well as the final quantity of securities offered to potential investors. After the valuation and determination of the number of available shares, the subscription should be carried out and the shares should be allotted to the subscribers; however, before the shares are officially admitted to trading on the regulated market, they must be registered with the National Depository for Securities. Shares, as well as rights to shares of a new issue, may not be admitted to exchange trading if, for example, their transferability is restricted, if the issuer is under liquidation or bankruptcy proceedings, or if an appropriate information document has not been prepared or approved by the Financial Supervision Authority[29].

Listed companies are joint stock companies called public companies, which means that all or part of the shares have been admitted to stock exchange trading and are transferable, meaning that anyone can freely buy and sell them. Investors acquiring shares of a given company constitute its shareholding divided into majority, i.e. owning at least 51% of shares, and minority. In the age of relentless digitalization, it has become mandatory to dematerialize most of the activities subject to exchanges with physical locations. The dynamically changing environment of the functioning of listed companies and shareholders on 30 August 2019 was regulated by the amendment of the Commercial Companies Code[30]. The main changes that have been introduced as of January 1, 2021 are the dematerialization of shares of all Polish joint-stock companies and limited joint-stock partnerships involving a change of the form of the document from physical to an entry in an ICT system, keeping a register of shareholders and having a website disclosed in the National Court Register with up-to-date data such as name, NIP, REGON, information about the management board. Failure to comply with this obligation is punishable by a fine of PLN 20,000[31].

As of 29 July 2021, the WSE's Main Market lists 429 companies, including 382 Polish and 47 foreign companies, whose total capitalisation amounts to PLN 1. 23 million.

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[27] Act of 29 July 2005 on Public Offering, Conditions Governing the Introduction of Financial Instruments to Organised Trading, and Public Companies (Journal of Laws 2020 position. 2080).
[28] Financial Supervision Authority, https://www.knf.gov.pl/ [access: 29.07.2021].
[29] Jak zacząć emitować? https://www.gpw.pl/jak-zaczac-emitowac [access: 28.07.2021].
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[31] https://kpmglaw.pl/spolka-akcyjna-oraz-spolka-komandytowo-akcyjna-sprawdz-jakie-zmiany-obowiazuja-od-1-stycznia-2020-r/ [access: 28.07.2021].

3. INCOME TAXATION OF PUBLIC LIMITED LIABILITY COMPANIES

Joint stock companies operating in Poland, including those that list their shares on the stock exchange, are subject to income tax rules. As joint stock companies are legal persons their income is subject to corporate income tax. In order to determine income, a joint-stock company must keep records in the profit and loss accounts. It must appropriately group the operations related to revenues received and costs incurred. According to the tax regulations, a joint-stock company, as a taxpayer, must keep accounting records in a manner ensuring determination of the amount of income and tax due. Accounting records should enable correct calculation of income, which is defined as the surplus of revenues over the costs of obtaining them, earned for a given tax year. The components of the income calculation are determined in accordance with the provisions of the Accounting Act and then adjusted for exclusions from income and expenses. As far as income is concerned, the Corporate Income Tax Act enumerates various exemptions. The income earned by the taxpayer is not taxable. For example, one can distinguish here the revenues of taxpayers whose statutory purpose is scientific, scientific and technical, educational activities, including student education, cultural, physical culture and sports, environmental protection, supporting social initiatives for building roads and telecommunication networks in villages and providing villages with water, charity, health care and social assistance, rehabilitation vocational and social disability and religious worship – in part for these purposes.

Taxable income that is taken into account for tax purposes includes, but is not limited to:

- money received, monetary values, including exchange rate differences,
- value of received things or rights as well as value of other benefits in kind, including value of things and rights received free of charge or partially paid benefits, as well as value of other free of charge or partially paid benefits,
- the value of cancelled or time-barred liabilities, including those on account of incurred loans (credits), except for cancelled loans from the Labour Fund.

Tax costs, on the other hand, are those incurred to earn revenue from a source of revenue or to retain or secure a source of revenue, with the exception of approximately 70 cost items listed in the Corporate Income Tax Act that contain exclusions from tax costs. To claim an expense as a deductible expense, a taxpayer must consider the following:

- first, the cost must be incurred,
- secondly, the cost must be incurred in order to obtain revenue,
- thirdly, it cannot be referred to as a cost excluded by way of an exhaustive list[32].

In the Corporate Income Tax Act, the legislator did not indicate which specific costs may be regarded as tax deductible. This is practically impossible because the multifaceted nature and scope of the business makes it difficult to catalogue such costs. Therefore, the legislator defines the notion of tax-deductible costs in a general manner, indicating certain features that a given cost must have in order to be recognized as a tax-deductible cost[33].

When a joint-stock company has already calculated the revenues and expenses it earned in the course of business for a given tax year, it calculates the tax result, which is then adjusted for tax exemptions/reductions. According to Polish regulations, make deductions e.g. for:

- donations made for public benefit purposes,
- donations for religious purposes.

[32] Durczyńska, M. (2014). Szacowanie podstawy opodatkowania w świetle przepisów ordynacji podatkowej. *Finanse i Prawo Finansowe*, *1*(4), 23–35.
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In addition, you can also deduct up to 50% of your losses from previous years once in a tax year. The taxpayer may do so for a period of 5 years. When applying the tax loss deduction to income in public limited companies in practice, managers should remember that:

- loss from a given year may be offset against income from the next five tax years rather than calendar years,
- the taxpayer decides for himself in which years and in what amount he will make deductions,
- provided that the amount deducted by him will not constitute more than 50% of one tax loss and that he will not settle one loss for more than 5 years,

After the adjustment, we obtain the tax base on which income tax is calculated at the appropriate tax rate. The taxpayer is entitled to.

Scheme for determining the taxable amount:

1. Tax revenue
2. – Tax cost
3. = Revenue or tax loss
4. – Exemptions and deductions
5. + Additions
6. = Taxable income or tax loss
7. Tax base x 19%
8. = Calculated tax
9. – Tax deductions
10. = Tax due to be paid to the Tax Office

The determination of tax according to the above formula is made after the end of the reporting year, which coincides with the calendar year.

A joint-stock company is a legal entity and therefore a corporate income taxpayer (CIT) with the rate of 19%. A company may benefit from a reduced 9% rate provided its annual income for the previous financial year does not exceed EUR 2 million. However, paying tax at 9% for a publicly traded joint stock company is almost impossible. On the stock exchange there are usually joint stock companies whose revenues amount to several dozen or several hundred million zlotys. It is also worth mentioning that the Polish tax law also allows entrepreneurs, including joint stock companies, to tax their income at the rate of 5% pertaining to the IP BOX relief. A joint-stock company can only apply the 5% tax rate (Innovation Box) to income received from qualified intellectual property rights (e.g. patent, protection right for a utility model, copyright for a computer programme).

4. TAXATION OF SHAREHOLDERS' DIVIDEND INCOME

The amount of the dividend is determined on the basis of the company's annual financial result as shown in the profit and loss account. The general meeting of shareholders decides on the date of dividend payment and its amount. Pursuant to the provisions of the Code of Commercial Partnerships and Companies (Articles 193–197), the persons entitled to dividend for a given financial year are the shareholders whose shares were entitled to it on the day the resolution on profit distribution was adopted. The articles of association may authorise the shareholders' meeting to set the date as at which the list of shareholders entitled to dividend for a given financial year is established (date dividends). The dividend date shall be set within two months from the date of adoption of the resolution. If the shareholders' resolution does not specify such a day, the dividend shall be paid on the day determined by the board of directors. The articles of association may authorise the management board to pay the shareholders an advance on the expected dividend for the financial year if the company has sufficient funds to do so. The Company may pay an advance on the expected dividend if its approved financial statements for the previous financial year show a profit. The

advance payment may not constitute more than a half of the profit earned since the end of the previous financial year, increased by reserve capitals established from profit, which may be used by the Management Board to make advance payments, and decreased by uncovered losses and own shares.

In the case of joint-stock companies that are required to have their financial statements audited, an audit must take place before a dividend is paid. This is followed by approval of the financial statements by the general meeting of shareholders in the case of a joint stock company and a decision on the distribution of profit and payment of dividends. The incorporated company after preparing the financial statements calculates the net profit allocates it for various purposes as decided by the shareholders through a resolution. For shareholders who are individuals, dividend income is classified in the capital gains source. Dividends paid to shareholders who are natural persons will be subject to a flat-rate income tax of 19%, collected by the payer (the joint-stock company) at the time of payment of the dividend.

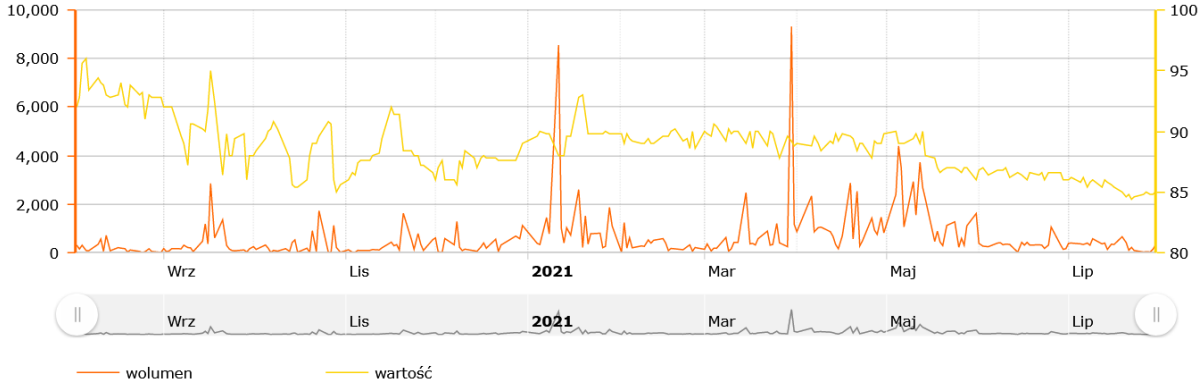
Dividends paid to legal persons, e. g. joint stock companies, limited liability companies, may be exempt from income tax under certain conditions. However, if they do not benefit from the exemption they are reported in financial income and are taxable.

5. TAXATION OF INCOME AND DIVIDENDS ON THE EXAMPLE OF A LISTED COMPANY, FABRYKI FARB I LAKIERÓW ŚNIEŻKA S. A.

In order to present a practical example related to taxation of income and dividends paid, we selected a listed company, ŚNIEŻKA S. A. The full name of the entity is Fabryka Farb i Lakierów ŚNIEŻKA S. A. The main operating activity is the production of paints and varnishes, adhesives, solvents and putties for various purposes, e. g. in construction, industry, etc. The Company operates in south-eastern Poland and its shares are listed on the Stock Exchange s. A. in Warsaw since 2003. The first debut took place on the Warsaw Stock Exchange on 31 December 2003, the debut price was PLN 28. 40[34]. At the time of preparing this article the share price is PLN 85. 00 (30. 07. 2021)[35].

Over the last year, i.e. from August 2020 to July 2021, the price of Śnieżka S. A., shares was at different levels, which is shown in the chart below

Chart 1. Trading volume of Śnieżka S. A. shares and share price value in the period from September 2020 to July 2021.



Source: https://www.gpw.pl/spolka?isin=PLSNZKA00033#indicatorsTab (30.07.2021)

From the data presented in Chart 1 we can deduce that the value of the exchange rate decreased by about PLN 10, taking into account September 2020 and July 2021. It is difficult to explain this condition without knowing more data. Our analysis mainly focuses on the financial performance of 2020, which was a very difficult year for a large number of entrepreneurs due to the COVID-19

[34] https://www.sniezka-sa.pl/relacje-inwestorskie/akcje-ffil-sniezka-sa-na-gieldzie
[35] https://www.money.pl/gielda/gpw/akcje/?date=2021-07-30 [access: 30.07.2021].

pandemic. Nevertheless, the Company managed to generate a net profit of PLN 56,381,558. 56. And the year 2019 a net profit of 49,208,979. 60 PLN was generated. Analyzing the data for 2019 and 2020, one can see an increase in net profit, despite the COVID-19 pandemic. The 2020 financial statements show that corporate income tax on the reported profit amounted to 10,268 thou. PLN.

Following the approval of the financial statements for 2019 and 2020 respectively, the company's shareholders holding more than 5% of the shares passed resolutions on profit distribution. The shareholding structure of Fabryka Farb i Lakierów Śnieżka S. A., as at 29 April 2021, holding more than 5% of votes was as follows[36]:

Table 1. Shareholding structure of Fabryka Farb i Lakierów Śnieżka S. A. as at 29. 04. 2021

Shareholder	total number of votes	% share of votes. at the Ordinary General Meeting	% share of votes. in the total number of votes
PPHU Iwona i Stanisław Cymbor Sp. z o.o.	2 375 000	22,68%	16,25%
PPHU Elżbieta i Jerzy Pater Sp. z o.o.	2 375 000	22,68%	16,25%
Piotr Mikrut	1 870 833	17,87%	12,80%
AVIVA OTWARTY FUNDUSZ EMERYTALNY AVIVA SANTANDER	1 400 000	13,37%	9,58%
Rafał Mikrut	1 337 497	12,77%	9,15%
Stanisław Cymbor	833 335	7,96%	5,70%

Resolution No. 5/2021 of the Ordinary General Meeting of Shareholders of Fabryka Farb i Lakierów "Śnieżka" S. A. with its registered office in Warsaw adopted on April 29, 2021 on the distribution of net profit for 2020, it was decided that the net profit for 2020 in the amount of N 56 381 558,56 PL shall be allocated:

1) in the amount of up to 45 424 000,80 PLN for dividend for Shareholders in the amount of PLN 3. 60 (three zlotys sixty groszy) per share, and
2) in the amount of 10 957 557,76 PLN for supplementary capital.

The dividend date is set for May 17, 2021.

When analyzing the issue of dividend payment from the perspective of tax burden, it should be pointed out that since the amount of 45 424 000,80 PLN was allocated for dividend, the total income tax burden on the payment will amount to 8 630 560 PLN. It will be divided proportionally among the shareholders in relation to the number of shares held.

As can be seen from the presented example, the tax burden with corporate income taxation is two-stage. First, the Company's income is taxed and then the net profit allocated to the dividend payment is distributed. This is a very high tax burden, since nominally it is 38% (2x 19%). Despite these burdens, many people are willing to set up a public limited company because it is a legal entity and it is responsible to its counterparties, not its shareholders. A joint-stock company is a subject of rights and obligations. Additionally, it provides an opportunity to raise capital for growth through the stock market. Also in the analysed example, Fabryka Farb i Lakierów Śnieżka S. A. chose this way of development through capital from the stock exchange.

[36] https://www.sniezka-sa.pl/relacje-inwestorskie/raporty/raporty-biezace/raport-biezacy-nr-102021

6. CONCLUSION

The presented issue of taxation of income of a joint-stock company showed that a large tax burden before the shareholder receives the earned dividend. The hypothesis posed at the beginning was verified negatively. The conducted verification of the financial data of Fabryka Farb i Lakierów Śnieżka S. A. showed that despite the appearance of the COVID-19 pandemic, the Company had a higher financial result for 2020 than in 2019 by 14. 6%. This leads to the conclusion that the difficult economic period that the world economy and the Polish economy were going through at that time did not influence the reduction of income of paint and varnish manufacturers. Moreover, the state budget, to which taxes are paid, also benefited from it, as it received higher income tax payments on the increased financial result. In the face of the crisis that has hit the economy, this situation seems to be almost impossible. However, it is explainable because the public took advantage of the period of restriction of all contact to stay at home and renovate. This was one of the main factors that increased the bottom line. Thus, listed companies were able to share their earnings through dividends. They were not forced to look for new sources of financing, e. g. through the stock exchange and issuance of new series of shares.

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CSR/Integrated and Non-Financial Reporting

EXPLORATION OF DIMENSIONS OF ETHICAL CODE

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Abstract
Idea: Ethical codes of companies influence the visible behaviour of managers. In this paper, we explore the dimension of the ethical code of Cargill incorporated, a multinational corporation involved in agribusiness.
Data and Tools: We perform a textual analysis of Cargill´s code of conduct using analytical software LIWC2015. Especially four summary dimensions of the text namely: the dimension of Analytic, Clout, Authenticity and Emotional tone.
What's new: We have assessed the level of four dimensions and compared the findings with scores of the previous analysis of the same company previously performed by Jindřichovská, Kubíčková, & Mocanu, (2020). This investigation enabled us to assess the differences between approaches of sustainability reports and the company code of ethics.
Contribution: In our exploration, we have discovered that there are some differences. The code of conduct displays the highest score in the Clout dimension implying, that the company is presenting rather confident and authoritative narrative in terms of rules the company honours. While at the same time by far the lowest score represents the Authenticity dimension. High authenticity implies that writing that is personal and honest.
Limitations and further research: Our findings may be distorted because our sample text in the case of code of conduct explored only the first 500 words, whilst the sample texts were longer in the parts of sustainability reports explored previously. Therefore, the score can be somewhat distorted. Further exploration is needed.

Keywords: *ethical code, Corporate Social Responsibility (CSR), LIWC2015, Cargill. Agri-business, dimensions, text analysis*

1. INTRODUCTION

An ethical code is a set of rules or a concise document, that regulates general and specific procedures in individual organizations and professions (Balcerzak & MacGregor Pelikánová, 2020). It also highlights the basic principles that the company honours. Ethical codes of companies are influencing the visible behaviour of managers (Aupperele, 1984; Aupperle, Carroll & Hatfield, 1985; Beatty, 1988; Bartlett & Preston, 2000). We can find the background of codes both in professions and in corporations. In this paper, we concentrate on the code of conduct of one of the largest companies in the agriculture segment and explores the coherence of the message delivered through ethical code. Cargill incorporated. Cargill is a multinational company involved in agribusiness and as such it forms a decisive part of the value in global agri-business chains. As mentioned earlier, it is one of the largest businesses in the segment see Table 1.

Table 1. Top 10 Largest Agricultural Companies in the World 2020

Rank	Name of Company	Revenue (USD billions)	Headquarters
1	Cargill	114.69	Minnetonka, Minnesota, U.S.
2	ADM	64.34	Chicago, Illinois, U.S.
3	Bayer	51.18	Leverkusen, Germany
4	John Deere	37.35	Moline, Illinois, U.S.
5	CNH Industrial	28.10	London, United Kingdom
6	Syngenta	23.00	Basel, Switzerland
7	DuPont	21.57	Wilmington, Delaware, U.S.
8	Nutrien	19.60	Saskatoon, Saskatchewan, Canada
9	Yara International	12.90	Oslo, Norway
10	BASF	6.80	Ludwigshafen, Germany

Source: https://blog.bizvibe.com/blog/largest-agricultural-companies accessed on 13.9.2021

In this paper, we explore the code of conduct of the biggest company of this industrial segment – Cargill, incorporated (CARG). We attempt to link this short study to a previous thorough exploration of the same business (see Jindřichovská, Kubíčková & Mocanu, 2020), where we have analysed sustainability reports of this agri-food giant.

The study of sustainability reports was exhaustive, whilst in this short research, we want to complement our exploration analysis exploring the values of the company as stated in another important document – the code of conduct. We expect to gain additional insight into the values of the multinational corporation from standpoint of ethics and morality as the official attitude of Cargill's management. The general background of sustainability reporting is linked to the stakeholder theory of Donaldson & Preston (1995).

2. PREVIOUS LITERATURE

A comparative study by Stevens (2008) reviews studies of corporate ethical codes published since 2000 and concludes that codes can be effective instruments for shaping ethical behaviour in companies (Balcerzak & MacGregor Pelikánová, 2020). In this vein, the code can be an effective tool guiding employee decision-making. Highlighting, that codes should be embedded in the culture and embraced by the company leaders are likely to be successful as guiding rules. Codes need to be discussed with employees, this means that effectively communicating the code's precepts is crucial to its success.

Likewise, Vitolla, Raimo, Rubino & Garegnani (2021) argue, that in recent years, attention to sustainability and corporate ethics has grown considerably. The importance of codes of conduct as traditional as tools to promote ethical, honest and fair actions (MacGregor Pelikánová, 2019) and create greater motivation among employees has significantly increased (MacGregor et al., 2020). Nonetheless, the content of ethical codes differs considerably between countries. Which implies a strong influence of national culture on the quality of the code of ethics. The authors argue that the quality of the ethical codes is related to international cultural differences. In this study, they use five of Hofstede's six dimensions to explain the differences on 191 international companies from 29 different countries and five continents.

High relevance of codes was documented by Adams, Tashchian & Shore (2001) comparing companies with and without ethical code. The authors assessed the behaviour of top management, supervisors, peers, subordinates and self. They established that the mere presence of a code of ethics appears to have a positive impact on perceptions of the ethical behaviour of the enterprise. Similarly, Somers (2001) explored the link between company values and the behaviour of employees. Interesting study on cultural difference and impact on ethics in multinationals exploring the initiatives of advanced economies in emerging multinational offered by Yang, Sun & Jiang (2021) who argue

that mutual trust between headquarters and subsidiaries serves as a mediating mechanism linking formal institutional distance and subsidiary initiatives respecting the same ethical values.

3. METHODOLOGY

In this paper, we perform a textual analysis of Cargill´s code of conduct using analytical software LIWC2015. Then, the results we compared with the results of previous analyses of the Cargill's Sustainability Reports in 2014 and 2018. The program LIWC2015 enables linguistic analysis of the text from different psychological aspects and understanding the real author´s thinking and intention.

Content analysis means any systematic transformation of a string of text into statistically manageable data representing the presence, intensity, or frequency of some relevant features (Shapiro & Markoff, 1997). The LIWC program provides any researcher with an automated, objective method for extracting insights about the attentional focus reflected through language (Boyd & Schwartz, 2021). Each word or word stem in the dictionary belongs to one or more pre-established categories with different meanings, most of them ensuing from psychological theories.

In the first stage, the programme LIWC2015 categorizes raw word counts characterizing the psychological aspects of the text. For each category, the percentage of the total number of words in the text is expressed. The five specific categories are: 1. I-words (I, Me, My) depicting self-reference, 2. social words (e.g., they, she, us, talk, friends), the high percentage of such words signify greater openness and higher social connection with others. 3. words of positive emotions which show a more optimistic position, 4. negative emotions refer to the opposite. 5. cognitive processes refer to the state of active thinking about the problem. 5. Cognitive Processes – these words reflect how much people are actively thinking about their writing topic, i.e. thinking, wonder, because, knowledge.

In the second stage, four summary language variables are identified. The variables include: 1. Analytical thinking – is an analytically derived dimension that captures the degree to which people use words that suggest formal, logical, and hierarchical thinking patterns. People low in analytical thinking tend to write and think using language that is more narrative ways, focusing on the here-and-now, and personal experiences. 2. Clout – this dimension captures the manner that the authors in speaking: either from the perspective of high expertise and is confident (high score), or a more tentative, humble, even anxious style (low score), thus refers to the relative social status. 3. Authentic – is a variable the higher numbers of which are associated with a more honest, personal, and disclosing text; the lower numbers suggest a more guarded, distanced form of discourse. 4. Emotional tone – is a variable, the higher number of which is associated with a more positive, upbeat style; a low number reveals greater anxiety, sadness, or hostility; a number around 50 suggests either a lack of emotionality or different levels of ambivalence.

The full text of the Code of conduct of Cargill is available at https://www.cargill.com/doc/1432076403017/guiding-principles-en.pdf. However, in this short analysis, we have used the openly available version of the tool LIWC2015. In our case, the text sample that entered was 751 words long, but the engine LIWC2015 analyses the first 500 words. Therefore, in this analysis, we provide the first 500 words. A full version would be needed to complete the study.

4. FINDINGS

Before approaching lexica analysis of the text, we analyse the guiding principles that Cargill pots to the forefront of its morality statement.

4.1 The guiding principles

As it concerns the Code of Conduct, Cargill firstly highlights the guiding principles, which are stated in the preamble of the code of conduct. Principles are stated as simple statements accompanied by

a short explanatory note. It presents the company's ethical and compliance standards for conducting business throughout the world and serves as a guide for employees when they face dilemmas where the right choice is not clear.

The Code is grounded in the seven Guiding Principles, which are ingrained in the firm´s culture and serve as the foundation for the behaviours expected from all of its employees in all parts of the world. These principles are listed with the following entries:

- **We obey the law.**
- **We conduct our business with integrity.**
- **We keep accurate and honest records.**
- **We honour our business obligations.**
- **We treat people with dignity and respect.**
- **We protect Cargill's information, assets and interests.**
- **We are committed to being a responsible global citizen.**

The full set of guiding principles is available on https://www.cargill.com/about/ethics-and-compliance. In these Guiding principles, Cargill displays a coherent and strict authoritative structure and presents a clear vision of its socio-social role. The whole text of principles contains only 337 words. The full text of these guiding principles we tested with the programme LIWC2015. The results are presented in Table 2.

Table 2. The guiding principles of Cargill

Traditional LIWC dimension	Our data (text)	Average for Professional or scientific writing
I-words (I, Me, My)	0.0	0.63
Social Words	18.1	7.62
Positive Emotions	8.0	2.32
Negative Emotions	0.6	1.45
Cognitive Processes	10.7	7.52
Summary Variables		
Analytic	76.2	92.57
Clout	99.0	68.17
Authenticity	3.9	24.84
Emotional tone	99.0	43.61

Source: own research

As can be discerned from the data in Table 2, the largest share in the first phase of the analysis has the category "Social Words", which can be interpreted per this category so that great attention is paid in the text to creating a clear vision of its social role and responsibility towards communities. Relatively large is the proportion of those words that reflect Cognitive Processes, i.e., words that reflect how much the company is actively thinking about Guiding principles.

In the second part of our analysis, the greatest portion of the variables was identified in the section of ´Clout´ and ´Emotional tone´. This can be explained as the company´s attempt to create the impression of a reliable and socially responsible subject forming a positive impression on the readers. A relatively very low score represents the authenticity parameter, which can be interpreted as a lower degree of openness, displaying greater caution.

It is also interesting to compare the dimensions with the average values that are found in the texts. In the first phase, there is a significantly higher share in the category of "Social words" and "Positive emotions", which can be interpreted to create a positive perception and impression of togetherness. In the second phase, the biggest difference is in the category of Clout and Authenticity, where the values found in the analyzed text are almost 1.5 to 2 times the average value. This can be interpreted as an effort to achieve the desired perception of Cargill by stakeholders, i.e., to create an image of a trustworthy, reliable and responsible company.

4.2 The dimensions of Ethical code

Furthermore, we have explored the dimensions of Ethical code using LIWC2015. The text sample, that we entered was 751 words long, however, the openly available engine LIWC2015 analysed only the first 500 words. Therefore, in this analysis, we analysed only the first 500 words. The scores of individual dimensions and summary dimensions are in Table 3.

Table 3. Individual dimensions and summary variables of text of ethical code 2019

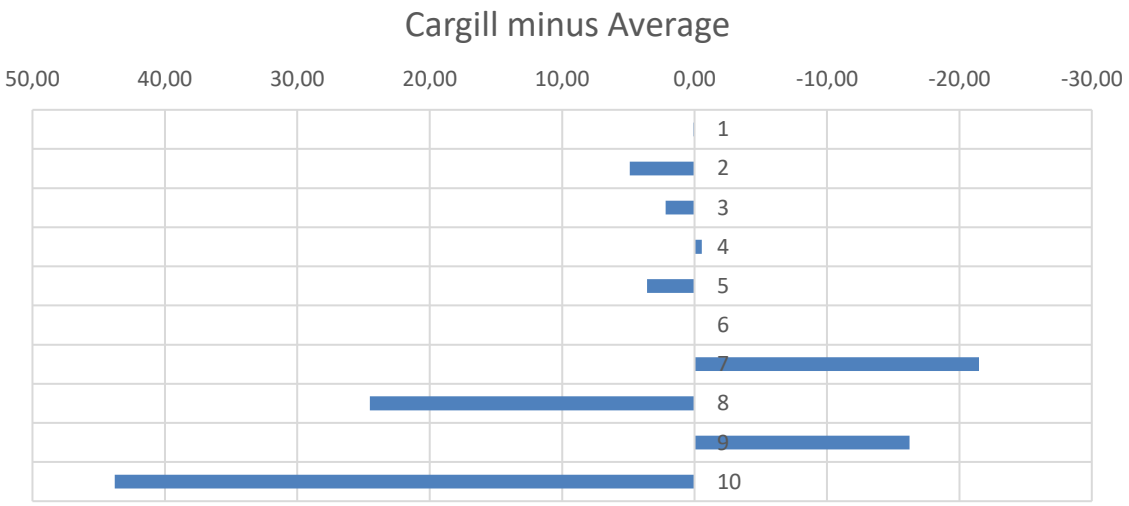
	CARGILL (% of text)	**Average for Professional or Scientific writing**	**CARGILL minus average**	**Difference vs average (%)**
I-words (I, Me, My)	0,70	0,63	0,07	11,111
Social Words	12,50	7,62	4,88	64,042
Positive Emotions	4,50	2,32	2,18	93,966
Negative Emotions	0,90	1,45	-0,55	-37,931
Cognitive Processes	11,10	7,52	3,58	47,606
Summary Variables				
Analytic	71,10	92,57	-21,47	-23,193
Clout	92,70	68,17	24,53	35,984
Authenticity	8,60	24,84	-16,24	-65,378
Emotional tone	87,40	43,61	43,79	100,413

Source: Own research

The results show in the first phase the very high portion in the category of Clout and another very high portion in the category "Emotional tone". In contrast of these categories is rather low portion of "Authenticity" of the text. From the individual dimensions, there is also quite high proportion for Social words highlighting togetherness.

In comparison to the average values, there are great differences in the Emotional tone (the difference forms more than 100 per cent) and in the category of Positive emotions (the difference is more than 90%). Negative, but also quite great differences are in the category of Authenticity and Negative emotions. It represents similar features compared to the text of "Clout" category.
The following chart is depicting the dimensions graphically.

Chart 1. Depicting individual dimensions and summary variables of text of ethical code 2019



Source: Own research

4.3 Comparison of dimensions of ethical code and sustainability reports

In the second stage, we have compared the dimensions of Cargill´s Code of Conduct and Sustainability reports. We have analysed all sustainability reports from the standpoint of qualitative characteristics, i.e., (1) analytical thinking, (2) clout, (3) authenticity, and (4) emotional tone. We have endeavoured to compare the sustainability reports from 2014 and 2017–2018. In the second period, the reporting was more extensive, and we thus provided the report analyses in more details.

In Table 4, there are scores of individual dimensions and summary variables for the Cargill Code of Conduct and average for professional or scientific writing provided by LIWC2015. For a detailed explanation see Pennebaker, Francis & Booth (2001), and Tausczik & Pennebaker (2010). The next values are the dimensions of Cargill´s partial, geographically and procedurally defined parts. To the more detailed description of the position of these Cargill´s part serves the sustainability reports extension. Dimensions of the Sustainability reports of these parts are adopted from Jindřichovská, Kubíčková & Mocanu, (2020) Case Study Analysis of Sustainability Reporting of an Agri-Food Giant, Sustainability 2020, 4491, page 12.

Table 4. Comparison of qualitative features of all sustainability reports and code of conduct

	Pages	Word Count	Variables			
			Analytic	Clout	Authentic	Emotion
Code of conduct 2019	19	751	71,10	92,70	8,60	87,40
AVERAGE for professional and scientific writings – in LIWC2015	x	x	**92,57**	**68,170**	**24,84**	**43,61**
Cargill 2014 P-Policies-to-PNC SR 2014	20	7,606	96.01	87.63	12.36	87.11
Aqua Nutrition Sustainability Report 2018	16	5,100	95.26	87.71	11.15	88.73
Cargill Cocoa and Chocolate Sustainability Report 2017–2018	74	22,036	92.54	85.63	19.01	90.48
Corporate Responsibility Report Cargill Ocean Transportation 2018	53	15,759	95.54	84.51	14.12	73.94
Corporate Responsibility and Sustainable Development 2017–2018 China	20	4,509	97.25	80.76	27.49	83.65
Corporate Responsibility and Sustainable Development 2017–2018 India	20	C	97.59	83.20	20.17	81.23
Corporate Responsibility and Sustainable Development 2017–2018 Indonesia	20	4.201	96.76	76.32	14.90	86.43

Source: Own research

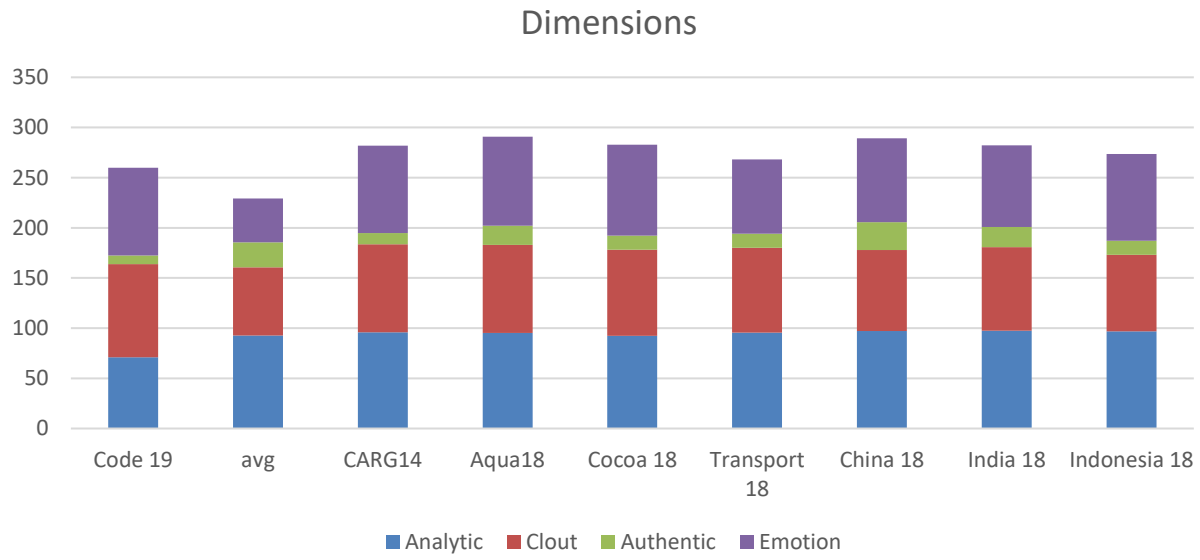
Firstly, it is necessary to point out significant differences in the scope of individual analysed reports – the reports have the highest value in Cargill Cocoa and Chocolate Sustainability Report 2017/2018 and the Corporate Responsibility Report Cargill Ocean Transportation 2018. The proportion of the LIWC2015 categories is very different in all the reports. The highest score in terms of Emotional tone from all reports has the report on the Chocolate business even though it must be admitted that the emotional tone is rather high in all reports disclosing a rather positive style of reports. The highest score in terms of Authenticity has the report of China.

The highest score in terms of Clout has the Code of Conduct, in the Sustainability reports it is in the Report of Aqua Nutrition Sustainability Report from 2018. The high score in the feature of analytical thinking was found in the India report 2017–18. On the contrary, the lowest level has the

feature of Authenticity, signifying that the reports are rather reserved in the case of Aqua Nutrition Sustainability Report 2018. The lowest level of Emotional was found in the Corporate Responsibility Report Cargill Ocean Transportation 2018 – the lower level is the average value in the Professional and Scientific writings. The lowest level of Clout was identified in the report of Corporate Responsibility and Sustainable Development 2017–2018 China. The lowest level in the variable Analytic was found in the Code of conduct 2019.

Chart 2 depicts the differences in the four dimensions between Cargill´s Sustainability reports and the Code of Conduct and the average value according to the LIWC2015.

Chart 2. Depicting dimensions sustainability reports and code of conduct 2019



Source: Own research

Some new findings can be derived from the graphical comparison – for example, we can see, that the highest values for all monitored variables can be found in the Aqua Nutrition Sustainability Report 2018, or that the highest share of authenticity can be found in the Corporate Responsibility and Sustainable Development Report 2017–2018 China, or that the highest level of analytics can be found in the Cargill Ocean Transportation 2018, China and India reports.

It is obvious that this analysis of the texts broadens the view and increases an explanatory power of the reports of the individual parts of Cargill, as well as the approach that is represented in the reports.

5. DISCUSSION AND CONCLUSION AND LIMITATIONS

The goal of this study was to supplement the exploration of sustainability reports analysed earlier by new elements coming from another official document published by the same multinational company – the code of conduct.

In our exploration, we have discovered that there are some differences. The code of ethics provides by far the highest clout from all official documents. Which signifies that the code of conduct is rather authoritative. On the other hand, authenticity is the lowest of all documents implying that the writing is not necessarily honest. In summary, the guidelines are proper as one would expect from a well-established and rich company being in the business for over 150 years.

We are aware of the major limitation of the study which is the short length of the analysed text. This was because we were using only a demo version of the LIWC2015 engine. We could have explored only the first 500 words. The text under examination could have been longer, but we assume, that the most important part of the message ought to be stated at the forefront of the document. This

also corresponds to the analysis of subsample – the specific part of guiding principles, which by themselves display the even higher score of clout and authority.

For further elaboration, we recommend exploring the full text of the document and possibly extend the analysis on codes of other companies in the same industrial sector.

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RATE OF NON-FINANCIAL INFORMATION REPORTING BY THE CZECH ACCOUNTING UNITS

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Abstract
Objective of this contribution was to identify rate of non-financial information reporting using quantitative research of resources of selected sample of the Czech enterprises. By the authors were set two basic research questions. Based on the first of them were analyzed differences in the rate of non-financial information reporting by medium-sized and large enterprises. This research question was confirmed, because large enterprises significantly exceed the rate of non-financial information reported by medium-sized enterprises in all analyzed areas – environmental area, social area, area of employee relations, area of respect to human rights and also area of fight against the corruption and bribery. Based on the second research question was analyzed if there are any subjects, in the sample of large accounting units, reporting non-financial information beyond the requirements of the Czech Accounting Act. Also this question was answered positively, because there were identified 26% of accounting units keeping accounting records just with respect to the Czech accounting rules reporting ***detailed*** *information from the social area, 16% of such companies reporting detailed information from the area of respect to human rights. Beyond the requirements set by the accounting legislation report also 40 % of accounting units keeping accounting records with respect to the Czech accounting rules and also with respect to the IAS/IFRS, 18% of such accounting units report detailed information from the area of respect to human rights and 26% of them report detailed information from the area of fight against the corruption and bribery.*

Keywords: *large enterprise; medium-sized enterprise; non-financial information; reporting*

1. INTRODUCTION

Impacts of economic activity are reduced by diverse environmental rules set with respect to the legislation of individual state. It′s often visible that the enterprises make preventive actions not only with the intention to meet all rules set by the legislation, but they are trying to implement to their activities also voluntary processes that are positively taken, from the point of view of social responsibility, by external audience. Public knowledge of this information is used by these accounting units very often as the specific tactics for their development and long-term maintenance of their market position. Companies are aware of their responsibility to the stakeholders, therefore they are trying to make information relating to their activities clear and available. That was the incentive for authors of this contribution to focus on research of the current situation in the area of non-financial information reporting. As the tool for making the overview was used quantitative research of available sources – web pages, annual reports and also accounting statements published on portal JUSTICE.CZ (www.justice.cz). As the research sample were set 100 accounting units. Research is focused on business subjects located in Pilsen region with no respect to the field of their business. All analyzed accounting units belonging to the research sample have the duty to verify financial statements by an auditor. This duty is set by the Act No. 563/1991 Coll., Accounting Act (2021) § 20. In the business sphere is necessary to know to which category of accounting units the individual accounting unit belongs and to conduct the test of the duty to verify the financial statement by an auditor to be able to decide if it really has this duty. For compilation of this contribution was used descriptive statistics and two research questions were set at the beginning of the research.

Research question no. 1: Is there visible difference, tens of percents, in the rate of non-financial information reporting between the group of medium-sized enterprises and large enterprises? For the purpose of research was selected 50 medium-sized accounting units and 50 large accounting units taking into account categorization set by the Act No. 563/1991 Coll., Accounting Act (2021). The published topics of non-financial information are reported in absolute and relative frequency according to the analyzed categories and the scope of individual topics is measured by the number of paragraphs. Then the median of frequency of the amount of information reported by medium-sized and large accounting units is analyzed. The amount of non-financial information reported in annual reports, notes to financial statements, web pages or other information sources used by the companies is measured in percents of the whole amount of these documents. Percents are counted based on the number of rows devoted to the analyzed topic against the total number of rows that these documents include.

Research question no. 2: Are there any subjects, in the sample of large accounting units, reporting non-financial information beyond the requirements set by the Czech Accounting Act (since 2017)?

Extent of accounting units reporting non-financial information beyond those required by the Czech Accounting Act is presented using absolute and relative frequency. Absolute frequency represents the detail of the amount of companies reporting above mentioned information (making this information available for public), relative frequency represents the percentage of companies having analyzed information included in the above described documents.

Accounting units are divided to units preparing financial statements with respect to the Czech accounting standards and to units preparing financial statements with respect to the Czech accounting standards and also with respect to the IAS/IFRS. At the end of this quantitative research is presented the comparison of these two research samples.

2. LITERARY RESEARCH

Companies having the duty to report non-financial information or report non-financial information voluntarily represent in fact setting of high ethical standards. Their effort is to minimize negative impacts on the environment, encourage the development of regions, taking care of the employees and maintaining good relations inside the company and also with external subjects. Companies may take this way the advantages in competitive environment by focusing on areas like social corporate responsibility, relations with employees, environment, climate, etc. (Mádlová, 2012). In order to compile a summary of non-financial information, companies that are required to report should respect generally accepted national, Union or international frameworks. Some of them are focused on transparency, others can include wide range of branches and transparency in many contexts. Companies then select, with respect to their employees' skills and other conditions, the framework that fits them the best and will not represent the administrative burden (EU-Lex, 2019).

Non-financial information had to be disclosed, as set by the Act No. 563/1991 Coll., Accounting Act, by the companies before 2017. Accounting units that belonged among the companies with the duty to have the financial statements verified by the auditor have to report, as set by § 21, paragraphs 2 and 3 of the Act No. 563/1991 Coll., Accounting Act (2021), in their annual reports at least the following financial and non-financial information: - on facts that occurred after the balance sheet date and are significant for the fulfilment of the purpose of the annual report according to § 21 par. 1; - on the expected development of the accounting unit; - on research and development activities; - on the acquisition of shares; - on activities in the field of environmental protection and labour relations; - on whether the entity has a branch or other part of a business abroad; - required by special legislation.

Reporting of non-financial information supports meeting the global goals set by the 'Transforming our world: the 2030 Agenda for Sustainable Development' adopted by the General Asembly of the United Nations in 2015. In 2016 were to this agenda added further steps leading to

sustainable European future (Kolářová, 2019). These activities follow the Paris Agreement (on climate changes), because it is expected that transparency will lead to financial flows that will be in accordance with planned decrease of emission gases and greater support of resistance to climate changes (OECD, 2019). Accounting Directive 2013/34 EU was changed in October 2014, because of adoption of the Directive 2014/95/EU about reporting on non-financial information and information associated with diversity of relations between selected great enterprises and groups of enterprises. Identified enterprises have the duty to comply with the new requirements since 2018. It means that they started to process, with respect to this directive, information belonging to the activities that were done during 2017 (EU-Lex, 2019). That year is therefore taken by the authors of this contribution as the most significant year for conducted research. This research builds on partial findings of many domestic and foreign authors that are in many cases interesting by their scope and also results.

For example, authors Kubascikova et al. (2019) confirmed in their contribution the expectation that non-financial 'narrative' data can be used for evaluation of financial situation. They therefore recommend investors and other users of information reported in annual reports to analyze described cases together with individual financial situations and other information sources to obtain complete view of potential future development of financial efficiency of the enterprise. This then support their ability to make correct investment decisions and enables to assess better the amount of invested capital. Similarly, Dragu (2014) confirmed his research hypothesis stating that companies disclosing integrated statements represent significant interest in information, becoming cases of success and represent real models for other companies following reporting with respect to traditional rules. Authors Kristofik, Lament and Musa (2016) emphasize the necessity to standardize non-financial information reporting in the area of CSR (corporate social responsibility) to ensure the transparency and clarity of reported information.

Study of Lament (2019) brings new findings in non-financial reports disclosure confirming that, among the Visegrad Group, 40% of all insurance companies compile non-financial reports even if it is voluntary for them. Evidence from Italy is provided by Raucci and Tarquinio (2020) who studied content and extent of non-financial reports before and after the Italian Decree implementing Directive 2014/95/EU came into force. Their results show that users take indicators set by this Decree as 'more relevant'. Since the Decree came into the force, the situation in the area of non-financial information reporting improves. Similar conclusions are brought by researchers from other countries – for example Croatian authors Milena and Lahorka (2018), German authors Quick and Inwinkl (2020), Russian authors Akhmetshina, Vagizova & Kaspina (2018), Czech authors Černá, Hinke & Zborková (2018) or Romanian authors Man & Bongeanu-Popa (2020).

From the point of view of abilities of companies to compile non-financial information on sustainability are calming results brought also by Gazzola, Pezzetti, Amelio et al. (2020). With respect to their findings were over the years taken, by the subjects of public interest observed by these authors, active policies associated with reaching some of specified objectives with respect to the European legislation, even if there are still differences coming from cultural differences among European areas that still influence approaches of societes to the questions of sustainability.

3. RESULTS

Results of the first research question confirmation

Analysis of the rate of non-financial information reported by medium-sized accounting units

In the chart below are summarized topics reported by medium-sized accounting units in these areas: environmental area; social area; area of employee relations; area of respect to human rights; area of fight against corruption and bribery.

Figure 1. Information available in sources of medium-sized enterprises

Environmental area			
Position	Category	Absolute frequency	Relative frequency (in %)
1.	Waste management	25	50
2.	Energy consumption	16	33
3.	Emission monitoring	8	16
4.	Setting up processes for environmental protection	8	16
5.	Carbon footprint tracking	7	14
6.	Heat recycling	7	14
7.	Waste minimization	7	14
8.	Remediation	5	10
9.	Landscape recultivation	5	10
10.	Use of secondary raw materials	2	4
11.	Ensuring the efficiency of the supply network with regard to environmental impacts	2	4
Social area			
1.	Assistance in local regions	9	18
2.	Cooperation with local communities	9	18
3.	Quality of provided services	8	17
4.	Charity and cultural events	8	17
Area of employee relations			
1.	Employee benefits provision	25	50
2.	Setting up work processes	16	33
3.	Employee healthcare	8	16
4.	Professional development, education	8	16
Area of respect to human rights			
1.	Acting in accordance with human rights	5	10
Area of fight against corruption and bribery			
1.	Training in antitrust law and public procurement principles	4	17
2.	Existence of a code of ethics	4	17

Source: own processing, 2021

Figure 1 shows that most of medium-sized enterprises is focusing on the topic of waste management (50% of analyzed companies). Waste management topic increases in its significance already in the group of medium-sized enterprises. The second most often mentioned topic is energy consumption. This topic is mentioned by 33% of analyzed accounting units. Other topics from the environmental area occur only rarely, only small percentage of accounting units (4–16%).

Every non-financial information in social area is focused on cooperation with stakeholders on the level of local communities or regions. For customers is surely interesting the topic of quality of provided services. All topics are represented almost evenly.

According to the Figure 1 can be stated that provision of employee benefits represents the most often mentioned topic in the area of employee relations (50% of analyzed companies). The second place belongs to setting up work processes, 33% of companies report this information. At the same level can be seen the frequency for questions of employee healthcare and professional development and education. This is reported by 16% of analyzed companies.

