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Content

Global Trends in Human Resources and Finance Management in the Shared Service Centres

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Abstract

Nowadays global economies must face many challenges due to the current trends. To these we can include globalisation, digitalization and mainly pandemic. All these factors influence enterprises all over the world and accelerate in innovations. Moreover, enterprises of all size tend to implement Shared Service Centres into the business strategy. They have realized that this decision may provide numerous advantages to their business, such as increase in the competitiveness, orientation on the primary business activity and consequent overall effectiveness. Consequently, enterprises can contribute to the overall sustainable development since they are innovative. The main objective of this article is to make implications about how the mentioned paradigms increase innovative behaviour of companies and promote sustainable development. In our research we mainly used meta-analyses of the existing data from research of domestic and foreign authors, international institutions, and selected world widely significant SSCs on this topic. We focus on two impacted areas – finance and HR. The research gap and added value of this article is the new view on the business environment from wide scale of areas and the trend of globalisation accelerated with the spread of COVID – 19.

Keywords*: *shared service centres, finance, human resources

1 Introduction

Numerous enterprises aim to succeed in the competitiveness and reduce their costs, so they tend to find various ways to achieve it. One of the ways to establish this benefit is to implement the platform of shared service centres (SSCs) into the business strategy. SSCs provide various services to their subsidiaries and to other businesses globally. They are unified business units which provide selected services to businesses (national corporations/multinational corporations) with the aim of reducing costs, increasing quality, providing additional value, or increasing the competitiveness. SSCs deliver wide spectrum of services which can be divided

into several fields. The concept of SSC is beneficial for the receiving country as it is considered as a direct foreign investment to the service sector.

According to Site Selection Group, (2019) the top 3 countries where the most SSCs are located are India, Poland, and United Kingdom. As every other sector of industry, the area of services has also been influenced by Industry 4.0 followed by digitalization. The consequence of this state is the implementation of innovations into the business models of companies. Current trends tend to contribute to the sustainable development in many ways which will be discussed in this article. As the early 2020, the COVID-19 pandemics stroke the whole world and so called New Normal has been established. Our article concerns the topic of how pandemic impacts companies which uses SSCs. The digitalization platform and its presence has been accelerated by the pandemic's regulations and new ways of functioning. We focus on the changes brought by both pandemic and digitalization in the tree main areas of SSCs which are finance and HRM.

2 Methodology

The aim of the paper is to analyse tree main functional areas of SSCs using scientific methods. Partial aims are to evaluate and compare current views and opinions of foreign authors on how the pandemic and Industry 4.0 platform have impacted these fields. Moreover, to compare these fields from the point of view of how they have changed considering these two paradigms. The primary method of this paper was data collection of theoretical background. This data was basically collected from researchers who are professionals in the area of SSCs and whose articles are published in registered databases Web of Science and SCOPUS. Furthermore, the official statements of shared services centres and international organizations. In this paper we use deduction. This means that from general information that pandemic influence all aspects of society we move to specific examples of how pandemic impacted selected areas of SSCs. In the current state we focus on definitions of the researched functional areas and in the results of the paper we mention the digitalization and pandemic and its influence. In the first section of the article, we use meta-analyses. Moreover, we compare how these areas are influenced variously. In the results we used the synthesis method to conclude similarities and differences of the researched phenomenon.

3 Results and discussion

The pandemic affected all areas of society. Some in the positive way and others in the negative way. In the following text, we present the effects of the pandemic and the resulting digitalization on 3 functional areas of the company: finance and human resources.

3.1 Trends in finance

Today, information technology is constantly evolving and innovating. Along with the development of the Internet, a large amount of available data also comes to the fore - so-called Big Data. Based on this fact, there is also a constant advancement and improvement of business services in the field of financial sharing, which are closely integrated with big data. Big data is a new tool that can be used effectively, for example, in a group financial audit, which can be considered as one of the ways to support business development (Hong, J., Wang, Z., 2021). The SSC that provides this (or other) type of financial service is another component within the companies that use the SSC.

The era of the Internet and the resulting big data, sharing, or other current trends have a major impact on corporate finance. All these technologies can benefit both companies and consumers by providing better access to financial services, offering a wider choice, and increasing operational efficiency. They can also contribute to removing national barriers and stimulating competition in areas such as: online banking, online payments and transfers, peer-to-peer loans, personal investment advice and services.

In addition to the growing phenomenon of big data and sharing, due to digitalization, investment in research and development in all areas of the company is also gaining prominence. In the case of corporate finance, there is an investment in research and the resulting development of various software that companies implement in this field. They are thus trying to streamline activities in this area. This category includes, for example, financial planning and management software. The software is often built into larger ERP (Enterprise Resource Planning) solutions.

An ERP system is an in-house software information system used to manage and coordinate all resources, workplaces, and business functions through shared data repositories. ERP systems are focused within finance on accounting, invoicing but also other parts within the company such as production, logistics, distribution, inventory. They often have an impact on other areas of business activities, which may include the areas of business mentioned below, such as finance and HR. In practice, many different ERP systems can be encountered. According to a survey by the ERP solution review company, the best in 2021 included: Accounting Seed, Acumatica, Adeaca, FinancialForce, IFS, Multiview Financial Software, NetSuite, Oracle, Ramco, SAP.

The ERP system represents an opportunity to simplify, speed up and thus increase the efficiency of financial activities in companies. In this way, certain processes in the companies that use the software are standardized. SSCs that specialize in selected software within the ERP system can

benefit from this standardization. Finance SSCs based on the ERP system are the latest form of management in the modern corporate financial management. The global pandemic has triggered a rapid increase in the digitization of SSCs to strengthen business operations and company value resulting from the gradual development of multinational corporations (Yao, 2018). Digitization has been greatly accelerated by the pandemic, the impact of which on finance is analysed later in this article.

Like all areas of the society, finance has not escaped the effects of the pandemic and the resulting changes. New challenges and opportunities are rapidly transforming financial services. The company's finance departments need to address common and lesser-expected situations while orienting themselves in a changing risk and regulatory environment. Organizations look to a future that is more interconnected, more collaborative**,** and frictionless - one in which trust, growth**,** and value delivery are paramount (KPMG**,** 2020)**.**

Good cash flow management is essential, especially during a crisis such as the COVID-19 pandemic. There are several business indicators that point to a lack of working capital. Many companies are currently facing this problem. As a result, there are other problems: the inability to pay bills at all, the inability to have the required stock, the material is purchased by the company only after receiving the order from the customer, resulting in further delivery delays and, last but not least, short-term cash in the form of cash. customers to finance the production of goods (Brag, 2015).

As in other parts of the company, there have been several fundamental changes in the finances and the companies have proposed new solutions for the future.

According to KPMG, the first fundamental change in 2020 was the change in the organization of work of employees working in financial services. In addition, however, they set the following priorities:

- increasing productivity and improving technology,
- reconnecting with customers (customer expectations and needs have changed)
- creating new partnerships (financial services companies communicate with non-traditional partners to create new value for customers)
- implementing social responsibility into the company's strategy
- improving risk management and agility (better preparedness for unexpected changes and risks in the future).

According to PWC, 2021, an increase in investments in innovation can also be expected., Many companies had already been undergoing a digital transformation before the outbreak of the

pandemic, and the crisis only speed up this process and increase the amount of investment in this area. In addition, however, they anticipate that companies with sufficient capital will consider acquisitions, partnerships, or joint ventures. Their basic goal will be to generate new income and expand their activities.

The ACCS GROUP considers the introduction of work from it (work from home introduced as a solution to a pandemic situation in the finance departments) to be a situation requiring a further series of changes. In addition to the introduction of telework as a new norm, this trend requires further changes in the finance departments. One is the move to cloud technology, which offers much more flexibility and data availability for finance members. In addition to human work in the field of corporate finance, they realized the importance of automation, which will prevent inefficiencies in finance and situations such as pandemics, or other barriers to work will not be so affected by this department in the future.

As we stated in the first part of the article, SSCs allow companies to focus on reducing financial costs and optimizing working capital in today's uncertain environment. In financial SSCs (as well as other SSCs) and because of the pandemic, which reveals gaps in existing SSC support models, organizations face the urgent need to accelerate their digitization plans to strengthen financial operations and ensure business continuity (JP Morgan, 2021).

3.2 Trends in HR

Nowadays one of the key values of a company in each industry is digitalization. Digital technologies have significant effect on how organizations create and deliver value to the customer. Besides that, companies must create and transform original business models by integrating technology to their internal organization, administration, processes, and strategies. Digitalization of these models started to accelerate by the outbreak of the COVID-19 pandemics. In the HR field digitalization means introducing the digital discipline to all processes and systems and reaching an operational effectivity and cost optimalization through the introduction of digital tools (Minbaeva, 2013).

New concept of HR includes modern technologies and includes the following elements:

- social media and software for recruitment (LinkedIn, Facebook...),
- social interactions with multimedia,
- trainings (video, audio, courses, presentations) from digital sources,
- using AI and big data in talent management,
- mobile applications as a main HR tool,

- active participation of HR managers on all business activities,
- customer orientation,
- real time decision-making,
- data protection,
- online job interviews (MS Teams, Zoom, Skype, Google Meet).