Commented area of respect to human rights is not visible in public documents compiled by companies so often. In fact, in a case of medium-sized companies, is this information provided in

a form of short sentence telling that 'the company acts in accordance with respect to human rights'. There is no other detailed information to this topic reported by medium-sized enterprises. This information is reported by 10% of analyzed companies.

Similarly, as the area of human rights is reported also the area of fight against the corruption and bribery. This type of information is in the group of medium-sized enterprises visible very rarely, significant topic is creation of code of ethics that selected companies follows. This information is based on the companies individual statements. Companies mention also preventive training in the area of antitrust law and principles for participation in public procurement. This information is disclosed by 17% of analyzed companies, for both training topics.

If studying division of the number of topics with respect to individual sources – the greatest number of non-financial information is reported by the medium-sized enterprises on their web pages. On the web pages of 33% of analyzed enterprises was the scope of non-financial information reported in the range of 1–10%, 17% of enterprises devote for this purpose greater space 26–50%. Again, the most often reported topic is environmental area and the second place belongs to area of employee relations. Other topics are rare. Annual reports include most often non-financial information from the environmental area and area of employee relations. 50% of analyzed accounting units report this information in the range of 1–10% from the total scope of the report. Analyzed accounting units do not include non-financial information directly to the notes to the financial statements.

Analysis of the rate of reporting of non-financial information by large accounting units

Each large accounting unit was analyzed similarly as medium-sized accounting unit. Evaluated were publicly available sources (annual report of the accounting unit, notes to the financial statements, web pages of the accounting unit). Findings are, similarly as in the case of medium-sized enterprises, summarized by the following figure.

Figure 2. Information available in sources of large enterprises

Environmental area			
Position	Category	Absolute frequency	Relative frequency (in %)
1.	Waste management – minimization and removal	45	90
2.	Energy consumption reduction	36	72
3.	Emissions and carbon footprint reduction	32	64
4.	Increase of energy efficiency	32	64
5.	Recycling of water, waste and other materials	30	60
6.	Quality of waste water	25	50
7.	Production of environmentally friendly products	12	24
8.	Landscape recultivation	10	20
9.	Remediation	10	20
10.	Extraction of raw materials	8	16
11.	Use of solar panels	6	12
12.	Measurement of chemical pollutants when technology changes	5	10
13.	Support for domestic organic farming	5	10
14.	Energetic evaluation of the production	3	6
15.	Support for domestic agriculture	2	4
16.	Public cleaning events	2	4
17.	Nuclear safety	1	2

18.	Respect for protected areas, animals and plants	1	2
19.	Protection of birds	1	2
Social area			
1.	Quality of provided services	26	52
2.	Assistance in local regions	25	50
3.	Cooperation with local communities	25	50
4.	Charity and cultural events	25	50
5.	Customer support	20	40
6.	Cooperation with suppliers	5	10
7.	Cooperation with schools	4	8
8.	Education of apprentices, talents	4	8
9.	Responsible consumption	4	8
10.	Responsible advertising	2	4
11.	Rules for responsible content of social networks	2	4
12.	Existence of information centres for customers, counselling	1	2
Area of employee relations			
1.	Employee benefits provision	38	76
2.	Professional development, education	36	72
3.	Safety of work and employees	26	52
4.	Employee healthcare	26	52
5.	Setting up work processes	25	50
6.	Minimization of work risks	14	28
7.	Open communication with employees	4	8
8.	Support for flexible working hours	4	8
9.	The right to form trade unions	4	8
10.	Recruitment of new employees	2	4
11.	Relationships between employees and management	2	4
12.	Entitlement to retirement	2	4
13.	Occupational diseases	2	4
Area of respect to human rights			
1.	Acting in accordance with human rights	17	34
2.	Existence of a code of ethics	14	28
3.	Gender issue	10	20
4.	Equal opportunities	3	6
5.	Promoting diversity, accepting differences, mutual respect	3	6
6.	Creating a culture of cooperation	2	4
7.	Privacy policy	2	4
8.	Integration of employees after returning from maternity leave, parental leave	2	4
Area of fight against corruption and bribery			
1.	Existence of company code of ethics	12	24
2.	Training in antitrust law and public procurement principles	10	20
3.	Internal control system	10	20
4.	Implementing measures against corruption risks	8	16

5.	Abuse of position	4	8
6.	Misuse of confidential information	4	8
7.	Prevention – regular training of employees (e.g. simulation of fraudulent scenarios)	2	4
8.	Apolitical behavior towards state administration bodies	2	4
9.	Conflict of interest	2	4
10.	Measures against money laundering	2	4
11.	Financing of terrorism	1	2

Source: own processing, 2021

Figure 2 demonstrates that large accounting units are aware of the significance of informing about impacts of their business on the environment and they are simultaneously trying to describe the activities they provide with the intention to improve the state of the environment in its surroundings. Companies present themselves with various public events or certificates. The most often solved problem is the waste management. This topic is reported by 92% of analyzed accounting units. This topic is followed by the energy and water consumption reduction reported by 72% of analyzed companies. The third place was taken by the topic emission and carbon footprint reduction. This is reported by 64% of analyzed companies.

In the social area is, by 52% of analyzed accounting units, taken as serious topic quality of provided services. On the same place (50% of analyzed companies) can be seen the topics assistance in local regions, communities, or charities. Analysis of public sources shows that companies take place in diverse public competitions, even international. These are competitions like Quality Innovation Award, Governor's Award, Exporter of the Year and others.

Topics belonging to the employee area are reported quite often. The most often reported topic is employee benefits, publicly treated by 76% of analyzed companies. Next important topic is education and professional development of employees reported by 72% of analyzed accounting units that take this topic as important to be published.

In the area of respect to human rights is list of information reported by large accounting units more comprehensive than in the case of medium-sized enterprises. It is most often reporting of public information that acting of the company is in accordance with human rights (this fact is reported by 34% of analyzed companies). In contrast with medium-sized entities, they also disclose, for example, the gender balance of their employees and also emphasize equal opportunities.

A much wider range of interest is also evident in the area of fight against corruption and bribery, where in addition to the code of ethics and compliance with rights, information on internal control systems, measures against corruption risks, abuse of position, misuse of confidential information and other additional issues are also reported. It is again visible that not all accounting units report these topics in the sources they made public.

In the category of large accounting units are huge differences between the numbers of data published by analyzed entities. Some companies give great interest to selected topics, others do not report these data at all. From analyzed sources can be deducted that if the large company gives the energy to compiling and publishing non-financial information, it usually focuses on one or two above mentioned categories in detail, with respect to the nature of its activities, and other categories are mentioned in reports or on web pages just shortly, using very brief formulation of this problem.

The topic 'natural environment' is reported by the majority of analyzed companies, area of respect to human rights and area of fight against corruption and bribery are far behind the others. 33 accounting units from 50 analyzed units do not mention respect to human rights anyway and similarly 37 accounting units from 50 analyzed units do not mention in their public documents the topic of fight against the corruption and bribery.

When talking about sources, large accounting units use for reporting non-financial information most often the web pages. Only small number of topics is reported in annual reports and

in the notes to the financial statements is non-financial information published rarely and in negligible extent. Three companies have compiled separate document including analyzed categories of information. Two of these three companies publish on their web pages document called 'Non-financial report' and one company publishes the document 'Social responsibility'.

52% of analyzed companies consider that space between 11 and 25% of the website is sufficient. The least space for non-financial information is given in the notes to the financial statements, 8% of analyzed companies (space 1–10% of the total notes).

In annual reports 32% of analyzed companies give to non-financial information, it is a space in the range 1-10 % of the report extent. It is visible that large accounting units report non-financial information mostly on web pages. Separate document including non-financial information is published by 0.6% of companies from the whole amount of analyzed ones.

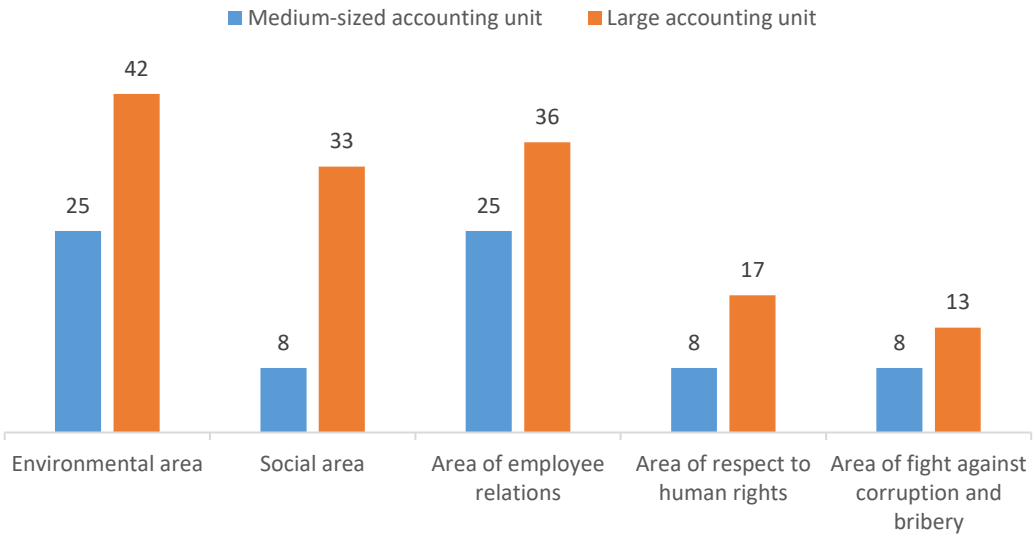
Comparison of reporting of medium-sized and large accounting units

The number of information reported by medium-sized and large accounting units is completely different. Medium-sized accounting units focus on topics in the area of environment and area of employee relations. In the environmental area is published a median of 2 and a median of 0.5 in the employee area. Median of 0 is, in the case of medium-sized accounting units, found in the area of human rights and anti-corruption area.

Large accounting units report in the area of environment median of 3, in the area of employee relations median of 2 and in the social area median of 1.5. Median of 1 is, in the case of large accounting units, found in the area of human rights and anti-corruption area.

Medium-sized accounting units are characterized by lack of published non-financial information. This activity is not so significant for them, therefore they do not give the energy to presenting their business and responsibility of acting this way. Against this, large accounting units like to publish the topics basically in comprehensive sections and parts, most often on websites. Low median of published information in individual areas comes from the fact that there is still significant percentage, among analyzed accounting units, of companies that do not report at all or publish non-financial information only shortly to meet the requirements set by the legislation.

Figure 3. Comparison of the number of information in individual areas reported by medium-sized and large accounting units



Source: own processing, 2021

Based on all gathered data is possible to answer the research question number 1: the reporting rate of non-financial information of medium-sized entities differs from the reporting of large entities, in the order of tens of percent.

Results of the second research question verification

During analysis of non-financial information reporting by the large accounting units was found that all large accounting units reporting non-financial information in special document compile this document with respect to the GRI standard regulating the socially responsible behavior of companies. Exception was represented by one accounting unit whose report has specific form but include non-financial information from all analyzed areas.

Further were large accounting units divided to category of accounting units keeping accounting records with respect to the Czech accounting legislation and category of accounting units keeping accounting records with respect to the Czech accounting legislation and also with respect to the IAS/IFRS. Results of the analysis of non-financial information reported by selected accounting units are summarized in the following figure.

Figure 4. Data on reporting of non-financial information by large accounting units

Category of non-financial information	Accounting units keeping accounting records with respect to the Czech accounting legislation			Accounting units keeping accounting records with respect to the Czech accounting legislation and also with respect to the IAS/IFRS		
	Absolute frequency	Relative frequency	Beyond the requirements of legislation	Absolute frequency	Relative frequency	Beyond the requirements of legislation
Environmental area	20	40 %	no	21	42 %	no
Social area	13	26 %	yes	20	40 %	yes
Area of employee relations	16	32 %	no	21	42 %	no
Area of respect to human rights	8	16 %	yes	9	18 %	yes
Area of fight against corruption and bribery	0	0 %	no	13	26 %	yes

Source: own processing in accordance with Kolářová (2019)

The figure shows that in the environmental area and area of employee relations is the amount of reported non-financial information in both analyzed categories quite equal. In other three areas is better situation in reporting non-financial information in the group of accounting units keeping accounting records with respect to the Czech accounting legislation and also in accordance with IAS/IFRS. Their reported non-financial information is more complex and include better view of environmental aspect. No accounting unit keeping accounting records just with respect to the Czech accounting legislation does report information in the area of fight against corruption and bribery. Area of respect to human rights is commented by four accounting units and social area by 13 accounting units from the whole number of 25.

A total of 66% of analyzed large accounting units report information from social area beyond the framework od their duties. From these 66% is this situation in 40% of large accounting units keeping accounting records with respect to the Czech accounting legislation and also with IAS/IFRS and 26% of large accounting units keeping accounting records just with respect to the Czech accounting legislation. In the area of human rights, a total of 34% of analyzed large accounting units report information beyond the framework of their duties. From these 34% is this situation in 18% of large accounting units keeping accounting records with respect to the Czech accounting legislation and also with IAS/IFRS and 16% of large accounting units keeping accounting records just with respect to the Czech accounting legislation. In the area of fight against corruption and bribery, 26% of analyzed large accounting units keeping accounting records with respect to the Czech accounting legislation and also with IAS/IFRS report information beyond the framework of their duties.

On the base of above mentioned evidence can be stated that in the group of analyzed accounting units were identified subjects that report non-financial information beyond the requirements of the Act No. 563/1991 Coll., Accounting Act.

4. CONCLUSION

Based on the conducted research results can be stated that medium-sized accounting units take non-financial reporting mainly as the duty given by the legislation and are trying to meet mostly the provisions in the relevant laws (especially in the Accounting Act). The most often commented topics are those from environmental area and area of employee relations. In other areas (social area, area of fight against corruption and bribery, area of respect to human rights) 42 accounting units do not report any non-financial information. Also, among medium-sized accounting units can be seen responsible entities commenting all analyzed areas. In this research consisted of this group of enterprises of 8 accounting units from the total of 50 analyzed. Non-financial information is usually reported on the web pages of the accounting unit (mainly information from the environmental area). Accounting units give to the reporting of non-financial information in used sources space in range of 1–10%.

Better results were recorded at the group of large accounting units. Again, most of the non-financial information was recorded in the environmental area and area of employee relations. The greatest space is given to non-financial information on web pages of the accounting unit and 52% of these accounting units give it in public sources space in the range of 11–25 %. For final answering of the first research question were compared many variants of information reported by medium-sized and large accounting units in analyzed areas of interest. Finally, was calculated that the reporting rate of medium-sized entities' non-financial information differs from that of large entities – in the order of tens of percent.

Based on the conducted research can be further stated that large accounting units keeping accounting records just with respect to the Czech accounting legislation have, in comparison with accounting units keeping accounting records also with respect to the IAS/IFRS, tendency to publish non-financial information in lower rate and focus mainly on environmental area and area of employee relations. Accounting units keeping accounting records with respect to the Czech accounting legislation and also with respect to IAS/IFRS are in different position. These entities have their activities more closely associated with environmental topics. Also, these companies focus mainly on environmental area and area of employee relations. They, however, give significantly greater space also to other areas – social area, respect to human rights and fight against corruption and bribery.

Beyond their duties set by Act No. 563/1991 Coll., Accounting Act, report information from the social area 26% of companies keeping accounting records with respect just to the Czech accounting legislation. 16 % of them also report information from the area of respect to human rights. 40% of accounting units keeping accounting records with respect to the Czech legislation and also with respect to IAS/IFRS report beyond their duties information from the social area, 18% of them report non-financial information in the area of respect to human rights and 26% of them report information from the area of fight against the corruption and bribery. It thus creates a positive image of the company for the public, the company′s surroundings and various interest groups. Non-financial information is reported with the intention to gain a good reputation in a competitive environment, not because of a legal obligation. The research also confirmed that in the group of large accounting units is 44% of them that do not report any non-financial information required with respect to the rules set by the Act No. 563/1991 Coll., Accounting Act which is in force since 2017.

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ANNUAL REPORTS NON-FINANCIAL TEXTUAL ANALYSIS

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Abstract
Various information sources are available for analyzing a financial performance of a company. Annual report is one of the most important information sources, within which companies reveal their results, developments and activities. Annual report provides broader insight into a company´s business and performance because it contains alongside the financial data also contextual non-financial data source. In this paper we focus on the readability, positive or negative tone and structure of language applied in annual reports and examine how these characteristics change over time. Then we compare the results obtained in order to propose reliable recommendations. Based on our results we conclude that non-financial data are used as a tool that companies use to enhance important performance-related information and these non-financial data can be used for the assessment of the company's financial performance, alongside quantitative information. Non-financial "narrative" data can be used as a support tool for decision making process of annual report users in order to predict the future company's financial performance.

Keywords: *annual report, financial performance, narrative data, textual analysis*

1. INTRODUCTION

In recent years we may observe the increasing average length of narratives in annual reports that investors or analysts use as a means of decisions support. According Delloite the narrative reporting volumes accounted for 61% of the average annual report in 2015, compared to only 52% in 2006 (Deloitte, 2014, 2015).

Some studies (Magnusson, 2005, Hajek, Olej & Myskova 2014) contributes to examining the financial performance forecasting based on annual report narratives. Beattie et al. (2014) in their study categorized three types of textual analysis in annual report narratives: thematic content analysis, linguistic analysis, and readability analysis. While thematic content analysis assesses what is written, the linguistic and readability analysis looks into how the narrative is written.

However textual analysis is according to some studies less precise in compare with traditional quantitative methods, it has equal importance to understanding the financial situation of company (Loughran & McDonald, 2004). Li (2010) finds that companies with lower disclosed earning have more complicated language used in their annual reports. According to findings the poorly performing companies have more difficult and complex sentences to send a message and explain their financial situation to stakeholders (Bloomfield, 2002).

Based on the results and theories of prior literature we can conclude that the textual analysis of annual reports has focused on the consequences of disclosure characteristics, positive or negative

tone, length and readability, sentiment of annual reports, effect on market pricing, company life cycle, analyst behavior, earnings persistence etc. According to Hajek (Hajek, 2017) automated textual analysis of annual reports can be used as an reliable decision support tool and stock returns predicting tool. Bakarich in his paper tests how the qualitative characteristics of annual reports change across different phases of the company's life cycle (Bakarich, 2019).

Shirata et al. (2011) noted: "Signs of the changing financial position of a company may appear in the nonfinancial information earlier than we can identify the changes in the financial numbers." Several studies analyzing textual information in annual reports confirmed the predictive power of corporate narratives. Cecchini et al. (2010) confirmed that based on qualitative information from annual reports it is possible to predict fraud and bankruptcy. Lounghran & Mc Donald (2014) found that companies using stronger language (more positive or more negative) are more likely to disclose a significant weakness in internal controls.

The sentiment textual analysis in many papers is examined by two commonly used softwares – dictionaries, namely a finance-specific dictionary proposed by Loughran & McDonald and general dictionary Diction 7.0 (Diction, 2015, 2016).

2. METHODOLOGY AND DATA

Changes in qualitative "narrative" data might precede also changes in future financial data. This work tests the validity of this hypothesis using the annual report textual analysis. The paper is mainly focusing on the sentiment forecasting, textual complexity and content analysis.

We examined data using software Diction – dictionary-based software that examines verbal tone of the text. It deploys about 10,000 search words and provides the platform for analyzing the 5 main categories (in addition to these sentiment features, it involves other 35 sub-features) of sentiment (Diction 2015, 2016):

a) Certainty language categorizes words describing resoluteness, completeness, inflexibility, and tendency to speak ex cathedra.
b) Active or inactive language indicates movement, the implementation of ideas.
c) Optimism endorses a person, group, event or concept.
d) Realism affects recognizable, immediate, tangible matters in our everyday lives.
e) Commonality language features values of a group.

To test the sentiment or our annual reports sample we used LIWX2015 (Linguistic Inquiry and Word Count) software for textual analysis. Various sentiment categories can be test by this software including positive and negative emotions, risk, certainty and others. LIWC2015 master dictionary consists of approximately 6,400 words. It is applicable in various domains, including psychology, business as well as personal writing. Software provides analysis results in the form of a words percentage (in all mentioned categories) contained in the text. For example, if the text contains 10,000 words, the dictionary might find 500 words which occur in the text which express negative or positive emotion, so then it allocates a score 5 to negative or positive sentiment. The score ranking from 0 to 100 may be attributed to the specific text within each category. The more words the textual analysis software analyses, the more reliable the results are. As our samples annual reports contained texts of more than 100 000 words, we consider the obtained results to be reliable.

The word choice expressing sentiment is not the only aspect that must be considered when analyzing report narratives. Besides the linguistic analysis, the readability is another dimension which helps us to reveal the quality of disclosure and assess syntactical complexity of narratives. Various measurements exist to determine report readability. The Flesch Readability formula (READABILITY-SCORE.COM, 2019) is one of the most commonly utilized tools in readability studies. Flesch Reading Ease score and Flesch-Kincaid Grade Level consider number of syllables per word and number of words per sentence to determine difficulty reading of the text. The score indicates the reading ease varies from very easy to very difficult to read, and grade level of education required

to fully comprehend the text is subsequently computed based on the score result. Other readability formulas similar to these are for example the Fog Index, or the Lix Text. All of them are based on word complexity and sentence length to assess reading ease, although they differ in specific calculation algorithms.

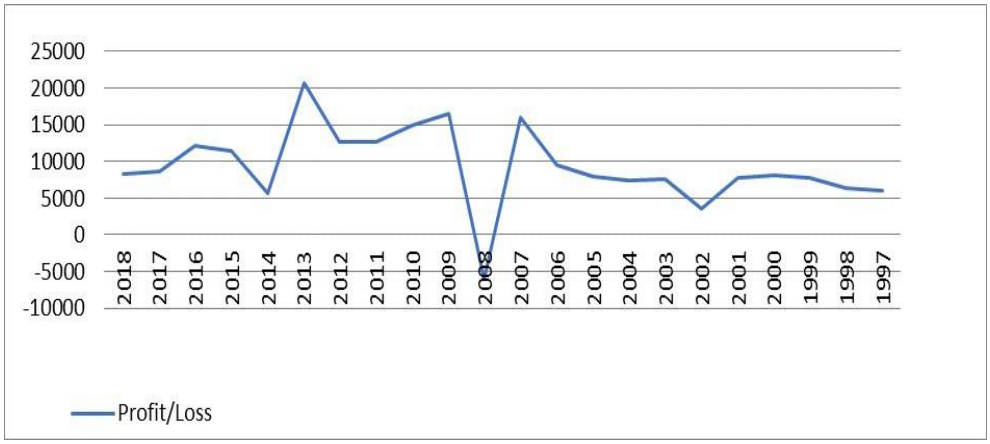
For our analysis we selected IBM company, we collected its annual report filings for the years 1995–2018. We tested whether some management tactics have been used to hide adverse information in the annual report. We analyzed the development of sentiment in their annual reports since 1995 till 2018 and whether the sentiment used in the annual reports correlates with the results achieved in that years.

For the purpose of analysis, we formulated and tested following hypothesis:
H1: When companies are facing financial problems, they use a different tone of language in their annual reports.
H2: Annual reports are more complex and less readable when company is financially distressed.

3. RESULTS

For the purpose of examination, a relationship between sentiment expressed in annual reports and the financial performance of the companies we choose one company IBM. We have chosen a company that had been performing well for several years but it experienced also financial problems – as it is shown in figure 1.

Figure 1. Profit/loss evolution of IBM for the years 1997–2018

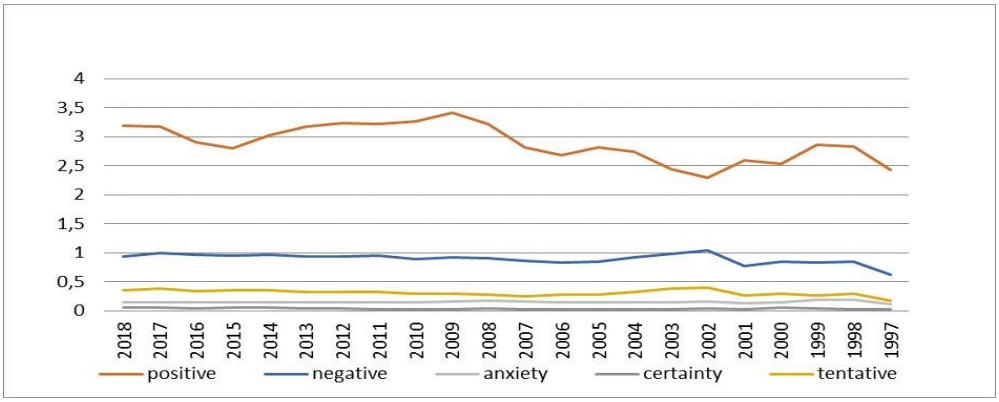


Source: Data obtained from IBM annual reports

Some authors suggested that "signs of the changing financial position of a company may appear in the nonfinancial information earlier than we can identify the changes in the financial numbers" (Shirata, 2011). By our analysis, we tested the validity of this argument, and thus justified the further applicability of sentiment analysis in the decision-making process. We examined textual information contained in annual reports across the years 1997–2018.

We employed software LIWC 2016 in order to analyze the sentiment aspect of IBM annual reports from the year 1995 till the year 2018. Each of the annual reports was, firstly, analyzed individually on several categories of sentiment – positive, negative, anxiety, certainty and tentativeness. Anxiety is a composite of the negative emotion category, together with anger and sadness, however for the purpose of the annual report sentiment analysis, we considered it appropriate to examine further this one composite, rather than sadness or anger. Results of this analysis in following graph.

Figure 2. Analysis of five sentiment categories (IBM annual reports for the years 1997–2018)



Source: Data obtained from IBM annual reports processed by LIWC2015 software

Above we can see that the company reported higher level of positive emotions in its annual reports compared to the negative ones. This finding confirms the Pollyanna hypothesis, that companies would employ more positive than negative words regardless of their financial performance. It is obvious that managers would like to present the company in a good light even though some financial problems could be anticipated. The graph shows fluctuations in positive sentiment, other categories – negative, anxiety, certainty, tentative are linear over the years. Positive language increased sharply in 2008 and 2009, we suppose that the company aimed to present a brighter, better future in order to persuade its investors that even though the company had financial problems, these may have been solved easily by restructuring or other initiatives, and company would survive.

To assess the textual complexity and readability of an annual report we used one of the most common readability measures, the Flesch Reading ease Index. The Flesch Reading Ease Formula considers two variables: the number of words in each sentence and number of syllables in each word to determine a readability score. The score obtained is then compared with a standard to identify the narrative in terms of reading difficulty ranging from very difficult to very easy across seven levels.

The Flesch Index uses a numerical scale from 0 to 100. The lower the reading ease score, the more incomprehensible the writing is and the harder each passage is to read. On the contrary, the higher score indicates the text is easier to understand (Clarke, 2009). A grade level corresponding to each score obtained is then attained based on the USA education system. It basically represents the number of years of education which a person needs to have in order to fully comprehend the text without difficulties. For example, a score of about 10–12 is a reading level of high school completion. The reading ease rating with the required education level of the reader to fully comprehend the text is shown in Table 1 below.

Table 1. The Flesch Reading Ease Score

Reading ease rating	Description of style	Educational attainment level	Typical style of magazine
0–30	Very difficult	Postgraduate degree	Scientific
30–50	Difficult	Undergraduate degree	Academic
50–60	Fairly difficult	Grades 10–12	Quality
60–70	Standard	Grades 8–9	Digests
70–80	Fairly easy	Grade 7	Slick fiction
80–90	Easy	Grade 6	Pulp fiction
90–100	Very easy	Grade 5	Comics

Source: Courtis, 2004

We employed these two formulas in order to compare the readability the annual reports over the time and to analyze whether it has connection to financial results of the company. We used also a computer assisted program available online (readability-score.com) to calculate the score. We tested hypothesis whether company in years when it achieved worse results would have annual reports more complex and less easy to read in accordance with the argument that company will be more likely to mislead stakeholders or hide bad news compared to the financially healthy companies.

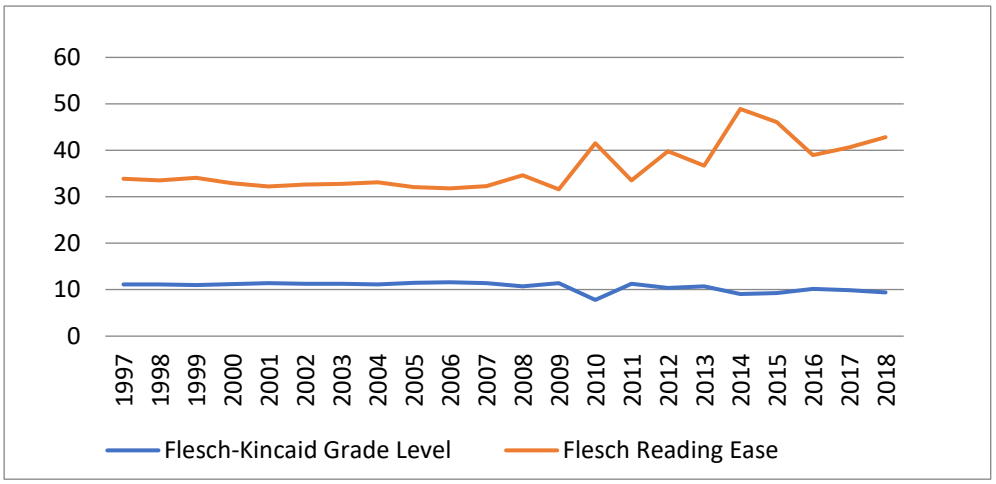
Table 2. Readability score determinants from IBM annual reports for years 1997–2018

Year	Word number	Sentence number	Syllable number	No. of words per sentence	No. of syllables per word	No. of characters per word
1997	28192	2836	51763	9,9	1,8	5,3
1998	29297	3183	58346	9,2	1,9	5,5
1999	31239	3757	68257	9,8	1,9	5,5
2000	38383	3757	68257	10,2	1,8	5,1
2001	55771	5243	97089	10.6	1,7	5,0
2002	93200	8845	175759	10,6	1,7	5,0
2003	61250	5703	113062	10,7	1,8	5,4
2004	57496	5241	110306	11,0	1,9	5,6
2005	64286	5242	124851	12,0	1,9	5,7
2006	70791	6807	137965	10,4	1,9	5,7
2007	71817	7639	138201	9,4	1,9	5,5
2008	69672	6467	134892	10,8	1,9	5,6
2009	70693	6303	136907	11,2	1,9	5,6
2010	73295	6630	141827	11,1	1,9	5,6
2011	77239	7572	149252	10,2	1,9	5,6
2012	77832	7435	150480	10,5	1,9	5,6
2013	81652	7659	157791	10,7	1,9	5,6
2014	81538	7697	158103	10,6	1,9	5,6
2015	80256	7723	155093	10,4	1,9	5,6
2016	82924	8306	159510	10,0	1,9	5,6
2017	77619	7683	149726	10,1	1,9	5,6
2018	82182	7879	157862	10,4	1,9	5,6

Source: Data obtained from IBM annual reports for years 1997–2018, processed by Readability-score software

Table 2 shows the level of readability score for each of two groups. On first sight, it seems that annual reports became longer and more difficult to read over the time. Results of Flesch Reading Ease and Flesch-Kincaid Grade Level is in following graph.

Figure 3. Readability scores across the years



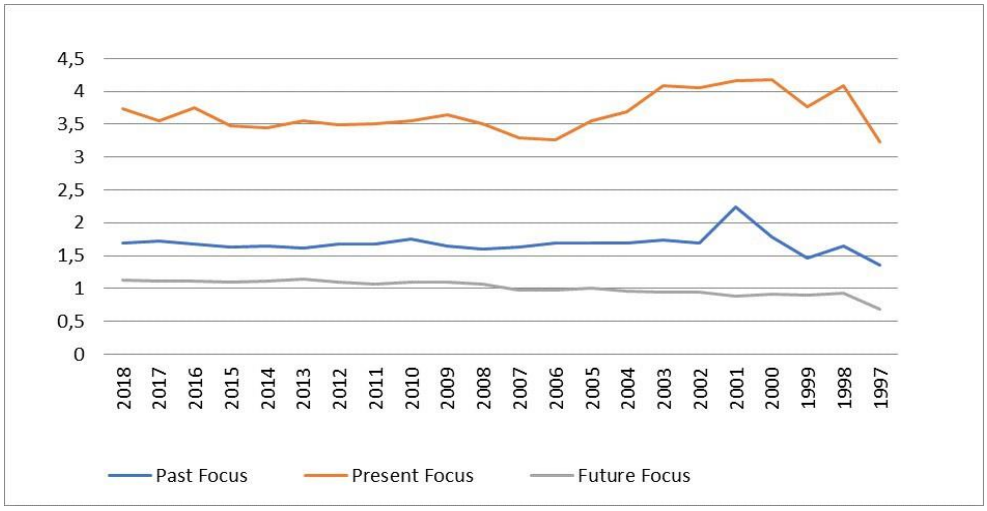
Source: Data obtained from IBM annual reports for years 1997–2018, processed by Readability-score software

Figure 3 shows that annual reports are difficult to read according to the Flesch Reading Ease Score because their obtained score is between 30 and 50. These results comply with the general conclusion of other readability studies which classify corporate annual reports as difficult to very difficult to read (Beatie, 2004).

According to previous papers the less profitable companies are likely to prepare annual reports which are less easy to read and not well performing companies tend to hide poor performance information in annual report (Li, 2008). Our finding rejected the hypothesis that annual reports of company with possible financial problems are more difficult to read and annual reports of companies which perform well are easy to read. There was not found relationship between financial performance and readability so according to these findings we do not recommend the readability score as the financial performance indicator.

Further, we examine the time orientation of IBM annual reports across all the analyzed years. Figure 4 shows whether the company has been more past, present or future orientated during these periods and how this focus changed over time.

Figure 4. Analysis of time orientation focus in IBM annual reports



Source: Data from IBM annual reports for years 1997–2018 processed by LIWC2015

Annual reports include both current performance and future trends and development, it is obvious that this section comprised expression focusing not only on present company situations, but also on the past and future. As Figure 4 illustrates, the present focus prevails over the other two, and was even stronger in the two years just before the financial problems in 2008. These results illustrate that

when a company was closer to bankruptcy, it seemed to place more emphasis on its future plans trends and expectations and on past results, speak less emphasis on present results, indicative of declining financial performance.

4. CONCLUSION

The annual report is not only a compulsory document and communication tool between a company and its investors, but the role of annual report is also to inform about companies performance. The financial and non-financial data disclosed in annual reports may also indicate future financial development. However, financial do not provide full insight into information about future trends, development and expectations. For this purpose, the qualitative data is especially useful.

In this paper we used a combination of two textual analyzes software in order to confirm or reject the hypothesis, that non-financial data could also be used for the assessment of the company's financial position and performance. The results of our sentiment analysis supported the hypothesis that companies use a different tone of language in their annual reports when they head financial problems. Present focus decreased in 2006–2008, although managers admitted poor financial position, they would have liked to emphasize news other that present poor performance. This is consistent also with the finding that positive language increased sharply in 2008–2009 – the company presented a positive, better future although the company had financial problems.

According to the results of readability test, we rejected original argument that annual reports are more complex and less easy to read when the company is financially distressed. Despite these findings, we can recommend to use non-financial data for the assessment of financial performance of a company.

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ENVIRONMENTAL REPORTING INFLUENTS AFTER EU DIRECTIVE 95/2014 IMPLEMENTATION

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Abstract
This paper seeks to examine empirically the level of environmental information disclosed by Romanian companies listed at Bucharest Stock Exchange (BVB) and companies elaborating sustainability reports according to Global Reporting Initiative (GRI). The period considered is 2017–2020 after implementation of the EU Directive 95/2014, which was transposed in the national legislation in January 2017, which imposes companies with above 500 employees to disclose information regarding environmental aspects, social and employee matters, respect for human rights and anti-corruption and bribery matters. Then, the paper intends to discover the level of environmental disclosure of Romanian companies from different industries. Moreover, the paper emphasis if the companies from environmentally sensitive industries (utilities, oil and gas) are disclosing more information regarding environmental aspects. The results tend to demonstrate the main influencing factor is the size of the company and not the sensitive aspect as might be considered. The paper attempts to offer a perspective on the environmental aspects disclosed by companies after becoming mandatory by law.

Keywords: *environmental disclosure index, EU Directive 95/2014, Romania, sustainability*

1. INTRODUCTION

Over the years, the environmental information was demanded by stakeholders to be disclosed by companies. For meeting this requirement, companies started to disclose voluntary the environmental aspects (Monteiro and Aibar-Guzman, 2010a). By disclosing voluntary environmental information, companies view this voluntary disclosure as a way to obtain legitimacy (Larrinaga et al., 2002), as there were not existing at that time any environmental accounting standards.

Currently, the European Directive starts to have impact on companies, especially the ones from European Union. The directive started to become active since 2017. The directive is set to for companies which have above 500 employees to disclose social and environmental information regarding their activities in order to understand the impact of their activity and the performance development of the company. Before and after appearing the European Directive, it draw the attention of different practitioners, researchers, regulators and investors.

Therefore, the objective of this study is to analyze the level of environmental disclosure made by the Romanian companies listed at the BVB (Bucharest Stock Exchange) for the period 2017–2020 after the implementation of the European Directive. Also, in study it is intended to proof if the environmental disclosure is correlated with financial performance (size, leverage, turnover, number of employees) and environmental performance (materials, energy, water, biodiversity, emissions, effluents and waste, materials, environmental compliance, supplier environmental assessment, management approach).

The study adds to the international research on environmental disclosure by focusing on an emergent country, where there is still limited evidence on this topic. This study adds value by evaluating the level of environmental information and its influencing factors. The empirical part of this study is composed by a quantitative study which compares the level of disclosure among industries and over time and determines the factors of influence through a regression analysis.

In literature, several studies were elaborated for emergent countries before the implementation of the directive. Some of them are reflected in Table 1.

Table 1. Studies elaborated for emergent economies

Authors	Objectives	Methodology	Sample	Industry
Imam (2002)	Position of corporate social performance reporting	Survey	40 listed companies at Dhaka Stock Exchange	Engineering, Textile, Pharmaceutical, Food and allied, Fuel and Power, Housing and Services, Miscellaneous
Al-Tuwaijiri et al. (2004)	Connections between economic performance, environmental performance and environmental disclosure	Content analysis	198 companies from 1994 IRRC Environmental Profiles Directory (1994)	Polluting industries
Ahmad (2012)	Identify the need for environmental accounting and reporting practices	Questionnaire and content analysis on annual reports	40 companies from Bangladesh listed at Dhaka Stock exchange (2010)	Pharmaceuticals, Tannery Industries, Cement, Ceramics, Engineering, Food & Beverage, Textiles, Fuel & Power
Al-Arussi et al. (2009)	Voluntary financial and environmental disclosures through the internet can be explained by the same determinants as in conventional reporting	Content analysis	201 Malaysian listed companies on the Bursa Malaysia's Main and Second Boards for the financial year 2005	Not mentioned
Buccina et al. (2013)	Analysis of disclosure strategy for potential liabilities	Case study	A company from Ecuador for the year 2001	Oil
Hassan & Reza (2013)	Correlation between environmental performance and disclosure	Regression analysis	Companies from Nigeria for the period 1965–2009	Oil and gas

Kuzey & Uyar (2017)	Determinants of sustainability reporting for Turkish companies	Regression analysis	297 companies from Turkey for the period 2011–2013	Manufacturing

Source: own projection

For emerging economies, Imam (2002) reported only 9 companies (22,5%) companies in Bangladesh and disclosed only positive information. Al-Tuwaijiri et al. (2004) highlighted an integrated analysis of the connections between economic performance, environmental performance and environmental disclosure. Ahmad (2012) revealed through his study that there is a strong need of environmental accounting and reporting. Regarding the environmental disclosures, only qualitative disclosures were provided in the different parts of annual reports. The environmental disclosures related to waste management, energy, environment protection and safety related measure were not satisfactory. Al-Arussi et al. (2009) concluded that the disclosure of environmental information through internet is affected by use of technology, firm size and CEO background. The study was conducted in the financial year 2005 for 201 companies from Malaysia. Buccina et al. (2013) examinated for the year 2001 how a parent company located in the US managed its obligations in less developed countries (Ecuador) taking into account that accounting standard requirement for disclosure is met and their justification for omitting to display financial statement disclosure of potential liability. Hasan and Reza (2013) investigated empirically for the period 1965–2009 the determinants of changes in carbon dioxide emission levels in Nigeria. Finally, they reached the conclusion that environmental performance is not related environmental disclosure in this setting.

The Romanian legislation transposes the European Directive by the Order No. 1938/2016. The order became effective starting with January 2017. The order requires from the companies to disclose information regarding environmental aspects, social and employee matters, respect for human rights and anti-corruption and bribery matters. For environmental aspects, the companies are required to disclose information regarding current and foreseeable impact of the entity's operations on the environment, health and safety, use of renewable and non-renewable energy, GHG (greenhouse gas) emissions, water usage and soil pollution.

According to the GRI Guidelines G4/2017, the companies are required to disclose environmental information regarding: Materials, Energy, Water, Biodiversity, Emissions, Effuents and Waste, Environmental Compliance and Supplier Environmental Assessment. Materials refers to recycled input materials and if they are used by weight and volume. For energy, the guideline stipulates regarding the consumption inside and outside the organization, the reduction of consumption. For water, the guidelines highlights if there is withdrawal by source, water sources affected by withdrawal of water and reused and recycled water. For biodiversity, the guideline highlight if there are habitats protected or restored, national conservation species with habitats in areas of operations of the company. The emissions are reflected by GHG emissions (direct, indirect, intensity, reduction), ozone-depleting substances (ODS) and other air emissions. The effluents and waste are represented by water discharge (quality and destination), waste (type and disposal method), significant spills, transport of hazardous waste and water bodies affected by water discharges.

According to the GRI database, in Romania there are 42 companies from different industries which elaborate environmental reports in the period 2009–2020.

Table 2. Companies reporting GRI in Romania

Company	Report level	Year	Sector
Ardrem	GRI-Referenced	2019	Energy
ALRO Slatina	GRI-Referenced	2020	Metal Products
Antibiotice Iasi	Non-GRI	2018	Health Care Products
ArcelorMittal Galati	Non-GRI	2016	Metal Products
Auchan Romania	Non-GRI	2014	Retailers

BCR	GRI-G3	2011	Financial services
CEZ Romania	GRI-Referenced	2020	Energy
Coca-Cola HBC Romania	GRI-Referenced	2019	Food and Beverage Products
COSMOTE ROMANIA	GRI-G3.1	2013	Telecommunications
Distributie Energie Oltenia SA	GRI-Referenced	2020	Energy Utilities
Electrica	GRI-Referenced	2019	Energy
EurActiv Romania	GRI-G3	2009	Other
Farmaciile DONA	GRI-G3	2010	Health Care Products
GlaxoSmithKline Romania	Non-GRI	2018	Health Care Products
GreenPoint Management	-	-	Waste Management
Groupama Asigurari	GRI-Referenced	2019	Financial services
HeidelbergCement Romania	GRI-G3	2015	Construction Materials
Heineken Romania	GRI-Referenced	2016	Other
Holcim Romania	Non-GRI	2011	Construction Materials
INSOFT Development & Consulting	Non-GRI	2015	Computers
Kaufland Romania	GRI-Referenced	2019	Retailers
KMG International	GRI-G4	2018	Energy
KPMG Romania	GRI-G4	2017	Other
Lafarge Romania	GRI-referenced	2014	Construction
Lidl Romania	GRI-Referenced	2018	Retailers
Maguay Romania	Non-GRI	2014	Computers
OMV Petrom SA	GRI-Referenced	2020	Energy
Orange Romania	GRI-G3	2009	Telecommunications
OTP Bank Romania	GRI-G3.1	2014	Financial services
Patria Bank	GRI-Referenced	2019	Financial services
Petrom	GRI-Referenced	2019	Energy
PROFI	GRI-Referenced	2020	Retailers
Provident Financial Romania	Non-GRI	2011	Financial services
Raiffeisen Bank Romania	GRI-Referenced	2019	Financial services
ROMGAZ	GRI-Referenced	2018	Energy
Romradiatoare	Non-GRI	2012	Consumer Durables
Romstal	GRI-G3	2009	Water Utilities
SIVECO Romania SA	GRI-G4	2017	Other
Telekom Romania	GRI-G4	2017	Telecommunications
TMK-Artrom SA	GRI-Referenced	2019	Metal Products
URSUS Breweries, a subsidiary of SABMiller plc	GRI-Referenced	2018	Food and Beverage Products

Source: database.globalreporting.org

The most recent reporting regarding sustainability is realized in accordance with GRI-G4 standards (KMG International, KPMG Romania, Siveco Romania SA, Telekom Romania). The most recent application level done in accordance with GRI are done under C level (EurActiv Romania, Farmaciile Dona, Orange Romania, Romstal) and under B level (BCR, COSMOTE ROMANIA, HeidelbergCement Romania, OTP Bank Romania). The column with Years represents the last year when the company elaborated a sustainability report. From the sector column, it can be observed the diversity of industries from which the companies belong (Energy, Energy Utilities, Food and Beverage Products, Metal Products, Telecommunications, Water Utilities, Consumer Durables, Financial services, Retailers, Computers, Construction Materials, Constructions, Health Care Products).

Previous studies presented an increasing engagement among companies to include corporate governance, social and environmental aspects into their annual reports, reporting and measuring these aspects, according to GRI (Gurvits & Sidorova, 2012). A study conducted by Suttipun and Stanton (2012) revealed that disclosing environmental information into online facilitates the connection with stakeholders at a lower cost. The increasing number of companies that started to present environmental information into their annual reports is also evidenced in the study of (De Villiers & Alexander, 2014).

2. RESEARCH METHODOLOGY

For answering these questions, we elaborated a quantitative research for a sample of 98 of companies listed at BVB and 42 companies elaborating sustainability reports according to GRI (Table 2). The period taken into consideration is 2017–2020. The companies from the sample were then grouped into industry sectors: Oil&Gas, Basic Materials, Industrials, Consumer Goods, Health Care, Consumer Services, Telecommunications, Utilities, Financials and Technology (Melloni et al., 2017). Furthermore, there were excluded companies from financial sector because of different accounting practices used for elaborating the financial statements and this is explained by the intention to "avoid unwanted noise associated with accounting numbers" (Frias-Aceituno et al., 2013, p. 47). From this research were also excluded insolvent companies.

For the first part, in order to measure the level of environmental disclosure provided by Romanian companies in their reports (annual reports, sustainability reports, financial statements, administrator's report or environmental report), it was performed a manual content analysis (Morhardt, 2009). For social and environmental reporting this method is selected due to its common usage (Gray et al., 1995). Moreover, the content analysis is considered "a technique for gathering data that consists of codifying qualitative information in anecdotal and literary form into categories in order to derive quantitative scales of varying levels of complexity" (Abbott and Monsen, 1979, p. 504). In order to quantify the information, it was attributed scores "0" if the element is missing and "1" if the element is present (Cormier and Magnan, 2003; Cormier et al., 2005; Tiron-Tudor et al., 2019). Therefore, it was developed an environmental disclosure index (EDI) by dividing the number of elements disclosed in annual reports to the total number of elements (Monteiro and Aibar-Guzman, 2010b; Ribeiro & Aibar-Guzman, 2010). The Environmental Disclosure Index (EDI) consists of 9 items related to environmental disclosure highlighted in Table 4 and which are used for evaluation also by GRI. The items received the value zero if they did not disclose this item in their annual/sustainability/environmental report and the value one if the company disclosed the information. Therefore, the Environmental Disclosure Index was computed as a ration between total score of the disclosure (sum of elements disclosed or not) over the total number of items (nine in this case). The Environmental Disclosure Index is calculated as a percentage and is measured in the following way:

$$\boldsymbol{EDI_i} = \sum_{j=1}^{n} \boldsymbol{e/n}$$

$\boldsymbol{EDI_i}$ – Environmental Disclosure Index of Company in the year i

e- Environmental item, which received the value "1" if the information is disclosed and "0" if the information is not disclosed

n- maximum number of disclosed elements (9)

For the second part, we selected the potential dependent variables based on previous studies from literature. The influencing factors that are most commonly used are size (market capitalization, total assets or number of employees). Most of the studies found a positive correlation between

environmental disclosure and size of the company (Archel & Lizarraga, 2001; Al-Tuwaijiri et al., 2004; Bramer & Pavelin, 2008). This positive relationship is explained by large companies which usually have more pressure to disclose information and are exposed to more attention from stakeholders in relation to their environmental performance (Monteiro & Aibar-Guzman, 2010a).