Due to the pandemic and related regulations, businesses transform their operation to online way or hybrid model which combines work from home and from the office. An important part of HR is acquiring quality and qualified workforce and therefore it is appropriate that the companies implement digital platform in order to keep the social distance. For these reasons, the model of HRM has changed over time. Besides the mentioned activities and organizational changes, the competencies of managers in the HR field are naturally changing considering the digital platform implementation. In the table below we compare the current and digital HR model.

Table 1

Comparison of current HR model and digital HR

Current HR model	Digital HR
HR fucuses on the process of designing and harmonizing the standard HR processes	HR focuses on optimizing employee productivity, engagement, teamwork
Traditional methods of HR	HR innovations such as applications and software
Paper documentation	Digital platform of documentation
Partial flexibility	Full mobility and flexibility
Process orientation, improving the processes	Using new digital technologies
HR SSCs are focused on self-provided service	HR SSCs are focused on employee support
Periodical report	Real time reports
Analytical HR platforms	Integrated HR platforms

Source: processed by authors

Pandemic regulations established in March 2020 have influenced the way of work of employees and managers. Organization ILO accents on the fact that there is a new important role of managers which is checking the subordinates in the context of working hours. I tis important to realise that the job performance is rapidly changing while working from home. Significant role of manager is to ensure that all employees finished their job correctly and that their mental health is working well. New part of managing people is respecting that their private life has changed under the influence of pandemic, and they should give them the value of flexibility.

The responsibility of each business is to provide their employees with the necessary technology and IT support for the work to be done in an appropriate way even though it is done from home. When we look at the new practices from the HR point, we can mention online interviews, recruitment, e-learning, online meeting etc. (ILO, 2021).

The COVID-19 pandemic brought changes on all levels of companies like economic changes, changes in the people behaviour and on the level of the whole organization. These changes are personnel safety, unemployment, Home Office, change in the motivation of employees, lowered salary. Moreover, disrupted work organization and absence of employees due to quarantine or suffering from the COVID-19 virus, stress, adjustment of laws, policies, procedures. Furthermore, the need of training employees who need new skills, complexity in the technology and digitalization integration, low job independency and job insecurity, and increased work hours because of absent colleagues.

Pandemics accelerate challenges for people management and the human resources are needed for an effective operation of the whole organization. It is recommended to use creative methods of talent management for the aim of making sure the company will survive. Talent management plays significant role in defining competencies, motivation employees and talent retention. HR functions are key factor in combining talent management methods.

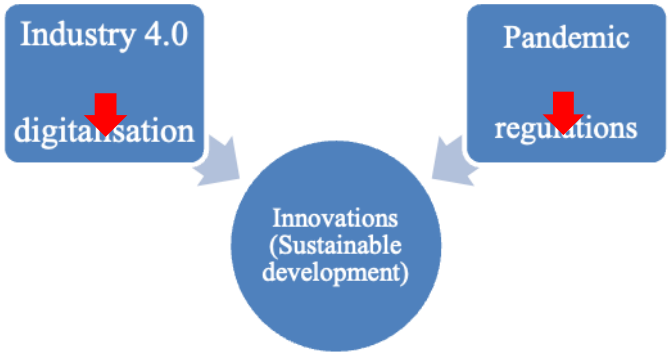
New trends are virtual communication with employees, creating benefits for supporting Home Office, supporting mental and physical health, improving training of employees in the given conditions. Currently, it is important to implement various strategies such as flexibility, work performance, job satisfaction, organizational performance, professional growth and development of social and work relations, motivation, and IT culture (Azizi et al., 2021).

3.3 Discussion

The concept Industry 4.0 causes changes worldwide and results in digitalisation. This trend comes along with regulations as the consequence of COVID-19 pandemic which started in early 2020 and accelerated the original conditions. Both phenomena contribute to the innovations which are part of UN sustainable development goals 2020-2030 (UNDP, 2020). The scheme illustrates the mentioned mutual interrelations between all elements.