Table 3. Environmental reporting influencing factors

Variables	Indicator	Measure	Source	References
Size	Total assets	Natural logarithm of total assets at the end of fiscal year	Thomson Reuters database and Ministry of Public Finance website	Bramer and Pavelin (2006); Qiu et al.(2016)
	Market capitalization	Sum of all shared prices daily recorded from each month of an year divided by number of recordings	Thomson Reuters database	De Klerk et al. (2011); Qiu et al. (2016)
	Number of employees	Number of employees at the end of the fiscal year	Thomson Reuters database and Ministry of Public Finance website	Galant and Cerne (2017); Caputo et al. (2020)
	Net turnover	Natural logarithm of turnover at the end of fiscal year	Thomson Reuters database and Ministry of Public Finance website	Qiu et al. (2016)
Industry	Sensitivity	Consumer goods and services “0”; Industry, Oil&Gas “1”	Thomson Reuters database and Ministry of Public Finance website, GRI database	Tiron-Tudor et al. (2019); Clarkson et al. (2011); De Villiers et al. (2011)
Reporting type	Mandatory	Criteria regarding number of employees	Thomson Reuters database and Ministry of Public Finance website	Caputo et al. (2020)
Big 4 Audit	Assurance provider	Companies audited by Big 4 “1” , not audited by Big 4 “0”	Thomson Reuters database and Ministry of Public Finance website	Caputo et al. (2020)
Listed at stock exchange	Quotation	Companies listed “1”, company ies not listed “0”	Bucharest Stock Exchange, GRI database	Sumiani et al. (2007); Monteiro and Aibar-Guzman (2010b)
Environmental certification	GRI certification	Companies with GRI certification “1”, companies without GRI “0”	GRI database	Monteiro and Aibar-Guzman (2010b); Lima Ribeiro and Aibar-Guzman(2010)

Source: own projection

3. RESULTS AND DISCUSSIONS

In order to analyse the openness of companies for disclosing environmental information, it was performed a two-steps investigation, followed by determinants' exploration. To begin with, for assessing the level of transparency (RQ1), the results showed an increase in disclosure from 2017 (the first year after becoming mandatory to non-financial disclosure) to the year 2019 (Table 2) and in 2020 having a decrease in disclosure. This decrease can be explained by the fact that at the date of collecting data, not all the companies have posted their report, even though their were bound to post them until April 2021. There are also companies not listed at BVB, but which issued environmental reports according to GRI until 2019 and for 2020 did not issue any more sustainability reports.

Table 4. Environmental disclosure level per element

Disclosure element	Total EDI	Year			
		2017	2018	2019	2020
MATERIALS	0.19	0.17	0.19	0.21	0.19
ENERGY	0.28	0.28	0.25	0.31	0.26
WATER	0.41	0.41	0.4	0.46	0.36
BIODIVERSITY	0.08	0.1	0.08	0.08	0.06
EMISSIONS	0.36	0.35	0.36	0.39	0.32
EFFLUENTS AND WASTE	0.43	0.41	0.43	0.47	0.4
ENVIRONMENTAL COMPLIANCE	0.54	0.53	0.53	0.6	0.5
SUPPLIER ENVIRONMENTAL ASSESSMENT	0.15	0.11	0.13	0.16	0.18
MANAGEMENT APPROACH	0.11	0.06	0.11	0.11	0.15
Total/average	0.28	0.27	0.28	0.31	0.27

Source: own projection using Excel and SPSS

In order to analyse how environmental reporting behavior change, it is important to consider the score per each element. As general overview, it can be observed the predilection of companies to reveal that are environmental compliant (having different authorizations regarding water, pollution, emissions). Then, most of the reports put accent on Effluents and Waste, Water, Emissions and Energy, which are the most common elements for disclosing information and also create a better image of the company (Cho et al., 2012). The other elements Materials, Supplier Environmental Assessment, Management Approach and Biodiversity are not very common for companies to disclose for some of them because they are not interested in reporting, or their activity are not related with these aspects. However, for companies elaborating Sustainability Reports according to GRI, they disclose some aspects or mention that they are activity does not impact the environment.

Table 5 displays in each industry the percentage of companies which disclose environmental information in the year 2017, 2018, 2019, 2020.

Table 5. Environmental disclosure level for companies from sensitive industries

Industry	Number of companies	EDI			
		2017	2018	2019	2020
Oil and gas	14	0.48	0.51	0.49	0.49
Utilities	6	0.48	0.46	0.48	0.57
Consumer good	17	0.22	0.22	0.22	0.23
Consumer services	13	0.14	0.13	0.15	0.16
Industrial	29	0.15	0.17	0.2	0.13
Total/average	79	0.29	0.3	0.3	0.31

Source: own projection using Excel and SPSS

The table shows a general increase on the level of environmental disclosure for the companies. The only high and lower significant changes are for companies from Utilities industry (increase) and for those from Industrial (decrease). The companies from Oil&Gas and Utilities have higher values of environmental disclosure as they were from the pollutant industries, which are more interested in disclosing this type of information.

The principal aspect for companies with more than 500 employees to disclose environmental information is the EU Directive 95/2014 that came into force in 2017, thus being for them the main motivation for reporting non-financial information. Although, the investigation included also companies with less than 500 employees, not taken into consideration by the Directive. Companies from "Oil&Gas" and "Utilities" tend to have good increase in disclosure due to their pollution impact.

In order to test the influences between the Environmental Disclosure Index (dependent variable) and its possible determinants (independent variables) it was applied the Pearson coefficient for correlation analysis, the strongest correlation being for size (0.442), while the lowest for sensitivity (0.277).

For studying the mandatory aspect regarding number of employees and the effects of environmental sensitivity of the industry, it was applied a Multiple Linear Regression. This one is being the most suitable for analyzing the dependent variable (EDI – environmental disclosure index) by one or more factors (mandatory status and sensitivity of industry).

Moreover, ANOVA test provides, after applying the Levene test and having a p-value of (.472). Therefore, it exists a significant difference in the environmental disclosure level across groups and the null hypothesis is rejected. The Two-way ANOVA test revealed a p-value 0.041 ($p<.005$) for the sensitivity of industries. For the number of employee's criteria (500 employees), the results revealed no significant difference ($p=.18$).

The multiple linear regression was used to determine the influencing factors that explain better factors. The results gave multicollinearity issues between total assets and number of employees and lack of significance for reporting type, thus it could not be obtained a robust and reliable model. Therefore, the model has only the independent variables with 95% probability to explain the Environmental Disclosure Index.

Table 6. Model for the multiple linear regression

Variable	Coefficient	t	p-value	VIF
(Constant)	-.619	-2.417	.017	
Big4Audit	.112	1.934*	.056	1.241
Sensitivity	-.003	-.056	.955	1.085
Over500	.141	2.132**	.035	1.690
Assets	.033	2.567**	.012	1.746
Quotation	.223	1.662*	.099	4.284
GRI	.231	1.794*	.075	4.681
N=133	R= 0.570	R2= 0.325	F= 9.223	Sig. = 0.000

Significance level: ***= 1%, **= 5%, and. *= 10%

Source: calculations made by author in SPSS

$$EDI = \alpha + \beta1(Assets) + \beta2(Over500) + \beta3Quotation + \beta4Assurance + \beta5GRI + ei$$

In conclusion, the model comprises those independent variables that prove to explain better the influences over the Environmental Disclosure Index with a probability of 95%.

The significance of results is confirmed by the R square coefficient value. The company size reflected by the number of total assets has the strongest influence, followed by criteria of having above 500 employees, assurance of Big4Audit, GRI certification and quotation at stock exchange. The size is has the strongest influence which confirms prior evidence (Monteiro and Aibar-Guzman, 2010b; Tiron-Tudor et al., 2019). The results also confirm no multicollinearity between variables as the VIF values are not above 10.

The variable price per share was tested as dependent variable, instead of constructing an environmental disclosure index. This variable did not bring the expected results as not all the companies are listed at the stock exchange and very few have registered significant changes on the value of price per share weekly.

4. CONCLUSIONS

As the society progresses, the companies are required to be more transparent towards its stakeholders (investors, managers, auditors, practitioners, regulators) and show more corporate responsibility on their activities. The disclosure of environmental information is a only part, but together with corporate governance, society and human rights, offers a more faithful image of the company towards the society. Even for the companies from emergent countries, this information offers a new image about the company.

For the Romanian listed companies and firms which elaborate sustainability reports according to GRI it was measured the level of transparency regarding environmental aspects after the implementation of European Directive. For those from sensitive industries (Industry and Oil&Gas), the level of environmental disclosure was increasing scores compared to the ones from other industries. The study also revealed that companies elaborating sustainability reports according to GRI disclose more information regarding environmental aspects. Furthermore, the CSR concept is considered one of the trend items and politically correct for companies, still in Romania is not so developed (Tiron-Tudor et al., 2019). The pollutant industry (Oil&Gas and Industry) disclose more environmental information than the other companies, although the industry sector is considered to be the least important factor impacting the environmental disclosure level, while the one influencing the most being the size of a company.

To conclude, the result of the study has implication to various users of accounting information (practitioners, regulators), who have interest in the developing the practice of sustainability inside their companies. The study has as limitations as the data collected were only from a annual reports and sustainability reports of the companies. The environmental information disclosed can be observed only for companies listed at BVB and for companies that elaborate sustainability reports according GRI supervision. As further directions of the study, beginning with 2022 it will be introduced an amendment for companies with above 500 employees to disclose new information regarding environmental aspects: climate change mitigation and climate change adaptation. Also, in the reporting for 2023, companies will have the obligation to disclose environmental information regarding sustainable use and protection of water and marine resources; the transition to a circular economy; pollution prevention and control; protection and restoration of biodiversity and ecosystems. Overall, a further study could investigate by comparison the level of environmental disclosure for companies having above 500 employees for two different years before and after implementation of this amendment.

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AVAILABILITY OF NON-FINANCIAL INFORMATION FOR OBJECTIVE GROUP OF USERS

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Abstract
The aim of this paper is at first to compare the requirements of non-financial information processing standards according to the available literature and then to determine whether non-financial information is publicly available to such an extent and quality to meet the needs of various stakeholders. Representatives of five group of stakeholders were selected to the sample of respondents: management of the organization; the owners of the organization; auditors; representatives of local governments and authorities; academics. The results of the questionnaire survey revealed that active users of non-financial information rely most on the information published in the annual reports, followed by the websites of the entities. Furthermore, it was possible to trace from the questionnaire survey that stakeholders are most interested in information about the area of the environment and employee issues. Less watched areas are social issues and the fight against corruption and bribery. Within the evaluation of important areas of non-financial information for individual groups of stakeholders, it seems interesting to find a greater variability of responses among management and owners, than among auditors and academics.

Keywords: *questionnaire survey, non-financial information, stakeholders, reporting*

1. INTRODUCTION

Since 2017 large entities have been required to disclose non-financial information as soon as they meet the established legal criteria. This information deal with the impact of their activities on society and the environment. This obligation is imposed by Directive 2014/95/EU of the European Parliament and of the Council, adopted by the Council of the European Union in 2014. From this obligation it is expected to improve the overall positive point of view at a responsible approach to business.

The requirements of users of accounting information no longer meet the reports prepared so far. The current trend is to improve and increase the amount of information that is reported on the non-financial situation of the entity, on the social and environmental areas. However, only a small amount of companies in the European Union are required to disclose this non-financial information. The form and quality of this information varies considerably, and in most cases the performance and position of entities in these areas cannot be compared. The main aim of this paper is therefore to determine whether non-financial information is publicly available to such an extent and quality that it meets the needs of various interests of stakeholders.

The sources examined are financial statements on the public portal of the Czech judiciary (www.justice.cz), annual reports and individual information on the websites of accounting entities. Selected categories of non-financial information are as follows: - environment; - social issues; - employee issues; - respect for human rights; - fight against corruption and bribery. Stakeholders are divided into five groups: - management of the organization; - owner of the organization; - auditors; - representatives of local governments and authorities; - academics, it being understood that each stakeholder group has a different motivation to monitor or actively retrieval of non-financial information. These groups of stakeholders were addressed by means of a questionnaire survey. The questionnaire consisted of 18 questions. To maintain the comparability of the questionnaire results the same number of respondents answered in each group. The sample of respondents thus consisted of 5 groups of 20 respondents. The questionnaire was given personally to the respondents, who

promised to fill in the questionnaire after the previous e-mail communication. The first two general questions of the questionnaire were focused on classification of the respondents into the relevant group and on determining the intensity of work with non-financial information. The second part of the questionnaire consisted of questions on individual categories of non-financial information. Descriptive statistics were used to describe the results of the questionnaire survey. The results of the questionnaire survey are presented in the proportion of respondents.

2. LITERATURE RESEARCH

Non-financial information is generally understood as non-quantified information that cannot be expressed in financial indicators and can have and usually has a great influence on the financial situation of entities. Reports of this type are issued mainly by managers in the form of reports, statements, comments and forecasts. (Růčková & Roubíčková, 2012) The annual accounts provide, in particular, financial information based on financial statements that are standardized, mandatory and regulated by a number of laws and regulations. All companies must publish financial statements in the prescribed form. Reporting on non-financial information has not yet been harmonized, it is still largely voluntary, and depends on management's willingness (Gulin, Hladika & Micin, 2018). All management´s decisions are based on financial data from previous financial year, but non-financial information gives a picture of the entity toward the future as well. Users of this information are thus able to get a more comprehensive picture of the subject (Jílek, 2018, p. 145).

According to the European Commission there is a need to strengthen the transparency and resilience of companies, a need to increase their performance not only in financial but also in non-financial terms. The consequent greater trust between the parties in the business environment, growth of the employment, favorable economic development – these are the attributes necessary for longer-term investments. The European Commission has therefore published a methodology that will be applicable in entities in all business environments and sectors, that is based on the principles and presentation of relevant, useful and consistent non-financial information not only in the EU but also internationally, ensuring comparability in general (EUR – Lex, 2019). According to Directive 2014/95/EU of the European Parliament and of the Council, non-financial information should be part of the annual report or the consolidated report of a group of companies. If companies prepare a separate report on non-financial information, they must also make it available to the public by the end of June, therefore six months after the balance sheet date. The Directive also sets out the auditor's obligation to verify that an entity provides a statement of non-financial information in accordance with the Directive (Kolářová, 2019).

Companies should formulate principles and goals in their relationship with society and the environment. Compliance with these principles should be monitored and the results of their achieving published. The directive leaves considerable discretion to companies in meeting the requirements, but also defines which matters they should report on. Its goal is to help set up management processes properly. It will directly affect only large companies if their average number of employees exceeds 500 and businesses that are public interest entity, but it provides the useful guidance that should be useful also for others.

Therefore, it can be expected that over time this standard will be extended to a wider range of companies (Bold, 2018).

Many authors deal with the evaluation of the current state of non-financial reporting in their research. Some assess the state of non-financial reporting in the Czech Republic – for example Paksiova (2018), she compares the requirements for disclosure of non-financial information under legislation in the Czech Republic and Slovakia, or Zborková & Hinke (2013), they appraise the level of reporting of non-financial social and environmental information in financial statements of entrepreneurs.

However, a number of foreign publications can also be found in citation databases – for example, Gulin, Hladika & Micin (2018), that examine the level of non-financial information

published in the annual report on a sample of the most liquid non-financial companies on the Zagreb Stock Exchange. Their analysis includes annual reports of 3 years (2013, 2014 and 2015) in order to compare the policy of disclosing non-financial information. The results of these authors showed an unsatisfactory level of published non-financial information by companies listed on the Zagreb Stock Exchange. However, the non-financial disclosure policy indicates increasing the transparency of non-financial disclosure during the period under review.

Authors Zhuk, Zamula, Liudvenko et al. (2020) selected both internal users (employees and owners) and external users (especially suppliers, customers, creditors, investors, government agencies, NGOs) for their observations in Ukraine. According to the results of their study companies should pay special attention to the areas of activity in which stakeholders are most interested when developing non-financial reporting. These include the development and improvement of working conditions, investment in regional development, respect for human rights and the implementation of corporate social responsibility programs in the supply chain.

The development of corporate reporting (financial and non-financial) in the digital economy was followed by the authors Efimova and Rozhnovaq (2019). The effects of data and technology on the development of reporting – preparation, publication and linking of financial and non-financial reports – were examined. The result is that the digital economy uses structured data to increase the efficiency and transparency of information for all users.

The opposite point of view is represented by Papaj-Wlislock (2018), who deals with the issue of the scope and reliability of published data and their information asymmetry. This author points to the problem of information overloading of entities through individual stakeholders.

3. RESULTS

3.1 Comparison of standards requirements in the processing of non-financial information

Both national and EU frameworks for non-financial reporting can be found to meet the requirements of individual stakeholders. The Eco-Management and Audit Scheme (EMAS) can be described as a the most mentioned framework in the Czech Republic. When dealing with the international frameworks these following can be used: the United Nation Convention, UN Guiding Principles on Business and Human Rights implementing the UN ‘Protect, Respect and Remedy’ Framework; the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises; International Organisation for Standardisation (ISO) 26000; Tripartite declaration of principles concerning multinational enterprises and social policy; SA 8000 – a standard designed to improve working conditions; Global Reporting Initiative, etc.

The table below presents the most commonly used standards that can be used to create corporate documents related to responsible corporate behavior. Each of the standards is suitable for certain types of companies, a company choose a standard corresponding to its character. The presentation of non-financial information is time consuming and companies should pay sufficient attention to it. By choosing the appropriate approach the company can contribute to a good self-presentation on the market and better relations with its stakeholders.

Figure 1. Matrix of standards for processing non-financial information

Designation of the standard	Content definition	Content quality	Requirement for verification of published information	Requirement for the scope of published information	Requirement for the time period of the published report
SA 8000	General	Partially	No	Yes	General
AA 1000	Specific	Yes	Yes	Yes	No
GRI	Specific	Yes	Yes	Yes	General
OECD Guidelines for Multinational Enterprises	General	Partially	Recommended	Yes	General
ISO 26000	Specific	Yes	Recommended	Yes	General
EMAS	Specific	Yes	Yes	Yes	Yes
UN Global Compact	General	Yes	Recommended	No	Yes

Source: own processing in accordance with Kašparová and Kunz (2013) and with PDQM (2016)

3.2 Results of the questionnaire survey

In the first part of the questionnaire, stakeholders were divided into the above mentioned groups and it was identified whether they are active or passive users of non-financial information. Active user means respondents of any interest group who search for and work with non-financial information themselves or directly interfere with annual reports, websites or notes to the financial statements. On the contrary, a passive approach to non-financial information means that this type of information is not important for decision-making, so the stakeholder registers it but does not actively use it. The questionnaire showed that 63% of respondents use publicly available resources as passive users. The remaining 37% of respondents themselves participates in the creation of this information and uses it actively in decision-making. In this case it is mainly the business owners and the management who are directly involved in the preparation of the financial statements and thus in the creation of the content of their websites, annual reports and notes to the financial statements.

Another question in the questionnaire concerned the sources from which respondents obtain the necessary non-financial information. Available sources include, in particular, the notes to the financial statements and the annual report, as well as the company's website and other sources. The analysis of the answers showed that in terms of drawing on non-financial information the most sought-after source is the companies' annual reports – the percentage is 33%. Websites and notes to the financial statements are at approximately the same level (27%). Only 13% of respondents stated that they also use other sources of non-financial information. The following other sources were repeated in the responednts´answers: - specialized journals (Hospodářské noviny); - internal documentation of the company.

Other questions of the questionnaire concerned the individual categories of non-financial information examined.

Each category was examined from the following perspectives:
- whether the interviewer works with information in the given area or searches for it,
- which information in this area he considers as important to publish,
- whether the scope of the published information in the given area is sufficient.

Results of a questionnaire survey in the social area of information
The survey shows that 75% of respondents search for and work with information in the social area, compared to 25% of respondents who do not require it in their information portfolio.

Regarding the type of information in the social field, 38% of respondents do not consider information of this nature important or do not know exactly what to imagine under this category.
The remaining 62% think that it is important to publish this information and at the same time to make sufficient communication with stakeholders, with the public more widely in general. 45% of respondents have the impression that social information does not appear at all in publicly available sources. 3 % of respondents are partially satisfied and only 22% are satisfied with the form and the content of published social information if they searched for or worked with this data.

Results of a questionnaire survey in the employee area

In the area of employment, 87% of respondents search for and work with information, to 13% for whom this area is not important and do not use this type of information for their decisions.

In this information area, 88% of respondents stated that the information is only partially available, 12% of respondents are satisfied with the published information. No stakeholder was found in this category who would have the impression that he would not find this information at all in publicly available sources.

The answers to the question of which information in the area of employment is important to publish showed that this area is important for each type of stakeholder. Representatives of all types of stakeholders have found a topic crucial for them. These are, for example, the following topics: principles of corporate culture; employee benefits; basic principles of collective agreements; employee training; career growth; employee satisfaction; pension issues; sports activities in the workplace.

Results of a questionnaire survey in the area of respect for human rights

The area of human rights is a category for which the vast majority (75%) of respondents do not seek information. Only in 25% of cases this category was marked as searchable.

63% of invited stakeholders do not find human rights issues at all – neither in the annual reports nor on the website, 25% of respondents say that information is only partially available and 12% of respondents have found the information to be sufficient.

In the area of respect for human rights the respondents stated the need to inform on the following issues: gender issues; rules on the employment of adolescents or minorities; protection of adolescents at work.

Results of a questionnaire survey in the area fight against corruption and bribery

Results of a questionnaire survey in the field of the fight against corruption and bribery shows that 37% of respondents look for information in the field of the fight against corruption and bribery, while 63% do not look for this information at all and do not work with it.

However in practice 89% of stakeholders do not actively seek the information. It is obvious that this topic is not given much space in publicly available sources. Stakeholders expect information of this nature only in the case of transparency of contracts of large-scale or of property interconnection of business entities.

Results of a questionnaire survey in the area of environment

The environment and its protection is a topic of interest of the majority of the population and has indeed been the source of much discussion. This is why it is getting to the forefront of interest even among interest groups around companies. This is also confirmed by the results of the survey: only 11% of respondents do not search for this information, resp. this issue does not affect their decision-making.

50% of respondents consider this information to be published in a sufficient quantity and quality. Another 37% of respondents partially agree with this statement. The remaining respondents (13%) did not find this information.

According to the groups of stakeholders topics that are important and they wish to publish include for example: the impact of the entity’s activities on the environment; what standards in the

field of ecology or environmental management must be met and to what extent the entity meets them; method of waste management; carbon footprint theme.

The following table shows the distribution of the significance of non-financial information for decision-making by respondents of individual user groups.

The rating scale was set in accordance with the school grading in the Likert scale (1 – absolutely important, 2 – rather important, 3 – I don't know, 4 – rather unimportant, 5 – completely unimportant).

Figure 2. The distribution of the significance of non-financial information for decision-making by group of stakeholders

Type of information/ Group of stakeholders	Management	Owners	Auditors	Representatives of local governments and authorities	Academics
Social information	1,8/2	1,5/1	2,1/2	2,5/2	1,6/1
Employee information	1,3/2	1,8/2	2,8/3	3,2/3	2,9/3
Information on respect for human rights	4,2/4	4,0/4	4,3/4	4,5/5	2,6/3
Information on fight against corruption and bribery	3,1/3	1,5/2	2,9/3	1,2/2	1,5/2
Environmental information	1,2/2	1,1/1	2,8/3	2,4/2	1,5/2

Source: own processing (2021)

The number before the slash indicates the average rating of the stakeholder group, the number after the slash indicates the mode value. The table shows that the group of management stakeholders considers non-financial information from the environment and information from the employment area to be the most important, followed by information from the social area. Also among corporate owners the environmental information is first in the importance. They prefer the social area in general to employment information. The importance of information in the field of the fight against corruption and bribery is significantly at the forefront of the owners. Auditors show the least variability in the evaluation of individual areas of non-financial information. The evaluation of the importance of non-financial information among academics is above average in all areas. These results support all the previously mentioned facts, but it seems interesting to find greater variability of responses in management and owners in contrast to auditors and academics.

4. CONCLUSION

The twenty-first century is an era of information. As mentioned in the research section of the paper, research shows that users expect a growing amount of published information not only on traditional financial issues but also on non-financial data.

The results of the questionnaire survey showed that active users of non-financial information rely most on the publication of information in the annual reports, the websites of the entities are in second place. Furthermore, from the questionnaire survey it was possible to trace that on the part of all stakeholders the greatest interest is in the field of the environment and employee issues. Less monitored areas are social issues and the fight against corruption and bribery. The area of respect for human rights is not one of the areas of predominant interest within the stakeholder groups. In the

context of the evaluation of the importance of non-financial information areas among individual groups of stakeholders, it seems interesting to find a greater variability of responses on the side of management and owners, in contrast to auditors and academics.

This paper is a primary probe into the issue of non-financial reporting, in which the authors want to continue by exploring the interest in various types of non-financial information among stakeholders within the fields of NACE.

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Legal Aspects and International Trade

DIFFERENTIATION OF DELIVERY OF GOODS AND PROVISION OF SERVICES TO ENTITIES FROM OTHER MEMBER STATES

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Abstract
The goal of this paper is to describe the differentiation between the delivery of goods and the provision of services in respect to the VAT in the Czech Republic, further to compare this concept with the German legislation, to demonstrate differences with practical examples and to make a recommendation based on the findings for the most suitable concept that would be applicable across the EU. From the performed desk research, demonstration of practical examples and comparison of defined ways, a clear rule was defined as the most suitable for the differentiation whether it is a delivery of goods or a provision of services – a product from a serial production is a delivery of goods. A product made according to the customer's wishes is a provision of services. In the case of repairs, any repair involving the work of a person, or a machine should be considered a service. Only the delivery of a thing that is a new product to the customer and is not a repair of his already owned product should be considered a delivery of goods with installation and assembly.

Keywords: *VAT; Member State; delivery of goods; provision of services*

1. INTRODUCTION

VAT can be found in many countries as a significant component of consumption taxes. These taxes are specific mainly because they do not clearly identify a specific taxpayer in advance, they are stable and predictable (the taxpayer can influence the amount of tax paid by changing their behavior), their collection is simpler than with direct taxes and they are equal – the same tax rate and the same collection conditions apply for all. However, the last-mentioned condition is only valid in a certain territory. Specific conditions are defined either by the national legislation or by regulations of a higher authority (e.g. the European Union). Although there is an instrument (directive) within the European Union harmonizing the VAT mechanism, significant terms for the processing (tax return and payment) of this tax on both sides of the business case may still be understood differently, without the intention of either party of tax avasion or attempt to reduce the tax illegally. It is the issue that will be dealt with in the following article, which aims to contribute to the theoretical discussion on the applicable form of an EU-wide VAT concept in the delivery of goods and provision of services to other Member States.

2. LITERATURE RESEARCH

Since the establishment of the European Economic Community, there has been a continuous debate on the need for overall tax and fiscal cooperation and harmonization in Europe, which has constantly been deepening, mainly due to the European Monetary Union (Garcia, Pabsdorf & Mihi-Ramirez, 2013). Nevertheless, there is a need for constant coordination of national tax policies in order to achieve a balance between the diversity of tax systems of the Member States and the right of free movement not only in the European Union but also worldwide. Progress has also been made in the field of value added tax, but there are still many not completely solved issues that are the subject of scientific research by the authors listed below.

According to David (2009), VAT is very suitable for use in the international trade due to its characteristics, but it is necessary to ensure sufficient explicitness, transparency and equal conditions for European Union players based on the development and adaptation of VAT rules set on the European Union level in each Member State. According to the above-mentioned author, the provision of services is a problematic field in the VAT implementation. It is necessary to consider the issue of VAT, both possibilities in this case, using the system of VAT self-assessment by the recipient of the service compared to billing the service including VAT by the service provider, even if the service provider from an EU Member State must have a permanent establishment in the customer's other Member State, but that establishment is not involved in the provision of the service, as well as the inclusion of services under the so-called extended performance guarantee that is subject to tax or free of tax when the entity provides technical support and assistance to its customers, for example in the case of agricultural machinery breakdowns, which the provider supplied to an entity in another Member State. In these cases, David (2009) recommends to compare constantly individual solutions to situations that may occur within the EU trade and to look for unifiable solutions. The authors Martko-Mazur & Sagan (2018) are looking for a solution to the proper functioning of the tax on services by extending the scope of the so-called VAT reverse charge mechanism to all transactions involving services.

The functioning of VAT in the provision of services and delivery of goods to consumers in the single market from one Member State to another EU country has also been dealt by authors Sumanova and Marci (2017) who concluded that a combination of a mini-one-stop-shop approach (a special regime with one administrative place) with the maintenance of the threshold levels for the VAT registration within the Community in various Member States could be an appropriate way. The reason is the minimization of administrative costs as an essential part of the objectives set out in the documentation of the VAT Expert Group which assists the European Commission in the administration of VAT.

The authors Bykanova & Akhmadeev (2019) deal with VAT reporting of the delivery of goods and provision of services in international online trade due to the rapidly growing volume of B2B transactions (which they attribute to the transition of trade participants to online platforms). Unlike B2C, e-commerce prices vary, while large orders and a wide range of goods require flexible delivery and efficient logistics solutions. Here, the significant problem of indirect B2B e-commerce taxation for each State needs to be solved to take into account the existing fiscal regulations for each participant. However, there is no uniform international approach to VAT collection for B2B. Individual States impose indirect taxes in accordance with local tax rules which creates a significant inequality for all B2B e-commerce participants, so the authors propose a more loyal approach to paying VAT to non-residents of B2B e-commerce (they specifically deal trade in Russia – using a declining coefficient that does not disrupt competition for Russian B2B market participants offering similar goods or services).

VAT is often stated as a key tax in the field of tax fraud. Dumitrescu (2014) deals with frauds that occur in operations with the delivery of goods and provision of services among economic subjects from EU Member States in his research. Depending on the type of transaction (which may be acquisitions or deliveries within the Community), tax fraud mechanisms have been analysed the goal of which is avoiding taxes and charges due to the tax base reduction or concealment. Tax losses due to tax frauds in transactions within the Community vary in individual Member States depending on the number, degree of implication and interests of the participants in the tax fraud mechanism. The main obligation that is subject to tax frauds in these transactions is VAT, taking into account that purchases and deliveries of goods are transported among Member States without VAT. In their research, the authors Moravec, Hinke & Kaňka (2018) present methods that can be used to identify the gap in VAT and they explain differences in the results of individual methods. On the contrary, the authors Krzikallova & Tosenovsky (2020) deal with the positive impact of selected legislative measures introduced to prevent the tax evasion and sustainability of the current VAT system in the European context, analyzing the importance of new legislative instruments – VAT control statement

and VAT reverse charge mechanism and providing evidence of a reduction in carousel frauds. Their results indicate the need for more systematic changes in the tax system.

However, the amount of exemptions from VAT may also have an effect on the amount of tax collected. In his article, Yiallourou (2020) presents a comprehensive overview of recent judicature developments relating to VAT exemptions issued by the Court of Justice in the European Union asking for an interpretation of the exemptions for financial services, healthcare services, postal services and the provision of services by autonomous groups to their members. The solutions adopted for these services will have an impact on the VAT within the European Union.

VAT can also be an instrument for regulating income inequality (despite criticism of its regressive nature). Using a wide range of data from 1984 to 2014, Chan & Ramply (2018) examined the VAT impact on income inequality in developed and less developed countries. Their results show that VAT reduces income inequality among the population. However, their research also found that the positive effect of VAT depends on the existence of a proper country administration, as countries with higher bureaucracy, higher democratic responsibility, higher government stability, effective law, low political risk and favourable socio-economic conditions can benefit from the VAT system to a higher extent. These findings confirm the sense of this article as its goal is to contribute to an effective law for a more efficient tax collection, which is the precondition for institutional stability and economic performance. The goal of our article is to describe the differentiation of the delivery of goods and the provision of services for the purpose of VAT in the Czech Republic, further to compare this solution with the German legislation, demonstrate differences with practical examples and to make a proposal of the most suitable concept that would be applicable within the Union based on the synthesis of findings, as otherwise non-taxation or a disproportionate burden of double taxation arise for involved entities.

3. METHODOLOGY AND MATERIALS

Demonstrative examples from practice will be abstracted from the first professional authors' own professional practice. The Examples have been selected that are closely related to the issue and are commonly found in business. Furthermore, these examples are intended to demonstrate the nature of the difference.

The comparison between the Czech Republic and Germany was chosen due to the geographical proximity of both countries and the large volume of mutual trade relations. However, further scientific efforts by the authors will focus on issues throughout the European Union.

4. RESULTS

For the purposes of the Value Added Tax Act no 235/2004 (hereinafter referred to as "VAT Act"), the transfer of the right to dispose of goods as the owner is considered to be the delivery of goods pursuant to s. 13/1. On the other hand, the provision of a service for the purposes of the same Act pursuant to s. 14/1 means all activities that are not the delivery of goods. The delivery of goods with installation or assembly has a specific status. As for the assignment within the notions of goods or services, this is considered to be the delivery of goods. However, when determining the place of taxation, it is closer to the regime of services.

A usual delivery of goods to another Member State has its place of taxation in the State where the transport of the goods begins (s. 7/2 of the VAT Act). If the delivery of goods by a Czech manufacturer to a German customer serves as an example, then from the point of view of the Czech supplier the place of taxation will be in the Czech Republic where the transport of goods begins. If a Czech VAT payer meets the conditions of s. 64 for the exemption from VAT due to a delivery within the EU, he shall state this delivery in the Czech Republic VAT return as exempt.

When a Czech taxpayer provides a service to an entrepreneur from Germany, the place of supply (according to s. 9/1 of the VAT Act) is transferred to the State where the recipient has their registered office, i.e. to Germany. If there was no reverse charge system of transferring the tax to the recipient, it would mean an obligation for the Czech taxpayer to register for VAT in Germany and issue an invoice for the service with the German tax. Thanks to the reverse charge concept, which can be applied to most cross-border services, a Czech taxpayer does not have to register in Germany and the service taxation in Germany is done by its recipient.

If a Czech taxpayer supplies goods to his German customer, including installation, such as a production line, the place of taxation will again be in the State of the recipient's registered office (according to s. 7/5 of the VAT Act), i.e. in Germany although under the Czech VAT Act it is a delivery of goods. The delivery of goods with installation or assembly can be qualified as a special provision for goods taxation rules, which has elements of the taxation of services. To be considered the delivery with installation or assembly, the installation or assembly must be carried out by the supplier, or an entity hired by the supplier. If a Czech manufacturer received from a German customer only a purchase order for installation or assembly of a machine owned by a German customer, it would not be considered a delivery of goods with installation or assembly, but simply the provision of services by a Czech entity.

The Czech Value Added Tax Act (2021), just as other national regulations of the Member States on this tax, is based on European Directive 2006/112 / EC – the common EU system of value added tax (2021) which obliges Member States to act uniformly in certain provisions and in others they are free to decide for themselves whether or not to apply the provisions of the Directive. In the case of a distinction between the delivery of goods and the provision of services, this Directive has almost identical wording in Articles 14 and 24 like the Czech VAT Act, i.e. the transfer of the right to dispose of tangible property as the owner is considered a delivery of goods and any other supply as a service. Nevertheless, there are differences among EU States in the approach to what the delivery of goods and what the provision of services are – specifically between the Czech Republic and Germany. The different assessments in the individual States either lead initially to double taxation or, on the contrary, to non-taxation in both States.

For the purpose of the VAT Act, goods are considered to be tangible things except for money and securities, as well as the right to build, a living animal, the human body and its parts and energy, i.e. gas, electricity, heat and cold. The question is though what the clear boundary is that would determine whether the subject to invoicing the delivery of goods or the provision of services is.

A product made in a factory from or of material purchased by the manufacturer and through the work of the factory employees, then offered in shops, is undoubtedly a delivery of goods.

In cases where a manufacturer uses his customer's material in the production, the question is where the boundary is between the provision of services on a movable thing and the delivery of goods in the form of a product.

An example can be the situation when a craftsman produces from two identical materials in size and composition, one bought by the craftsman and the other delivered by the customer. The final product will always consist of these two materials and only a fraction of auxiliary jointing or other material bought by the craftsman. Therefore, the final product will consist of 100% of the craftsman's work and more than 50%, maybe only 50.5% of the craftsman's material. Is it still work on movables, processing of the customer's material or already the delivery of goods? When selling the product, the possession of the material not delivered by the customer contained in the product, i.e. a tangible thing, will be transferred to the customer.

The concept of the tax base is based on the supply indivisibility. If a supply is not a goal itself, but serves only to improve a main supply, it is an additional supply to the main supply according to the verdict of the Court of Justice of February 25 in case C-349/96 Card Protection Plan Ltd (CPP) against Commissioners of Customs & Excise and must be subject to the same taxation method as the main supply.

Practical examples: The value of the material delivered by the customer is CZK 10,000. A craftsman needs two parts of the same material. Auxiliary jointing material is worth CZK 100, the

work of the craftsman is CZK 5,000. The invoiced supply consists of material delivered by the craftsman in the amount of CZK 10,100 and the work of the craftsman in the amount of CZK 5,000. The additional supply, which is not the goal itself, shares the tax regime of the main supply, which is the goal. In the case of a Czech customer, the craftsman could theoretically invoice separately the delivery of material and the delivery of work, because both will be taxable supplies with the same place of supply and at the same tax rate. However, if the customer was from another Member State, the delivery of goods within the country would be taxable in the Czech Republic, while the delivery of services would be taxable in the State of customer's registered office, i.e. outside the Czech Republic.

As the main supply, the supply is considered which is the goal. In this example, the goal is the product made of the combination of two materials, i.e. a tangible thing that becomes the customer´s property. If the craftsman provided only a service i.e. work on the movable thing, he would not be able to produce the final product. This would lead us to the conclusion that the subject of the supply would be the delivery of goods, since the result is a tangible thing which was not made simply by processing. As stated in the Judgment of the Court (Fifth Chamber) of May 14, 1985. – Van Dijk's Boekhuis BV in Staatssecretaris van Financiën. – Reference for a preliminary ruling: Hoge Raad – Netherlands – VAT – Work on customers' materials – Book repairs. – Case 139/84 ('Case C-139/84, 2021') in the case of repairs, the delivery of goods is given if a completely new type of goods is created from the customer's material. With the general application of this rule, every production from the customer's material probably creates new goods and then this would always be a delivery of goods, although the supplier's activities only changed the material into a product – a door was made of delivered boards, the production of which the carpenter will undoubtedly charge as a service provided, the question is however what the solution is on the part of the buyer – he can enter into accounts a product or processing of wood into the form of a door, and therefore a service.

For bookkeeping or income tax, this assessment is not crucial, but for VAT it is important if the craftsman and the customer are established in different Member States. If the door made of the customer's planks was a delivery of goods, then the place of taxation would be in the craftsman´s State. If it was a service, the place of taxation is transferred to the customer's State. In the case where the customer is a VAT payer, the difference between the assessment of whether it is a service or goods is reflected only in a different tax return and a summary report. For non-VAT payer customers, different assessments of goods and services have an impact on budget revenues of individual States. If the customer is not a VAT payer, the place of taxation of the service is in the State of the service provider and because the customer is not a VAT payer and cannot claim a VAT refund or its deduction, the VAT paid by the provider is the final State budget revenue. By contrast, in the case of the delivery of goods within the meaning of Article 14/4 of Directive 2006/112 / EC (2021) termed as distance sales of goods, when the seller transports the goods to a non VAT payer customer, a private person in another Member State, the delivery may be subject to the tax of the supplier´s State just until the moment when the distance sale of goods exceeds the limit of EUR 10,000 within a calendar year. After that, the distance sale of goods must be compulsorily taxed in the EU State where the customer is established. The limit of 10,000 EUR does not apply separately for each individual EU State, but in total for distance sales of goods to all EU States.

Practical example: A supplier from Germany, who, for example, made a distance sale of goods to France in January for EUR 9,000, in February for EUR 2,000, so the subsequent distance sale of goods in the amount of EUR 500 to the Czech Republic can no longer be taxed in Germany, but this delivery is subject to tax in the Czech Republic. If a German supplier considered that their activity was the provision of services he would tax it to a private customer, a non-payer, with the German tax, which would be a non-refundable revenue of the German State budget. If the supplier from Germany assessed their supply as the delivery of goods in the form of a distance sale of goods to a private customer in the Czech Republic, then the tax on this supply would belong to the Czech State – the supplier would charge the Czech VAT which would be a non-refundable income of the Czech State budget. Cross-border trade is no longer just the privilege of business companies (VAT payers), but it is also common for private customers (VAT non-payers), and it is therefore necessary to have a clear

criterion distinguishing the provision of services from the delivery of goods, as this distinction has a direct impact on public finances.

Work on a movable thing, which is considered a service, is neither defined in the VAT Act (2021) nor in Directive 2006/112 / EC (2021). The Information for Determining the Place of Supply of Services of 2004 (Financial Administration, 2021) – the year when the European amendment to the VAT Act entered into force in the Czech Republic – states that repair, maintenance, modification, processing, assembly, installation, polishing, grinding, painting and other finishing work on a movable thing of another person are regarded to be work on a movable thing. In the sense of this information, all activities that only modify in any way the movable thing supplied by the customer should be considered a provision of service. On the contrary, in the sense of Case C-139/84 (2021) which concerned repairs, the addition of other materials which would create a new type of goods would be a delivery of goods.

Unlike the Czech Republic, which makes no distinction between services and goods, Germany has an implementing regulation to the VAT Act (Umsatzsteuer-Anwendungserlass 3.8 Werklieferung, 2021) where section 3.8 sets out the criteria according to which it is possible to decide whether it is the delivery of goods or the provision of services.

A typical example of the indivisibility of supply as a concept is the delivery of goods with installation or assembly. As it is clear from the description, it is a supply which involves the delivery of goods but also the provision of services. The common Czech tax practice does not take into account the value of goods and the value of installation or assembly when distinguishing whether it is a delivery of goods with installation or assembly or the provision of services. In the Czech Republic, a car repair is always considered the provision of services for the purpose of VAT, although it could be an engine replacement worth several hundred thousand crowns, where the work associated with the replacement was trivial compared to the value of a new engine. In Germany, on the other hand, the value of material and the value of work are sometimes decisive in assessing whether it is a provision of services or a delivery of goods with installation or assembly. The same repair consisting in the engine replacement could be assessed as the delivery of goods with installation or assembly regarding VAT in Germany. This difference then has an impact on taxation in individual EU States, where it can lead to double taxation or, on the contrary, non-taxation of the repair.

In Germany, the primary criterion as to whether it is a delivery of goods, or a provision of services is who supplied the main production substance. If the manufacturer, he will charge his product as a delivery of goods. If the main production substance was supplied by the buyer, the manufacturer will charge him for the service. In situations where more than one main material is needed to process a purchase order, it is sufficient for the manufacturer to supply one of them and it will already be a delivery of work, not a provision of services.

The assessment which material is the main one for the production does not primarily depend on its value but on the opinion of the so-called average consumer. Practically, however, this concept set out in the Implementing Regulation (Umsatzsteuer-Anwendungserlass 3.8 Werklieferung, 2021) in section 3.8 of the German VAT Act is not clear enough and leads to frequent disputes with the Revenue Office on two levels. From the point of view of accountancy, because there is a difference whether something is kept in books as a purchase of goods or as a received service, and from the tax aspect because if the customer is not established in Germany, the supply is taxable in Germany, while the received service would be subject to taxation in the State of the customer´s registered office outside Germany, in the case of a business entity.

A repair has a very specific position in the German tax law. As the first step of the assessment, the view of the average consumer is again important. If the nature of the turnover can be assessed from the point of view of the average consumer and both the customer and the repairer are in agreement as to whether it is the delivery of goods or the provision of services, the assessment is not based on the value. If the decision as to whether it is a service or a delivery of goods is not possible from the point of view of the average consumer, it is crucial for repairs whether the value of the material or the value of labour prevails. When the value of material prevails, it is a delivery of goods. Repairs where the value of labour predominates are considered a service.

The Value Added Tax Act (2021) does not have a decisive criterion as for the value of work and material. Neither does the judicature of the Court of Justice. It dealt with the assessment of whether it was a service or a delivery of goods in Case C-139/84 of the Dutch tax administration and of a company which dealt mainly with the repair of schoolbooks. The Court was asked whether major repairs or renovations of movables carried out by VAT payers at the customer's request were the delivery of new goods or the provision of services. The Court decided that it would be a delivery of goods only if a completely new type of goods was produced from the materials entrusted to the supplier. Brand new goods are considered to arise only if the result of the supplier´s work is a new type of goods, the functions of which differ from the function of the goods originally supplied by the customer. A repair is considered a service, even in the case of major repairs, if it only restores the original function of the goods that the customer handed over for the repair.

If we base our consideration on the judgment of the Court of Justice in Case C-139/84 (2021), the value assessment applied by Germany can be contrary to this judicial act when deciding on repairs as provision of services or delivery of goods. Every repair, even a major one, (in the opinion of the authors) only restores the original function of the goods. For example, the function of a car is to transport people or a load to a certain destination. If it breaks down, it should not matter whether the material used for the repair fundamentally exceeds the value of the repair work but even then, it should be considered a provision of a service, because the repair will again result in the car transporting people or things.

The application of the ratio of values which is not harmonized within the EU causes non-conformance in taxation between Member States.

Practical example no 1: A car repair shop in Germany assesses a repair of a car where the value of material significantly exceeds the value of work as the delivery of goods with installation and assembly in Germany where the car is repaired. As the delivery of goods with installation and assembly is not covered by the VAT exemption, the Czech payer, a business company, whose car broke down in Germany and therefore had to be repaired there, will receive an invoice with German VAT. As for the Czech VAT Act, however, it is a service consisting in work on a movable thing, the place of taxation of which is in the State of the service receiver´s registered office, in this case in the Czech Republic. The Czech taxpayer who has already paid VAT in Germany will also have to state the repair in his Czech tax return as a service received. Thereby one business transaction will be double taxed.

Practical example no 2: The manager of a German business company needs to repair a broken car in the Czech Republic. The Czech car service issues an invoice without the Czech tax, because it assesses the repair as service. The accountant in the German company goes through invoice items according to which the value of the material was CZK 50,000 and the value of the work was CZK 5,000 and, based on the value criterion, he/she does not state the tax from the received service in the VAT return, because he/she assumes it is a delivery of goods with assembly. Therefore, the repair will be taxed neither in the Czech Republic nor in Germany.

In cases where the work concerns real estate the taxation is clear and uncomplicated. The place of taxation is always the State where the property is located, and therefore there can be no double taxation or non-taxation. For work related to real estate, it does not matter whether it will be assessed as a repair of the real estate and therefore a service or as a delivery of material that will be installed or assembled in the real estate. In both cases, the place of taxation will be the same.

As for the international taxation, only the distinction between the concept of the provision of services and the delivery of goods related to a movable thing is problematic, for both, customers as taxpayers and customers as non-payers. This is a more fundamental problem for non-payer customers because the VAT they pay is the final revenue of a given State budget, and therefore, especially here, it is necessary to have the boundary between service and goods clear and transparent. If the customer is a taxpayer, the impact on public revenues may be in the range of 0%–100% depending on how high the customer´s VAT refund is. Pursuant to s. 72 of Act 235/2004 of the Czech Republic Statutes at Large (2021), it is related to the activity for which the taxpayer uses the received supply. If for a taxable activity or an exempt activity with a claim to a refund, then they are entitled to a 100%

refund and an incorrect distinction of the goods or services would have zero impact on the State budget. On the contrary, if the customer uses the received supply for an activity without the right to refund, an incorrect distinction of goods or services has an impact on the State budget of 100% because the State budget to which VAT from the supply to the customer who cannot claim the refund will be paid is for this State budget the final revenue which is not to be returned. If the customer-taxpayer uses the received service or purchased goods for an activity for which they can claim the related input tax only in a reduced amount according to the coefficient set out in s. 76 of Act No. 235/2004 of the Czech Republic Statutes at Large (2021), then because of the false distinction between the service and the goods the State budget of the other State loses the VAT in the refund which the customer – taxpayer cannot claim.

Practical example: A Czech manufacturer of diagnostic devices used in medical treatment (VAT payer) receives a machine for an overhaul from a German customer (VAT payer in Germany). The Czech taxpayer will issue an invoice for the repair of the machine, stating the value of the replaced parts in the amount of EUR 30,000 and the value of the work in the amount of EUR 3,000. The Czech taxpayer considers the repair of the machine as a service and will therefore issue an invoice for the repair of the machine to a medical facility in Germany without the Czech VAT. The German medical facility evaluates the supply by the Czech taxpayer as a delivery of goods with installation and assembly, which took place in the Czech Republic, and therefore does not report the received invoice in the German VAT return, because regarding the prevailing value of the material they will consider it the delivery of goods with installation and assembly which was to be taxed by the Czech service provider. As the device is used to provide medical services which are exempt from VAT under Article 132/1 / b and 132/1 / c of Directive 2006/112 / EC (2021), the medical facility could not claim the VAT refund, whether German or Czech, and the VAT declared in the VAT return would therefore be 100% the revenue of one of the State budgets. Due to the fact that Act no 235/2004 of the Czech Republic Statutes at Large (2021) does not distinguish between goods and services on the basis of the value of material and work, in contrast to the German regulation, the provided service would not be taxed in this case.

Figure 1. Different taxation of the device repairs in the Czech Republic for German taxpayers without VAT refund

Type of repair	Solution in the Czech Republic	Solution in Germany	Verdict
The value of the material prevails	In CZ invoiced without the Czech tax as a service to be taxed in Germany	No subject to tax in Germany because the place of supply is considered to be in CZ	No taxation either in CZ or in Germany
The value of the work prevails	In CZ invoiced without the Czech tax as a service to be taxed in Germany	Service received from the EU is taxed in Germany	Taxed only in Germany

Source: own processing, 2021

If the same service was provided in Germany, there the loss would be not for the State budget, but for the medical facility.

Practical example: A German manufacturer of diagnostic devices used in medical treatment (VAT payer) will receive a device for an overhaul from a Czech medical facility (VAT payer in the Czech Republic). The German taxpayer will issue an invoice for the repair of the device, stating the value of the replaced parts in the amount of EUR 30,000 and the value of the work in the amount of EUR 3,000. As the value of the material significantly exceeds the value of the work, the German taxpayer issues an invoice with the German VAT of 19%. A medical facility which provides medical services exempt from VAT under Articles 132/1 / b and 132/1 / c (2021) of Directive 2006/112 / EC (2021) cannot claim a refund and the VAT declared in the VAT return is therefore fully the revenue of the German State budget. As for s. 108/3/1 of the Czech Act no 235/2004 of the Czech Republic Statutes at Large, the medical facility was obliged to declare VAT in the Czech Republic from

a supply received from the German company. As the medical facility is not entitled to a refund from the received invoice for the repair of the diagnostic device, the Czech VAT declared in the VAT return would be a revenue of the Czech State budget. Therefore, the medical facility first paid the invoice including the German VAT and then paid the Czech VAT from the tax base – in contrast to the previous example, the State budgets of both States have revenues. As can be seen from both examples, the system must be the same in both States, otherwise it either leads to an excessive burden on taxpayers or, on the contrary, to tax revenue shortfalls.

Figure 2. Different taxation of the device repairs in Germany for Czech taxpayers without VAT refund

Device repair in Germany for a Czech taxpayer without VAT refund			
Type of repair	**Solution in Germany**	**Solution in CZ**	**Verdict**
The value of the material prevails	Invoiced with German VAT of 19%	Obligation to pay the VAT of 21 % from a service received from the EU	Taxed both in CZ and in Germany
The value of the work prevails	Invoiced without German VAT	Obligation to pay the VAT of 21 % from a service received from the EU	Taxed only in CZ

Source: own processing, 2021

Solutions resulting from the analysis of practical examples

The value is expressed by the price. The value created without added human labour is the value of the raw material, the substance that has value in itself. Its processing for further use is the first added value associated with this primary source. Added value is created by work, i.e. service. Then there could be a clear difference between the delivery of goods and the provision of services at the level of serial and custom production. The product that the manufacturer offers to customers in the form in which it was invented has no additional added value for a particular customer. Every customer can buy the same product – such as a snow shovel. Its sale is the delivery of goods. If the technical services come to the manufacturer with a proposal of what they would like the shovel to look like, other product different from the serial production will be created. Its development represents added value in the form of a service – modification of an existing product according to the customer's wishes. If the customer gets a single one custom-made shovel, he has been provided a service. If the manufacturer turns the new shape of the shovel into a new product, which he will already produce in this new form, the sale of individual shovels will again be a delivery of goods, because so they will be created as a new product. All custom-made products should be considered a provision of service. At the moment when the custom-made model became serial production, these products would be a delivery of goods, as illustrated by the example with the snow shovel.

The explicitness of the regime with repairs should be given by the presence of human labour which adds value. The spare part located in the warehouse has an X value which was composed of some primary raw material, modified several times by the activity of either a machine or a man during production. Incorporating a spare part into a broken machine creates added value by joining the spare part and the broken machine – a functional repaired machine. Therefore, any repair involving human, or machine work should be considered a service – the repair does not create a new product, but the work adds value to the existing product so that it is usable again.

Only the delivery of a tangible thing that is a new product to the customer and is not a repair of his already owned product should be considered a delivery of goods with installation and assembly. If EU Member States followed the proposed rules without derogations and exceptions, there should be no shortfalls in State budget revenues due to non-taxation in any of the States, or taxation in States which should not collect the tax, or disproportionate burden on taxpayers if taxation is required in both Member States.

5. DISCUSSION

Each amendment of a European Union directive needs a consensus of the European Parliament and the Council of the European Union. The Council of the European Union is formed by ministers of all EU member states. If the amendments concern taxes, the ministers of finance decide. Their primary interest is to secure tax revenues of their states sufficiently and that is why with every amendment its impact on the national budget is evaluated in detail. Apart from this also national habitual practice manifests in the vote in the Council as well as in the Parliament. A criterion regarded reasonable by one state may be absolutely unacceptable for another because it completely changes the usual tradition of evaluation in the state. Because of this a common and harmonized distinction between goods and services may show itself hard to enforce.

6. CONCLUSION

Cross-border trade is no longer just the privilege of companies as VAT payers, but it is also common for private customers – non-VAT payers – and therefore it is necessary to have a clear criterion distinguishing the provision of services from the delivery of goods, as this distinction has a direct impact on public finances when supplying to private customers. By different assessments between the delivery of goods and the provision of services, one business transaction can be taxed in both Germany and the Czech Republic, or there will be no taxation in either Germany or the Czech Republic leading to shortfalls in State budget tax revenues because private customers who are not VAT payers are not entitled to VAT refund. After analyzing practical examples with a disputable solution as for their taxation, the authors proposed a clear rule for distinguishing whether it is a delivery of goods or a provision of services – a product made in a serial production is a delivery of goods. A product made according to the customer's wishes is a provision of services. In the case of repairs, any repair involving the work of a person, or a machine should be considered a service. Only the delivery of a tangible thing that is a new product to the customer and is not a repair of his already owned product should be considered a delivery of goods with installation and assembly.

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SOUTH KOREAN CAPITALISM: FORMATION OF INSTITUTIONAL COMPARATIVE ADVANTAGE

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Abstract
The purpose of this article is to investigate South Korean capitalism from the viewpoint of formation of South Korea's institutional comparative advantage. Specifically, by the use of the varieties of capitalism (henceforth VOC) model, the article examines the following: 1) key coordination mechanism in the five spheres of Korea's political economy, namely corporate governance, vocational education and training, industrial relations, inter-firm relations, and companies' internal structures including the relationship with employees, 2) the existence of institutional complementarities, 3) innovation and other strategies of Korean companies as a product of the mentioned coordination mechanisms and institutional complementarities. The findings suggest that South Korea is a special type of a coordinated market economy with particularistic ties as the key coordination mechanism, combined with market mechanisms in specific cases, such as the relationships with competitors or the case of companies with significant portion of foreign capital. The article also finds that due to specific socio-cultural features, Korean large-size companies are able to compete in radically innovative industries, a pattern not fully typical for coordinated market economies.

Keywords: *South Korea, varieties of capitalism, institutional comparative advantage, political economy, innovations*

1. INTRODUCTION

The structures, institutions and relationships prevailing in business environment belong among the key factors influencing the competitive relationship within a political economy, including the external position of local companies in the international trade. In the current world, which has become interconnected and interdependent, the unique competitive advantages that local markets endow companies within the international market, have become even more important.

The purpose of this article is to investigate the formation of institutional comparative advantage of South Korean economy. This research relies on the VOC model as developed by Hall and Soskice (Hall and Soskice, 2001) to examine South Korea's political economy and looks into how this translates into South Korea's advantage in international trade. Implied by that, the key research objectives are as follows: 1) to examine the key coordination mechanism in the five spheres of Korea's political economy, namely corporate governance, vocational education and training, industrial relations, inter-firm relations, and companies' internal structures including the relationship with employees, 2) to identify key institutional complementarities, 3) to analyse the implication for company strategy and the ability to compete on innovations of specific type.

This paper represents a summary of an 80-page study; thus, only key principles, patterns and tendencies can be mentioned. The complexity and interdisciplinary nature of the phenomena studied combined with limited scope of this paper also mean that the theoretical terms and notions used in the paper cannot be explained further. For more information and details, readers are kindly referred to the reference list.

This research is unique in that, to the knowledge of the author, this is one of the first attempts to conduct the analysis of South Korean political economy based on the VOC Model, including the influences of culture and examination of patent specialization profile. The findings of the article can

provide useful insights to practitioners, who can better target their effort in the promotion of business ties with South Korea, as well as to academia as the application of the VOC model to South Korean business environment provides different framework and considers richer variety of relationships among economic, political and social agents, that in most existing studies.

The remainder of the article proceeds as follows. The next section provides brief overview of existing studies, followed by Section 3 shortly outlining the methodology. Section 4 summarizes the key findings and Section 5 concludes the article.

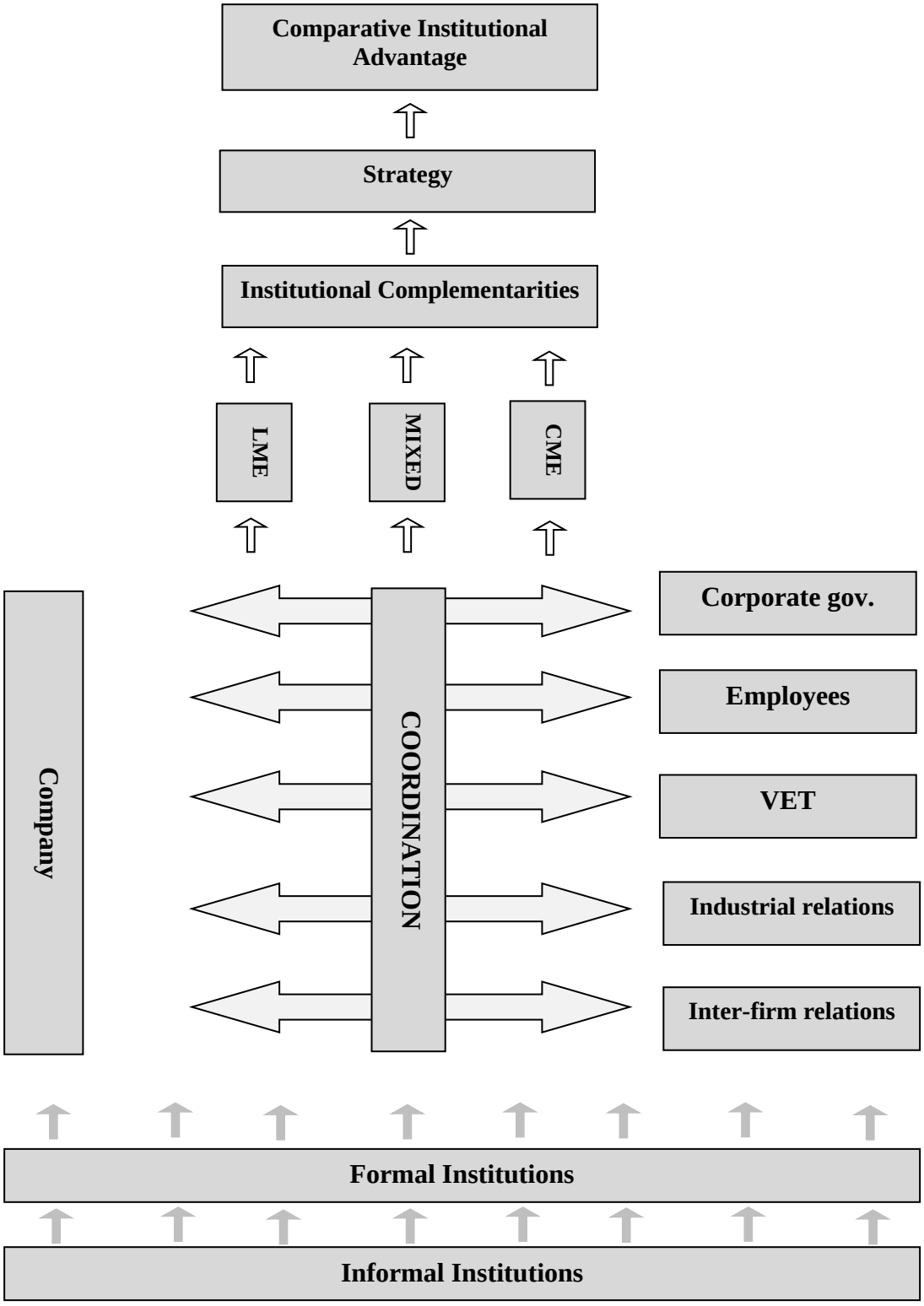
2. LITERATURE REVIEW

Until now, a number of studies have been written about South Korea's capitalism, especially from its evolutionary perspective. A number of authors study the role of Korean government (e.g. Hundt & Uttam), Korea's capitalism key structural characteristics (e.g. Lee & Shin, 2021; D'Costa, 2018), its development (Lee, 2020; Park, 2013, etc.) or its individual aspects (Pérez-Nájera, 2021) Most authors agree that Korea case can be described at the situation of state-guided capitalism with strong government intervention and the existence of non-market ties of the key economic agents. Furthermore, a number of authors say that recently, the traditional coordination modes are being diluted by the influence of globalization and business ties with the parts of the world outside Asia, thus resulting in modification and changes of the current capitalism (D'Costa, 2018). However, these existing studies typically provide a more detailed view of selected aspect(s) of Korean economy, while neglecting of others. Thus, literature sufficiently considering all spheres of Korean political economy including both, formal as well as informal institutional formative influences, is missing. This paper is the attempt to fill this void in literature as is unique in the sense that it attempts to study Korean economy in its full complexity, as suggested by the VOC model (Hall & Soskice, 2001). Its value thus lies in the fact that it considers relationships and complementarities among all the studies spheres of Korean capitalism, rather than providing detailed examination of its individual aspects.

3. METHODOLOGY

The conceptual framework of this research is depicted in Figure 1. The article uses the model of Hall and Soskice (Hall & Soskice, 2001) as the key methodological framework. The model considers relational view of a company, meaning that the political economy of a country is studied through the relationships of a company in internal and external environment. Internally, company coordinates relationships with its employees, considering topics such as the participation of employees in the decision-making of the organization, the stability of employment, hierarchical structures existing inside a company, or the willingness of a company to pay for the employees' education and training. External relationships of a company include the sphere of corporate governance structures, i.e. the relationship with the owners and investors; industrial relations, i.e. the existence of labour unions and their power the influence the decisions of the organization; relationships with other companies in the industry, i.e. competitors, suppliers and buyers; and vocational education and training providers, i.e. any kind of institutions, organizations and actors operating in this sphere.

Figure 1. Conceptual Framework



Source: Elaborated by the author

The modes of coordination are a product of informal (e.g. culture) and formal institutions (e.g. legislation). The model essentially recognizes two different modes of coordination. In so-called liberal markets economies (henceforth LMEs), the key coordination mechanism is free market. Relationships among economic agents are thus governed by short-term economic efficiency. On the other hand, in coordinated market economies (henceforth CMEs), the main coordinating mechanism exists outside the market. For example, in case of Germany, which the authors use as the model case of a CME, the coordination happens based on an industry and insider-information sharing that exists

among the agents that operate in the industry – e.g. labour unions, companies, education and training institutions, banks, and the government.

Further, the model uses the term of institutional complementarities that are the result of the existing coordination patterns. The institutional complementarity means that relationships in one sphere of a political economy are complemented by specific types of relationships in a different sphere of a political economy that make them more efficient. This also means that it is not possible to change the relationships in one area of business environment without corresponding changes in other areas. For example, if investors demand short-term economic profit based on quarterly basis and without sufficient profitability, they easily withdraw their investment, it is very difficult for an organization to provide lifetime employment. The existing institutional complementarities then result in an institutional comparative advantage of a country which endows companies with specific types of competitive advantages compared with companies operating in different countries. It should be emphasised that the varieties of coordination mechanisms are considered at the level of countries rather than industry sectors or organizations.

The institutional complementarities influence various aspects of companies' competitive strategies; innovation mechanism considered by the model as the key one. As a result of intuitional complementarities, companies may be better equipped to compete based on radical innovations or incremental innovations. Institutional complementarities also influence the types of assets companies invest in (general, switchable) and the skills people are motivated to develop (general, co-specific, specific). To this, the author of the article adds the influence on strategy time horizon – long-term vs. long-term strategy. Through their impact on strategy, institutional complementarities give domestic companies an advantage in the local but also international environment. Thus, relationships in domestic business environment form and influence the ways in which companies compete in the international environment – the mentioned comparative institutional advantage of a country (or companies of a given country) in the international trade.

This notion can be then verified by the analysis of a country's import and export commodity structure, in which the commodities are divided into categories based on the portion of incremental and radical innovations. Another measure to use is patent specialization profile looking at what industries (typically radically innovative vs. incrementally innovative) companies from a given country tend to register more/fewer patents in. The rationale is that if a company bases its competitive advantage in the international trade on an innovative product, the company will be interested to internationally protecting its know-how to retain this advantage. Based on the model, LMEs, such as the USA, provides companies with more advantages in radically innovative industries, thus, LMEs' commodity structure of exports and patent specialization profile should show stronger portion of radically innovative commodities/patents than the average for the rest of the world. On the other hand, CMEs provide companies with more advantages in incrementally innovative industries.

This work focuses on the domestic part of the model, i.e. the analysis on the relationships in the mentioned five spheres of a political economy and the formative factors. Due to the broad scope of the analysis, the investigation of South Korea's patent specialization profile and the commodity structure of its export in relationship to the application of the VOC model is elaborated in a different article.

4. FINDINGS

In the following lines, the key characteristics of South Korean political economy in the five spheres as mentioned above are going to be described. In each case, the formative influence of informal as well as informal institutions is discussed. In the current Korean economy, three different types of companies relevant for the analysis must be distinguished. First, on the side of large business enterprises (henceforth LBE), huge traditionally managed conglomerates, so called chaebols, are one group of companies. During the 1997 Asian financial crisis, 8 out of 10 biggest chaebols effectively bankrupted (Lee et al., 2000; Peng, 2010) and they were saved by foreign capital, which started

demanding and applying Western-style management methods – in this article, the companies previously recognized as chaebols with reformed management practices (e.g. KTF, POSCO, Kim & Kim, 2007) are referred to as ex-chaebols. Finally, the third group is represented by small and medium size enterprises (henceforth SME), which are now enjoying increasing support by the Korean government, as they were largely left behind during South Korea's fast economic development.

4.1 Analysis of the five spheres of Korean political economy

The analysis departs from corporate governance structures including the sources of investment. Considering informal institutions, i.e. especially cultural influences, in South Korea, capital is provided on long-term basis as strong preference for long-term orientation exists (Hofstede & Hofstede, 2005). Furthermore, particularistic, and collectivistic features of Korean society (Trompenaars & Hampden-Turner, 1998; House, 2004) play a major role in this sphere, meaning that capital is still provided based on networking and knowing somebody, rather than based on the quality of business and investment plans. This feature is so strong that it has led to the situation that South Korean banks as a whole, as one of the major types of capital providers, have not yet developed full capacity to evaluate these business plans thoroughly. For example, the cultural mindset of "the bigger, the better" still very much influences capital flows and large-size companies are thus favoured, enjoying either more funds or preferential interest rates. This is the situation of private banks as well as state owned banks. Korean government also plays a significant role in this sphere, either making decisions as to where capital should flow (the case of preferred industries or companies) or as to setting preferential terms under which companies operating in these industries have access to capital. Furthermore, the government can also provide state guarantees for companies' loans. In either case, the funds are again provided based on particularistic and in-group collectivistic ties, leading to the distortion of fair competition, market mechanism and inefficiencies. Even though the government has taken a number of measures over the last decade to enhance the transparency of decisions and capital flows, the old mindset continues asserting itself (Ick, 2018).

On the side of **corporate governance**, the typical traditional structure of a Korean company is that the business is controlled by one founding family with close as well as distant relatives occupying major management roles in the separate branches or businesses within the conglomerate. This results in strong concentration of power and decision-making authority, but also often leads to decreasing efficiency due to the issue of succession, as not all family members are as good businessmen and managers as the original generation (Kang, 1996). Although since the reform of Korean business environment after 1997 Asian financial crisis, new legal framework making participation of external independent members in the supervisory boards has been in place (Shin, 2003), studies show that even though these 'independent' board members seem to be independent of paper, the original founding family typically maintains sufficient power to influence the decision (Kim & Kim, 2007), again distorting fair competition and reducing companies' profitability. A controlling role to curb similar practices and inefficiencies represent institutional investors. However, in case of Korean companies, they are represented to a small extent and due to cultural features emphasizing obedience, loyalty and agreement with seniors, they only exercise their role to a limited extent.

In the **relationship** of companies **to their employees**, several features are apparent. First, traditional understanding calls for a stable, ideally lifetime, employment (Jun, 2009; Lee 2012; Jun et al, 2019). However, since the mid-1990s, and even more strongly since the post-crisis reform, this concept has been gradually diluted as, due to issues with profitability, Korean companies can no longer afford to provide stable employment to the same extent as in the past. This has resulted in dual structure of workforce and the labour market. On the one hand, core employees enjoy the benefit of a stable job, career progress, company perks, the willingness of companies to support their training financially and though other resources, etc. On the other hand, the portion of irregular workers or workers employed based on a fixed contract, who are deprived of the above, has gradually increased and for the past two decades has been seen as a serious problem of Korean economy. The duality is

also apparent in that when core employees are to be dismissed, the company always makes effort to find a position for them within the group or, through networking, within other companies with who relationships exists. Thus, if a person becomes employed with a good company from the beginning, there is high likelihood they will be similarly employable in future. On the other hand, if a graduate finds a job within SME, it is quite likely they will have difficulties finding a job with an established LBE in the future, pointing at low mobility between employment in SME and LBE. This is a problem, as large salary discrepancy between SME employees and LBE employees with comparable qualification, seniority and skills exists. Other traditional features of Korean companies' relationship to employees are the existence of hierarchy reflected in salaries and perks, top-down decision-making structures and lower participation of employees and women in decision-making. At the same time, based on Confucianist features of Korean society, managers and superiors are supposed to take the welfare of their employees into account when making decisions. Since the opening up of Korean economy to international trade and the 1990s imported influences of globalization, the concept of a benevolent autocratic leader-patriarch has been transformed into a model, in which the interests of an in-group are considered with more weight. By Kim (Kim, 2003) this is described as the shift to family egoism and ritualistic moralism. Due to this shift, again, the pattern of particularistic ties, factionalism and in-group collectivism, has become strengthened and currently represents a major problem decreasing efficiency of Korean companies and economy as a whole.

Related to the above sphere is the system of **vocational education and training** (henceforth VET). Due to cultural characteristics, Koreans tend to prefer general education over VET, which is in their minds connected with lower social status. This results in the long-term trend that an increasing portion of young people attend general education schools, rather than vocational training institutions (Kuczera et al., 2009). The negative consequence is that Korean labour market and companies lack skilled manually focused labour, while the competition for other types of jobs is very high and only outstanding applicants are then able to get good jobs. A mismatch between company needs and the skills of fresh graduates is very high, which is also one of the important reasons for a high unemployment rate among graduates (over the last ten years, the youth unemployment rate has fluctuated around 10%, OECDa). With the exception of a few prestigious companies, which have their own high schools (polytechnic institutes), VET graduates are typically employed by SMEs. However, as signalization value of diplomas is low and the graduates lack the necessary manual skills, the work they do is rather of routine nature and salaries are low, even enhancing the above-mentioned duality in Korean labour market. Korean in-group collectivism and factional strive (Kim, 2003) also contribute to the problem, as the mutual coordination of the two ministries (Ministry of Education, Science and Technology and Ministry of Labour) involved in setting educational as well as practical standards in VET area is low. Korean government has in the past tried to support the improvement of VET graduates' skills by the provision of support for companies offering internships and trainings as part of the student's preparation. However, these programmes proved inefficient, as the traditional cultural features asserted themselves. The larger the company, the higher the support the company was able to obtain. Also, if a training was already happening in the institutions, the company was entitled for more support than if the training was not happening yet. This resulted in the fact that LBEs, which already offered better positions and attracted the best graduates, were obtaining more support than SMEs, in which funds for training were lacked. In LBE, training is seen as investment while in SME, training can be seen as substitution since internees are perceived as cheap labour. For example, in 2015, 64% of LBE provided non-mandatory training, compared with 53% of medium-size and 43% of small firms, with only 32.7% of SME workers in seeing their job-related training very useful for the job, which is the lowest among OECD members (OECD, 2020). Currently, although various government programmes to improve the situation of SME and support the creation of skills in their employees exist, the discrepancy remains.

Regarding **industrial relations and labour**, weak labour unions, low participation rate (e.g. in 2018, the unionization rate in South Korea stood at 11.6%; OECDb, 2021) and low participation of manual and low skilled workers in benefits brought by Korea's economic progress can be observed. Labour unions and the organization of labour was weak throughout Korea's economic development,

with low wages, overwork, no benefits, non-existing or very limited health and social insurance, poor working conditions, accompanied by discrimination and undervaluation of women. Labour started organizing itself relatively late in the 20th century in the early 1990s, when large Korean conglomerates (so-called chaebols) started seeing rising labour unions as a threat and used various, often times illegal, measures to weaken them. The situation continued until 1997, the year of Asian Financial Crisis, after which weakened position of labour due to the negative impact of the crisis on companies could be observed. In the post-crisis environment, the number of irregular and un-unionized workers increase and increasing polarization and segmentation of labour, which continues till present, could be observed (Peng, 2010). In unionization of employees, the cultural features mentioned above assert themselves, too. Traditionally, the loyalty towards seniors, the principle of hierarchy, obedience and concentration of power does not support mutual coordination with the view of collective bargaining of lower social classes (Lee et al., 2019). Furthermore, financial matters and in general, earning money, has lower prestige, making negotiation about wages more difficult. Factionalism results in the fact that separate labour unions exist for blue- and white- collar workers. Also, labour unions are rather organized based on the company group, than the industry, weakening labour's bargaining power. Thus, until know and despite effort that have been made, especially lower skilled and manual workers have less protection than other employees. Those, who are well taken care of, as mentioned, are the core employees of LBEs.

Inter-firm relations are again strongly influenced by insider-outsider concept (in-group vs out-group collectivism); hence, it is not common to see close cooperation among firms belonging to different business groups. In business groups, based on family and kinship ties, very strong cooperation and coordination can be observed. Korean conglomerates are characterised by high degree of vertical integration, however, horizontally, rather competitive market-based types of coordination can be observed. A few cases that competitors operating within the same industry cooperated more closely have been observed, but they are rare (although since 1961 Federation of Korean Industries, an institution having as an objective the improvement of cooperation and image of chaebols has been in existence; Federation of Korean Industries, 2021). Other than that, selective ad-hoc cooperation concerned topics such as application for licenses, barriers to enter the industry (with the view of protecting existing position in the market), or wage negotiations. Naturally, industry wide associations such as Korea Plant Industry Association or Korea Pharmaceutical Manufacturers Association exist, however, the scope of their activities is quite limited.

4.2 Key complementarities and strategy implications

In this section, key complementarities are identified and the influences on firm strategy are discussed. The key coordination principle inside a conglomerate or in-group is in-group particularistic ties, while the coordination with an out-group is driven by the criteria of short-term economic efficiency, i.e. market-style type of coordination.

Again, the analysis begins with access to investment, as capital is the essence of companies' existence and growth. As already mentioned above, Korean companies typically have access to capital under preferential terms, whether coming from the private or public sector. The fact that capital is provided long-term, and the criteria reflect particularistic ties and networking, rather than hard, measurable economic indicators, means that Korean companies can plan their strategies long term. Complementarity can be found in their relationship to employees, to which they can offer to provide long-term and stable employment. However, at the same time, even Korean companies are under pressure for more profitability, so the portion of core employees has been gradually decreasing, while the portion of fixed-term, seasonal and irregular workers has decreased. The push for more efficiency can be observed especially in companies operating based on a significant amount of foreign capital. In case of chaebols, the old traditional practices prevail, while in case of ex-chaebols (such as LG), Western-style criteria are applied to corporate governance, profitability requirements and manager. At the same time, a number of foreign investors found out over time that if they apply so-

called "hands-off approach", Korean companies will still provide profit on the investment, so it has turned out that the policy of minimum interference is efficient.

Another complementarity can then be seen in the VET sphere. If companies know that employees stay in the company long-term, they can afford to invest in their qualification and training, i.e. "training as investment". Nevertheless, as already mentioned, this is only the case of highly qualified, core employees. This system is even enhanced by well-known conglomerates establishing their own high schools, further contributing to the polarization and segmentation of Korean employees. The strategy impact is that companies can be sure of having sufficient amount of well-qualified loyal workers with specific and co-specific skills useful and the level of chaebol, thus, they can compete based on quality supported by long-term plans. In case of SME, who cannot be sure of the quality of their workforce, the rational strategy is to offer lower salaries and fewer benefits and compete based on low cost, rather than quality.

The sphere of relationship with employees partially overlaps with the VET sphere with similar strategy implications. The above-mentioned features support the ability of Korean LBE to compete based on quality, also supporting creation of company-specific know how and investment in technology. The fact that strategies can be planned long-term, without immediate push for high profitability combined with preferential access to capital distorting fair competition results in LBE creating significant, in many cases excess, production capacity. The size of companies and the ability to efficiently mass produce quality products supports competition based on incremental, rather than radical innovation. However, apart from being internationally successful in incrementally-innovative industries, such as automotive, Korean companies are also known for having achieved success in radically innovative industries, like internet and computer technologies and related. The key source of this hybrid structure and competence is a special feature of Korean workforce, so-called mobilizational culture (Kim, 2003), combined with the above characteristics of hierarchy, concentration of power and obedience. This results in the fact that absorption capacity and the willingness to follow the decisions of leaders exist within Korean workforce, even if the leader decides to radically change the direction of company or production. Although Koreans are known for high anxiety avoidance and preference for stability, this feature, reinforced by Japanese occupation and the reconstruction and fast economic development after Korean war together with so-called "palli-palli" attitude makes it possible for Korean companies to compete based on radical innovations. Naturally, this would not be possible without educated workforce. In this respect, Confucianism plays a significant role as Koreans highly value education, skills and self-development, that are supposed to be used for the good of the group, in this case a company or society at large. Once again, this is mostly the case of LBE, the strategy of SME is mostly to compete based on low cost.

The autocratic decisions of leaders are also highly likely to be followed with minimum resistance and opposition due to low degree of unionisation as mentioned above. Factionalism, fragmentation, polarisation and segmentation of Korean workforce weakens its bargaining power. Traditional Confucianism thinking also support the pattern of obedience, so disapproval or discussion with senior (manager) is seen as inappropriate. Even though Korean government is currently making significant effort to change the situation and implement measures to improve the position of Korean workforce, especially the lower skilled workers, and introduce social measures, Korean society is slow to change in this respect. Also, traditionally, it is not the employer but the family which is supposed to take care of a person if they lose a job or are in difficult situation (the same also applies to the cost of education, which is typically born by family, rather than companies, with the exception of the core, privileged employees of LBE). The low protection of workers results in lower cost, which is the case of prevailing strategies of SME and irregular workers. In case of core employees of LBE, the situation is the opposite and these employees create the backbone of LBE long-term strategies.

Finally, relationships within the industry are marked by factionalism and fragmentation. Thus, companies coordinate their strategies within a chaebol or with affiliated companies, while they compete with other companies in the industry. This has strategic implications for the dissemination of know-how, technology and technology platforms, which are normally shared within the group, but not with the outsiders. Thus, it can be said that inside a business group, coordination based on

particularism and in-group collectivism prevails, while outside the group market-style coordination based on market mechanism, rationality and economic efficiency is more obvious. This is also typically the case in relationship with foreign companies in international trade.

The implication for international trade is that due to structures in their domestic environment, Korean companies are able to compete based on incremental as well as radical innovations. The special preferential access to capital also equips them with better ability to withstand economic shocks as the fact that immediate profitability is not the key metric in capital provision gives them more time and space to absorb any turbulent changes. The mentioned preferential treatment is actually distortion of market mechanism and breach of fair competition and is often seen as unfair competitive practices by competitors from other countries operating in the international market.

5. CONCLUSION

The key goal of this paper was to analyse the formation of comparative institutional advantage of South Korean economy based on the views of a VOC model developed by Hall and Soskice. The key focus was on the formative factors and their interactions. Due to the complex nature of the model and the interdisciplinary nature of a political economy, it was not possible to provide a detailed study of each relevant aspect, thus, the focus was rather on key principles and tendencies.

South Korea is identified as a mixed system, with prevailing mode of coordination being particularistic ties and in-group collectivism concept, making it a special case of CMEs. However, to provide a more accurate picture, three different cases must be distinguished. First, on the side of LBE, in case of chaebols, the above-mentioned coordination pattern is the key one. However, in case of ex-chaebols and SME, market-based modes of coordination putting emphasis on economic rationality and efficiency rather typical for LMEs, can be observed. An interesting feature of Korean economy is that Korean LBE are not only well equipped to compete based on incremental innovations as the model predicts, but also, due to special workforce characteristics, they can perform well in radically innovative industries.

The study results should be understood as general tendencies, since Korean business environment is continuously changing and traditional coordination patterns are being diluted by the influence of globalization and foreign investors. At the same time, currently, original coordination patterns still prevail.

In future research it would be worthwhile to pay closer attention to coordination modes for different types of companies in detail, based on their size, industry and presence of foreign capital. Also, better insight into technology and know-how dissemination patterns within and across different companies would provide policymakers with more information to suggest more efficient policy with the view of improvement of Korea's competitive position in the world economy.

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ESTABLISHMENT OF AN E-SHOP IN THE CZECH REPUBLIC

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Abstract
E-shops are usually used by small companies and sole traders as an easy way to enter the market in the Czech Republic. Large manufacturing companies build e-shop sales as a supplement to the mainstream product range. Besides, there are distribution companies which, on the other hand, have based their general sales concept on internet commerce with a subsequent delivery service. This paper analyzes the establishment of an e-shop on the Czech market. The author identifies the main advantages and disadvantages, discusses the strategy and gradual steps of establishing an e-shop within the local environment. The paper also analyses the legal framework for running an e-shop business according to applicable legislation in the Czech Republic. In the end, useful recommendations for success are given. This paper is the result of the Metropolitan University Prague research project no. 87-02 "International Business, Financial Management and Tourism" (2021) based on a grant from the Institutional fund for the Long-term Strategic Development of Research Organizations.

Keywords: *e-shop, Czech Republic, strategy, SEO, PPC, domain*
JEL Classification: *L81, K20, M13*

1. INTRODUCTION

According to available statistics, the Czech market is relatively saturated with e-shops. E-commerce Europe ranks the Czech Republic among the countries with the largest share of online purchases in Europe (Uďan, 2020). The data from the Association for Electronic Commerce and the comparison portal heureka.cz show that the total turnover of e-shopping in our country increased from 81 billion CZK in 2015 to a respectable 115 billion CZK in 2019 (APEK, 2020). The total number of e-shops in the Czech Republic reaches almost forty thousand, within the next three years there should be more than fifty thousand. The ongoing pandemic caused by the SARS-CoV-2 virus further stimulated the massive development of e-shops. From other APEK data, we learn that two-thirds of online store customers use goods comparators for most purchases, common payment methods are bank transfer (approx. 27%), a payment card (approx. 25%), and cash on delivery (approx. 24%), with only 12% prefer to pick up the goods at the branch. Two-thirds of people are reluctant to register in the online store before completing the order, about one-third of customers welcome the removal of an old appliance and about 40% are willing to buy an extended warranty for the goods (ibid.).

It is evident, that e-shopping has become a very rapidly growing segment of the market, and that the investments into it quickly return to those who start the business. The paper focuses on the establishment of an e-shop in the Czech Republic. To prove the above hypothesis, the author raised three basic research questions: A) What are the main advantages and disadvantages of e-shops?; B) What is the strategy and what gradual steps are necessary when establishing an e-shop within the local environment?; and C) What is the legal framework for running an e-shop business according to applicable legislation in the Czech Republic? The answers to these questions result in a final summary of findings and the formulation of useful recommendations for e-shops success. The paper is based on the analytical and practical experience of the author, who works as a consultant in the field of marketing.

2. LITERATURE REVIEW AND RESEARCH METHODOLOGY

E-shopping is much more than just electronic marketing (El-Gohary, 2010). Online shopping has changed the customers' attitudes, they like fast shopping with one click (Alsharief, 2017). According to Harris, Hoye, & Lievens (2003), customers gain more experience through online platforms, and a new consumer profile called the "online consumer" has appeared (Racolta-Paina & Luca, 2010). Consumers do not prefer shopping online if the website is not trustworthy (Bianchi & Andrews, 2012; Al-Nasser, Yusoff, Islam, & ALNasser, 2014; El Ansary & Roushdy, 2013) and perceived risk decreases consumers' intentions to purchase (Almousa, 2014; Clemes, Gan, & Zhang, 2014; Kim, S.H., & Byramjee, 2014; Leerapong & Mardjo, 2013). The website quality, such as layout, colours, graphics, interesting content, etc. build relations between retailer and the customers (Eroglu, Machleit, & Davis, 2001), and brings higher feelings and experience level (Loureiro, 2015). Barreto & Martínez (2018) state that a higher number of visual effects as pictures, videos, and so-called intuitive zones have also a positive effect. On the other hand, many consumers perceive different types of risk, such as financial risk, intrusion to privacy risk, non-delivery risk, time-delay risk, health-harming risk, and social risk. Particular risk in the elderly is also a fear of credit card frauds committed by hackers (Li et al., 2019). Many studies show that gender affects e-shopping intention. Most of them confirm that men prefer it more than women (Fan & Miao, 2012; Vaidehi, 2014). Clemes et al. (2014) reveal that younger consumers tend to shop online more than older ones due to their past internet experience. According to Gong & Maddox (2011) and Thamizhvanan & Xavier (2013), more educated people are more likely to purchase online. The level of income is also an important indicator. However, the findings of the research studies are ambiguous. From one side, Gong & Maddox (2011) conclude, that richer consumers shop more online, Clemes et al. (2014), on the other hand, state that higher-income consumers do not use online that much because they prefer buying branded products at physical retail stores to enjoy the exciting experience, and an adequate customer service. From the e-shop creation point of view, Kalianko (2014) suggests firstly to decide on the shop's form: either run an own warehouse or act as an intermediary. Srpová et al. (2011) point out the most important expenses when creating an e-shop: trade license, rental of the warehouse, SEO optimization, packaging material, promotional items, and labour cost. The Internet domain is a unique internet address through which potential customers can find the e-shop (Janouch, 2011). From a legislation point of view, e-shopping is usually governed by current legislation, based on three laws: the Civil Code, the Consumer Protection Act, and The Law on Personal Data Protection (Sedlák & Mikulášková, 2012).

The identification and systematization of the theoretical and methodological issue on the e-shop literature in the business context required a systematic literature review and collection of real examples from business practice. Two critical procedures of this process were systematic literature searching and comparison of existing companies using online shopping. The former procedure involved the selection of relevant analyses and determining the inclusion and exclusion criteria of papers. To provide a systematic review, relevant articles from leading academic online databases ACADEMIA, EBSCO, ProQuest, and ASPI were gathered and examined. Additionally, to ensure that no significant articles were left out, Google Scholar and ResearchGate were searched using the snowball technique. For the selection of articles, an online exploration with the use of a list of keywords was performed. These keywords were combined with "e-shop", "e-commerce", "online shopping", "online consumer", "online retailing", "Internet domain", and "home shopping". The searching process covered a period from 2001 till 2021. The limitation of searches was connected with the date of the publication of the article by Eroglu et al. (2001) in which Online Retailing was defined. After establishing the research objectives and the conceptual boundaries, the author was involved in the process of searching, identifying, and analyzing the relevant articles. A significant number of the articles were excluded from the analysis after rejecting duplicates, texts in other languages, and other published sources outside the domain. During the research, the number of articles increased over time, which shows a growing interest in the subject. Until now, a lot of journals from several disciplines (e.g. finance, operations management, sociology) have published the articles.

This indicates that researchers from various disciplines are interested in the topic and that it has become a multidisciplinary issue. The later procedure involved an extended search over existing e-shop companies that are already active in the market. The comparison method was applied to find "the best practices" in the field. The relevant data of APEK (The Czech Association of E-commerce) were used for the quantitative analysis of e-shops in the Czech Republic. To answer the third research question concerning the legal framework for running e-shops in the country, a detailed examination of legal acts and regulatory measures at the level of the Czech government as well as the European Union institutions was carried out.

3. ANALYSIS AND DISCUSSION

The answer to the first research question "What are the main advantages and disadvantages of e-shops?" is as follows. A clear advantage of the e-shop is the opening hours 24 hours a day, 7 days a week with the option to purchase any device connected to the Internet and without the need to travel anywhere. The operator has the opportunity to reach a large number of potential customers, who do not have to be located in only a certain area, they can register their company at any address. A website with offers can target selected groups of customers through SEO (Search Engine Optimization), plan advertising, and measure using PPC (Pay Per Click). There are no costs for maintaining a stone shop. There is an immediate possibility to compare the prices of identical or similar goods and choose the optimal shopping variant (e.g. heureka.cz). The customer also has the opportunity to find out the experience with the product by reading professional reviews or independent user comments. The creation of the e-shop page itself is simple and a company can even rent such a page from specialized companies (e.g. shoptet.cz, byznysweb.cz, etc.). The most visible disadvantage of the e-shop is the inability to take over the goods immediately after payment, which almost eliminates the so-called impulsive shopping (very widespread in the Czech Republic). Upon delivery to the destination, the cost of postage and packaging is to be paid. Complaints are longer by the time the product is sent back to the seller. And last but not least, there is ever-increasing competition.

The answer to the second research question "What is the strategy and what gradual steps are necessary when establishing an e-shop within the local environment?" is as follows. The first step is, as in any other business, to compile a business plan, which must prove that the e-shop pays off. Classically, it is necessary to define who is the target customer and what goods will buy through the e-shop, what type of e-shop is most suitable for him, how much capital is needed to establish the e-shop, what returns can be expected in the first 5 years, what internal and external risks exist, what trends can be expected in the marketplace, and last but not least, what means should be used to promote the entire e-shop and what brand positioning needs to be created. It is important to define own competitive advantage, which can be: unique goods, professional service, functioning logistics, innovative promotion, and the right pricing policy.

The financial plan of the e-shop is not too complicated. On the cost side, there are usually expenses on getting a trade license, establishing an Internet domain, SEO optimization, dispatching and packaging, promotion, administration, and labour costs. In case credit is used, the repayment and interest must be included. Revenues are calculated based on the estimated number of pieces sold at the prices offered. Discounts, bonuses, and losses from complaints are to be subtracted. It has been recommended to calculate a break-even point, which shows the level of production at which the costs of production equal the revenues for a product.

E-shop promotion rarely uses traditional mass media, such as television, print, radio, and billboards, because they are very expensive and associated with traditional shopping in brick-and-mortar stores. An e-shop must be able to be found fast on the internet portals (e.g. Seznam, Centrum, Atlas, etc. in the Czech Republic) and be registered in the catalogue. The price of paid entries in catalogues is in the thousands of CZK per year. The second recommended step is registration in pay-per-click (PPC) systems. In the Czech Republic, this service is offered by the AdWords system from Google, Sklik from the List, AdFox from the Center, and eTarget. The advantage is that in these

systems the company pays for advertising only if the customer clicks on it and thus gets directly into the e-shop. The price per click ranges from 0,1 to 5 crowns. E-shop can take advantage of banners or so-called affiliate programs, in which the payment for placement on a foreign portal is calculated and accounted for as a commission from actual purchases made in the e-shop. The Potenza commission system, for example, works on this principle. A very recommended promotion tool is a full-text search through SEO, i.e. how well e-shop applications are optimized for individual search engines. Additionally, to all said above, it might be possible to place targeted advertising in narrowly focused magazines with a nationwide scope or a PR article about what a given e-shop offers and why it is important. Support for charities and charitable events is also popular when the company donates part of the money from its customers to needy citizens. Viral marketing using social networks such as Facebook, Instagram, Twitter and more, is also recommended.

The key issue is the choice of the provider of the technical solution of the e-shop. There are three variants. In the case of so-called free systems, it is the use of an open platform, which is distributed under a free license. It is possible to download the free software to own computer, add other suitable modules and start running. Only web hosting fees are paid, usually once a year. ZenCart, OsCommerce, and PrestaShop platforms are popular in the Czech Republic. The advantage of this solution is the low price, but often the desired technical support and professional advice in case of problems with use are lacking. The second variant is the acquisition of a comprehensive pre-prepared e-shop solution from the provider. In addition to the basic installation of the system, the buyer receives all services with the operation of the software and is entitled to higher versions (upgrades) and additional modules. Any adjustments must be made, however, through the service provider, which allows him to charge higher prices than if using his programmers. The third option is tailor-made e-shop programming. In this case, it is the most expensive, but in the long run the most stable solution. The business is tailored exactly to the company's expectations, it can project its vision and strategy into it. This technical solution of the e-shop gives an option to automate many activities, thus achieving savings in operating costs and human resources. The disadvantage remains the amount of the initial investment and a longer time to "run in" the system (in the order of weeks to months).