Figure 1

Interrelations of examined phenomena

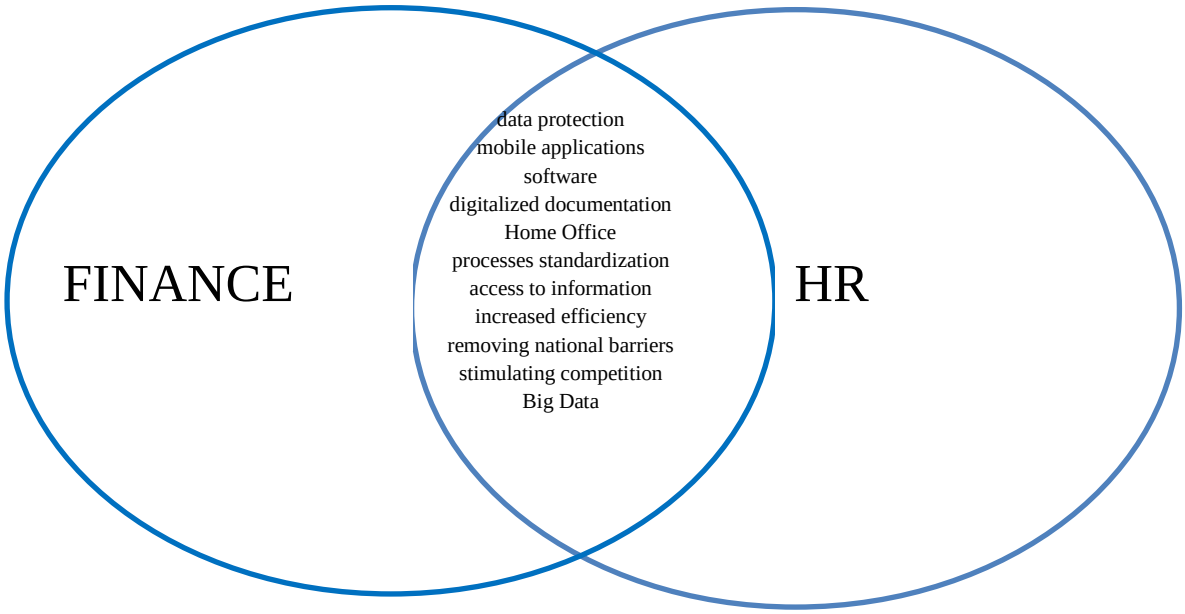


Source: processed by authors

Whereas we focus on HR and finance department of SSCs the result of our examination is the conjunction of innovations in both areas. To clarify the similarities in the transformation process we illustrated the same characteristics in the following diagram. Digitalisation and pandemic have transformed both fields significantly and lead to business innovations.

Figure 2

Conjunction of the digitalisation and pandemic changes in HR and finance



Source: processed by authors

4 Conclusion

SSCs and their related advantages are used by many businesses all over the world. Companies has had to implement new strategies to their procedures and consolidation when they decided

to implement this form of selected companies‘ services operation. That is just the beginning of the business transformation process. Companies must stay focused on constantly changing business environment and innovations, accept the changes and ideally use them for their advantage at the most efficient level. All the functional areas of business are affected by these changes. In relation to the stated challenges, all fields are influenced but the measure of change varies according to individual conditions.

One of the changes is the phenomenon of the current state – the digitalisation of business processes. In this article we focus on the impact of digitalisation on selected areas of business – finance and human resources management. Besides digitalisation, nowadays a very discussed topic is the global COVID-19 pandemic. Resulting from the article, the pandemic strengthened the ongoing digitalisation trend of business processes and companies have been forced to establish, respectively fasten the digitalization in all examined areas. As we mentioned in the last part of the article, innovations are one of the goals of sustainable development.

The differences in individual functional areas are apparent and it was possible to expect also slight differences in these fields based on the digitalisation and pandemic influence. In this article we focused on defining common and similar character of changes which became present under the examined trends.

These phenomena affected all two examined functional areas of business, and the most common similar changes are Home Office, establishment of new software, documentation digitalization, Big Data, standardized processes implementation and legislative changes.

Concluding the stated data about digitalization contribution from the previous chapters, we can refer to productivity optimization (employees, companies’ processes, data collection), flexibility, connectivity, and overall integration of business processes. The global pandemic introduced new changes in the digitalisation field and accelerated those existing.

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Corporate Sustainability in the Context of the 2021 United Nations Climate Change Conference

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Abstract

The paper emphases the results of research on estimation of corporate sustainability of Ukrainian business that are directly related to targets of the Glasgow Climate Pact 2021. The data were collected with a cross-sectional random sampling of industrial enterprises in Ukraine. The variety of research methods (e.g. abstract-logical method; economic and statistical methods; survey, method of expert assessments; correlation-regression, graphical methods) allowed to propose the adopted methodology for estimation of corporate sustainability. Integrated sustainability index was found to define the level of corporate sustainability as well as a direction for company further development. The research results offer practical implementation for firms' sustainable development strategy as far as they are operating with strategic gaps and sustainability values while maintaining high market performance.