The gradual necessary step is the selection of the domain. It is a unique internet address through which potential customers can find the e-shop. It is possible to contact one of the domain registrars (there are dozens of them in the Czech Republic, e.g. www.active24.cz) and for a fee place the domain on web hosting (renting space for websites on a foreign server). The domain should have a simple, well-remembered form that captures the focus of the e-shop as much as possible (e.g. the name of the owner, the name of the goods, the term for the services provided, etc.). Many domains are already occupied. The company can find a free domain for purchase or rent, for example, on the server www.domeny.cz. To increase the security of the domain (e.g. against redirection to a foreign site - so-called pharming), it is recommended to purchase protection called DNSSEC (Domain Name System Security Extensions) and activate it from its domain registrar. It can also install a Secure Sockets Layer (SSL) certificate, which is used to encrypt the sending of sensitive information (such as a credit card number) or to encrypt login to secure parts of the Web site (such as when logging in to a site with a name and password). To prevent theft of images on the website, it is recommended to provide the images with a so-called watermark, which is difficult to remove. It is a good idea to create the websites on which the company displays its e-shop using SEO (Search Engine Optimization) methods and thus ensure that they appear in the search results on the required keywords in the leading positions. In the Czech Republic, the e-shop should be seen mainly on search engines Google, Seznam, Firmy.cz, Najisto.cz, Klábosení.cz, Google+, but also on Facebook and Twitter. The latest recommendation within the technical solution of the e-shop concerns the possibility of statistically monitoring and quantifying important data on traffic, purchases, and many other activities directly from the Internet interface. The company can use Google Analytics or Microsoft Power BI to do this.

The answer to the third research question "What is the legal framework for running an e-shop business according to applicable legislation in the Czech Republic?" is as follows. When setting up the e-shop store, it is strongly recommended to use specialized lawyers to avoid often very harsh sanctions and fines for violating legal regulations in the Czech Republic, i.e. the European Union.

The legislation governing relations electronic commerce is largely based on current legislation, in particular, The Civil Code No. 89/2012 Coll., which also contains standards specific to electronic commerce, namely: § 1810–1867 – Provisions on obligations under contracts concluded with the consumer; § 1810–1819 – General provisions; § 1820–1851 – Concluding contracts in a distanced manner and obligations from contracts concluded outside business premises; § 2079–2183 – Purchase (purchase contract) – warranty, liability for defects; and § 2976–2989 – Unfair competition – misleading advertising, misleading labelling of goods and services, creating a risk of confusion, parasitism on the reputation of the plant, product or services of another competitor, intrusive harassment, comparative advertising, if not allowed as permissible, etc. The second legal frame for e-shops is defined by The Consumer Protection Act No. 634/1992 Coll., of which in particular: § 9 – information on the characteristics of the products sold or the nature of the services provided, § 10 – product labelling rules, § 12 – price information, § 13 – information about the complaint, and § 14 – information on out-of-court settlement of consumer disputes. Like any other legal entrepreneurship, the e-shop selling is a subject of The Revenue Registration Act No. 112/2016 Coll. (EET), The Personal Data Protection Act No. 101/2000 Coll., together with the Regulation (EU) No. 2016/679 of the European Parliament and the Council on the protection of individuals concerning the processing of personal data and on the free movement of such data (GDPR), and The Trade Licensing Act No. 455/1991 Coll.

The extended research resulting in this paper also showed that every e-shop is obliged to inform the customer before concluding the contract or before the consumer makes a binding offer its identity, or telephone number or e-mail address or other contact information; the designation of the goods or services and a description of their main characteristics; the price of the goods or services, or the method of its calculation, including all taxes and fees; method of payment and method of delivery or performance; delivery costs and, if these costs cannot be determined in advance, an indication that they may be charged additionally; information on the rights arising from defective performance, as well as on the rights under warranty and other conditions for the exercise of these rights.

The research also discovered numerous unfair practices and frauds. Therefore the list of behaviors that are explicitly prohibited by law follows: to exclude or limit the consumer's rights from defective performance or compensation; to allow the trader not to return the consumer what the consumer has given him, even if the consumer does not conclude the contract or withdraws from it; to oblige the consumer irrevocably to perform under conditions with which he had no opportunity to become acquainted before the conclusion of the contract; to allow the entrepreneur to change the rights or obligations of the parties of his own free will; to postpone the determination of the price until the time of performance; to enable the trader to increase the price without the consumer having the right to withdraw from the contract in the event of a substantial price increase; to deprive the consumer of the right to bring an action or prevent him from exercising such a right, and to oblige the consumer to exercise his right exclusively before an arbitral tribunal or an arbitrator who is not bound by consumer protection law. The research also found that the price was not announced including all taxes (e.g. VAT) and fees (e.g. recycling, transportation, and packaging), and thereby mislead the consumers. The owner of an e-shop should always check whether: the business conditions are available on the e-shop's site, a complaint procedure is available to the customers, the instructions on the possibility of withdrawing from the contract were sent to the purchasers, and all identification data are transparently shown on the e-shop.

4. CONCLUSION

The ongoing pandemic caused by the SARS-CoV-2 virus has stimulated the massive development of e-shops around the world, and in the Czech Republic in particular. These became a thriving business benefiting from new online platforms and advanced ICT tools. E-shopping has changed the customers' attitudes. They mostly appreciate 24/7 operation, home delivery, free choice, comparison, and comfort. Successful establishing and running an e-shop requires adequate online software,

functional logistics, a developed supplier chain, and digital marketing support. The right domain, SEO, and web design are crucial for establishing stable customer relations. Current legislation is sufficient to operate a secure e-shop, however, building a good reputation and strong brand recognition is essential. This paper has analyzed the possibilities and procedures of establishing the e-shop on the Czech market and proved the hypothesis that e-shopping has become a very rapidly growing segment of this market with high returns on investment. Useful recommendations for success were given. The text intends to serve as study material for business courses on the university level. It can also be a practical guide for companies in the private sector active in the area of e-commerce. It might be viable to aim the future research into the area of payment methods and security and online identity verification of customers.

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THE MACROECONOMIC EFFECTS OF INTERNATIONAL TOURISM IN EASTERN AND CENTRAL EUROPEAN COUNTRIES

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Abstract
This paper studies the tourism industry in Central and Eastern European countries and its weight on the GDP. It emerges that those countries with the strongest touristic industry are the most developed ones and even the least dependent on tourism (share of touristic industry over GDP). The least developed CEE are more dependent on tourism and this expose them to the risks that a crisis in the sector can entail.

1. INTRODUCTION

Tourism has already become one of the global economy's cornerstones, with its share of global GDP surpassing such traditional economic sectors as automotive and chemical industries. Besides that, before the COVID-19 crisis, the global projections on the future tourism development had been largely bright: the demand was steadily increasing in both the developed and developing world (WTO, 2019). The growth rates of this sector's revenues were usually exceeding the world's GDP growth tempo, and even the financial crisis appeared to be a one-off event in terms of the tourism sector's constriction (WTO, 2019). The tourism sector brings in significant foreign revenues, supports the balance of payments, has one of the strongest multiplication effects on GDP, and accommodates a substantial share of the diverse labour force (Hara, 2008). Central and Eastern Europe (CEE) didn't become an exception. Most of the former socialist countries were quick to close the gap (or to at least attempt to) on the traditional holiday destinations of Western Europe (Banaszkiewicz et al., 2017). They have been going through above-average growth not only by foreign visitors but also tourism receipts, which signal the growing effectiveness of the region's tourism industry (WTO, 2019). This paper studies the weight of tourism over the GDP in the CEE area, country-by-country until 2020, which means before the COVID-19 crisis. This paper will not consider the impact of the COVID-191 crisis on tourism as that data is still not widely available. This is the first of a planned number of studies on the macroeconomic effects of tourism in CEE countries. This paper is structured in the following way: the first section will discuss some methodological issues, the second will present the tourism market in CEE, and the third will analyse the weight of this industry on the GDP. A conclusion and references will then follow.

2. METHODOLOGICAL ISSUES WITH MEASURING TOURISTIC ACTIVITIES

Measuring touristic activities is difficult. The services provided by the tourism industry are too heterogenic to be easily unified under one category; additionally, most of the tourism-related services do not only cater to those who we identify as tourists[37] (Canela – Figini, 2012).

The most well-known approaches to the definition and quantification of the tourism sector are the supply-side approach and the demand-side approach (Hara, 2008). Another methodology is the tourism satellite account (TSA). The TSA is built upon the categorization of the consumers of services and combines the concepts based on both supply and demand (Hara, 2008). The pillars of TSA usually include the definition of visitors; the definition of tourism demand and tourism commodities; identification of these commodities' suppliers; tourism employment; the value created by the tourism sector (Hara, 2008). The TSA approach has become the most adapted in practice.

3. TOURISM AND ECONOMIC GROWTH

Tourism has been discovered to grow faster than the manufacturing economy, making it a viable option for countries aiming at reducing their economic underdevelopment (Canela – Figini, 2012). However, tourism's contribution to economic growth and development is significant mainly in low-income states, and the economic advancement tends to reduce the positive impacts of the tourism industry (Ekanayake – Long, 2012; Rivero et al., 2013). This leads to the conclusion that this sector may serve as a trampoline for initial economic growth, but over-dependence on tourism revenues would prevent the development of other sectors (Rivero et al., 2013). However, the tourism sector's benefits for the economy decrease with its rising share in GDP. More touristically advanced countries don't enjoy the multiplication processes common for those in earlier stages of development, and its contribution to the economic growth becomes more negligible the more developed the state is. This issue presents the first important drawback of the tourism industry: while it is quick to enhance economic growth, in the beginning, over-dependence on tourism decreases countries' perspectives and hinders their potential development. Therefore, the tourism industry plays an important role in macroeconomic development and stability, but overdependence on tourism is risky due to both the potential instability of demand and this sector's limits in income generation.

4. TOURISM INDUSTRY IN CENTRAL AND EASTERN EUROPE

This region is very diverse but shares a number of common characteristics such asa socialist past, middle to high income, and relatively high level of overall economic development (though considerably lagging behind Western Europe and North America). The analysed countries sample is to include the region's countries as defined by the OECD, which are Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovakia, Slovenia.[38] Low prices, vast cultural heritage, and advantageous geographical location (Hall, 2017) have been their main assets. The success of economic reforms and transition in the Czech Republic, Slovakia, Poland, Slovenia, and the Baltic states contributed to foreign investment to the countries' tourism sector and was quick to elevate their travel industry to the level of more advanced states while the Balkans lagged behind (Hall, 2017).

Several countries established themselves as major touristic destinations, but their economic growth was not exclusively tied up to touristic activities; the others were becoming more and more

[37] For example, hotels, restaurants and transport services form a substantial part of tourism industry, but also provide their services to other types of consumers.

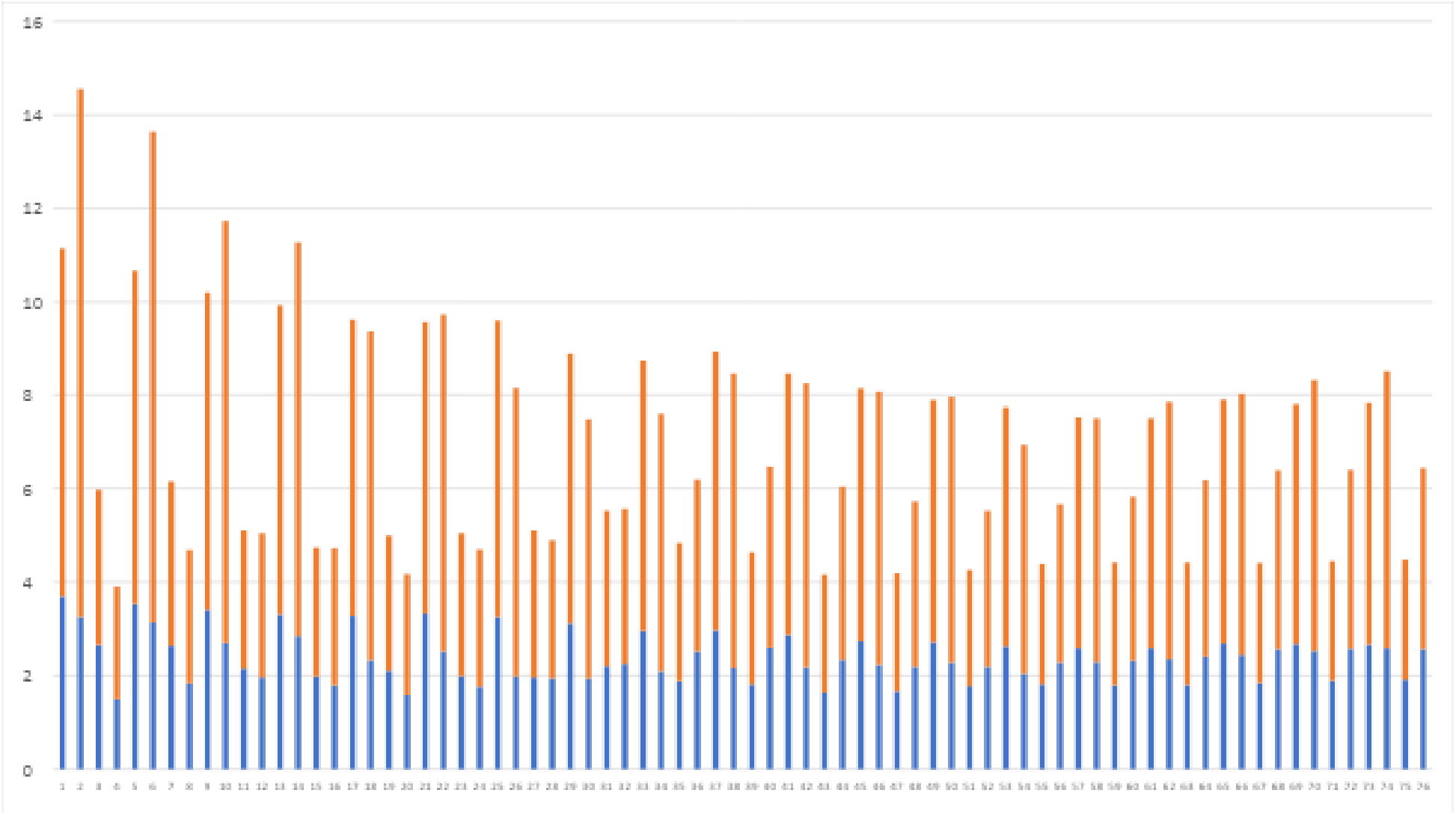
[38] Several states, albeit being geographically a part of the region, were excluded due to the lack of local data on touristic activities (Belarus, Moldova, Ukraine) or for being only partially recognized (Kosovo, Transnistria). Russia is also excluded.

dependent upon foreign arrivals but managed to greatly benefit from it; a few remained relatively unknown for foreign visitors either due to the lack of touristic attractions or poor economic policies (Ana, 2017). Generally, the CEE region became an important touristic area, though the disproportions between the leaders and the outsiders remain substantial (Aubert et al., 2015; Ana, 2017). Croatia, Poland, and the Czech Republic became the regional standard-bearers of the tourism development; Bulgaria, Hungary, Slovenia, Slovakia, and the Baltic states, albeit being less successful, still enjoyed considerable per capita income from the tourism industry; initial lack of development and slow reforms hindered the growth rate of the tourism sector in Albania and Montenegro, but they were rapid to advance in the last 15 years (Ana, 2017; UNWTO, 2020). However, several states including Serbia and Bosnia have yet to realize their tourism potential, although they still enjoyed some tourism development (UNWTO, 2020).

5. TOURISM MACROECONOMICS IN CENTRAL AND EASTERN EUROPE: TOURISM AND GDP

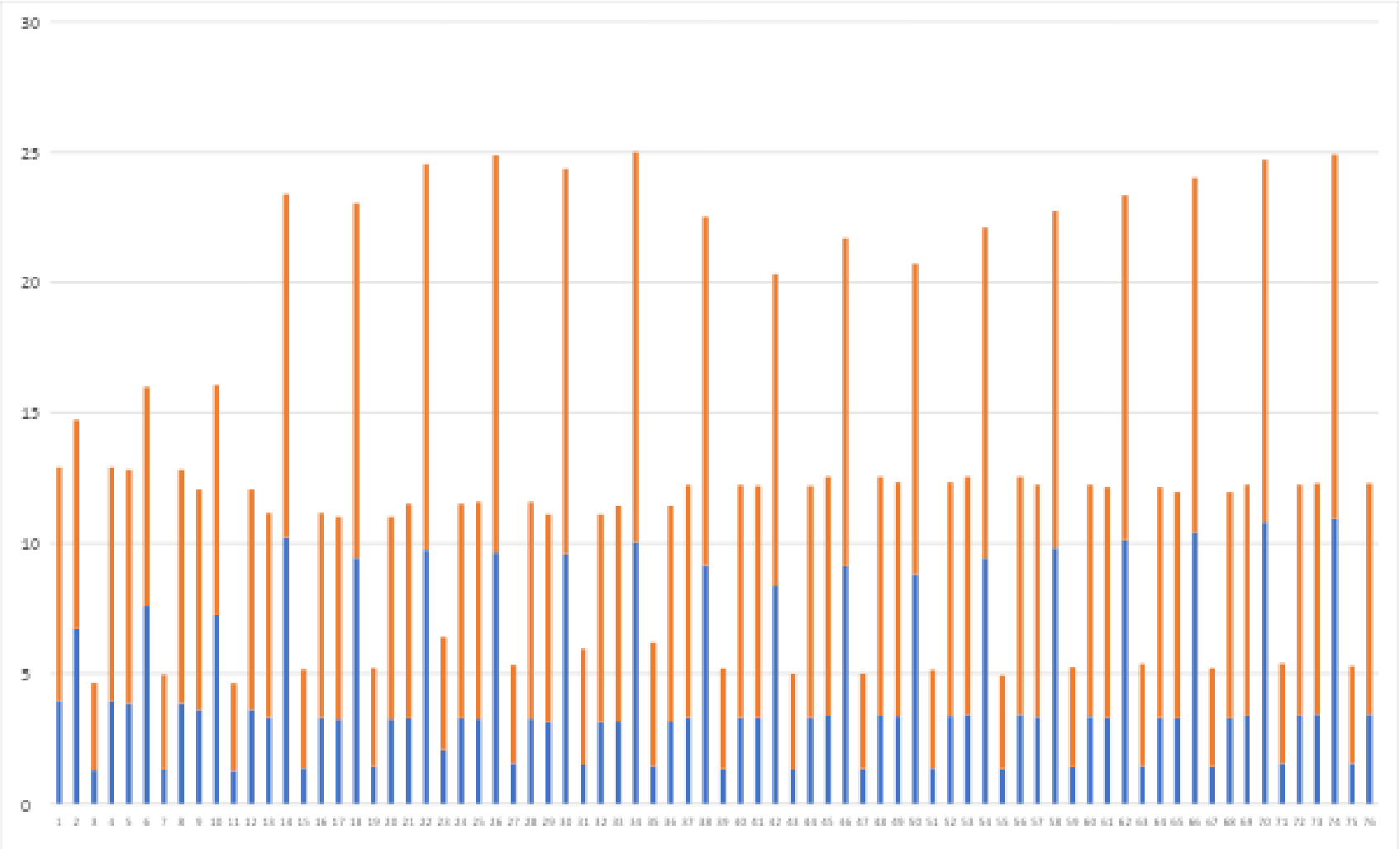
Given the multiplication effects of tourism on the economy, the complete picture could be observed by judging the impacts of foreign travelling on GDP. The analysed period is from 2000 to 2018. The quantitative data are either from the World Bank, World Travel & Tourism Council, or UNWTO if not stated otherwise. The share of tourism over GDP is the most well-known and commonly used indicator of tourism's development. Furthermore, its values not only signify the level of countries' tourism sectors but their potential dependence on tourism revenues. Given the broadly cited tourism multiplication effect, the common approach to the measuring of tourism's contribution to GDP includes the so-called direct contribution, which is derived from the national tourism satellite accounts, and total contribution, which encompasses the multiplication effects of the tourism economy. This would allow to roughly quantify the multiplication effect itself as the ratio of total and direct shares of tourism over the GDP.

Chart 1. Share of tourism sector in GDP in Czech Republic, Hungary, Poland, and Slovakia, %, 2000–2018



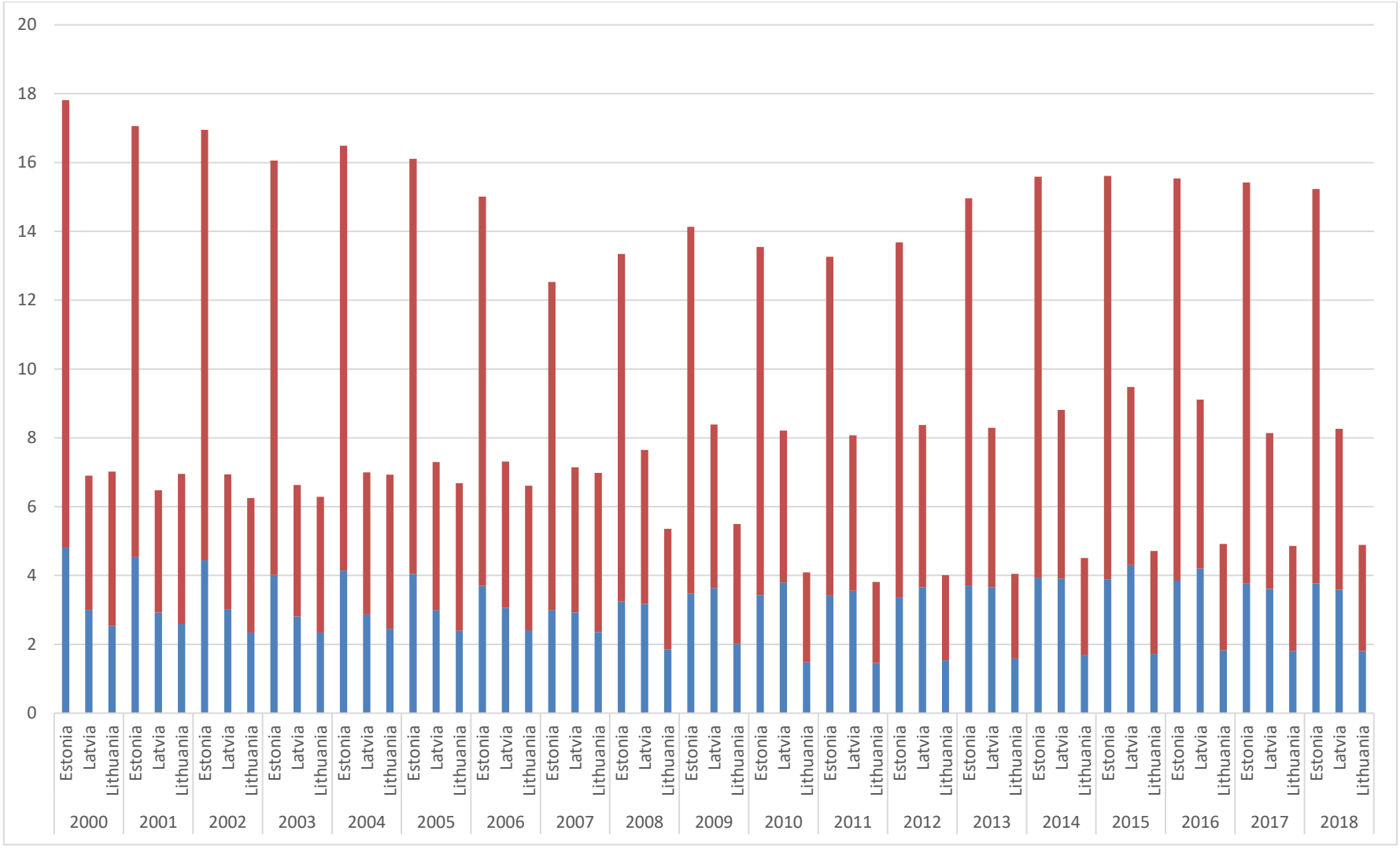
Source: World Travel & Tourism Council, 2020; own calculations

Chart 2. Share of tourism sector in GDP in Bulgaria, Croatia, Romania and Slovenia, %, 2000–2018



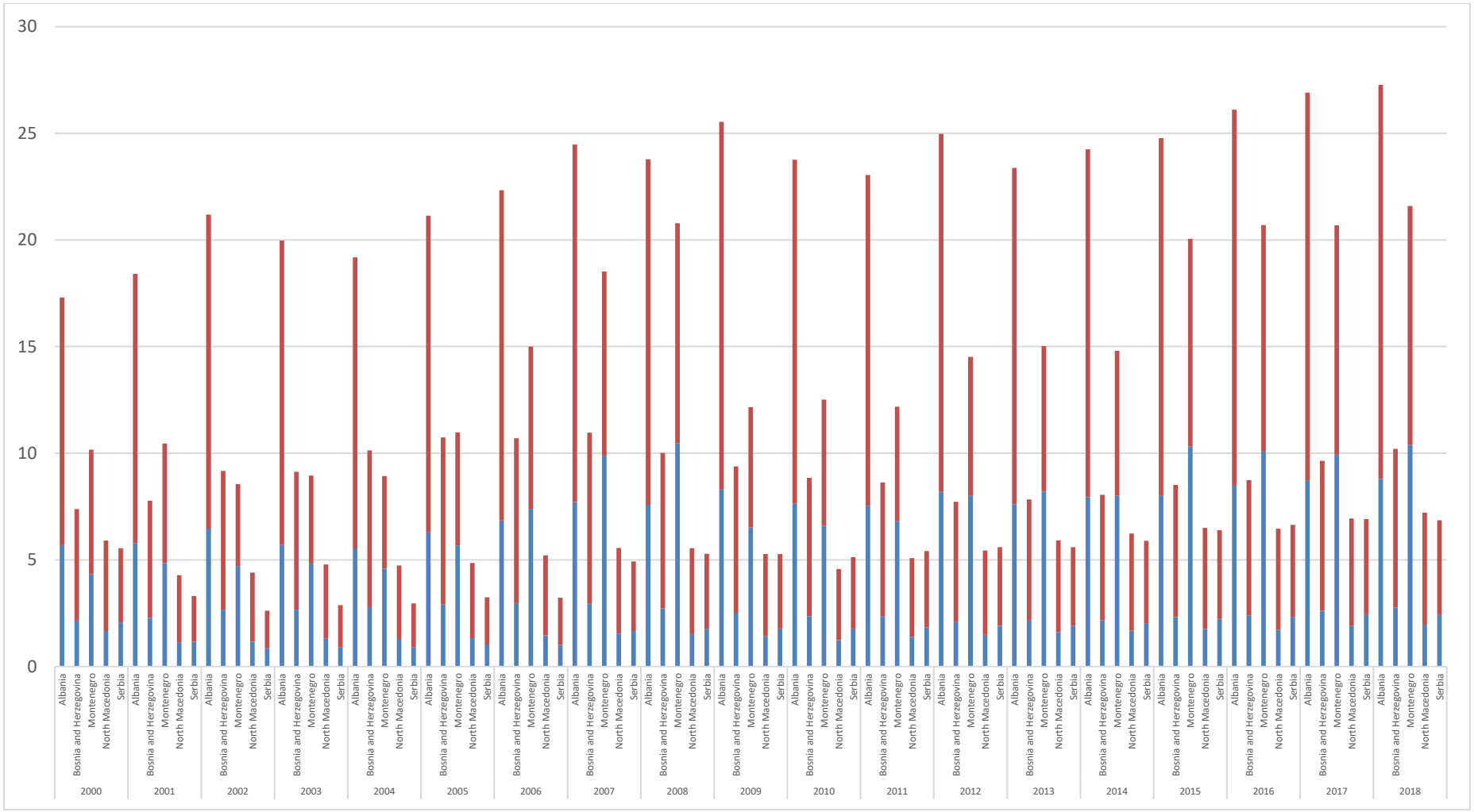
Source: World Travel & Tourism Council, 2020; own calculations

Chart 3. Share of tourism sector in GDP in Estonia, Latvia and Lithuania, %, 2000–2018



Source: World Travel & Tourism Council, 2020; own calculations

Chart 4. Share of tourism sector in GDP in Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia, %, 2000–2018



Source: World Travel & Tourism Council, 2020; own calculations

Table 1. GDP-based[39] indicators of the tourism economy in the CEE countries

Country	Tourism sector/GDP, average for 2000–2018	Tourism sector/GDP, last known value	Tourism sector/GDP, average growth rate, %	Total contribution/ Direct contribution, average for 2000–2018	Tourism sector growth rate, last known value, %
Czech Republic	0,0885	0,0783	-1,8900	2,9326	-0,1
Hungary	0,0913	0,0851	-2,5964	3,2857	7,7
Poland	0,0481	0,0448	-1,3752	2,3456	4
Slovakia	0,0550	0,0644	3,1296	2,5058	3,4
Bulgaria	0,1292	0,1171	-1,1373	3,7653	-2,5
Croatia	0,2206	0,2492	3,5000	2,2800	4,1
Romania	0,0527	0,0530	1,1762	3,4416	1,3
Slovenia	0,1202	0,1229	-0,2085	3,5727	-2,3
Estonia	0,1518	0,1523	-0,6962	4,0398	1,6
Latvia	0,0782	0,0826	1,1528	2,3008	0
Lithuania	0,0549	0,0489	-1,4720	2,7167	-0,5
Albania	0,2304	0,2727	2,7461	3,0989	8,5
Bosnia and Herzegovina	0,0913	0,1020	2,0554	3,6957	6,9
Montenegro	0,1456	0,2159	5,9590	2,0800	6,1
North Macedonia	0,0552	0,0721	1,5772	3,6786	3,8
Serbia	0,0493	0,0686	2,6378	2,8347	5
Average	0,0507	0,1144	0,9091	3,0359	2,9375

Source: World Travel & Tourism Council, 2020; UNWTO, 2020; own calculations

The data from these charts distinctly portray the divergences between the analysed indicators in the countries of interest, with the region including the states with almost a quarter of GDP made up by tourism sector as well as countries with the only residual role of travelling sector in the economy. The dynamics of tourism's relative significance in the region vary greatly between the countries: while some registered a solid growth rate of the tourism sector/GDP indicator,[40] the relative size of the tourism sector declined in others.[41] It is indirectly supported by very dissimilar growth rates of the countries' tourism sectors in 2018. The tourism industry's multiplication effects also appear to be distributed with a high degree of variation, with almost twofold differences between the individual countries.

However, it's evident that although the CEE region is quite diverse in terms of tourism economics, some clear analytical patterns can be derived. The Balkans bear the states whose economy is greatly contingent upon foreign travel into the country, with its contribution reaching more than a quarter in the case of Albania and more than 20 % for Croatia and Montenegro. All these countries are well-known for being seaside destinations, and, albeit not being the most visited by foreigners in absolute terms, enjoy high per capita tourism income and outgrow the other countries of the region. Additionally, Montenegro and Croatia expressed the highest tourism/GDP growth rate in all CEE,

[39] If not stated otherwise, the indicators are constructed using total contribution to GDP due to its higher analytical value in context of this paper's aim.

[40] Meaning that their tourism economy grew faster than the overall GDP.

[41] Even though, the average growth rate for the whole country sample was substantial; and today tourism plays a more important role in the region's economy than it did two decades ago.

meaning that the tourism sector's growth rate greatly exceeded the total pace of GDP increase. However, the multiplication effects calculated as the ratio of tourism's total and direct contributions to GDP were relatively low in these countries (except for Albania, whose multiplicator's value could be considered average). This may signify that too large of a tourism sector doesn't have the multiplication effect that can be expected from the economy not so contingent upon foreign travelling.[42] Generally speaking, the above-described factors indicate that these three states could be too dependent on the tourism sector and will not be able to benefit from it to the extent common for less touristically developed countries. Furthermore, in light of current COVID-related events such a significant size of a tourism economy may prove to be risky.

There are a large and diverse group of countries with their tourism economies being of considerable size, but not dominating the other sectors: these states include the Czech Republic, Hungary, Bulgaria, Slovenia, Estonia, Latvia, and Bosnia. There are visible and obvious differences between these countries: some of them are renowned tourism destinations, while the others remain relatively infrequently visited (especially in absolute terms). Additionally, their tourism sectors' specialization also varies from active to seaside travelling. However, they share one important thing in common: all of them, except for touristically underdeveloped Bosnia and Herzegovina, registered a negative travelling sector/GDP growth rate during the analysed period, meaning the relative importance of their tourism economies declined (it is, unfortunately, possible to anticipate a further deterioration due to COVID, which is not captured in our analysis). Despite this common trend, these states differ in the size of their tourism multipliers – some of them have the highest values in the country sample (such as Estonia, Bulgaria, and Bosnia), while the others are calculated to have only average values. Although the data on tourism GDP is not enough to fully judge the countries' tourism potential, it may be enough to imply that these countries, with relatively well-developed but not exceedingly large tourism sectors and high multipliers, could be the most stable in terms of tourism macroeconomics.

The remaining CEE states (Poland, Slovakia, Romania, Lithuania, North Macedonia, and Serbia) have relatively small tourism sectors, meaning that their economies cannot be considered dependent on foreign travelling revenues. None of these states are regarded as particularly famous tourism destinations, and they greatly lag behind their neighbours in terms of the tourism economy. Most of them (except for North Macedonia) enjoyed only a modest tourism multiplication effect and don't rely on this sector to the extent common for the other two analysed groups. However, Slovakia, Serbia, and North Macedonia expressed solid growth rates of tourism's relative significance, which may transform them into more attractive destinations if such a pace of increase persists. Hence, this region may have solid tourism potential, but whether or not its realization takes place is a question of time, economic conjuncture, and government policies in this field.

6. CONCLUSION

Generally, the data on tourism GDP brings us to several conclusions. As expected, there is a high divergence in the relative importance of tourism for the CEE countries' economies, but there is also a variation in this sector's dynamics and multiplication effects. Some states appear to be over-dependent on tourism revenues and receive only limited benefits from the tourism multiplication, while others tend to have an above-average growth rate of the tourism/GDP ratio. At the same time, a substantial part of the region is touristically underdeveloped and is still to reap the rewards from the foreign travel growth. To divide it roughly, the seaside countries of Albania, Croatia, and Montenegro were discovered to have too large a share of tourism in their GDP while having modest multiplicators. The largest multiplicators and high enough shares of tourism in GDP to consider this sector advanced were registered in Estonia, Bulgaria, and Bosnia; based on this chapter's data, these states may be the

[42] Which is in line with theoretical underpinnings described in chapter 2.

most successful. The remaining countries are either unpopular with foreign visitors or don't fully rely on tourism revenues even though attracting substantial masses of travellers and being renowned tourism destinations.

There are implications stemming from this study. One of them is that those countries which are particularly dependent on tourism are particularly vulnerable in case of a crisis of the sector. Unfortunately, this is exactly what has been happening since the beginning of the ongoing pandemic crisis. Countries such as Albania, Croatia, and Montenegro risk being caught in a trap that could have long-term repercussions. In particular, Albania and Montenegro are economically weaker than Croatia and the sudden touristic crisis, accompanied by a considerable state of uncertainty regarding its solution, may create major and dramatic consequences for the welfare of the local population. It is clear that reconversion to other activities would request not only time but also considerable capital resources. These countries would hardly be able to generate resources, also exactly because a leading sector of their economies would be facing a serious recession. International assistance and specific programs would therefore become essential, nonetheless, this would generate a further issue. The levels of corruption and institutional development in such countries are problematic and this fact risks jeopardising the effective and efficient use of those resources eventually made available. We consider that this is a major issue, which may risk worsening the living standards in those states particularly hit by the decline of the tourism sector. Future studies could obviously measure the impact of the COVID crisis on the tourism sector as well as the impact of the tourism economy on other macroeconomic parameters like the balance of payments and the labour market.

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THE DRIVERS OF REAL ESTATE PRICES IN UKRAINE: AN ESTIMATION

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Abstract
This study looks at the determinants of real estate prices in Ukraine. Ukraine is a post-Socialist country, a former Soviet Republic, and it is not considered to be among the most progressed post-Socialist countries. Its economy is not fairly developed and the political situation is far from being stable. Nonetheless, the country presents opportunities for investors and developers. A study appears useful also because the country presents specific characteristics which render it worthy of a specific study because traditional factors influencing the evolution of prices do not necessarily apply also to the Ukrainian case. Despite being constrained by the lack of reliable data, we have nonetheless devised an original methodology and we came to estimate the determinant drivers of real estate prices in Ukraine. We have at first, run a regression specific to the Ukrainian case and then developed a second regression analysis where Ukraine is compared with other former Soviet Republics.

Keywords: *Real Estate, Price, Ukraine*

1. INTRODUCTION

The aim of this work is to conduct an analysis of the Ukrainian real estate market and discern the factors that have been influencing property prices in this country. The real estate prices have been covered by numerous researches, and the prices' movements are believed to be determined by a number of macroeconomic and socio-political factors: peoples' income, availability of loan financing, demographic changes etc (Igan, 2011; Eymen 2021; Giannarelly & Tiwari, 2021). The cyclicity and relatively low volatility of the property prices have also been a long-known issue (Ciarlone, 2012). It is not surprising that most research concentrates on the well-developed and advanced real estate markets that are usually situated in wealthy Western states – most of the world's real estate investment still comes to and from developed countries. Real estate in relatively developing states is much less studied and even less regarded as an attractive investment asset. Nevertheless, its common property is a large tempo of price growth, and even relatively unstable countries are habitually recording two-digit annual growth rates of residential real estate prices.

Such situations are frequently observed in the countries of the former Soviet Union. These countries have traditionally been considered as institutionally underdeveloped. Institutions are formal rules and informal norms (North, 1990, 2005), and are considered as developed if suitable to reduce the costs of enforcing contracts and find market information (Transaction Costs, Coase, 1937). After gaining independence and overcoming initial economic turbulence, these states boasted a steady growth tempo of the asset prices, with a surge in real estate prices being on par with the stock market and other financial assets (which is unimaginable in more developed states, where real estate prices' pace lags behind the growth rate of more liquid assets – Keith et al., 2000; Stepanyan et al., 2010).

At the same moment, such countries are often troubled by political and economic perturbations of huge magnitude.

The country that may serve as an embodiment of the above-mentioned attributes – the rapid growth of real estate prices and severe slumps caused (presumably) by economic imbalance and political turmoil – is among the largest (in terms of both population and geographic size) in Europe: Ukraine. Its real estate went through several cycles of booms and busts, allowing some to make fortunes on the huge price increases of the 2000s, but discouraging the investors due to seemingly never-ending economic problems and political crises (Yurchenko, 2018). Nowadays Ukraine is coming through another cycle: the revolution of 2014 and subsequent hybrid military conflict with Russia made the housing prices plummet (Yurchenko, 2018). But there are signs of gradual economic revival and a certain bettering of basic economic indicators. Even though the political conflict is still far from resolution, there are reasons to believe that an improving economy may be creating the basis for future growth of seriously suppressed real estate prices; thus, a purchase conducted at the right moment may allow an investor to receive a tempting yield (Property Times UA, 2018). But to be able to identify such moments requires an understanding of the determinants of real estate prices in Ukraine: a matter that has not yet been well-studied and documented. This thesis aims to shed some light on this issue.

2. REAL ESTATE AND REAL ESTATE PRICES IN UKRAINE

Although there has been research that has discovered the relations between real estate prices and traditional determinants of their development (Mavrodiy, 2005; or Stepanyan et al., 2010), the Ukrainian market as a whole can be analyzed only by taking into consideration its peculiarities that are not usually encountered in other countries.

The Ukrainian real estate market is distinctly underdeveloped. The first sign of this[43]is the absence of official statistics on real estate prices (Wynveen & Chantefort, 2016). Other institutional concerns come from the chaotic reforms of the 1990s. The real estate market in Ukraine is considered overregulated, corrupted, and bureaucratic (Pavlov & Shevchuk, 2017).

Immense divergence of the real estate quality is another peculiarity of the Ukrainian market (UTG, 2016; Wynveen & Chantefort, 2016). Another issue influencing the demand and affordability of housing is the dysfunctional credit market (Komarov, 2011). High inflation and a constantly depreciating currency have resulted in the interest rates being too high (Komarov, 2011; Pavlov & Shevchuk, 2017). (UTG, 2016). Most of the transactions were conducted in US dollars due to the fluctuating value of the national currency.

The Ukrainian real estate market emerged in the 1990s and went through several cycles of price booms and busts. There is a standing consensus on the matter that real estate price drivers are mainly of economic origin (Egert & Mihaljek, 2007; Ciarlone, 2012; Gevorgyan, 2019).

3. METHODOLOGY AND RESULTS

Two approaches were adopted. Firstly, simple ordinary least squares regression was conducted using the reference real estate price as a dependent variable and choosing four explanatory variables; all the data is available on a monthly basis. At the same time, it is reasonable to expect that this regression's results would not be of acceptable quality due to a short time frame of observations and an insufficient number of available explanatory variables (an eminent part of the macroeconomic indicators relevant for this regression is available only in annual frequency). Due to that, we have run the second stage of analysis. We turned to panel regression, where five other former Soviet Union countries were

[43] And more importantly, an issue that influences both the real estate market development and the analysis conducted in this thesis.

included, and estimated the real estate prices' determinants for the region in general. Although this approach would not grant us the results specific for Ukraine, it will allow us to have an idea of if (or when) the Ukrainian housing prices are overvalued and what was the degree of their deviation from the fundamental values.

For the analysis, we employed the data on the monthly prices of a 2-bedroom apartment in Kyiv as a dependent variable. The independent explanatory variables and their expected relation to the housing prices are presented below:[44]

- Average mortgage rate (%) – although there is no confirmed link between the mortgage rates and real estate prices in Ukraine, evidence from other countries and some previous research (for example, Mavrodiy, 2005) have suggested that increasing mortgage rates tend to bring the housing prices down.
- Average wages (US dollars) – it is reasonable to expect that an increase of average wages would augment the real estate prices (dollar-nominated average wages were used due to the real estate market transactions in Ukraine being nominated mostly in American dollars).
- Exchange rate (UAH/USD) – although Ukraine is considered to be a dollarized country, and dollar prices of real estate and dollar-nominated wages are a more fitting depiction of the real estate market's situation and population's real income respectively, most Ukrainians' wages are nominated in national currency; thus, the hryvnia-dollar exchange rate and its changes are closely influencing the nation's real purchasing power. Therefore, a negative correlation between the exchange rate and property prices can be expected.
- Housing loans stock (millions USD) – despite the fact that banking financing is playing a less significant role on the Ukrainian real estate market than it does in more developed countries, it still accounts for a large share of housing purchases. Therefore, we may expect a positive influence of this variable on property prices.
- Unemployment rate (%) – a higher share of the unemployed population is an unfavourable overall economic occurrence and is stated to be linked to the property prices (Stepanyan et al., 2010), with an increase in unemployment being of negative impact on real estate prices.

The data on variables was obtained from the National Bank of Ukraine, Ukrainian Statistical Committee, and World Bank's database. The first differences of the above-mentioned variables were used for the estimations. The equation of the regression is as follows:

$$\Delta(Squaremeterprice) = C + X_1 * \Delta(Exchangerate) + X_2 * \Delta(Housingloansstock) + X_3 * \Delta(Mortgagerate) + X_4 * \Delta(Unemployment) + X_5 * \Delta\,(Dollarwages)$$

Estimation's output is presented in Table 1.

Table 1. The estimations of determinants of real estate prices in Ukraine using regression analysis

Variable	Coefficient		Standard error	p-value
Constant	C	-3,036	6,269	0,629
Exchange rate	X_1	-3,084	8,200	0,707
Housing loans stock	X_2	0,056	0,020	0,005
Mortgage rate	X_3	-3,470	2,359	0,143
Unemployment	X_4	-36,825	43,98	0,404
Dollar wages	X_5	0,460	0,322	0,146
Time period			01.2006–12.2019	
Number of observations			155	
R-squared			0,377	

Source: author's estimations

[44] Only the variables with available monthly time series were included. Some variables (for example, construction activity index – see chapter 4) were excluded due to insufficient length of time series.

In this estimation, only three explanatory variables appeared to be (at least marginally) statistically significant: housing loans stock, mortgage rate, and average wages.

The housing loans stock is in positive relation with property prices, meaning that its increase stimulates the growth of apartments prices in Kyiv. The same applies to average wages. Additionally, the regression proved the negative relation between the mortgage rates and real estate prices: higher rates make mortgages less affordable and, therefore, restrain the price growth.

Although this estimation allowed us to receive some results, we cannot fully rely on it due to its possible incorrect specification: the number of observations and the number of explanatory variables is too low because of the unavailability of monthly data on other relevant indicators. To address this issue, another estimation using panel data has been conducted

Another regression was carried out using the data for Ukraine and a number of other former Soviet Union countries. It allowed the incorporating of a larger number of explanatory variables, including those that were available only in annual frequency. Usage of panel data signifies that the results will be common for a sample of countries, and thus, cannot be considered absolutely relevant for Ukraine. At the same time, given the similarities between Ukraine and other countries included in the panel, it is reasonable to expect that the results could be an additional valid proof of the housing prices determinants.

For the regression, data on six countries were used: Ukraine, Russia, Belarus, Georgia, Armenia, and Kazakhstan. All these countries have a comparable level of income and economic development; none of them aspire for integration into the European Union, and, due to common Soviet heritage, we could expect some similarities in their economic institutions. Therefore, the country sample is relatively homogeneous, and the results could be expected to be at least partly relevant for our country of interest.

The dependent variable is an average dollar-nominated square meter price of 2-bedroom apartments in the relevant countries' capitals.

Besides the explanatory variables presented in chapter 5.1 (exchange rate, mortgage rates, unemployment, and dollar wages; the housing loans stock was not included in the regression due to this information being unavailable for most of the country sample) the regression also includes:[45]

- Foreign direct investment inflows (as % of GDP) – higher foreign investment boosts the local economic activity and may be positively correlated with the demand for residential real estate; therefore, it has a potentially positive impact on housing prices.
- GDP growth rate (%) – the growing economy is traditionally associated with the rise in real estate prices
- Newly constructed apartments (square meter/thousand population) – it is the basic real estate supply indicator and increases in supply can be potentially associated with the decrease in prices.
- Population growth in the capital city (%) – this variable could be expected to have a positive impact on real estate prices because of its direct correlation with the demand for apartments.

The regression's equation is presented below:

$$(Squaremeterprice) = C + X_1 * (Exchangerate) + X_2 * (Foreigndirectinvestment) + X_3 * (GDPgrowth) + X_4 * (Mortgagerate) + X_5 * (Newlyconstructedapartments) + X_6 * (Populationgrowth) + X_7 * (Unemployment) + X_8 * (Dollarwages)$$

All the data is in annual frequency. The estimation was conducted using country fixed effects, this approach's validity was confirmed by the Hausman test (Wooldridge, 2012). The results are presented in Table 2.

[45] The data was obtained from World Bank and the countries' respective national statistical committees.

Table 2. The determinants of housing prices in former Soviet Union countries – panel regression output

Variable	Coefficient		Standard error	p-value
Constant	C	1811,091	379,787	0,000
Exchange rate[46]	X_1	-69,647	14,576	0,000
Foreign direct investment	X_2	50,670	16,492	0,003
GDP growth	X_3	-30,715	10,303	0,004
Mortgage rate	X_4	-10,406	7,102	0,146
Newly constructed apartments	X_5	-1,495	0,445	0,001
Population growth	X_6	-36,620	13,852	0,009
Unemployment	X_7	-71,912	19,342	0,000
Dollar wages	X_8	3,978	0,377	0,000
Time period			2000–2019	
Number of observations			120	
R-squared			0,846	

Source: author's estimations

The low p-values indicate the statistical significance of the explanatory variables, with the mortgage rate being the least significant. Most of the results are in line with the preceding simple regression (table 6) and our expectations. As before, the negative impact of the exchange rate, unemployment, and mortgage rate on real estate prices was discovered, as well as the positive linkage between the prices and dollar wages. As expected, the foreign direct investment (as % of GDP) growth also acts as a stimulus for the increase of property prices. Surprisingly, the regression also discovered the relation between the GDP growth and population growth on one side and housing prices on the other side to be negative, signifying that the increase of those indicators pushes the real estate prices lower. In the case of GDP growth, it can be presumably explained by the economic growth's effect on housing supply; but the negative impact of population growth on property prices cannot be easily interpreted.[47] The increase in housing supply (represented by the space of newly constructed apartments) is proved to have a negative effect on real estate prices; which is in accordance with conventional wisdom.

Due to the panel data usage, the above-described effects hold for the full country sample, but are not necessarily relevant for Ukraine, but, given the fact that they support our results from the previous section, we can be relatively confident of some of the stated variables' impact on real estate prices being true for this country.

4. CONCLUSION

These findings indicate a possible linkage between the basic economic indicators (level of income, construction activity, housing loans stock, etc.) and housing prices. The regression conducted on monthly time series of the Ukrainian property prices revealed the statistically significant positive relationship between the dependent variable and both housing loans stock and dollar-nominated average wages, while additionally discovering a negative interconnection between the reference price and mortgage rate. A second analysis has not only confirmed the impact of the statistically significant variables of the previous estimation but has also outlined the negative relation between property prices and exchange rate, housing supply, unemployment, and (surprisingly) GDP growth rate.

Further research would be needed to check the robustness of our results; however, this would be difficult as long as complete data on the Ukrainian market are not available.

[46] Year-to-year indexed values of the countries' national currency-dollar exchange rates were used in the regression.
[47] Perhaps, the causal relation is reversed and the growing real estate prices (in general) provoke the migration from the capital cities due to the real estate becoming too unaffordable.

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EU AGRARIAN EXPORTS DEVELOPMENT UNDER THE RUSSIAN IMPORT BAN

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Abstract
The European Union is the largest supplier of agricultural products to Russia. In 2014, Russia imposed a ban on most imported agricultural products from European Union countries. The main objective of the paper is to estimate the value of the Russian import ban impact on EU countries agrarian trade activities. The majority of EU exports value reduction is associated with those trade items involved under the import ban list. Based on UN COMTRADE data and provided calculations, it is possible to estimate export value reduction according to scenario 1 in cumulative value of about 40.5 bil. USD (85% of total exports value reduction) and according to scenario 2 in cumulative value even higher about 70.3 bil. USD (74% of total exports value reduction). The significant impact on mutual trade development could be demonstrated mainly in the case of Cyprus, Greece, Finland, Spain, Belgium, Lithuania, Poland, Denmark, Ireland, France, Latvia and Austria. Finally, it is necessary to understand applied ban as an instrument of Russian foodstuff policy. It is a result of long-run development and planning.

Keywords: *European Union, Russia, agri-food, trade, import ban, value, structure, character*

1. INTRODUCTION

There are already several published studies, theories and research on economic efficiency of sanctions. On the other hand, they do not yet provide a comprehensive framework for deciding on the effect of sanctions. There are no exact data available that can be completely generalized. In addition, sanctions are imposed mainly for political reasons. Estimates of economic benefits and risks for sending countries are therefore not the main decision-making criteria for political representatives (Shojai & Root, 2013). In addition to the effectiveness of sanctions, it is important to consider social aspects as well. According to Neuenkirch & Neumeier (2016), long-term economic sanctions contribute to increasing income disparities and increasing poverty in target countries.

The European Union is the largest supplier of agricultural products to Russia. In 2014, Russia imposed a ban on most imported agricultural products from European Union countries. The list of banned products includes beef, pork, poultry, fruits, vegetables, fish, seafood, cheese, milk, and other products. During 2014, the list of prohibited products was reduced. Products that similar ones from Russian production could not replace were excluded. Such products include, in particular, dietary supplements, vitamins, minerals, and protein concentrates (Svatos et al., 2014). In the following years, Russia changed the list of prohibited products. In 2016 Russia excluded organic baby food inputs and several fish fry species from the import ban. In 2020, there were certain types of whey and seeds. While in 2017, Russia extended the ban on food imports to swine and by-products (Sultonov, 2020).

Coufalová (2020) assessed the effects of sanctions on the Russian economy in the period 2013–2017. This study also analysed, using statistical methods, the Czech Republic's export to Russia in the period 2013–2017. The methodological approach was based on macroeconomic analysis and a gravity model. Coufalová (2020) states that the Russian economy was hit mainly by the negative shock on the oil market and the subsequent currency depreciation, which was associated with rising

inflation. According to the results of the gravity model, the effects on the Czech Republic's exports to Russia were not confirmed as statistically significant. The decrease in Czech exports was caused more by a decline in the purchasing power of demand on the Russian market (Coufalová, 2020). Charap et al. (2017) report higher risks for the Russian economy in terms of oil price volatility and stock indices after the introduction of sanctions.

A differently focused research was presented by Horák (2000), who quantified the effects of sanctions on the development of trade between Russia and China. Research using neural networks has confirmed the strengthening of trade between Russia and China after 2014. The study assumes the growth of mutual trade also in the future (Horák, 2000). The effects of economic sanctions on the development of trade between Russia and China are also confirmed in other research papers (Bradshaw and Waterworth, 2020).

The main objective of the paper is to estimate the value of Russian import ban impact on EU countries agrarian trade activities. The evaluation of export performance is extended by hierarchical cluster analysis, which is based on Ward's method. Cluster analysis creates groups of export countries with similar characteristics. At the same time, we assess international competitiveness through the Lafay Index (LFI) and the level of intra-industry trade performance through the Grubell-Lloyd index (GLI).

2. METHODOLOGY

The Harmonized System (HS) is applied to analyze the effects of restrictions applied to the agrarian trade of EU countries by the Government of the Russian Federation. Agrarian aggregations are represented by HS 01 to HS 24.

Table 1. Harmonized system – agrarian trade aggregations

HS 01	Live animals
HS 02	Meat and offal
HS 03	Fish, crustaceans, molluscs and other aquatic invertebrates
HS 04	Milk, dairy products, eggs and honey
HS 05	Products of animal origin, not elsewhere specified or included
HS 06	Live plants and floricultural products
HS 07	Vegetables, plants, tubers, edible roots
HS 08	Fruits, nuts, edible peels of lemon melons
HS 09	Coffee, tea, mate and spices
HS 10	Cereals
HS 11	Mill products, malt, starches, inulin, wheat gluten
HS 12	Seeds, fruits of plants medicinal industry straw etc.
HS 13	Shellac, gums, resins, other juices and vegetable extracts
HS 14	Vegetable plaiting materials and other vegetable products
HS 15	Animal and vegetable fats and oils
HS 16	Preparations of meat, of fish, of crustaceans or other aquatic invertebrates
HS 17	Sugar and confectionery
HS 18	Cocoa and cocoa preparations
HS 19	Cereal preparations
HS 20	Preparations of vegetables fruits nuts
HS 21	Various food preparations
HS 22	Drinks, spirits and vinegar
HS 23	Residues and waste from the food industries, feed
HS 24	Tobacco and tobacco products

Source: CZSO, 2019

The analyzed period is between 2009 and 2019. The source of data for individual analyzes is UN Comtrade. The analysis itself is processed in USD at current prices.

Items under the analyses are divided into two groups.

1) Aggregations affected by applied import ban (those – their items are affected by applied sanction):H3-01, H3-02, H3-03, H3-04, H3-07, H3-08, H3-15, H3-16, H3-19, H3-21.
2) Aggregations not affected by applied import ban (those – their items are not affected by any official sanctions): H3-05, H3-06, H3-09, H3-10, H3-11, H3-12, H3-13, H3-14, H3-17, H3-18, H3-20, H3-22, H3-23, H3-24.

The following tools for analyzing the impact of import sanctions on individual EU countries (including the United Kingdom) are as follows:

Comparative advantages – The Lafay index (LFI) is applied for the analysis of comparative advantages.

$$\mathbf{LFI} = \left[\frac{\mathbf{Xij-Mij}}{\mathbf{Xij+Mij}} - \frac{\sum(\mathbf{Xij-Mij})}{\sum(\mathbf{Xij+Mij})}\right] * \frac{\mathbf{Xij+Mij}}{\sum(\mathbf{Xij+Mij})}, \quad (1)$$

where X represents the value of exports and M the value of imports. The letter "j" represents a traded product realized by country "i" (Czech Republic), in relation to a selected country or group of countries (Lafay, 1992). In the case of this work, it is a relationship with the states of the European Union. The resulting positive LFI value indicates the existence of a comparative advantage for a given product and a negative one indicates its non-existence. The higher the resulting value of the index, the higher the degree of specialization of a given country in trade in a given commodity, and vice versa in the case of a negative result.

Grubel – Lloyd index - In the next part of the dissertation we deal with the relationship between international trade of EU countries in the field of inter-industry trade and intra-industry trade. Intra-industry trade refers to the trade in products that belong to the same industry. To define these differences, we use the Grubel – Lloyd index (GLI) defined as follows (Grubel and Lloyd, 1975):

$$\mathbf{GL_{ij}} = \frac{\mathbf{(Xij + Mij) - |Xij - Mij|}}{\mathbf{Xij + Mij}} = \frac{\mathbf{1 - |Xij - Mij|}}{\mathbf{Xij + Mij}}, \quad (2)$$

where Xij is the export of the product i to country j and Mij is the import of the product i from country j. The resulting values of the index can be interpreted according to the Table 2 below.

Table 2. GLI index characteristics

GLI	Interpretation
$0.00 \leq GLI \leq 0.25$	Significant inter-industry trade
$0.25 < GLI \leq 0.50$	Low inter-industry trade
$0.50 < GLI \leq 0.75$	Low intra-industry trade
$0.75 < GLI \leq 1.00$	Significant intra-industry trade

Source: Qasmi a Fausti, 2001

Cluster analysis – The next step is to perform a cluster analysis. Cluster analysis is a powerful tool for analyzing multidimensional survey data. Its aim is to identify groups of similar objects according to selected variables (Řezanková, 2014). In the case of this article, a cluster analysis is performed at the level of individual EU countries, depending on the development of their exports, imports and the balance of agricultural trade in relation to the Russian Federation.

The cluster analysis aims to divide the 28 EU states into individual clusters on the basis of common features in relation to their foreign trade activities towards Russia in 2009 and 2013, i.e. before the onset of sanctions and then in 2015. The aim is to identify changes in the territorial structure of agricultural trade of EU countries in relation to Russia and to identify countries according to the degree of impact of the applied sanctions.

Cluster analysis is chosen due to the need to analyze the information that is contained in the monitored variables and we do not know its division into individual clusters. In this respect, clusters

capture the similarity of objects that are part of one group on the one hand and the dissimilarity of objects belonging to different categories on the other (Hendl, 2012). The aim is to perform an analysis that allows you to create a cluster structure so that this structure corresponds to the representation of individual categories in the data.

Variables are first transformed using a Z-score (Milligan and Cooper, 1988). The Z-score represents the deviation of a given variable from the mean (Elefteriades, 2016), and the transformation is performed by subtracting the column mean and dividing by the column standard deviation (Meloun, Militký and Hill, 2012).

The Euclid distance is used as a measure of distance (Hubalek, 1982).

Euclidean distance is calculated as following:

$$d = \sqrt{\sum_{i=1}^{n} (p_{1i} - p_{2i})^2} \qquad (3)$$

where, d represents the distance between two objects for individual variables (i = 1,…., N).
p represents their similarity

The processed article uses a hierarchical analysis of clusters with agglomeration clustering (Meloun & Militký, 2012) and Ward's method, which is also called the method of square increments (Ward, 1963).
The goal of Ward's method is to minimize the diversity of individual clusters. Intra-cluster variability (VSS) is given by:

$$VSS = \sum_{j=1}^{m} \sum_{i=1}^{k} (x_{ij} - \overline{x_j})^2 \qquad (4)$$

where k is the number of objects characterized by m characters, then we get a matrix of structure kxm, which contains elements xij, which represents the value of the jth character for the i-th object, where i = 1,……,k and j = 1,……, m a $\overline{x_j}$ is:

$$\overline{x_j} = \frac{1}{k} \sum_{i=1}^{k} x_{ij} \qquad (5)$$

A so-called dendrogram can be used for graphical representation.

The graphical representation is also used for multidimensional scaling. This is the use of a two-dimensional graph in which we place individual variables (objects). The distribution of individual variables is based on the similarity between the individual objects of research (Chun-Houh, Härdle & Unwin, 2008).

The final part of the article analyzes the degree of impact of the applied sanctions on agricultural exports of individual EU member states in relation to Russia. Agrarian trade is divided into two groups of segments, i.e. aggregations affected by the applied sanctions HS01, HS02, HS03, HS04, HS07, HS08, HS15, HS16, HS19 and HS21 and then aggregations that were not affected by these sanctions. In this respect, the analysis is prepared with the emphasis on both groups of agricultural exports, so that it is possible to identify the effects of deteriorating mutual trade relations not only at the level of directly affected commodity aggregations, but also at the level of those that avoided direct sanctions. The impacts associated with the development of agrarian trade in the last ten years in relation to the EU and its individual members have been quantified through two scenarios. The first scenario can be called a minimalist scenario, as it does not assume further growth in the value of exports after 2014, the second scenario is a maximalist scenario, as it assumes a relatively

high dynamics of agricultural export growth, which was before sanctions for mutual trade between EU countries and Russia observed.

3. ANALYSIS AND DISCUSSION

The applied agrarian trade ban between Russian Federation and European Union affected significantly mutual trade performance. As only in the period between 2013 and 2019, the value of mutual trade turnover was reduced from 18 bil. USD to 10 bil. USD. The applied ban by Russia affected the EU's exports significantly as their value reduced from 15.4 bil. USD in 2013 (before the ban was applied) to about 5.9 bil. USD in 2015 (one year after the import ban was applied). In the period 2016-2019, the value of EU's exports slowly increased up to 7.4 bil. USD (less than 50% value in the period before the ban was applied). The applied food imports ban by Russia is the result of existing tension between the EU and Russia after the Crimean crisis. As a result of the Russian annexation of the Crimean Peninsula, the EU applied financial transfers and military material transactions against Russia. Russian decided to apply the set of counter-sanction. One of those activities is the existing agri-food trade import ban covering a selected set of agri-food items (mainly meat and meat products, milk and milk products, fruit and vegetables and related products, fish and fishery products). The applied ban could be understood not only as an attempt for counter-sanctions, but it could also be understood as an attempt to reduce Russian dependency on food imports from western countries and to support the growth of national production capacities and national food security/self-sufficiency. The following Table 3 provides an overview of the EU-Russian agricultural trade in the period 2009 and 2019. Based on available data, it is possible to see the significant EU's export value in the period 2009–2013 (before than ban was applied) as the value of exports increased from 9.8 bil. USD to 15.49 bil. USD and the cumulative export value for the above mentioned period reached 66.1 bil. USD. The applied ban significantly reduced European exports to Russia, and in 2015-2019, the cumulative value of EU's exports reached only 33.6 bil. USD (the value of exports reduced by 50% in comparison to the previous period). The year 2014 must be understood as a rather specific one as the trade ban was applied in August 2014. Therefore, first seven months of that year did not suffer because of the ban. The most significant impact of the applied ban could be demonstrated as the comparison between 2013 and 2015. Between 2013 and 2015, the value of mutual agri-food trade turnover reduced by 46%. The value of EU's exports was reduced by 62%, and the value of Russian exports was reduced by 20% (EU did not apply any sanction for food imports from Russia). The applied ban affected majority of trade items, but as the most affected we could consider the following: HS02 (-99.3%), HS03 (-77%), HS04 (-88%), HS07 (-92.5%), HS08 (-93.5%), HS15 (-40%), HS16 (-87%), HS21 (-50%). Those trade commodity groups suffered export value reduction in cumulative value about 7 bil. USD (i.e. 80% of the total value of exports reduction). The ban originally applied for one year has been extended up to nowadays. But its character and structure have also been developing as the Russian federation excluded from the ban some sensitive items (mainly specialized food for children, old people and people suffering because of specialized diets). Therefore while in 2015 some EU's exports suffered massive reduction, their value increased later on (some trade items export value even increased their value over the level of the year 2013 (e.g. HS01, HS09, HS12, HS14, HS17, HS24). In the period 2015–2019, the EU's exports value increased from 5.9 bil. USD to about 7.4 bil. USD. Based on available data, it is possible to highlight the following statement. The applied ban affected not only trade in items directly involved under the ban list but also many other items (not included under the ban list). The result of the applied ban is not only the significant mutual trade reduction and especially EU's exports value, but as another important result of applied ban we could understand the significant trade balance reduction as EU agri-food trade surplus reduced from 12.88 bil. USD in 2013 to less than 4 bil. USD in 2015 (later on, the value of trade surplus again increased but only up to 4.7 bil. USD in 2019). While in period 2009–2013, the value of cumulative EU trade surplus reached about 56 bil. USD, in period 2015–2019 the cumulative surplus-value reached only 22 bil. USD.

Table 3. EU-Russian agrarian trade performance in USD

	2009	2011	2013	2015	2017	2019
Export	**9 785 201 277**	**14 388 739 657**	**15 448 517 383**	**5 895 408 649**	**6 977 999 997**	**7 384 788 817**
H3-01	351 710 620	318 785 281	123 937 344	119 421 476	169 610 622	199 521 370
H3-02	1 396 995 421	2 152 112 946	2 104 253 220	14 875 435	11 630 253	1 873 799
H3-03	292 111 400	252 912 957	208 548 629	48 503 112	92 830 867	39 817 169
H3-04	912 913 174	1 548 484 043	1 929 645 828	231 872 413	163 230 900	238 037 237
H3-05	53 274 518	57 164 802	46 281 407	20 600 937	31 064 545	27 009 848
H3-06	398 849 697	544 521 125	605 681 924	420 424 739	424 362 431	550 070 460
H3-07	493 853 608	1 012 418 261	1 011 415 660	75 179 416	68 620 324	48 469 608
H3-08	1 007 896 699	1 528 760 630	1 667 582 582	108 757 346	86 012 172	119 390 392
H3-09	137 136 430	195 603 845	227 272 677	188 097 643	229 758 356	244 760 599
H3-10	36 853 137	207 631 479	214 937 146	135 823 210	188 282 589	96 750 760
H3-11	66 024 329	95 920 812	95 113 803	68 395 851	70 390 640	72 024 441
H3-12	212 119 806	396 888 270	396 952 162	296 688 689	538 755 967	482 108 524
H3-13	109 319 177	100 108 293	90 575 589	75 329 500	52 187 095	84 867 405
H3-14	324 721	560 370	461 007	394 260	591 530	788 793
H3-15	262 550 494	414 545 456	369 135 291	227 206 514	323 492 006	395 532 814
H3-16	138 800 310	242 121 033	233 820 209	54 224 341	29 416 392	22 406 619
H3-17	133 744 785	123 227 519	146 231 572	114 341 202	162 602 857	156 208 947
H3-18	442 005 842	715 412 059	720 528 513	567 405 136	623 572 170	620 114 763
H3-19	382 385 478	491 638 198	730 967 746	472 866 065	490 975 719	530 897 123
H3-20	446 704 387	536 122 615	598 143 673	419 720 038	461 285 268	479 507 438
H3-21	798 818 370	1 020 830 941	1 152 435 769	576 014 392	690 186 282	719 628 920
H3-22	874 201 088	1 583 448 923	1 908 851 770	980 404 088	1 296 503 966	1 489 841 041
H3-23	631 688 140	718 620 356	732 246 017	520 756 066	606 180 055	602 081 947
H3-24	204 919 646	130 899 443	133 497 845	158 106 780	166 456 991	163 078 800
Import	**1 361 371 682**	**1 990 982 050**	**2 568 666 187**	**2 053 141 423**	**2 022 618 162**	**2 638 973 391**

Source: UN Comtrade, own processing

The most affected trade commodity groups are those directly involved under the applied ban. While in the period before the sanction ban was applied, those items represented about 62% of EU export value, later on, their share reduced to about 31%. Their export value reduced from 41 bil. USD in period 2009–2013 to only 10.5 bil. USD in period 2015–2019. Only between 2013 and 2015, the value of commodity aggregates involved touched by ban list reduced from 9.5 bil. USD to less than 2 bil. USD. The only aggregates that did not suffer because of the applied ban are HS01 and HS15. Another very important feature of the above-mentioned events is massive trade surplus reduction, speaking about the items under the ban list. Their cumulative trade surplus reduced from 36 bil. USD in period 2009–2013 to only 5.8 bil. USD in period 2015–2019. The majority of export value reduction was recorded on account of aggregations touched by the ban (94%).

Table 4. EU-Russian agrarian trade commodity aggregations affected by applied import ban (in USD)

	2009	**2011**	**2013**	**2015**	**2017**	**2019**
Export	6 038 035 574	8 982 609 746	9 531 742 278	1 928 920 510	2 126 005 537	2 315 575 051
Import	832 086 298	986 686 359	1 201 187 809	761 144 601	864 183 064	1 158 904 184
EU28 BALANCE	5 205 949 276	7 995 923 387	8 330 554 469	1 167 775 909	1 261 822 473	1 156 670 867

Source: UN Comtrade, own processing

Sanctions have been affected also trade in commodity aggregations not included under the Russian import ban (for details, see Tables 4 and 5). Just in period 2013–2015, the value of EU exports not involved under the Russian import ban list reduced from 5.9 bil. USD to about 3.96 bil. USD. As the most affected items, we could highlight HS22, HS23, HS20, HS 18, HS06, HS12. But later on, the value of trade in items not listed under the ban nearly recovered. If we compare the period 2009–2013 and 2015–2019, we could see only marginal value changes as the cumulative export value changed

from 24.9 bil. USD to 23.1 bil. USD. On the other hand, Russian exports to the EU covering items not listed under the ban increased from 4.9 bil. USD to 6.8 bil. USD and EU trade balance significantly reduced. As in the period 2009–2013, the cumulative EU trade surplus reached 20 bil. USD and in period 2015–2019, the cumulative EU trade surplus reached only 16 bil. USD.

Table 5. EU-Russian agrarian trade commodity aggregations not listed under the import ban (in USD)

	2009	2011	2013	2015	2017	2019
Export	3 747 165 703	5 406 129 911	5 916 775 105	3 966 488 139	4 851 994 460	5 069 213 766
Import	529 285 384	1 004 295 691	1 367 478 378	1 291 996 822	1 158 435 098	1 480 069 207
EU28 BALANCE	3 217 880 319	4 401 834 220	4 549 296 727	2 674 491 317	3 693 559 362	3 589 144 559

Source: UN Comtrade, own processing

The applied trade ban did not affect only trade value performance. The impact of the applied ban could also be demonstrated through the changes in EU-Russian comparative advantages distribution (for details, see Tables 6 and 7). While in the period before the Russian ban was applied, the EU reached comparative advantages in 8 out of total 10 commodity aggregations. In nowadays EU disposes of comparative advantages only in the case of 5 aggregations (EU lost comparative advantages in the case of HS02, HS07, HS16).

Table 6. EU-Russian agrarian trade bilateral comparative advantages (Lafay index) – related to aggregations affected directly by applied ban

	2009	2013	2015	2017	2019	2013/19
H3-01	0.759	0.175	0.735	0.833	1.031	0.856
H3-02	3.038	3.285	0.014	0.004	-0.034	-3.319
H3-03	-5.259	-3.773	-8.701	-9.907	-11.012	-7.239
H3-04	1.990	3.013	1.458	0.799	1.226	-1.788
H3-07	0.168	0.804	-0.850	-0.882	-1.153	-1.956
H3-08	1.892	2.364	0.122	0.038	0.238	-2.126
H3-15	-4.506	-5.129	-1.020	-0.078	-0.546	4.583
H3-16	0.216	0.360	0.322	-0.077	-0.052	-0.411
H3-19	0.555	1.028	2.899	2.238	2.535	1.507
H3-21	1.272	1.525	3.352	2.760	2.895	1.370

Source: UN Comtrade, own processing

Comparative advantages had changed not only in the case of items involved under the trade ban list, but their character also changed in other items. But changes could be considered only as marginal ones. EU lost comparative advantages in HS09; on the other hand, its own comparative advantages improved in the case of HS06 and HS23. In the case of other items, some structural changes could also be demonstrated as EU improved comparative advantages values also in the case of HS11, HS13, HS17, HS20, HS24. On the other hand, EU LFI index value development recorded negative changes in the case of HS05, HS12, HS18, and HS22.

Speaking about intra-industry trade development measured by the Grubel-Lloyd index (Table 8), EU-Russian trade also recorded changes in monitored time, especially in the period under the applied export ban. In the case of items under the trade ban, we recorded positive changes in intra-industry trade development in the case of HS07, HS02, HS08 and HS16. In the case of aggregation not affected by the applied ban, EU countries recorded positive trends in intra-industry trade development, especially in the case of HS23, HS05. In the case of other aggregations, only marginal changes in GL index value were recorded.

Table 7. EU-Russian agrarian trade bilateral comparative advantages (Lafay index) – related to aggregations not affected directly by applied ban

	2009	**2011**	**2013**	**2015**	**2017**	**2019**	**2013/19**
H3-05	0.004	-0.062	-0.180	-0.112	-0.144	-0.419	-0.238
H3-06	0.870	0.757	0.931	2.689	2.109	2.882	1.951
H3-09	0.243	0.221	0.284	1.000	0.986	1.020	0.736
H3-10	-0.881	-4.179	-1.956	-4.493	-4.176	-2.174	-0.219
H3-11	0.122	0.115	0.116	0.336	0.264	0.273	0.156
H3-12	-1.298	-1.100	-1.597	-1.686	-0.803	-0.997	0.601
H3-13	0.236	0.145	0.140	0.484	0.248	0.428	0.288
H3-14	-0.079	-0.092	-0.112	-0.310	-0.135	-0.364	-0.252
H3-17	-0.241	-0.222	-0.200	0.119	-0.037	0.166	0.365
H3-18	0.721	0.857	0.929	3.269	2.713	2.755	1.826
H3-20	0.888	0.650	0.764	2.395	2.012	2.241	1.478
H3-22	0.339	1.093	1.383	3.221	3.603	4.307	2.924
H3-23	-1.255	-1.059	-4.332	-6.119	-2.949	-5.683	-1.351
H3-24	0.206	0.126	0.178	0.876	0.581	0.437	0.259

Source: UN Comtrade, own processing

Table 8. EU-Russian agrarian trade intra-industry and inter-industry trade relations measured by GLI index at the level of individual aggregations

GLI	**2009**	**2011**	**2013**	**2015**	**2017**	**2019**	**2013/19**
H3-01	0.004	0.005	0.036	0.036	0.010	0.012	3.038
H3-02	0.002	0.005	0.004	0.459	0.425	0.771	0.006
H3-03	0.876	0.687	0.652	0.182	0.267	0.099	6.577
H3-04	0.001	0.001	0.004	0.022	0.011	0.014	0.313
H3-07	0.210	0.110	0.153	0.977	0.982	0.672	0.227
H3-08	0.039	0.057	0.034	0.448	0.418	0.363	0.094
H3-15	0.897	0.904	0.762	0.741	0.466	0.622	1.225
H3-16	0.078	0.031	0.009	0.058	0.613	0.680	0.014
H3-19	0.090	0.057	0.036	0.039	0.049	0.063	0.578
H3-21	0.073	0.062	0.053	0.070	0.109	0.154	0.343
H3-05	0.237	0.386	0.730	0.780	0.717	0.829	0.881
H3-06	0.001	0.017	0.009	0.011	0.003	0.002	5.227
H3-09	0.052	0.064	0.067	0.119	0.078	0.137	0.491
H3-10	0.753	0.663	0.942	0.641	0.776	0.693	1.360
H3-11	0.043	0.052	0.073	0.157	0.135	0.181	0.401
H3-12	0.691	0.568	0.741	0.790	0.547	0.665	1.115
H3-13	0.004	0.006	0.007	0.008	0.028	0.029	0.261
H3-14	0.120	0.122	0.075	0.046	0.137	0.061	1.229
H3-17	0.405	0.469	0.473	0.453	0.465	0.444	1.066
H3-18	0.069	0.052	0.060	0.076	0.072	0.105	0.573
H3-20	0.025	0.049	0.062	0.082	0.071	0.076	0.822
H3-22	0.205	0.138	0.165	0.294	0.228	0.277	0.597
H3-23	0.419	0.432	0.881	0.989	0.728	1.000	0.882
H3-24	0.140	0.093	0.050	0.098	0.161	0.298	0.169

Source: UN Comtrade, own processing

The following analyses have provided an overview of the impact of the applied Russian ban on the territorial structure of EU exports to Russia. The effect of the applied ban is different country by country (for details, see Table 9).

Table 9. Territorial structure of EU member states agrarian exports to Russian federation (in USD)

	2009	2011	2013	2015	2017	2019
Austria	214 055 864	283 870 067	315 168 306	130 585 675	224 582 495	240 506 211
Belgium	546 091 853	588 112 177	550 566 875	149 561 453	188 914 601	238 050 052
Bulgaria	58 938 808	63 233 381	70 886 641	49 314 795	45 736 459	72 390 772
Croatia	13 159 454	22 627 039	20 918 141	14 335 081	28 604 563	16 555 459
Cyprus	10 114 977	14 832 056	17 990 632	443 308	1 098 838	1 539 398
Czechia	73 930 936	106 021 858	125 160 217	95 555 906	115 664 815	155 042 039
Denmark	516 755 385	769 842 213	856 044 396	154 257 748	220 825 099	166 549 376
Estonia	327 234 668	474 394 808	506 727 199	271 005 068	260 971 975	217 097 719
Finland	394 581 132	546 657 180	574 395 868	130 244 857	135 562 699	107 786 296
France	723 022 804	916 791 512	970 410 734	360 125 074	416 961 386	408 743 386
Germany	1 928 896 730	2 739 921 507	2 185 541 058	1 020 982 657	1 122 691 749	1 220 431 898
Greece	103 827 819	173 897 135	223 528 816	42 996 356	38 641 925	26 758 640
Hungary	203 068 000	265 396 000	355 535 883	199 085 679	246 794 383	220 264 115
Ireland	56 558 469	213 395 044	297 052 294	52 797 048	75 805 346	38 251 091
Italy	452 323 219	789 093 280	912 051 674	414 309 662	580 834 920	654 189 452
Latvia	216 296 255	467 836 343	656 682 089	344 089 475	494 270 462	500 560 459
Lithuania	768 205 171	1 372 604 444	1 823 790 529	539 517 827	550 508 571	572 880 779
Luxembourg	54 213	11 465 278	11 826 446	6 075 184	1 817 352	8 810
Malta	778 995	2 008	29 438	839	5 371	2 361
Netherlands	1 518 954 705	1 985 299 643	1 975 408 297	895 660 606	959 115 351	1 137 315 054
Poland	778 264 746	1 114 419 093	1 668 689 716	442 200 017	519 905 027	591 616 646
Portugal	23 043 932	29 066 303	65 084 266	30 224 178	51 868 535	56 323 309
Romania	10 151 329	38 059 614	55 371 806	52 135 847	83 691 408	61 694 982
Slovakia	20 932 660	27 130 929	41 369 151	17 903 906	15 164 320	26 166 832
Slovenia	23 747 949	29 481 067	38 625 373	24 451 933	44 219 315	42 017 875
Spain	523 470 077	988 621 173	775 886 069	267 232 344	301 804 893	312 678 786
Sweden	74 288 093	101 224 077	130 792 021	68 458 799	111 801 801	119 834 211
UK	204 453 034	255 444 428	222 983 448	121 857 327	140 136 338	179 535 170

Source: UN Comtrade, own processing

There are significant changes in Russian imports agri-food trade territorial structure concerning individual EU countries. The processed cluster analyses' results calculated based on mutual EU-Russian exports, imports and trade balance specifics distributed individual EU countries into several groups. In fact, four specific clusters could be identified in the period under the investigation. While 2009 and 2013 data is relatively homogenous, and only marginal changes exist. In the period after the ban, the distribution of individual countries among individual clusters changed significantly. Changes are better demonstrated through Figure 4 and its four quadrants. It is more than evident that respective countries could be divided into three basic categories: not-affected at all; marginally affected; heavily affected. The real impact of applied sanctions on individual EU countries agri-food exports performance is demonstrated through Tables 9 and 10. There are two different scenarios calculated to illustrate the effect of the applied Russian food import ban on the EU and its member countries. The first scenario calculates the final value of losses as the difference between individual years (2015–2019) trade performance and trade performance in 2013 (the last year not affected by the applied ban). The second scenario is calculated as the difference between the theoretical value of exports (the base year 2013) multiplied by the growth rate of exports (based on inter-annual growth rate in period 2009–2013) and the actual value of EU agrarian exports to Russia in period 2015–2019.

Based on available data, the EU countries lost exports in cumulative value about 47 bil. USD (for the period 2014–2019), if we also consider the loss of dynamics (EU export value recorded inter-annual growth rate about 12.1% in period before sanctions), the cumulative value export losses could be estimated about 95 bil. USD (EU registered even negative trend of inter-annual growth rate cc -

12%/year in the period 2014–2019). The impact of the applied ban is different country by country. The majority of export value reduction recorded, especially Germany, Lithuania, Netherlands, Poland, Italy, Spain, France and Denmark. These countries participated in EU exports to Russia by 72% in 2013, and their exports reached about 11 bil. USD. The impact of the applied ban reduced their share to about 69%, and the value of their exports reduced to only 4 bil. USD in 2015. According to the first scenario, they lost exports by about 35 bil. USD during the period 2014–2019. If we also consider the loss of trade dynamics – scenario 2 – they lost export opportunities in value about 76.8 bil. USD. As the most affected countries we could consider the following ones: Malta and Cyprus (-97%), Ireland and Denmark (-82%), Greece (-80%), Finland (-77.3%), Poland (-73.5%), Belgium (-72.8%), Lithuania (-70%). The EU cut its exports by 62% (for details – see Table 10).

Table 10. The impact of applied agrarian import ban on individual EU countries agrarian export performance

Inter-annual growth rate (GEOMEAN)		**2009–2013**	**2014–2015**	**2014–2019**	**Scenario 1 – simple trade value reduction**	**Scenario 2 – dynamic trade value reduction**
Austria	Export	1.102	0.644	0.956	-655 631 861	-1 453 770 364
Belgium	Export	1.002	0.521	0.870	-1 968 408 172	-1 992 102 665
Bulgaria	Export	1.047	0.834	1.004	-87 371 552	-163 476 826
Croatia	Export	1.123	0.828	0.962	-14 543 637	-81 019 681
Cyprus	Export	1.155	0.157	0.664	-94 754 927	-170 914 449
Czechia	Export	1.141	0.874	1.036	6 839 270	-462 848 718
Denmark	Export	1.134	0.424	0.761	-3 856 508 395	-6 895 348 038
Estonia	Export	1.116	0.731	0.868	-1 334 791 477	-2 830 113 075
Finland	Export	1.098	0.476	0.757	-2 420 167 772	-3 822 425 229
France	Export	1.076	0.609	0.866	-3 125 065 265	-4 894 619 560
Germany	Export	1.032	0.683	0.907	-5 862 778 214	-7 398 142 705
Greece	Export	1.211	0.439	0.702	-989 150 345	-2 414 243 277
Hungary	Export	1.150	0.748	0.923	-726 688 000	-2 176 206 365
Ireland	Export	1.514	0.422	0.711	-1 326 519 932	-9 202 753 078
Italy	Export	1.192	0.674	0.946	-1 919 115 589	-7 013 932 214
Latvia	Export	1.320	0.724	0.956	-1 099 572 875	-8 780 190 659
Lithuania	Export	1.241	0.544	0.824	-6 766 020 361	-20 761 354 978
Luxembourg	Export	3.843	0.717	0.301	-45 109 566	-51 465 360 484
Malta	Export	0.441	0.169	0.657	-156 038	-2 454
Netherlands	Export	1.068	0.673	0.912	-5 302 820 306	-8 460 532 856
Poland	Export	1.210	0.515	0.841	-6 247 839 785	-16 801 439 432
Portugal	Export	1.296	0.681	0.976	-96 093 993	-772 186 139
Romania	Export	1.528	0.970	1.018	69 742 970	-1 478 618 984
Slovakia	Export	1.186	0.658	0.927	-114 917 324	-336 495 500
Slovenia	Export	1.129	0.796	1.014	-24 742 318	-155 389 813
Spain	Export	1.103	0.587	0.859	-2 629 868 169	-4 636 541 240
Sweden	Export	1.152	0.723	0.986	-173 195 293	-713 624 328
UK	Export	1.022	0.739	0.965	-415 970 868	-522 481 801

Source: UN Comtrade, own processing

4. DISCUSSION AND CONCLUSION

The majority of EU exports value reduction is associated with those trade items involved under the import ban list. Based on UN COMTRADE data and provided calculations, it is possible to estimate export value reduction according to scenario 1 in the cumulative value of about 40.5 bil. USD (85% of total exports value reduction) and according to scenario 2 in cumulative value even higher about 70.3 bil. USD (74% of total exports value reduction). The significant impact on mutual trade development could be demonstrated mainly in the case of Cyprus, Greece, Finland, Spain, Belgium, Lithuania, Poland, Denmark, Ireland, France, Latvia and Austria. The EU, as the set of countries, reduced the cumulative value of exports of those items listed in the ban list by 80%. EU trade under

the ban list recorded a massive export value dynamics reduction as in period 2009-2013 the value of exports increased by 12.1%/year. In the period 2014–2019, the value of exports suffered because of even negative value dynamics on average about -21%/year.

Based on available findings, the most suffering countries are traditional Russian trade partners and those countries sharing a common border with Russia. The most affected are Lithuania, Poland, Germany, the Netherlands and Denmark. On the other hand, there are also a few countries, which are not affected by applied ban at all, or the impact is marginal (speaking about trade value losses). Such countries are the following: Sweden, Malta, Romania, Slovenia and Czechia. But definitely, those countries which are suffering because of the applied ban are those whose exports to Russia represented the significant portion of their cumulative agrarian exports as (in brackets, you can see the share of Russia in individual countries agrarian exports in 2013, 2015 and 2019): Lithuania (29.5%-11%-9.45%), Finland (27.1%-8.8%-5.6%), Estonia (27.1%-19.03%-12.7%), Latvia (25.5%-16.1%-16.4%), Poland (6.21%-1.7%-0.6%).

Table 11. The share of aggregations covering food items under the applied import ban in total agrarian exports of individual EU countries

	2009	2011	2013	2015	2017	2019
Austria	67%	71%	67%	32%	32%	30%
Belgium	67%	74%	76%	31%	28%	31%
Bulgaria	13%	24%	23%	10%	10%	18%
Croatia	96%	94%	94%	43%	20%	33%
Cyprus	93%	97%	96%	9%	5%	5%
Czechia	20%	32%	36%	36%	30%	29%
Denmark	88%	77%	83%	62%	61%	62%
Estonia	37%	33%	30%	14%	28%	61%
Finland	73%	73%	75%	31%	28%	33%
France	57%	54%	48%	21%	18%	21%
Germany	64%	66%	58%	38%	36%	39%
Greece	56%	75%	80%	12%	18%	27%
Hungary	48%	41%	51%	31%	22%	27%
Ireland	75%	92%	94%	73%	78%	52%
Italy	50%	50%	49%	30%	28%	25%
Latvia	24%	24%	19%	7%	2%	2%
Lithuania	81%	79%	72%	27%	19%	19%
Luxembourg	93%	73%	76%	93%	53%	0%
Malta	99%	100%	7%	103%	42%	96%
Netherlands	52%	54%	54%	45%	43%	37%
Poland	65%	68%	79%	34%	36%	35%
Portugal	33%	56%	43%	35%	12%	14%
Romania	21%	9%	5%	2%	2%	2%
Slovakia	81%	63%	58%	74%	51%	54%
Slovenia	83%	81%	82%	81%	85%	84%
Spain	67%	71%	74%	23%	17%	19%
Sweden	77%	66%	57%	71%	75%	79%
United Kingdom	59%	46%	46%	34%	33%	33%
Total	62%	62%	62%	33%	30%	31%

Source: UN Comtrade, own processing

The last Table 11 demonstrates the shift in individual EU countries' agrarian exports to Russia commodity structure. While items under the ban represented in the period before the ban was applied about 62% of total agri-food export value, in 2015 it was only 33%, and in 2019 their share was

reduced to only 31%. The most significant commodity structure shift in favour of those items not suffering because of applied ban we could demonstrate in the case of majority EU countries except for Sweden, Malta, Slovenia, Slovakia, Romania, Czechia, Bulgaria. Sweden and Malta even increased their share of items under the ban in total agrarian exports to Russia.

The impact of the applied ban is significantly associated with the EU-Russian trade territorial structure. The impact of the applied ban must be understood in three dimensions. First, the impact on export value performance. Second, the impact on mutual trade performance with respect to the share of Russia in individual countries agrarian trade export activities. Third, the loss of export value dynamics. Concerning the first criterion, the most affected are Lithuania, Poland, Germany, the Netherlands and Denmark. Speaking about the second criterion, the most affected are Poland, Lithuania, Latvia, Estonia and Finland. According to the third criterion, as the most affected countries, we could understand Portugal, Slovenia, Luxemburg, Czechia, Bulgaria, Lithuania, Greece, Latvia and Poland. If we make a synthesis of the above-mentioned findings – the following could be highlighted: as the most affected countries, we could consider Russian neighbours both with respect to the share of Russian in their trade activities and trade reduction value. The main losers are especially Poland and Baltic countries – especially Lithuania.

The applied ban must be understood not only as the attempt of Russia to reply to EU sanctions applied by EU countries in the past. But it must also be understood as an instrument of long-term Russian effort to reduce its import dependency on EU countries and to improve its food self-sufficiency through the better protection of local food producers. In this case, we have to understand that the list of items under the applied import ban is nearly the same as it is mentioned in the Russian food doctrine approved by the Russian government in 2010. For details, please see: On January 30, 2010, Russian President Dmitriy Medvedev signed a Decree "On Approval of Food Security Doctrine of the Russian Federation". The text of the Decree and the text of the Food Security Doctrine of the Russian Federation are available on the site http://graph.document.kremlin.ru/doc.asp?ID=57030).

The Doctrine establishes the following minimum production targets as the share of domestic production in the total supply of commodities (USDA, 2010). For example: grain – 95 per cent, sugar – 80 per cent, vegetable oil – 80 per cent, meat and meat products (on meat basis) – 85 per cent, milk and dairy products (on milk basis) – 90 per cent, fish products – 80 per cent, potatoes – 95 per cent, edible salt – 85 per cent.

The applied ban covers nearly the same items. Finally, it is necessary to understand applied ban as an instrument of Russian foodstuff policy (food security one and food independence goals). It is a result of long-run development and planning, and probably the Crimean crisis itself could be understood only as a good opportunity to apply ban as trade sanctions applied as by side effect of political tensions are not in WTO competencies and cannot be judged by WTO authorities.

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Quantitative studies and management

WEAK FORM MARKET EFFICIENCY HYPOTHESIS TESTING – AUTOCORRELATION ANALYSIS AND UNIT ROOT TEST

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Abstract
The Efficient Market Hypothesis (EMH) assumes that stock prices take a random walk and that it is impossible to achieve above-average returns in such markets. The evidence to date on market efficiency is mixed. This paper deals with testing the weak form of the efficient market hypothesis (EMH) using daily data on the development of indices representing selected stock markets for the period 2001–2021, which was further divided into shorter periods. Autocorrelation analysis and unit root tests are used as statistical tools. The Czech, German, British, American, Japanese and Chinese stock markets were chosen for the study. The autocorrelation analysis results suggest that for the period 2001–2021 only the Japanese market shows effective behaviour. In the period 2001–2007, the Czech, American, Japanese and Chinese markets also behaved in accordance with the weak form of efficiency. In the post-crisis period 2009–2019, the German and British markets also showed weakly effective behaviour. In the COVID-19 period 2020–2021, the Japanese and Chinese markets showed signs of the weak form of efficiency. Unit root tests did not confirm the weakly effective behaviour in all markets in all tested periods. It can be concluded that the market efficiency is not stable over time in the individual markets examined.

Keywords: *Autocorrelation analysis, Efficient Market Hypothesis, Ljung-Box Test, Stock Market, Unit Root Test*
JEL Classification: G14, G15, C58

1. INTRODUCTION

The question of whether markets behave efficiently has been of interest to economists with varying intensity for more than 50 years. The concept of an efficient market, where the prices of traded instruments fully reflect a set of unexpected, available and relevant information, was first defined by Fama (1965b) in his study focusing on the analysis of price movements in stock markets. The result of this Fama's study was the finding that stock prices take a random walk, that is, stock price movements are independent. Future exchange rate developments cannot be forecasted. Markets have no memory. The essence of random walk theory, which theoretically overshadows Fama's discovery, and its implications for proponents of technical and fundamental analysis, Fama presented in his previous publication (Fama, 1965a). The term Efficient market hypothesis (EMH), in which the efficient market is a key concept, was coined by Roberts (1967). In the following years, EMH became an important theoretical concept in the field of financial theory, which was predominantly used to explain the behaviour of not only stock markets for several more decades.

At the same time, practical knowledge in this case significantly preceded the emergence of a comprehensive theory. For the random movement of pollen grains as well as dust particles in water (Brown, 1828), prices of selected commodities (Bachelier, 1900), food and stock prices (Working, 1934), stock and commodity prices (Kendall, 1955) and stock prices again (Osborne, 1959) drew attention to important scientific works several decades before Fama's definition of the efficient market. In his dissertation entitled Theorie de la Speculation, Bachelier (1900) even developed the mathematics and statistics of Brownian random motion of microscopic particles in liquid and gas, according to Sewell (2011), 5 years before Einstein (1905) created the equations for Brownian motion.

According to the kind of information that is quickly, almost immediately absorbed by stock prices, Fama (1970) distinguished three forms or degrees of market efficiency. With the lowest degree of market efficiency, i.e. with the weak form of market efficiency, all historical information is absorbed by stock prices almost immediately. Under these conditions, technical analysis, which is based exclusively on the use of historical information, cannot be used to successfully forecast the future development of stock prices. In the semistrong form of market efficiency, stock prices react quickly, almost immediately to all publicly available information, i.e. to historical and current information. In this situation, the fundamental analysis, which bases its outputs entirely on public information, also loses its usefulness. The strong form of efficiency presupposes the rapid, almost immediate reaction of stock prices to both public information and non-public, i.e. inside information. It is clear that the semistrong form includes the weak form and that the strong form as the highest degree of market efficiency includes both the weak form and the medium form.

The view on the validity of EMH has never been uniform. Opinions on the validity of the EMH split into two camps, but their relationship has changed over time. Proponents of EMH believe that it is unnecessary in the market to look for trends and dependencies in price developments because they do not exist. According to EMH supporters, market developments are moving persistently towards equilibrium, where there are no significantly overvalued and undervalued instruments on the market that fundamental analysts would find using their valuation methods, and technical analysts would use their graphical methods and indicators to time their sales or purchases to achieve an excess return. Opponents of EMH, on the other hand, argue examples of unexpected market shocks (eg the October 1929 crash, or the October 1987 crash, the Hong Kong flu in 1997, the bursting of the Dotcom bubble, the 2008 financial crisis, etc.) that show that stock prices often significantly and repeatedly deviate from their fundamental intrinsic values. It should be noted that the recurrence of events that are inconsistent with EMH has given rise to other theoretical concepts that have also offered alternatives to explain financial market behaviour, such as behavioural finance, adaptive market hypothesis (AMH) or fractal market hypothesis (FMH).

The aim of this paper is to test the presence of the weak form of efficiency in stock markets in the Czech Republic, Germany, Great Britain, USA, Japan and China using the autocorrelation analysis and the unit root test in the period 2001–2021, and also in shorter periods, before the financial crisis and after the financial crisis and before the COVID-19 pandemic. Knowing whether the market is behaving efficiently or not is crucial for investors. In an efficient market, it is not possible to repeatedly achieve excess returns over a long period, no matter what tools and strategies are used. In an inefficient market, on the other hand, certain investment instruments and strategies can be repeatedly excessively profitable.

2. LITERATURE REVIEW

From its inception in the second half of the 1960s to the present, EMH has been very frequently studied in a large number of studies, but the results have by no means been uniform. Researchers' interest has not disappeared since 2000. Of a large number of studies, the paper focuses on recent studies that have used statistical methods to test the presence of random walk in stock prices in selected countries. Attention will not be paid to studies that have focused on anomalies or the success of investment strategies in examining the weak form of efficiency.

Smith and Ryoo (2003) focused on 5 selected European countries, namely Greece, Hungary, Poland, Portugal and Turkey. To test the weak form of efficiency of these markets, they used the variance ratio test and weekly data of national indices from these countries for the period 1991–1998. The results rejected the validity of the random walk hypothesis for all countries studied, except for Turkey, where stock prices followed the random walk process.

Malkiel (2003) argued in favour of market efficiency, concluding that markets behave efficiently and are unpredictable. According to Malkiel, the behaviour of stock prices does not create opportunities for investors to repeatedly achieve excess returns. Although there are anomalies in the

market that are irrational, their effect on equity returns is not strong enough to cover the related transaction costs.

Worthington and Higgs (2004) focused their study on examining the validity of the weak form of market efficiency on the stock markets of 20 European countries in the period 1995–2003. The authors used an autocorrelation test, a runs test, an augmented Dickey-Fuller test (ADF) and a variance ratio test. Only 5 of the 20 countries surveyed met all the strict criteria for the random walk. These were Germany, Ireland, Portugal, Sweden and the United Kingdom. Another 5 countries – France, Finland, Netherlands, Norway and Spain – met only some random walk requirements.

Hameed & Ashraf (2006) focused on the Pakistani stock market, where they tried to model and forecast stock return volatility and test for weak efficiencies using the GARCH model and daily data for December 1998–March 2006. The results rejected the weak form of efficiency in the Pakistani market.

Borges (2008) tested the weak form of efficiency in European markets. The markets of France, Germany, Great Britain, Greece, Portugal and Spain for the period 2003–2007 were tested using national stock indices. The autocorrelation test, the runs test, the augmented Dickey-Fuller test and the multiple variance ratio were used. The tests performed provided convincing evidence that using monthly data, stock prices in all six markets surveyed take the random walk. However, using the daily returns, only the markets of France, Germany, the United Kingdom and Spain met the conditions for the random walk. The serial positive correlation was found in the markets of Greece and Portugal.

Patel et al. (2011) turned their attention to the Indian stock markets, both the Bombay Stock Exchange and the National Stock Exchange. The existence of the weak form of efficiency was tested on data from both Indian stock exchanges using the unit root test and autocorrelation analysis for the aggregate period from August 1998 to July 2010, which, however, was divided into three-year intervals. The analysis revealed the significant autocorrelation in the period from August 2001 to July 2004, i.e. during this period the Indian market did not behave in line with the weak form of efficiency. On the contrary, in the period 2004–2010, the tests used provided evidence of the functioning of the weak form of efficiency in the Indian market.

The validity of EMH in the British stock market was examined by Konak and Seker (2014). They analyzed the development of the FTSE 100 index for the period 2001–2009. Both authors concluded that the FTSE 100 performed the random walk during that period, which supports the validity of the weak form of efficiency.

Bahmani-Oskooee et al. (2016) tested the occurrence of the weak form of market efficiency on weekly stock index data representing 8 transition markets in the period 2000–2015 using a modified unit root test. The results confirm the functioning of the weak form of efficiency in Croatia, the Czech Republic, Hungary, Lithuania and Poland. According to the authors of the study, it is not possible to repeatedly achieve excess returns in these markets. In contrast, in the markets of Bulgaria, Romania and Russia, the weak form of efficiency was not confirmed by the study. To test for weak market efficiency, the newly developed quantile unit root test by Koenker & Xiao (2004) was used to increase the accuracy of the estimate, its considerable advantages are pointed out by Hosseinkouchack and Wolters (2013).

The efficiency of the Nepalese stock market was the subject of a study by Risal and Koju (2021). To test the weak form of efficiency, the authors used the normality test, the autocorrelation test, the runs test and the unit root test, which they applied to the daily returns of the Nepalese stock index NEPSE for the period from January 2010 to December 2019. The calculations and analyzes refuted the existence of the weak form of efficiency in the Nepalese market. The authors point out that if the Nepalese market is inefficient, it is possible to forecast rate movements using past rate movements, which is the starting point for the technical analysis.

3. METHODOLOGY AND DATA

If the market reflects all available formation, any shock to prices must be permanent and the market according to the EMH must follow the random walk process. This paper focuses on two aspects of the random walk model – the autocorrelation and the stationarity of the time series. Tsay (2002) claims that financial data tend to be nonstationary. The common type of such nonstationarity in the time series data is the unit-root nonstationarity and its example is the random walk model.

Both methods will be applied to selected stock indices: the Czech PX index (Prague Stock Exchange Index), the German DAX index (Deutscher Aktienindex), the British FTSE 100 index (Financial Times Stock Exchange Index), the American S&P 500 index (Standard & Poor's 500 Index), the Japanese NIKKEI 225 index (stock index calculated by the Nihon Keizai Shimbunsha Company) and the Chinese SSEC index (Shanghai Stock Exchange Composite Index) for the period 3.1.2001–16.7.2021. The whole period will be further divided into shorter periods, taking into account the impact of the financial crisis and the COVID -19 pandemic, i.e. for the period before the financial crisis, 2001–2007, for the period after the financial crisis and before COVID-19, 2009–2019 and for the current COVID-19 period, 2020–2021. The year 2008 was eliminated due to the turbulence in the capital markets because of the outbreak of the financial crisis. However, PX index data are only available from January 2002. The daily return of the market index was calculated as the difference between two subsequent natural logarithms of daily closing prices of the index.

a. Autocorrelation analysis

Tsay (2002) states that the return of an asset must not be predictable under the EMH. One of the ways how to check the predictability is the testing for the zero autocorrelations. The test of the random walk checks for the autocorrelation where the correlation of two observations of the same time series in different time moments is estimated. Under the random walk assumption, these autocorrelations coefficients at various lags are all zero. The test has the hypotheses:
$Ho : \rho_1 = \ldots = \rho_m = 0$
$H_1 : \rho_i \neq 0$ for at least one $i \in \{1, \ldots, m\}$

The Ljung-Box test uses the Q_{LB} test statistic (Ljung-Box, 1978)

$$Q_{LB} = n(n+2)\sum_{k=1}^{m}\frac{\hat{\rho}_k^2}{n-k} \sim \chi^2(m),$$

where
n – sample size
m – maximum lag length
$\hat{\rho}_k^2$ – autocorrelation coefficient at lag k estimated from a sample
The test statistics Q_{LB} has approximately the chi-square distribution with m d.f.

b. Unit root tests

Another test of the random walk is the unit root test, the literature review shows that the commonly used is the augmented Dickey-Fuller test (e.g. Brooks, 2014). The time series can be written in the form of the stochastic trend model

$$y_t = \varphi y_{t-1} + u_t,$$

where
y_t, y_{t-1} – the values of the time series in time t, resp. $t-1$
u_t – the white noise disturbance term

The augmented Dickey-Fuller (ADF) test hypothesis says that the series contains the unit root, against the hypothesis that the series is stationary. Most financial time series are either containing the unit root or are stationary. The third option, $\varphi > 1$, is possible but the process would be explosive (Brooks, 2014, p. 355).

The ADF hypotheses are:
H_0: $\varphi = 1$
H_1: $\varphi < 1$

In the case of $\varphi = 0$, the time series would represent the white noise process, for $\varphi < 1$ shocks have only temporary effects on the stock market, and for $\varphi = 1$ the time series follow the random walk process.

For the support of the ADF test result Brooks (2014, p. 365) advises also use the Kwiatkowski–Phillips–Schmidt–Shin (KPSS) test to support the ADF test results. The null hypothesis of this test is that the time series is (weakly) stationary against the alternative, it is not (weakly) stationary. The details of the test can be found in the cited book. The failure to reject the null hypothesis will mean that for the tested data the random walk model cannot be applied. i.e. hypothesis of the random walk is rejected.

Four options are resulting from the use of both tests (ADF and KPSS) simultaneously:
1. Reject H_0 and do not reject H_0 – random walk hypothesis is rejected (weak stationarity confirmed)
2. Do not reject H_0 and reject H_0 – random walk hypothesis is not rejected (weak nonstationarity confirmed)
3. Reject H_0 and reject H_0
4. Do not reject H_0 and do not reject H_0

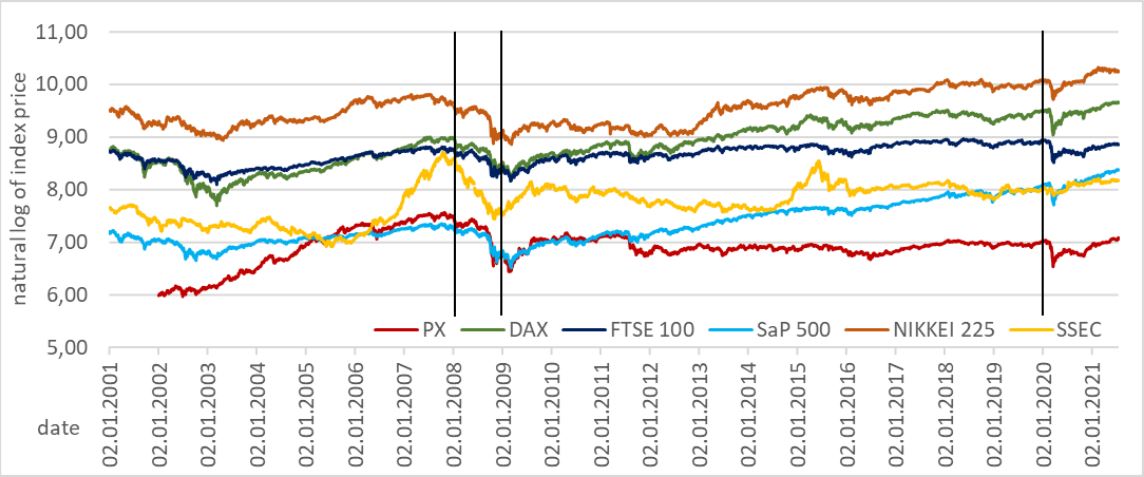
In the case of results 1 or 2, the conclusions are robust, i.e. both tests concluded that the series is stationary or nonstationary. Outcomes 3 or 4 show the conflict in results.

The ADF test needs to have determined the number of lags, in this paper, the Akaike information criterion (AIC) was applied.

4. CALCULATIONS AND RESULTS

The data of six indexes have different behaviour in the selected intervals. The chart shows the significant drop in all six markets in the year 2008 and at the beginning of 2020. All of them have recovered until the end of investigated period.

Figure 1. Stock market indexes – natural logarithm of closing prices (2001–2021)



Source: authors' work based on data from investing.com and The Wall Street Journal (FTSE 100)

a. Autocorrelation analysis

The data were divided into three subperiods and the Ljung-Box test statistics was calculated in the Eviews.

The number of lags *m = 10* was used according to the previous research and for possible comparison with these results.

Table 1. Ljung-Box test statistics

	PX	DAX	FTSE 100	S&P 500	NIKKEI 225	SSEC
			2001–2021			
Ljung-Box test statistics	46,456	21,837	78,307	104,440	10,923	29,723
p-value	0,000	0,016	0,000	0,000	0,364	0,001
included observations	4880	5212	5188	5166	5029	4981
			2001–2007			
Ljung-Box test statistics	8,675	30,721	56,685	11,560	14,747	13,918
p-value	0,563	0,001	0,000	0,316	0,142	0,177
included observations	1486	1778	1766	1757	1719	1686
			2009–2019			
Ljung-Box test statistics	28,923	13,676	11,201	28,851	12,878	30,243
p-value	0,001	0,188	0,342	0,001	0,231*	0,001
included observations	2756	2788	2777	2768	2691	2676
			2020–2021			
Ljung-Box test statistics	37,369	50,468	43,134	202,050	16,768	3,975
p-value	0,000	0,000	0,000	0,000	0,080	0,948
included observations	386	391	392	388	386	373

*This test of 10 lags was not significant but lags of 1 till 5 were significant therefore the Japanese market must be taken as rejecting the H_0 in the period 2009–2019.

Source: authors' work based on data from investing.com and The Wall Street Journal (FTSE 100)

In the whole period, 2001–2021 only NIKKEI 225 shows no autocorrelation in the data. In the period before the financial crisis, there was no autocorrelation in most of the surveyed markets – Czech, US, Japanese and Chinese. After the financial crisis, all six studied markets changed their behaviour, the German and British show the random walk behaviour from the autocorrelation test point of view and the other four markets do not. The COVID-19 period caused that the German and British markets lead to the rejection of the random walk hypothesis and the Japanese and Chinese market indexes contain no autocorrelation.

b. Unit root tests

Two tests were used to confirm the random walk model in these six markets. ADF test results from the Eviews offer the p-value but the KPSS test statistic value needs to be compared with the asymptotic critical value. For the 5% significance level, the value of 0,463 needs to be exceeded for the H_0 rejection.

Table 2. Unit root tests (2001–2021)

2001–2021	PX	DAX	FTSE 100	S&P 500	NIKKEI 225	SSEC
ADF test statistics	-4,658	-15,124	-9,138	-6,254	-73,267	-19,752
p-value	0,001	0,000	0,000	0,000	0,000	0,000
included observations	1948	3945	1699	824	4785	3798
number of lags (based on AIC)	29	18	43	32	0	9
KPSS test statistics	0,332	0,147	0,050	0,246	0,176	0,077
KPSS H_0: series stationary	not rejected	not rejected	not rejected	not rejected	not rejected	not rejected

Source: authors' work based on data from investing.com and The Wall Street Journal (FTSE 100)

Data from the whole period do not follow the random walk model in any studied market. The tests confirm each other result that the data is stationary.

Table 3. Unit root tests (2001–2007)

2001–2007	PX	DAX	FTSE 100	S&P 500	NIKKEI 225	SSEC
ADF test statistics	-35,931	-9,126	-9,380	-44,238	-29,172	-16,327
p-value	0,000	0,000	0,000	0,000	0,000	0,000
included observations	1429	1419	1115	1693	1560	1518
number of lags (based on AIC)	0	18	18	0	1	5
KPSS test statistics	0,127	0,612	0,412	0,259	0,233	1,399
KPSS H_0: series stationary	not rejected	rejected	not rejected	not rejected	not rejected	rejected

Source: authors' work based on data from investing.com and The Wall Street Journal (FTSE 100)

The German and the Chinese market data show the conflicting result of both tests is in the period before the Financial crisis. The rest four markets tests do not confirm the random walk process.

Table 4. Unit root tests (2009–2019)

2009–2019	PX	DAX	FTSE 100	S&P 500	NIKKEI 225	SSEC
ADF test statistics	-11,113	-24,638	-52,004	-6,681	-24,467	-6,636
p-value	0,000	0,000	0,000	0,000	0,000	0,000
included observations	1792	2569	2711	1027	2193	1043
number of lags (based on AIC)	14	4	0	20	3	25
KPSS test statistics	0,055	0,037	0,055	0,025	0,042	0,098
KPSS H_0: series stationary	not rejected	not rejected	not rejected	not rejected	not rejected	not rejected

Source: authors' work based on data from investing.com and The Wall Street Journal (FTSE 100)

Table 5. Unit root tests (2020–2021)

2020–2021	PX	DAX	FTSE 100	S&P 500	NIKKEI 225	SSEC
ADF test statistics	-5,807	-4,705	-3,423	-3,545	-18,592	-20,463
p-value	0,000	0,000	0,011	0,008	0,000	0,000
included observations	308	318	274	188	358	362
number of lags (based on AIC)	6	9	14	14	0	0
KPSS test statistics	0,317	0,116	0,231	0,123	0,155	0,054
KPSS H_0: series stationary	not rejected	not rejected	not rejected	not rejected	not rejected	not rejected

Source: authors' work based on data from investing.com and The Wall Street Journal (FTSE 100)

All indexes were confirmed to be stationary in both last periods: 2009–2019 and 2020–2021. ADF tests lead to the rejection of the hypothesis of the unit root, therefore acceptance of the alternative hypothesis of the stationarity and the KPSS test failed to reject the stationarity null hypothesis.

c. Summary of results – random walk hypothesis rejected?

Three applied tests conclusions are summarized in the following table.

Table 6. Random walk hypothesis rejected?

	PX	DAX	FTSE 100	S&P 500	NIKKEI 225	SSEC
			2001–2021			
Ljung-Box test	YES	YES	YES	YES	NO	YES
ADF	YES	YES	YES	YES	YES	YES
KPSS	YES	YES	YES	YES	YES	YES
			2001–2007			
Ljung-Box test	NO	YES	YES	NO	NO	NO
ADF	YES	YES	YES	YES	YES	YES
KPSS	YES	NO	YES	YES	YES	NO
			2009–2019			
Ljung-Box test	YES	NO	NO	YES	YES	YES
ADF	YES	YES	YES	YES	YES	YES
KPSS	YES	YES	YES	YES	YES	YES
			2020–2021			
Ljung-Box test	YES	YES	YES	YES	NO	NO
ADF	YES	YES	YES	YES	YES	YES
KPSS	YES	YES	YES	YES	YES	YES

Source: authors' work based on data from investing.com and The Wall Street Journal (FTSE 100)

The tested weak form of the efficient market hypothesis based on the random walk model was rejected for the majority of periods and markets. The data were autocorrelated in four markets in all four periods. All markets contain serial correlation in the market returns in at least one period and almost all unit root tests lead to the rejection of the random walk hypothesis.

5. CONCLUSION

For the entire period 2001–2021, but also in two time periods (2001–2007 and 2020–2021), the autocorrelation analysis showed the existence of the weak form of efficiency in the Japanese market. On the other hand, unit root tests rejected the existence of the random walk in terms of stationarity. It is therefore not clear whether investors are offered excess returns opportunities.

Based on the performed calculations according to the Ljung-Box test, the Chinese market behaved weakly effectively in two of the three monitored short periods, namely in the period 2001–2007 and in the period 2020–2021. This is the pre-crisis and COVID-19 period. In the post-crisis period, the Chinese market appears to have been inefficient, offering investors excess returns. This is the period of the huge boom for the Shanghai Stock Exchange.

According to the autocorrelation analysis, the Czech market showed weakly effective behaviour only in the period 2001–2007, which is also the period when the original SPAS and KOBOS trading systems were used on the Prague Stock Exchange and the period when the Prague Stock Exchange experienced record trading volumes and record investor interest, i.e. it was characterized by much higher liquidity than in the remaining two short periods. It is known that market liquidity is one of the prerequisites for market efficiency. In both periods after the financial crisis, the weak form of efficiency on the Czech market was no longer proven from any of the examined points of view.

In the US stock market, the autocorrelation analysis revealed the weakly effective behaviour only in the period 2001–2007, i.e. in the pre-crisis period. In the post-crisis and COVID-19 periods, the effective behaviour of the American market disappeared. Thus, the largest stock market in the world has been behaving inefficiently for the last decade, which again represents excess return opportunities for investors.

European markets – British and German markets – behaved effectively in terms of the autocorrelation analysis only in the post-crisis period 2009–2019. In the pre-crisis period 2001–2007, as well as in the COVID-19 period 2020–2021, not a single test revealed the existence of the weak form of efficiency. Half of the years from the observed aggregate period, both markets were thus able to offer investors excess return opportunities.

Thus, the occurrence of the weak form of efficiency in the European and American markets seems to be rather temporary or occasional. Persistently, the weak form of efficiency is represented only in the Japanese market and repeatedly in the Chinese market and only from the serial correlation point of view. For further research concerning previously performed studies, it would be interesting to perform identical tests on data with a longer interval, i.e. weekly or monthly. If investors want to identify markets and regions where excess return opportunities can be successfully sought, it is necessary to re-test the occurrence of weak efficiencies in individual markets, as it is clear that weak efficiencies are not a permanent phenomenon but vary in time and place.

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ETHICS EDUCATION IN ECONOMIC UNIVERSITIES – A VIEW FROM STUDENTS

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Abstract
This is part of a wider research aiming to offer a 360-degree view on status quo, opinions and instruments of ethics education in accounting with an ultimate goal of improving all.
After undertaking the first overview of whether and how ethics is taught in Romanian accounting and business faculties, members of the Association of Economics Faculties of Romania (AFER), I went on to address the shortcoming of that quantitative desktop overview by interviewing professors in the same faculties regarding their opinion on ethics education. Then, as the most recent step, the one which is the subject of this paper, I asked the opinion of "end-users", the students themselves regarding ethics education in academia, through a questionnaire. While reviewing literature on the subject, there were too few articles which focused on finding the perception of students, which I find paramount as they ultimately benefit of and apply the ethics education.
Some professors I interviewed on the matter, helped this research by sending the online questionnaire out to their students, hence the questionnaire gathered 413 responses. For the purposes of this paper, only a selection of questions and respondents were analyzed (choosing the largest group, BSc and the fundamental questions that gave an outlook of students' opinions regarding the perceived necessity of an ethics course, its best timing, effectiveness and best way of teaching it). It is only appropriate that this initial research answers just the initial questions of necessity, when and how. No surprises appeared during the basic statistical analysis, in that people who most found an ethics course to be necessary also thought it should be taught early and that it has a practical effect on them.

Keywords: *education, ethics, opinions, necessity, students*

1. INTRODUCTION

The accounting profession is undergoing numerous changes and is doing so very publicly. It is truly a profession affecting every part of our existence and the fact that we place so much confidence on the professional accountant is because we trust them to poses certain qualities. Fatt (1995) applied a questionnaire to the public, students and professionals themselves to determine what they perceive to be the most important qualities of a professional accountant. From a total of 380 respondents, regardless of the category they belonged to, the top two qualities of a professional accountant were determined as being integrity and ethics (out of a total of eight such qualities).

As ethics is such a central trait of the accountant, it warrants a very rich domain of research and how professionals can gain this trait, specifically how it can be educated, is paramount.

Indeed, literature research on ethics education has grown and according to Nguyen & Dellaportas, (2020) starting from the 70s when there was only one article on the topic, in the 2010s they discovered 106 such articles.

The topics were ranging from whether ethics can be taught in accounting (Ponemon, 1993) to who should be teaching ethics (Caglio & Cameran, 2017 were introducing companies into the equation asking whether they do enough to address integrity in training). From my research I did not find a conclusive survey as to the impact of ethics. Definitely there was a call from several authors to increase quality, breadth and depth of ethics education (Ponemon, 1993) and some authors noticed the lack of ethics courses in their respective countries: in universities (West & Buckby, 2020 in

Australia and New Zealand and Miller & Becker, 2011, in US) and in professional associations (Fleming, 1996 in UK). It almost seemed to me that the research on ethics education had taken an advance while practice lagged and there were still not so many courses and ethics interventions implemented.

Therefore, as first step in my wider research to determine the role that ethics plays in the development of the successful accountant, I started in 2021, together with a fellow researcher, by **studying whether ethics is taught in Romanian economics faculties**, members of the Association of Romanian Economic Faculties (AFER). Through a quantitative desktop review of their curricula, we found out that 92% of them (meaning 55) had an Ethics course (a stark increase from the analysis of only three years before by Mălăescu, 2018). Also, on average there were two or more courses in ethics in each program with half of the Master's degree including three or more disciplines in which ethics was tackled. Not only that the presence of ethics courses in Romanian economic faculties curricula counted as a success, given that they are not formally required by the Romanian higher education regulator (ARACIS), but from the 123 courses we found 80% of them were compulsory. Also, these courses were relatively important in the curricula, around 85% being awarded more than half of the maximum credits allowed for any subject. This research was presented in the 15th International Conference on Business Excellence (ICBE) which took place on 18–19 March 2021 in Bucharest, Romania, the proceedings of which are not yet published at the time of writing.

As a second step in this wider research to determine the role that ethics plays in the development of the successful accountant, I used the database built for the previous research with economic faculties in Romania and I contacted some **professors to interview them in order to understand the importance they place on ethics** and its influence in future professionals' development. The professors were either teaching ethics as core subject or including it in other disciplines. I undertook this qualitative research (with a total of 17 interviews) in order to counterbalance the limitations of the quantitative research as through the simple analysis of the curricula (by subject title) it was not possible to determine how much ethics was covered in other disciplines. The research has not been published yet but from the initial analysis of the interviews I was happy to note that professors were including ethics discussions and topics in their lectures (even if their main subject wasn't ethics).

As a third step in my wider research on ethics education, I asked the professors who agreed to be interviewed to help me find out the **opinion on ethics education from the "end-users", their students, in order to take it into account for potential curricula updates**. Thus, I received a total of 413 responses to a questionnaire which is hereby attached as the appendix, the partial analysis of which is the subject of this paper. Again, the overall results are gratifying with most students considering an ethics course necessary and having the opinion that it has a practical impact in their development.

These three steps offered a rounded view of how ethics education is implemented and perceived in the Romanian economic faculties, and it forms the basis of the continuation of my research, taking it one level higher in the context of the practicing accountant and maybe involving employers as well. My next aim is to compare how ethics is included in the curricula of several national and international accountancy associations and compare their ethics interventions in order to offer a cross-border map for their improvement.

2. LITERATURE REVIEW AND RESEARCH QUESTIONS

All previous steps in my research were based on a thorough literature review as ethics education research is abundant, especially in the field of accounting, my focus as well. Ethics education was covered from various angles and I was able to find an excellent account of its history (Nguyen & Dellaportas, 2020); instruments for implementing it (Limijaya, 2019) and their effectiveness, methods for improving the effectiveness of teaching ethics education (Chelariu et al, 2014) and who

are the actors who should be involved in its processes (Fleming 1996 for instance saying that the responsibility should not rest solely on academia).

Detailed discussions around the determinants of the success of ethics interventions formed the basis of **my research as this is its goal – understanding how we can make ethics education interventions more relevant and applicable**. Two determinants of ethics interventions success I found very interesting: one was at what stage of accountants' careers are they more impactful (Fiolleau & Kaplan, 2017, disproved their hypothesis that practicing accountants are less ethically sensitive than students of the domain) and the other was the moment and timeline of the ethics intervention (whether it is one-off and self-standing like in Miller et al, 2014) or spread in the accounting curricula (Shawever, 2017) of universities and accounting associations.

Finally, coming to this third step of my research presented here, the opinion of university students regarding the necessity and impact of their ethics education, I did find some articles having students' behavior as main center point as well as articles using questionnaires to find out the impact of various interventions on students' behavior, however most of them didn't ask for students' opinion of how they were impacted, which I considered to be paramount. Hence the below literature review focuses more on research methods that influenced this paper as there were not too many articles focused on students' opinions.

Some of these articles examined the subject of ethics through questionnaires. For instance, Koljatic & Silva (2015), Fiolleau & Kaplan (2017) or Wang & Calvano (2015) however, while these articles were helpful in shaping my research, they did not ask the opinions of end-users as to their experience with an ethics course.

The first exception to asking students' opinion on the importance of the ethics course via a questionnaire were Adkins & Radtke (2004) who then compare this perception of accounting students to that of professors and find that students perceive ethics education to be more important than professors.

The other exception I found on using a questionnaire to ask students' opinion on ethics course usefulness and how it is taught was Davidson (2011). In that paper he draws on his financial accounting teaching experience to describe how he improved the way he taught ethics as part of his course. At the end he asks a couple of questions trying to determine the students' opinion as to how they were taught and the practicality of what they were taught, and he finds that there is an increase in the students' interest following the introduction of these improvements.

Another article studying perception, not of students but that of managers on how business schools teach ethics and the success they have is the one by Sigurjonsson et al. (2015) and this is also using a questionnaire.

Some of the other articles giving a picture of students' attitudes and behavior through questionnaires did not address ethics at all but I also found them interesting and useful because they discussed accounting education. For instance, Silva et al, (2019), involved accounting (and marketing) students in a questionnaire to assess the importance of gamification in the improvement of their motivation and interest to study.

Smith et al (2019) asked students in accounting to complete the Connor-Davidson Resilience Scale (CD-RISC-10) and extensively analyzed the answers from accounting and business students by gender as well as by degree.

Other articles were useful because they used questionnaires in determining success criteria or status quo of accounting education and hence I could use them for inspiration and idea stirring for my own questionnaire. I name only a few:

Kotb et al. (2019), Douglas & Gammie (2019), Fatt (1995) and Caglio & Cameran (2017).

These articles helped this research by giving me ideas how to put together its structure, how to ask the right questions and what method to use in such an endeavor. Finally, it was an encouragement to find out that the questionnaire was the dominant method in collecting data in accounting ethics empirical work (94% of surveys – Bampton, 2013).

Hence, I was able to distil my **research questions** into:

- is an ethics course necessary?
- does an ethics course have a practical effect?
- is theory or case studies prevalent in the teaching of ethics?
- what is the preferred timing of the ethics intervention?
- is it preferable to implement an ethical behavior by promoting negative cases or positive ones?

all viewed through the lens of students' opinion and perception. Also, two research questions which delved into the status quo are:

- what were the ethics teaching instruments students were exposed to?
- what was their knowledge of whistle-blowers?

With all these in mind, I was able to put together a nine-question questionnaire from which the research questions analyzed in this paper are:

- do BSc students think an ethics course is necessary?
- how does the students' belief that an ethics course is necessary affect their belief that the course influenced them?
- how does the students' belief that an ethics course is necessary affect their belief that a course in ethics has to be taught as early as possible in their academic life?
- do BSc students think it is better to teach ethics through theory or through case studies?

The main objective of this research is to include the opinions of end-users of ethics education in shaping how it will look for the future. It will be shared with academics and regulators with the hope that they will be able to benefit from these findings when they next update the ethics curricula in universities.

3. RESEARCH METHOD AND DATA LIMITATIONS

The questionnaire I devised (included in this paper as Appendix 1) has a demographic component (the first two questions, required, single choice) to breakdown the level and domain of studies of university students answering it. It has three required single choice questions to tackle status quo of their ethics education level (Q4) and of their knowledge of whistle-blowers (Q9) and to tackle their opinion as to whether it is better to promote ethical choices through negative or positive examples (Q8). It has one required question with six Likert scale affirmations (Q3) to rate students' feelings regarding their own level of ethics and that of the profession in Romania, the necessity of an ethics course in university, the effect, method and timing of such a course. I used a five-point Likert scale that range from 1 (Total disagreement) to 5 (Total agreement).

The questionnaire also has three optional questions (Q5–7) the first being single choice to determine their opinion regarding the applicability of ethics discussions in practice, the second being multiple choice to determine the instruments of teaching ethics they were exposed to and the final optional one, also the only open question in the questionnaire asks students opinions as to what discipline should have had more ethics included.

The questionnaire was devised specifically to be addressed to people who are still university students, in Romania, in faculties members of the Association of Economic Faculties of Romania (AFER) and henced it was disseminated in the Romanian language. It has a brief introductory sentence giving a high-level overview of the scope of questions. Then it states the purpose for which it will be used – doctoral research – and it has an anonymity disclaimer. Students received the questionnaire from their professors (who might have taught them ethics) hence anonymity was important for them to know that their professor is not going to have access to their specific answer and thus prevent them from feeling the need to alter their response.

Since my previous research project involved interviewing seventeen professors in the same faculties on their views of how ethics is taught and how the course might influence future professionals, I asked the same professors to distribute the questionnaire to their students at all levels of studies, regardless of the fact that the professors were teaching ethics or not and regardless of the

fact that the students had undertaken a course in ethics or not. Many of the professors kindly took my request and this is how my questionnaire to students ended up having 413 responses giving a broad range of opinions regarding the necessity of an ethics course and the influence of the ethics course on their future but also offering a detailed status quo regarding the instruments of ethics teaching they were exposed to.

While I did not use any sampling method, I believe that the sheer number of the respondents and the fact that they come from different faculties in different areas of Romania make them representative for the purposes of this research.

The questionnaire was built following extensive literature review regarding how ethics is taught. For instance, the research question regarding the usefulness of the course was inspired by Davidson (2011), the methods of teaching ethics were in great part inspired by Limijaya (2019).

The fact that I also asked a question about students' opinion on whether it is better to study ethics in an academic context as early as possible was inspired by Fiolleau and Kaplan (2017) who compared ethical sensitivity of practicing accountants to that of accounting students (so by different stages of seniority and hence I extrapolated this idea in my questionnaire, by age and level of study).

After defining the generic research questions and putting together the first couple of questions of the questionnaire along these lines, my coordinating professor reviewed the questionnaire and added a few ideas. She came with the idea of adding Likert scales of whether respondents consider themselves ethical persons, how they perceive the ethical level of the Romanian profession and how important they perceive ethics courses to be in order to determine the relation (cause or association) between the variables. She also helped reformulate question 4 to clarify what an ethics intervention means (is it a self-standing course or a discussion in another discipline) and to give a broader spectrum of answer variants.

After all the survey questions were finalized, I transposed them into an online form and issued the link to the professors who had accepted to distribute it to their students. They then forwarded it to their students e-mail groups. The questionnaire is still open, and it collected data between 12 April and 10 June 2021 reaching 413 respondents to date, taking on average 4 minutes to complete.

For the purposes of this **article, I only used the data from the demographic first two questions to then choose only answers from BSc students and analyze the findings from four of the six Likert scales in question 3**. I only chose Bachelor students as they were the most diverse and the largest group.

The **narrowed-down research questions** I was looking for an answer to in this article are:

- do BSc students think an ethics course is necessary?
- how does the students' belief that an ethics course is necessary affect their belief that the course influenced them?
- how does the students' belief that an ethics course is necessary affect their belief that a course in ethics has to be taught as early as possible in their academic life?
- do BSc students think it is better to teach ethics through theory or through case studies?

I used basic descriptive statistics in analyzing the quantitative data and have attempted to provide an explanation and attribute significance to numbers.

Data limitations

Due to the way the questionnaire was distributed I did not perform any sampling exercise so there is no scientific method to prove that the 413 respondents are representative of economic students in Romania. However, since several professors from AFER faculties in main cities in Romania distributed the link and due to the size of the responding group, I think it is safe to assume they are.

I did not ask a question regarding their previous or current employment status (in accounting or not). It is customarily in Romania that students at all levels of university education also work (sometimes in their relevant field). It would have been interesting to be able to split the sample also by their work experience.

BSc studies in Romania last for a three-year period and there might be some differences as well in terms of how they perceive the questions based on how far ahead in their studies they are.

Although it was clearly mentioned that the questionnaire is anonymous the fact that some students received the link from their ethics professor might have been a pressure for them to inflate their perception as to the necessity and effect of an ethics course (external pressure). Also, the fact that this was reporting on their own level of ethics, it might have been an incentive to show an inflated perception on themselves since we all want to see ourselves as the good persons (internal pressure).

Another limitation comes from the fact that the study only addressed students in Romania, in the Romanian language, hence there is no opportunity to certainly state that the same opinions might come from students in other countries. This research focusing on students' opinions is limited because it offers a narrow point of view but taken into consideration in the ensemble of my previous research and that to come, it will give a comprehensive view of the ethics education landscape in accounting.

4. RESULTS

As mentioned before, only part of the survey was analyzed for the purposes of this article due to time limitations. Besides the demographic questions I chose only four out of the six Likert scale statements which were all asking opinions, not status quo.

Even if not all the questionnaire was considered and not all correlations were analyzed, I feel that given the fact I chose the largest group of respondents, the BSc students and I chose fundamental questions among which relevant associations can be made, this can form the sound basis of future, more detailed research.

The first two questions of the survey were giving the demographic outlook of the group – the questionnaire had a total 413 respondents of which 77% were BSc students, of which more than half were accounting and audit students.

For the purposes of this paper, I have only analyzed several answers of the 319 BSc students without necessarily always making a comparison between students in accounting and of other disciplines.

Table 1. categories of respondents split by level of studies and faculty domain

Category of student responding / faculty domain	**PhD**	**Masters**	**BSc**	**Total**
Economy	0	13	54	**67**
Accounting, audit	7	32	178	**217**
Finance	0	0	36	**36**
Business management	0	3	16	**19**
Other	0	39	35	**74**
Total	**7**	**87**	**319**	**413**

Source: Analysis of own online survey answers

Of the total 319 BSc students replying, 90% of them agreed and totally agreed that a course in ethics is necessary (159 and 127 respondents), 9% were neutral to the proposal and only 2% disagreed. This matches the accounting and audit students' opinion with 88% in agreement with the affirmation, 11% neutral and 1% disagreeing. This is different for business management faculties, but they are represented by too few respondents (16) to consider.

Table 2. BSc students by faculty domain thinking a course of ethics is necessary – numbers and percentage of total

A course in ethics in university is required / faculty domain (total respondents)	**Total disagreement**	**Disagreement**	**Neutral**	**Agreement**	**Total agreement**
Economy (54)	-	1	6	29	18
	-	2%	11%	54%	33%
Accounting, audit (178)	1	1	19	86	71
	0.5%	0.5%	**11%**	**48%**	**40%**
Finance (36)	1	-	1	19	15
	3%	-	3%	53%	41%
Business management (16)	-	-	-	5	11
	-	-	-	31%	69%
Other (35)	-	1	2	20	12
	-	3%	6%	57%	34%
Total **BSc** respondents (319)	2	3	28	159	127
	0.5%	**0.5%**	**9%**	**50%**	**40%**

Source: Analysis of own online survey answers

I then wondered whether the fact that students consider that an ethics course is necessary somehow influences whether they perceive it as useful.

Of the 286 who agreed that an ethics course is necessary (127 total agreement and 159 agreement) 81% also agreed or totally agreed (50% and 31%) that it can make them a more ethical person. Only 2% disagreed. Also, of the 28 people who were neutral as to the necessity of an ethics' course 43% (12 people) agreed that it can make them a more ethical person.

Table 3. BSc's students' opinions on the effect of the ethics' course on them split by categories of their agreement regarding the necessity of the course

An ethics course can make me a more ethical person / An ethics course is necessary	**Total dis-agreement**	**Disagreement**	**Neutral**	**Agreement**	**Total agreement**
Total agreement that an ethics course is necessary (127)	-	1	14	**44**	**68**
	0	0.1%	11%	34.9%	54%
Agreement that an ethics course is necessary (159)	1	3	35	**98**	**22**
	0.5%	1.5%	22%	61.5%	14%
Total agreement and agreement combined (286)				(98 + 44)/ 286 * 100 = 50%	(68 +22) / 286 * 100 = 31%
Neutral that an ethics course is necessary (28)	-	3	13	12	-
	-	11%	46%	43%	-
Disagreement that an ethics course is necessary (3)	1	1	1	-	-
	33%	33%	34%	-	-
Total disagreement that an ethics course is necessary (2)	1	-	1	-	-
	50%	-	50%	-	-
Total **BSc** respondents (319)	3	8	64	154	90

Source: Analysis of own online survey answers

I went further to analyze students' opinion regarding best timing within their academic studies to undertake an ethics course also against the backdrop of the initial question of whether they consider an ethics course to be necessary.

From the total 319 BSc respondents, 87% considered that it is important to take an ethics course as early as possible with 11% being neutral. I then wanted to make the same correlation between different perceptions of the necessity of the ethics course and whether they thought it is a good idea to undertake it as early as possible. The biggest percentages that thought it is important to take an ethics course in the academic context as early as possible (agreement and total agreement) came from people who were in agreement that an ethics course is necessary but also 60% of people who were neutral towards the necessity of the course.

Table 4. BSc's students' opinions on the best timing of ethics' course split by categories of their agreement regarding the necessity of the course

It is important to take an ethics course as early as possible in an academic environment / An ethics course is necessary	**Total dis-agreement**	**Disagreement**	**Neutral**	**Agreement**	**Total agreement**
Total agreement that an ethics course is necessary (127)	-	-	4	39	84
	-	-	3%	**31%**	**66%**
Agreement that an ethics course is necessary (159)	-	2	19	89	49
	-	1%	12%	56%	31%
Neutral that an ethics course is necessary (28)	-	-	11	14	3
	-	-	40%	**50%**	**10%**
Disagreement that an ethics course is necessary (3)	2	1	-	-	-
	67%	33%	-	-	-
Total disagreement that an ethics course is necessary (2)	-	-	1	1	-
	-	-	50%	50%	-
Total BSc respondents (319)	2	3	35	143	136
			11%	45%	42%

Source: Analysis of own online survey answers

On the issue of the importance of ethics theory over case studies (so theoretical over practical approach) 6% of total respondents of the survey (413) were in total disagreement, 33% disagreed, 40% were neutral (which was also the highest level of neutral answers from all questions besides the one regarding the level of ethics of the Romanian accountancy profession) and 21% were in agreement or total agreement. I did not think it is important to analyze these answers against the group's opinion as to whether they think the ethics course is necessary or not.

Of the 178 BSc students in accounting and audit 8 were in total agreement (4%), 27 in agreement (15%), 64 neutral (36%), 66 in disagreement (37%) and 13 in total disagreement (7%).

5. DISCUSSION AND NEXT STEPS

The data analyzed did not bring too many surprises as compared to my expectations. Indeed, students who believed a course in ethics to be necessary also believed that the course can make them a more ethical person and that it should be started as early as possible in the academic curricula. The numbers of respondents who were neutral towards the necessity of the ethics course were quite small and

interestingly enough even from them 43% said that they agree an ethics course can make them a more ethical person and 60% of them agreed (and totally agreed) that an academic course in ethics should be undertaken as early as possible.

This means that the perceived applicability of the course is very visible even to students who are not so certain whether it is necessary or not at their own level.

In the light of this last remark, maybe a follow-up question should have been asked of students who were uncertain (or neutral) regarding the necessity of the ethics course as to why this was their opinion. Maybe they would think that an ethics course would be more relevant as soon as they start their traineeship with an accounting or audit firm and not necessarily that they are uncertain as to whether they should have it as part of the university curricula.

I did not expect theory to be such a preferred option of ethics education with 21% of total respondents and a similar proportion (19%) of accounting and audit students agreeing or totally agreeing that "It is more important to know the theory of ethics than case studies related to ethics". Maybe this is due to the fact that the Romanian education system has long been focused on offering theoretical knowledge to students, while case studies were scarce and not adapted to the knowledge. Perhaps unsurprising, this question regarding preference of theory over practicality of teaching ethics had most neutral answers from students (40%) as probably students felt they are unequipped to issue opinions as to how a discipline should be taught.

As next steps of the research I will expand on the question regarding the necessity of the ethics course and include it in the questionnaire which I will apply to the employed people to clarify whether the same percentages of respondents apply there too. The same thing goes for the question regarding the preference of theory education over practical case studies – it will be interested to find out whether while employed, the percentage of people favouring theoretical education significantly drops.

Also, I will continue to analyze the rich dataset the questionnaire provides and perform analysis using multiple regression to determine links between variables. I will single out differences in opinions and status quo depending on faculty of origin and year of study. I will also correlate the results of this survey to the desktop review of curricula of AFER members and ultimately to the interviews of professors. To have a complete view of ethics education and its applicability, I might go further and organize interviews with employers of junior accountants as well as with the fresh graduates themselves to see whether they still believe the ethics course they had in university is applicable to their job.

6. CONCLUSION

There are few studies I found on university education which also ask the opinion of students of what they feel about it, its impact in their lives and how it should be taught. Some professors shared with me that, after completing the survey, their students started conversations on how they perceive ethics courses in the classroom which means that the questionnaire stirred their interest. They commented on how the questions were asked and on involving other stakeholders (like employers). This demonstrates the power of involving every stakeholder in any conversation. I will take their comments further in my research. The goal is to broaden the understanding of the status quo and gather various opinions on ethics education in the world of accounting (academic and professional) so that it becomes better and more useful for all involved. There were not many surprises in the findings in that most of the students thought that an ethics course was necessary for instance however I think what really mattered in this case was the fact that their opinion was asked.

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Appendix 1 – Used questionnaire (translated from the original version in Romanian)

ETHICS – YOUR OPINION

A couple of questions about how ethics is seen from the perspective of students of economics and business faculties. The questionnaire is part of a doctoral research. All answers are anonymous.

1.I am a student of: *(required, single choice)*

(___) Bachelor
(___) Master
(___) PhD

2. The field of my faculty is: *(required, single choice)*

(___) Economy
(___) Accounting, audit
(___) Finance
(___) Business management
(___) Another

3. Please give a rating for each of the allegations below, checking the relevant box: *(required, Likert)*

	Total disagreement	**Disagreement**	**Neutral**	**Agreement**	**Total agreement**
I am an ethical person					
A course in ethics in university is required					
An ethics course can make me a more ethical person					
It is more important to know the theory of ethics than case studies related to ethics					
The level of ethics in the accounting profession in Romania is high					
It is important to learn ethics in an academic context as early as possible					

4.Which of the following statements applies to you: *(required, single choice)*

(___) I have not had any discussion about ethics in any course
(___) In a few disciplines we have sometimes discussed issues related to ethics
(___) In many disciplines we have discussed issues related to ethics
(___) I took a self -contained course in ethics (besides that of academic ethics)

5. If you had at least one discussion about ethics in one of your courses, did these concepts seem applicable for your profession? *(optional, single choice)*

(___) Yes
(___) No

6. If you had at least one discussion about ethics in one of your courses, were you exposed to one of these methods of teaching? (Tick all those that apply) *(optional, multiple choice)*

(___) Case studies
(___) Ethics study texts (books)
(___) Free discussions about ethics (debates)
(___) Homework
(___) Personal diary about situations in which you had to make an ethical decision
(___) Guest lecturers
(___) Literature and other forms of material narrative (theatre plays, novels, film)
(___) I was asked to teach part of the course

7. Is there any course / discipline in which you think ethics should have been insisted upon? *(optional, open answer)*

_____

8.To encourage an ethical behavior of professional accountants in their day to day life is it better to promote: *(required, single choice)*

(___) Decisions of the disciplinary commissions of professional associations (negative cases)
(___) Stories whistle-blowers of integrity (whistle-blowers – positive cases)

9. Have you heard of any whstileblower (in any profession, in any country)? *(required, single choice)*

(___) Yes
(___) No

DATA REPORTING AND TOOLS FOR IDENTIFYING ERRONEOUS DATA

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Abstract
Every business generates a large amount of data. The data is used for correct decision-making by managers as well as for accounting and payment of taxes. There is a problem with data falsification. This paper describes controls that can identify data that contains erroneous values. These mechanisms are based on Benford's laws. Benford's laws analyze digit frequencies in empirical data and work well, for example, for values in accounting. If the values show significant deviations from Benford's distribution, this indicates that the data contains errors. A model has been created by us for quick and easy data control, which we will describe in this article. And this model works on the basis of Benford's laws.

Keywords: *data, Benford's laws, detection of incorrect values, statistic methods*

1. INTRODUCTION

Intuitively, we would assume that the accounting data are completely random, in fact this is not the case. In 1881 American astronomer Simon Newcomb discovered, that empirical data show a special distribution of digit frequencies at the beginning of a numeric data (Crilly, 2010, pp. 137–138). E.g., intuitively we would assume that the frequency of values starting with the number 1, 2 to 9 will be the same, but the reality is different. Values starting with 1 will have the highest frequency. This frequency is decreasing and will be lowest for values starting with 9. This discovery was found in an interesting way. S. Newcomb noticed that in logarithmic tables are more worn and dirty pages containing values starting with numbers 1 and 2. On the contrary, pages containing values beginning with numbers 8 and 9 are as new and clean. And so, he got the idea that numbers beginning with values 1 and 2 appear and use more frequently than numbers beginning with values 8 and 9 (Livio, 2006, p. 210). This finding has been demonstrated for empirical values such as river lengths or numbers of people living in large cities. But it had no practical use. There are other regularities and possibilities of calculations that work only for empirical data. In 1938, Frank Benford (an American electrical engineer) rediscovered this knowledge (Crilly, 2010, pp. 137–138). And so, the frequency distribution and other laws called Benford's laws. Because accounting data are also empirically generated values, Benford's laws work for them. Today, this knowledge is used to verify the accuracy of data of all kinds and specially accounting data (Nigrini, 2017).

This paper describes the implementation of Benford's laws in practice and describes the model created by the authors to identify incorrect values. The model works by comparing the frequencies of the digits in the first and second place with the Benford's frequency distribution and using statistical methods to determine the magnitude of the difference. When a statistical method evaluates a difference as being too large, the data is suspicious and there is a real possibility that it has been falsified.

2. MATHEMATICAL MODEL OF BENFORD'S LAWS

The probability that the value starts with the number d_1 can be calculated by formula 1 (Hanzal, 2017).

$$P(\%) = \log\left(1 + \frac{1}{d_1}\right) \cdot 100\ \%, where\ d_1 = (1 \div 9) \quad (1)$$

Examples of calculations are described in formulas 2 and 3.

$$if\ d_1 = 1:\ P(\%) = \log\left(1 + \frac{1}{1}\right) \cdot 100\ \% \doteq 30.1\ \% \quad (2)$$

$$if\ d_1 = 9:\ P(\%) = \log\left(1 + \frac{1}{9}\right) \cdot 100\ \% \doteq 4.58\ \% \quad (3)$$

The results of the calculations are shown in Table 1. There is a significant difference in probabilities clearly visible. It's interesting and non-intuitive, but values starting with number one are about 30 percent and values starting with number nine are less than 5 percent. The probabilities of other numbers are between these values (see Table 1) And of course the sum of all probabilities equals one.

Table 1. Benford's probability distribution of numbers in the first digit of the value

The first digit of the value	1	2	3	4	5	6	7	8	9
Probability (%)	30.10	17.61	12.49	9.69	7.92	6.70	5.80	5.11	4.58

Source: Own

Formula 1 can be extended for probability calculations for the first two digits, see formula 4 (Hanzal, 2017, Clippe, 2012).

$$P(\%) = \log\left(1 + \frac{1}{10 \cdot d_1 + d_2}\right) \cdot 100\ \%, where\ d_1 = (1 \div 9)\ and\ d_2 = (0 \div 9) \quad (4)$$

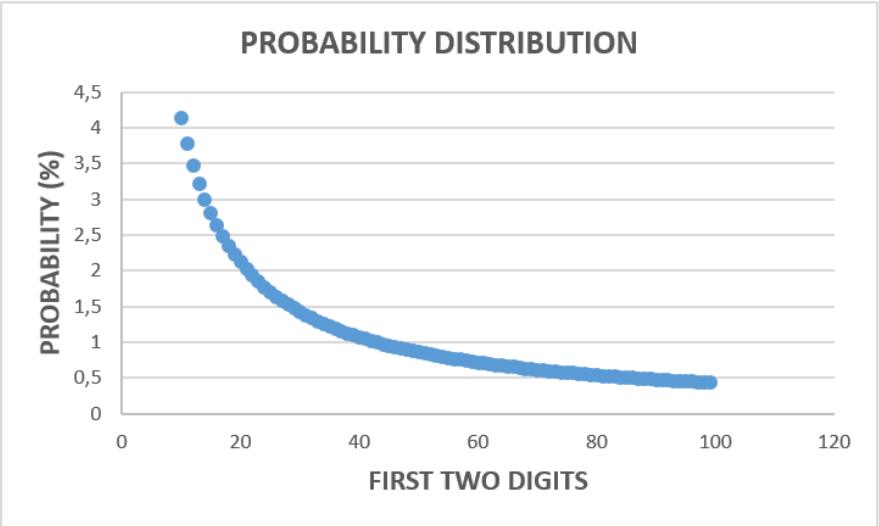
Examples of calculations are described in formulas 5 and 6. Situation where the value starts with the numbers 10 and 99. The other values are shown in Figure 1.

$$if\ d_1 = 1\ and\ d_2 = 0: P(\%) = \log\left(1 + \frac{1}{10 \cdot 1 + 0}\right) \cdot 100\ \% \doteq 4.14\ \% \quad (5)$$

$$if\ d_1 = 9\ and\ d_2 = 9: P(\%) = \log\left(1 + \frac{1}{10 \cdot 9 + 9}\right) \cdot 100\ \% \doteq 0.44\ \% \quad (6)$$

We can say that the difference between the results from formulas 5 and 6 is much smaller than between the results from formulas 2 and 3. In general, there is an extension of this principle to the first 3 or 4 digits, but because the differences in the calculated probabilities decrease significantly in practice, mainly calculations for the first 2 digits are used (Hill, 1995).

Figure 1. Benford's probability distribution of numbers in the first two digits



Source: Own

Furthermore, it is possible to modify the formula 4 and calculate the probabilities of occurrence of digits in the second place. E.g. the probability that the number 5 will be in the second place corresponds to the situation where the data start with the numbers: 15..., 25..., 35…, ..., 85..., 95.... This probability can be calculated by formula 7 (Berger, 2011, Shi, 2018).

$$P(\%) = \sum_{d_1=1}^{9} \log\left(1 + \frac{1}{10 \cdot d_1 + d_2}\right) \cdot 100\ \%, where\ d_1 = (1 \div 9)\ and\ d_2 = (0 \div 9) \quad (7)$$

The probability that the number 5 is in the second place is calculated in formula 8.

$$P(\%) = \left[log\left(1 + \frac{1}{15}\right) + log\left(1 + \frac{1}{25}\right) + log\left(1 + \frac{1}{35}\right) + \cdots + log\left(1 + \frac{1}{95}\right)\right] \cdot 100\ \% = 9.67\ \% \quad (8)$$

The use of Benford's laws has its limits. Values must contain at least three digits and values must be at least 200 (Berger, 2011). These laws apply only to empirical values, not to artificially created values. Therefore, for example, values in accounting must have the frequencies of the initial digits identical to the Benford's distribution. In the event of a significant difference, there is a serious suspicion that the values have been adjusted.

Benford's distribution has one more very important and interesting property. Values can have any units (Nigrini, 2012, Watrin, 2008). If financial or accounting value in Euros show Benford's distribution, then it will show even if it will convert e.g. to Dollars.

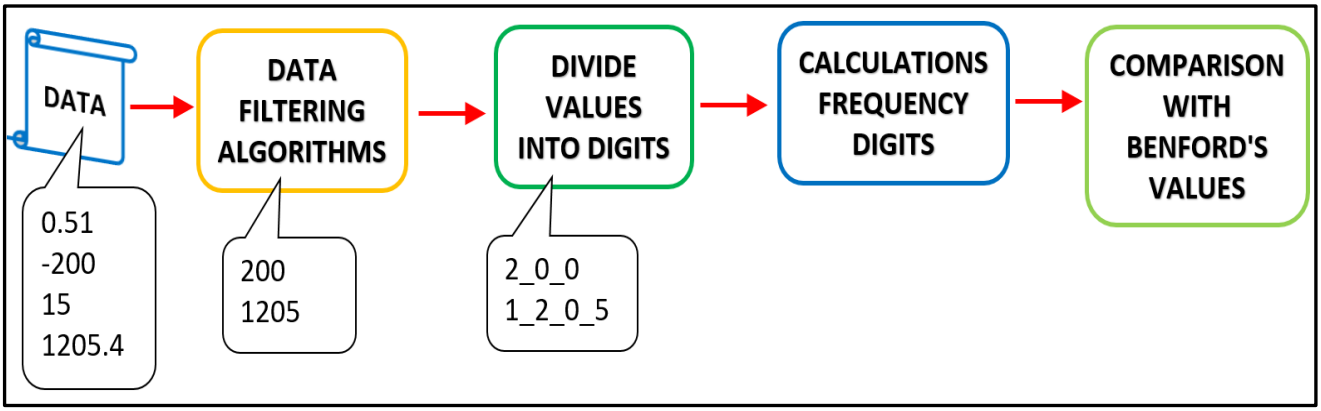
3. IDENTIFING ERRONEOUS DATA USING MODEL

The input to the model is some data (accounting, financial, measurement results, etc.). The model analyses this data. And the output is information on whether the values are correct or whether there is a suspicion that they have been modified, manipulated or falsified.

The first step is "to filter" the data. Because the Benford's distribution works only for values that have more than three digits, the model removes values less than 99. Negative values are adjusted to absolute values. Decimal places are automatically deleted.

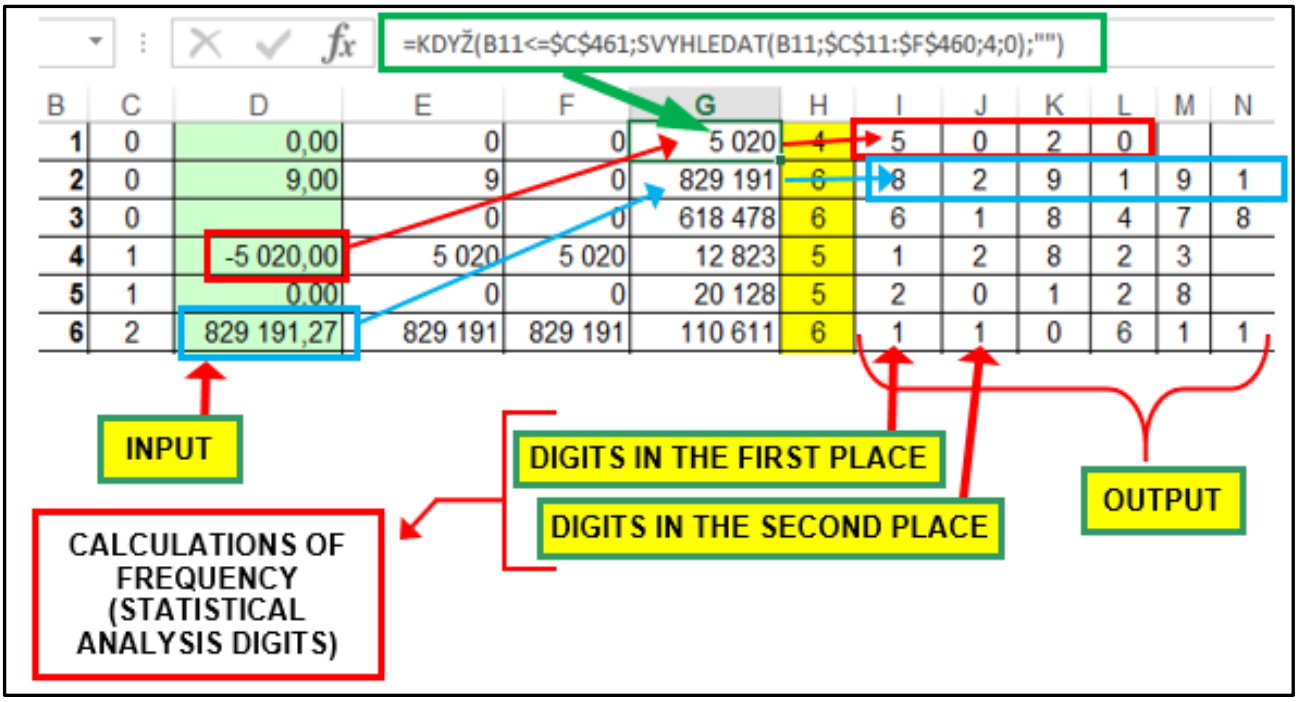
The second step is to divide each value into individual digits and calculate the frequency of the first digits, the first two digits and the second digits, see Figure 2.

Figure 2. A demonstration of model operation



Source: Own

Figure 3. A preview of the model – data filtering phase



	B	C	D	E	F	G	H	I	J	K	L	M	N
1	0	0,00	0	0	5 020	4	5	0	2	0		
2	0	9,00	9	0	829 191	6	8	2	9	1	9	1
3	0		0	0	618 478	6	6	1	8	4	7	8
4	1	-5 020,00	5 020	5 020	12 823	5	1	2	8	2	3	
5	1	0,00	0	0	20 128	5	2	0	1	2	8	
6	2	829 191,27	829 191	829 191	110 611	6	1	1	0	6	1	1

Source: Own

The third step is to compare the real frequencies of the digits with the theoretical frequencies calculated using Benford's laws. This problem is solved using special statistical methods: $\chi 2$ test and Kolmogorov-Smirnov test. All calculations are performed by the model automatically. The output of the model is information on whether the data is OK or whether the data is non-standard and there is a suspicion that it has been modified.
The outputs of the model are the results of tests of conformity with Benford's distribution:

- for the first digit (statistical method χ^2 test)
- for the first two digits (statistical method Kolmogorov-Smirnov test)
- for the second digit (statistical method Kolmogorov-Smirnov test)

The principle of statistical method χ^2 test has tree parts.
The first part: There is formulated statistical hypotheses. Hypothesis H_0 says, that there is conformity between real and model (Benford's) frequency (respectively probabilities) of digits. Hypothesis H_1 is opposite of H_0.
The second part is a calculation of the test criterion (Budíková, 2010, pp. 205–206) , see formula 9.

$$\chi = \sum_{j=1}^{r} \frac{(n_j - n \cdot p_j)^2}{n \cdot p_j} \qquad (9)$$

Where "r" is a number of digits, "n_j" is real frequency, "n" is a number of values, "p_j" relative model frequency.
The third part is a determination of a critical value from χ^2 distribution, see formula 10.

$$K = \chi^2_{1-\alpha}[r - p - 1] \qquad (10)$$

Where "p" is zero, because Benford's distribution hasn't any parameters.
We reject hypothesis H_0 when the test criterion is greater than the critical value and we don't reject hypothesis H_0 when the test criterion is less than the critical value. The validity of the test is according to the parameter α (significance level). The usual value is 0.05. The critical value is calculating in our

model with statistical functions CHISQ.INV. Model uses all these formulas and methods everything is set in it.

The problem with this method is the condition that $n \cdot p_j \geq 5$, this condition is fulfilled for the first digit. The model used for the first two digits and for the second digit other method. The Kolmogorov-Smirnov test is better suited to situations where frequency values are low. The basic principle of this method is the same as for the method χ^2 test. We formulate statistical hypotheses; we calculate the test criterion and the critical value. We reject hypothesis H_0 (there is conformity between real and model frequency) when the test criterion is greater than the critical value. But this method uses other formulas for calculations, see formula 11 (the test criterion) and formula 12 (critical value) (Kubanová, 2004, pp. 86–87).

$$D(n) = \frac{1}{n} \cdot MAX\left|N_i - \widehat{N_i}\right| \qquad (11)$$

$$D_{(\alpha=0.1)} = \frac{1.22}{\sqrt{n}} \; ; \; D_{(\alpha=0.05)} = \frac{1.36}{\sqrt{n}} \; ; \; D_{(\alpha=0.01)} = \frac{1.63}{\sqrt{n}} \qquad (12)$$

Where "n" is number of values and "N_i" is cumulative frequency. There is an assumption in formula 12, that "n" is larger as 40 values. Statistical tests work also with the significance level parameter α. This value is usually 0.05, but the model allows you to set any value. The Figure 4 describes the calculation principle for the first two digits in the model.

Figure 4. A support calculation for Kolmogorov-Smirnov test in the model

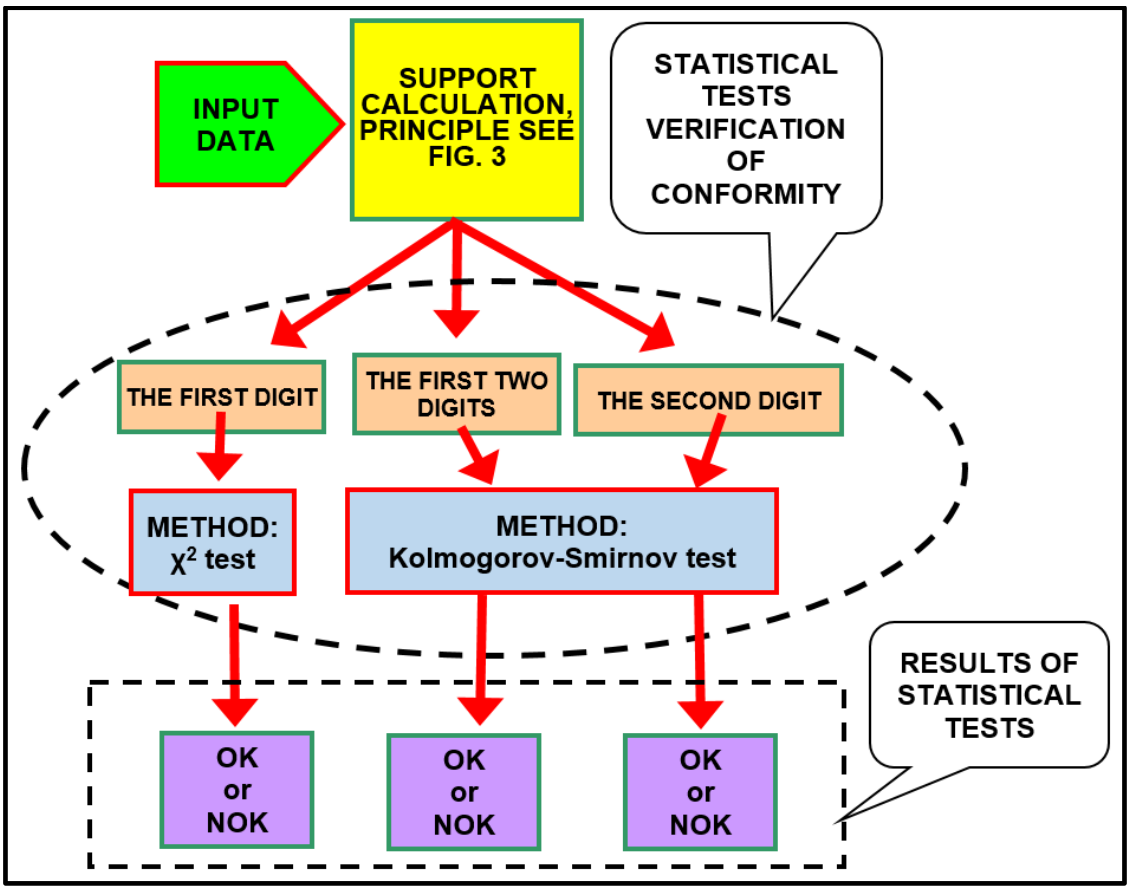
FIRST TWO DIGITS	Absolute frequency	Relative frequency	Cumulative frequency absolute		
	REAL DATA	MODEL DATA	REAL	MODEL	DIFERENCE (absolute value)
10	13	14.11	13	14.11	1.11
11	13	12.89	26	27.00	1.00
12	14	11.85	40	38.85	1.15
13	8	10.97	48	49.83	1.83
14	10	10.22	58	60.05	2.05
15	8	9.56	66	69.60	3.60
16	7	8.98	73	78.58	5.58
…	…	…	…	…	…
…	…	…	…	…	…
…	…	…	…	…	…
95	1	1.55	339	334.95	4.05
96	1	1.53	340	336.49	3.51
97	1	1.52	341	338.01	3.01
98	0	1.50	341	339.51	1.49
99	0	1.49	341	341.00	0.00

Source: Own

The same statistical method is also used to verify the agreement for the second digit.

We enter the accounting data into the model input and all calculations are performed automatically, see Figure 5. The model generates an output that contains information on whether the frequencies of the first digit, the first two digits and the second digit are identical.

Figure 5. The principle of calculations in the model

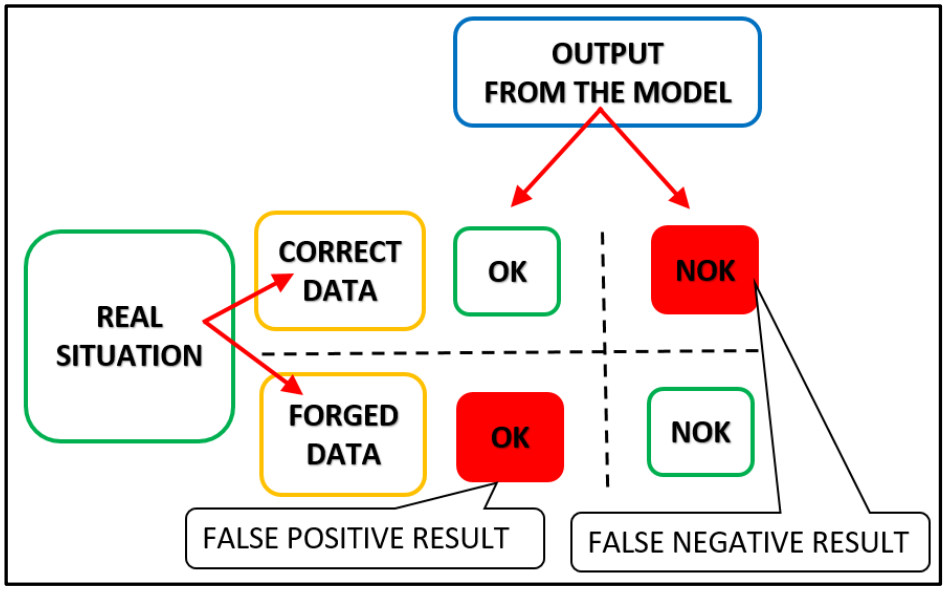


Source: Own

When the theoretical values (Benford's distribution) coincide with the frequencies of the input data, the result of the statistical test is positive. Then the output from the model is OK. This means that the data is not suspicious. And no falsification has been proven.

The model may evaluate the situation incorrectly. In the first case, it may mark the correct data as forged. In the second case, it may mark the forged data as correct, see Figure 6.

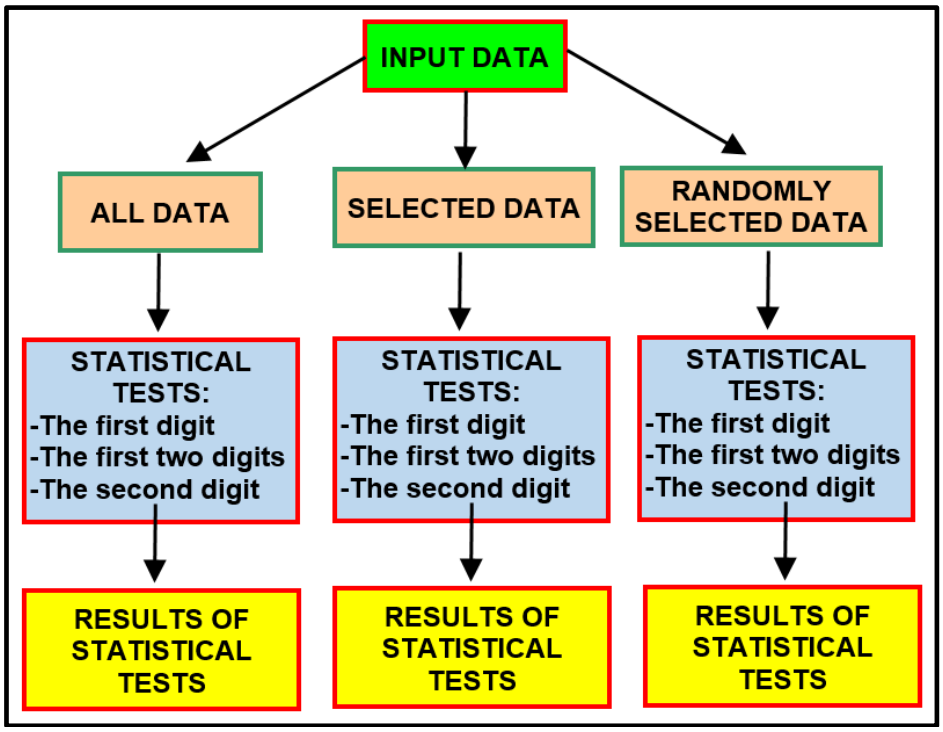
Figure 6. Cases of right and wrong decisions



Source: Own

The model has been improved to minimize bad decisions. The model uses other tools for data analysis. It was described how all entered data are analysed. There may be a problem here that falsified data is "lost" among the correct data. Therefore, the model automatically performs three analyses. The model analyses all entered data, selected data (it is possible to set which) and randomly selected data (it is possible to set their number), see Figure 7.

Figure 7. The principle of calculations in the model – tool for increasing model accuracy



Source: Own

This tool increases the reliability of the model because it eliminates situations where fake data "is hidden" in a large amount of correct data.

4. APPLICATION OF THE METHOD IN PRACTICE

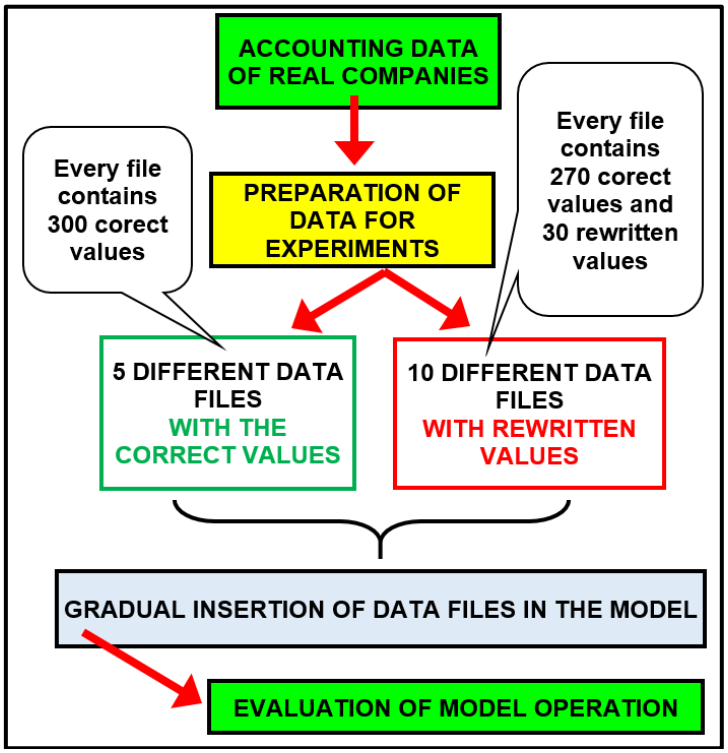
Is it possible to use a model to verify the plausibility of data? We did an experiment to verify the correctness of our model's decisions. We simulated a real situation. We took 300 values from the accounting of a real company. Data was from the balance sheet (values from assets and a liabilities). For this company, we were sure that the accounting data were not falsified. We entered the data into the model and it evaluated it as correct.

We repeated this test for the accounting data of four other companies. Data was also from balance sheets and from profit and loss account. The model again evaluated them as correct. We can state that the model works properly even if it is a small sample. The main task of the model is to solve a more difficult problem, namely, to identify that accounting data is falsified when it has been modified or rewritten.

We prepared the next phase of the test. We took this right accounting data of real companies and we produced five different data files with right accounting data. And we also produced ten different data files, which contained 300 values, but among them were 30 values that we randomly selected and rewritten. And then we took these fifteen data files and tried to insert them into our model. The aim of this experiment was to determine whether the model can identify which data files contain the correct data and which data files contain rewritten (falsified) data, see Figure 8. As described above, the model performs many different analyses and statistical tests after data entry.

When the model evaluates the data as not rewritten by the output is "OK", otherwise the output is "NOK".

Figure 8. Principle of experiments and model test



Source: Own

Indeed, the model was able to identify the data as OK in five cases out of five and NOK in six cases out of ten. In this experiment, the significance level was $\alpha = 0.05$, see Table 2.

Table 2. Results of the model in test 1: 15 data files (15 experiments) and $\alpha = 0.05$

$\alpha = 0.05$		
	NUMBER OF RESULTS OUTPUT FROM THE MODEL	
	OK	NOK
CORRECT DATA	5	0
FALSIFIED DATA	4	6

Source: Own

We repeated the whole test, but in the model we set the significance level to $\alpha = 0.10$. In one case, the model identified the correct data as incorrect at this setting. But in eight cases, the model was able to identify falsified data as NOK, see Table 3.

Table 3. Results of the model in test 2: 15 data files (15 experiments) and $\alpha = 0.10$

$\alpha = 0.10$		
	NUMBER OF RESULTS OUTPUT FROM THE MODEL	
	OK	NOK
CORRECT DATA	4	1
FALSIFIED DATA	2	8

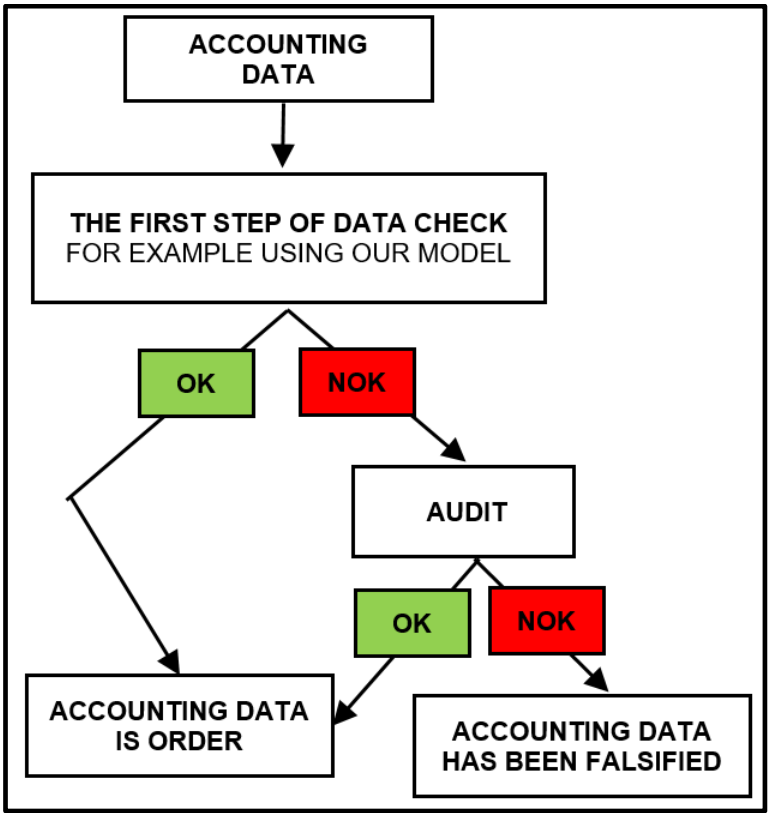
Source: Own

The test simulated the use of the model in the real identification of accounting data (or data in general) forgery. We can see that the model worked quite well in the second test. The model marked the correct

data as correct in four out of five cases. False data was contained in ten files and the model was able to mark eight of them as false. We can also see that the model works better at a higher level of significance α. Level of significance is a parameter that affects the result of a statistical test that identifies the magnitude of the difference between frequencies of real data digits and the theoretical (Benford's frequencies). The level of significance α quantifies the probability that the model will mark the correct values as falsified. In general, each statistical test is associated with the problem of rejecting the correct hypothesis and, on the other hand, with the problem of not rejecting the hypothesis, which is false. The level of significance $\alpha = 0.01$ is the optimal value to balance these two problems for us model. We must realize that the model works with calculations using statistical tests and it is never possible to completely rule out false positive and false negative results. But it is a matter of minimizing these cases.

In Table 3 we see one case of a false negative result (the model evaluated the correct data as "NOK") and two cases of a false positive result (the model evaluated the falsified data as "OK"), out of fifteen cases. We can say that when the model evaluates the data as correct, there is a high probability that data is correct. And when the model evaluates the data as forged, there is a high probability that the data is really forged. Our model and methodology using Benford's laws can work as the first step in data check (e.g. in accounting). The data evaluated as suspicious will then be verified by a thorough audit, see figure 9.

Figure 9. The possibility to verify accuracy of accounting data



Source: Own

A complete accounting audit is expensive and time consuming. This procedure saves time and money. The time factor is very important because data validation needs to be done in a short time. If an audit is performed only on a random sample, we run the risk of not detecting some accounting offenses.

The Benford's distribution describes the frequencies of the first digits of empirical data, and this distribution has another very important feature that is again used very well in accounting: When the data coincides with the Benford's distribution and we multiply them all by any constant, the new values will again coincide with the Benford's distribution. (Multiplying by any constant will not affect the test result.) In practice, this means that we can use any financial currency. For example, if we

enter values in Euros into the model and the result is that the model detects a significant difference from Benford's laws and marks the data as suspicious. The model would determine the same conclusion if the values were in Czech crowns or US dollars. This property of the Benford's distribution is well known and many times tested not only for financial data, but for example for river lengths in different units (miles, kilometres). But we cannot explain this phenomenon mathematically.

5. CONCLUSION

Falsification and alteration of accounting and financial data is a worldwide problem. This article describes the methods and tools for solving this problem. Here we describe our model, which we created using Benford's laws, data processing algorithms and statistical methods. Data is inserted into the model, and it automatically evaluates whether the data has been manipulated. We simulated a real problem and tested how the model evaluates the correct data and falsified data. The results of our experiment are recorded in tables 2 and 3. We can say that the model does not work badly. But of course, when we have data and decide whether it has not been falsified, there are several non-trivial problems. Benford's distribution is theoretical and real values always converge on it. Statistical methods must be used for compliance testing. There is always the problem of false negative and false positive results. The challenge is to minimize these cases. If the model evaluates the data as suspicious (NOK), it is not entirely certain that it is falsified. But there is a signal that such accounting needs to be verified, for example, by an audit. There is also the opposite problem, where the model cannot detect that the data is falsified. This problem can be partially eliminated by increasing the level of significance α in the model.

On the other hand, our model can well serve as the first part of the control mechanism, when it is necessary to decide which data needs to be thoroughly checked and which are in order. The model uses sophisticated statistical methods but is very simple for users because all calculations are performed automatically. The user enters the data, and the model writes the test results.

Benford's laws are interesting in that mathematicians can't explain them accurately. We know what interesting properties empirical data have, but we don't know why this is so. There are a number of documented cases around the world where the application of Benford's laws has helped to find data forgery, especially in accounting and finance (Livio, 2006, p. 210).

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BUSINESS MODELS CLASSIFICATION: A LITERATURE REVIEW

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Abstract
This paper focuses on four published Business Models classification in the literature. The literature review consists of groupings of Rappa (2004), authors from MIT (2006), Ribaudo (2016), and Budský and Dvořák (2019). Classifications are presented, examined, and discussed. Other classification approaches of previous research are then referenced and considered.

Keywords: *Business Models, Classification of Business Models, Business Models Categorization, Business Models Grouping*

1. INTRODUCTION

For a methodical study of business models, it is necessary to divide business models into groups that accentuate main differences among them. Such division is relatively problematic, as a clear definition of a business model is missing. A fragmented state of a business model definitions is due to many authors coming up with their own definitions that better suit their applications based on the nature of the measurements or researches that use them (Osterwalder, Pigneur & Tucci, 2005). Business models also tend to change over time as companies strive to stay in the market. Their strategy to do so may be determined by looking for ways to provide their customers the greatest possible value at the lowest possible cost, while creating value for its shareholders. For that, companies try to differentiate themselves from the competition and their business models. That explains inexhaustible number of innovative approaches in this field of study. The scholars try to cover these changes, too. According to the co-citation analysis of Li, Qiao & Wang (2019), the current research of business models at universities is focused on business model innovation, digital business models, value creation, e-business models, and business model design. As a result of current development, the breakdown of business models is more difficult. Initial contributions to the area of study business models have been reviewed by Lambert (2006). There is not a widely used framework for business model classification, existing frameworks might become obsolete. In this paper, the four groupings of business models used in previous publications are more deeply examined, their categorization is presented and discussed. The examined business models were chosen according to them being developed and used in the published quantitative studies focusing on business model performance (MIT's classification, William Ribaudo's classification and Patrik Budsky's and Jan Dvořák's classification), and the number of citations (Rappa, 2004). The classification from Michael Rappa (2004) is one of the most cited classifications and is the oldest one in this review.

Research of business models may improve IFRS reporting rules that, to this day, do not recognize all types of intangible assets. Even though the intangible assets are a critical cause of added value of many companies and IFRS standards improve their recognition over time, some companies are still unable to include all their intangible assets in their reporting. A systematic research of business models could enumerate the extend of such inaccuracy.

2. MICHAEL RAPPA'S CLASSIFICATION

Michael Rappa (2004) designed a classification of business models on the web. The author divided business models into nine classes. He defined categories by using comprehensive taxonomy with the customer relationship as the primary dimension.

1. Brokerage Model,
2. Advertising Model,
3. Infomediary-intermediary Model,
4. Merchant model,
5. Manufacturing Direct Model,
6. Affiliate Model,
7. Community Model,
8. Subscription Model,
9. Utility Model.

Brokerage business model connects buyers and sellers. Advertising business model is based on the principle that company sells its users to the advertisers. Infomediary-intermediary companies provide analytical services for targeting advertising and sales. Merchant business model is a retail business model based on selling products and services to customers through web, email, and other internet services. A company with manufacturing direct business model sells products directly. Affiliate business model provides links to purchase products or services. Community business model is based on creating monetizing a community. Subscription business model provides products and services for a subscription, and utility model is based on fees charged according to the actual use of the services. The author was focusing strictly on e-Business and admits himself that the classification cannot be generalized for all types of businesses. It could be useful for extension of classifications by different authors.

3. MIT'S CLASSIFICATION

Researchers from MIT (Malone et al., 2006) classified business models on two dimensions. The first dimension accentuates the type of right being sold. The authors defined the following types of business models based on the transfer of rights: producers (creators/manufacturers), distributors, lessors (landlords), and intermediaries (brokers). Manufacturers transform inputs (mostly material) into outputs, distributors buy and sell assets (goods), landlords lease their assets, and intermediaries link supply and demand in the market. Types of involved assets represent the second dimension. Authors identified the following four types of assets: tangible, intangible financial, and human. The classification recognizes following 16 types of business models based on combining the dimensions:

1. Entrepreneurs,
2. Manufacturers,
3. Inventors,
4. Human Creators,
5. Financial Traders,
6. Wholesalers/Retailers,
7. Intellectual Property (IP) Traders,
8. Human Distributors,
9. Financial Landlords,
10. Physical Landlords,
11. Intellectual Landlords,
12. Contractors,
13. Financial Brokers,
14. Physical Brokers,

15. Intellectual Property (IP) Brokers,
16. Human Resources (HR) Brokers.

The authors admit that "Human Creators" and "Human Distributors" are nowadays illegal business models and are only ancillary to the division. From the point of view of the methodology (typology), the dimensions based on the type of asset and the method of its commercialization provided a fresh take on dividing business models. This breakdown was also used in a later publication (Weill, Malone, and Apel, 2011), in which the business models "Human Creators" and "Human Distributors" have already been eliminated. The authors also divided manufacturers into "manufacturer innovators" and "manufacturer non-innovators" according to the resources they invest in research and development relative to their industry average.

4. WILLIAM RIBAUDO'S CLASSIFICATION

Ribaudo (2016) divides business models into four groups according to the principle of product creation and its commercialization. The principle of division is close to the division of authors from MIT, but it aggregates business models into only four groups. The commercialization in Ribaudo's classification replaces the type of asset involved from Malone et al. (2006) as the primary step in analysis. Unlike the MIT's authors, however, Ribaudo lags far behind in the distinguishing the type of asset. Ribaudo recognizes only four groups of business models:

1. Producer of Tangible Assets,
2. Service Providers,
3. Producers of Intangible Assets,
4. Network Orchestrators.

Manufacturers of tangible assets base their business model on the principle of "make one, sell one". The principle of the business model is that each product (or output) can be sold on the primary market only once. Companies that use this business model are, for example, Coca Cola, McDonald, Nike, or Chevron. Service providers focus their business model on the sale of time (consulting companies, banks and financial institutions or even educational institutions). Producers of intangible assets provide licenses for works protected by copyright or industrial properties (Microsoft, ARM, Adobe, or Disney, as well as pharmaceutical companies). The Network Orchestrators business model is a relatively new business model. Its essence is to link supply and demand in the market. Companies with this business model are, for example, social networks (such as Facebook), card associations (VISA, MasterCard), and gig economy and retail e-commerce companies (such as Uber).

The division is relatively rough, as vastly different companies are sorted into the same group. That is because Ribaudo does not reflect different types of monetization (Revenue Model). Google and Facebook are relatively close to each other in terms of monetization, as both companies have built their original business on selling their users to advertisers. Both companies are probably representatives of companies with the Network Orchestrators business model. The same business model characterization however shares i.e. card associations, Visa and MasterCard, whose business model is built upon commission from every transaction. Classifications omitting differences of revenue models may not to provide a valuable division of business models further research could benefit from.

5. PATRIK BUDSKY'S AND JAN DVOŘÁK'S CLASSIFICATION

In their publication, Patrik Budský and Jan Dvořák (2019) identified nine types of business models:

1. Producers of Products with Low Value Added,
2. Retailers,
3. Service Providers,
4. Infrastructure Providers,
5. Producers of Products with High Value Added,
6. Intangible Assets Producers,
7. Network Orchestrators,
8. Diversified,
9. Technology Platforms.

The authors extend upon the division of business models described by Ribaudo (2016) with more in-depth breakdown. The authors are of the opinion that there is a significant difference in the business model between a sportswear manufacturer (such as Nike) and a processor manufacturer (Intel). The result of authors' approach diminishes the aggregation of companies compared to Ribaudo by further dividing their further division. One of the examples is the division of producers of tangible assets according to their added value (more technologically demanding production and less technologically demanding production). The division of producers of tangible assets coincides in principle with the division of producers into "innovators" and "non-innovators" in Weill, Malone and Apel (2011). The separation of companies from retail and infrastructure providers is similarly close to the division of authors from the MIT. (Retail is specific in that it does not actually produce anything.) The retail business model is based on the principle of buying cheap and selling at a profit. Infrastructure providers also differ from tangible asset manufacturers. Although their business model is based on physical infrastructure, they do not sell it, but provide access to it for a fee. This is a "make one, sell many" approach, which in terms of Ribaude's breakdown is closer to producers of intangible assets. There is however one fundamental difference between the business models of infrastructure providers and producers of intangible assets that concerns the growth possibilities of product commercialization (scalability). Infrastructure providers are still limited by the capacity of physical assets. Producers of intangible assets operate on the principle of "zero marginal costs". This means that creating a new copy of the software (granting a new patent license) is associated with almost zero additional costs. There is also a category of "technology platforms" that is used by Alphabet, Microsoft, Amazon, and Apple. Their business model is built upon connecting different parts of their business into one platform, which is difficult for customers to leave. In connection with this business model, the ecosystems of individual companies are also discussed. These companies operate on the principle of a "modified network effect". Each new product should increase the value of the ecosystem. A business model of this type has another fundamental implication. Different parts of the business can subsidize less successful divisions (products) or enter new markets.

6. OTHER POSSIBLE CLASSIFICATION IN THE LITERATURE

The vast majority of other classification of business models were not in-depth explored in this paper. They are mostly focused on business models used on the modern platform like web. Other possible classifications are offered by Timmers (1998), Weill & Vitale (2001), Afuah & Tucci (2003), Johnson (2010), Osterwalder and Pigneur (2010), and Berger & Hess (2015). For more general businesses could be used Cantrell and Linder (2000), Applegate (2001), Betz (2001) and Laudon & Traver (2003).

7. DISCUSSION

The division of Rappa (2004) is the oldest one in this paper. However, the author deals with a new sector (web-based business) that was, in the last twenty years, disrupted by one radical innovation after the other. For instance, Brokerage Model is used by online retailers in massive scale. A Community Model is used in a social network type of business. However, the focus of this classification is strictly on business running on the web. The classification itself, however, cannot be applied in many cases from traditional industry sectors but can be used for an extension of a different categorization from other scholars. The classification from MIT (Malone et al., 2006) is the most logical and empirical one in this review. It is universal, too, except for its with development of tech companies, because the classification is not able to classify big tech companies appropriately. The other issue is that the classification is very detailed (as it is working with sixteen categories). Some categories may not even be recognized in the data sample when data is limited. The classification should for that be used only for empirical studies with large amount of date, where each category has at least five representatives. Ribaudo (2016) includes modern tech business in his division, but the aggregation is, according to the opinion of the author of this paper, too rough. Ribaudo recognized only four types of business models (Manufacturers, Service Providers, Intangible Assets Producers and Network Orchestrators). There is fundamental difference between manufactures non-innovators, retailers, and for instance biotech businesses that Ribaudo includes into "Producer of Tangible Assets". When this business model classification is used in empirical studies, some very interesting information and results may get lost due to rough grouping. The classification could be useful in research with limited amount of data. Each group in this case has more representatives and the authors are therefore to analyze each category. The division of Budský & Dvořák (2019) needs to be theoretically better anchored, and the individual categories need to be described in more detail. It would be appropriate to suggest subcategories as well. The business model of the "Technology Platforms" could be reclassified to an "Ecosystem Business Model", "Platforms", or a "Customer Lock Business Model". Still, the classification is universal and detailed and could be used to classify big tech companies. The detailed grouping may deteriorate the validity of limited empirical data, and as such should be used in empirical studies that are not data limited.

8. CONCLUSION

There are many classifications of business models depending on research subject of their authors. Some classifications are more universal and could be used in the research of other authors. Endless innovativeness of business models in many sectors however hinder the usability of most classifications, as there are continuous pushes on new competitive advantages. Many companies try to innovate their business models and differentiate themselves and currently published classifications of business models could become relatively soon outdated. Still, there should be a demand for universal classification of business models that will cope with the ever-changing world. If such classification were possible, it could then be used in quantitative studies in the subject of business models that would be comparable. Although it might be not possible to define such classification, the definition of a robust universal classification of business models is a possible direction of further research.

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SUMMARY AND FINAL COMMENTS

The **9th edition of the International Scientific Conference IFRS: Global Rules & Local Use – Beyond the numbers** was organized as an online event due to the unpredictable development of the situation with pandemic COVID-19.

Topics of this year´s conference covered various aspects of IFRS implementation in the context of varied national and cultural environments, as well as topics from the area of international business and the topics analysing the impact of COVID-19 on various aspects of academic life and research. Conference papers arrived from the international audience – including, Czech Republic, Slovakia, Poland, Romania, Great Britain, Greece, Ireland, Turkey, Canada and Peru.

All contributions went through the double-blind and sometimes triple-blind review process, and the proceedings are prepared for submission to Clarivate (formerly Thomson Reuters as in previous years). The proceedings from the years 2014–2020 are indexed in the core collection.

This year from the point of organization we need to highlight namely the support on the side of organisers and IT providers. Their work had a tremendous impact on the quality of the whole event because this year the conference turned to be a big challenge since we had to overcome obstacles stemming from the lack of face-to-face negotiation.

Many contributions covered very interesting and up to date and topics worth further elaboration for scientific journals. The conference is collaborating with some CEE journals which could offer some new publication opportunities after the further elaboration of the original conference contribution.

To sum up, the conference contributions provide open-minded insight into the current state of contemporary accounting and finance topics, the state of implementation of IFRS in different areas of national economies, including the current conditions of non-financial reporting to enhance better evaluation of the current situation.

This collection of conference contributions is intended to provide for the dissemination of new findings presented at the conference amongst interested parties on this issue and further inspire new research in this area.

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IFRS:
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