Keywords: *sustainable development, corporate sustainability, business sustainability, Glasgow Climate Pact 2021, integrated sustainability index*

1 Introduction

The 2021 United Nations Climate Change Conference united in Glasgow world leaders and national delegates from nearly 200 countries in their intention to stave off the dangerous climate changes. The negotiated Glasgow Climate Pact has a number of challenging targets, such as reductions in global greenhouse gas emissions, phase-down use of unabated coal power and phase-out of inefficient fossil fuel subsides, forest conservation, financial help for climate change mitigation and other. The leading industrial corporate sector is expected to forward to zero emission. Ukrainian president Volodymir Zeleskiy in his speech mentioned besides the climate changes other global and regional challenges related to the energy crisis and the security situation in Europe, particularly in eastern Ukraine. And the further situation development showed that they were interconnected.

Different authors note multidisciplinary features of corporate sustainability and variety of its effects. So, i.e. a study of J. Ukko et al. (2022) showed its positive influences on the market performance of the company and future company value; their results of their study correspond to conclusions of R. Lozano et al (2021) concerning interconnection between development of e-businesses and supplier collaboration on sustainability in the e-business context. Many authors highlight contribution of corporate sustainability into energy transition (Patala, Juntunen, Lundan & Ritvala 2021), corporate and regional energy efficiency (Fowlie, Greenstone & Wolfram 2018), and to reduction of consumption-based CO2 emissions (Baloch & Danish 2022) in different countries and regions. Our

previous research demonstrated a positive impact of sustainable energy consumption on energy intensity (Degtiareva & Pudycheva 2020). For this reason, the Outcomes of the Glasgow Climate Change Conference (2021) refer to corporate sustainability as an essential way to confront the climate change and its consequences.

There are different approaches how to reach the corporate or business sustainability. On the one hand, J.S. Shapiro (2021) considers that the state legal regulation is an effective instrument of sustainable development on macro and micro level. Thus, global externalities, related to the climate change, affect foreign and domestic companies. That's why the taxation is considered as an effective tool to extend to the class of local externalities, e.g. non-cooperative Pigouvian tax. On the other hand, M.A. Baloch and I.G. Danish (2022) note that modern society becomes more responsive to international debates and motivated to promote sustainable development targets to mitigate environmental pollution and to increase the corporate social responsibility. This statement can be expended by study of P. Sun et al. (2021) in context of social and environmental context of business competition. Thus, the corporate sustainability becomes a necessary requirement for the functioning of modern businesses especially of big ones.

Hence, in context of achievements and limitations of the Glasgow Climate Change Conference literature represents an important avenue for advancing the research for corporate sustainability. To this end we integrated the fragmented corporate sustainability research into hierarchical system of interrelated components (Degtiareva & Teleshevska 2012) and suggested a four-factor model for sustainable development of enterprises (Teleshevska 2015).

2 Method

2.1. Theoretical Background

In today's business environment, society's expectations of business are increasing, and stakeholders are asking companies to become more mindful in their sustainability interests (Pinelli & Maiolini 2017). Many authors highlight that companies are responding to these expectations and they build up the corporate or business sustainability model in frameworks of sustainable development paradigm (Ashrafi, Acciaro, Walker, Magnan & Adams 2019). M. Pinelli, R. Maiolini (2017) as well as P. Bansal and M. R. DesJardine (2014) prove that neither corporate nor business sustainability is not the same as the corporate social responsibility. In the same time there was found not big difference between business and corporate sustainability in the theory and practice. That's why in this paper we will consider them as similar categories.

T. Dyllick and K. Muff (2016) differ certain stages on the way from business-as-usual to true sustainability: business sustainability 1.0 (Refined Shareholder Value Management), 2.0 (Managing for the Triple Bottom Line) and finally 3.0 (True Sustainability). On this point there is discussion what should be considered as a true sustainability?

The global goals of sustainable development are represented by the conservation of environmental resources, the eradication of poverty and economic injustice, are compatible and complementary. Production is directly related to the consumption of significant natural, material and energy resources, and hence - depletion, pollution of the biosphere by emissions and waste, as well as damage to ecosystems. Most environmental issues are related to ownership issues. Many natural resources cannot be privately owned (Earth's atmosphere, waterways, landscapes, sound or electromagnetic spectra) or collectively owned (oil deposits, fishing zones). These are resources that are open and free. The main cause of environmental problems is the inability of the market system in the existing structure to effectively allocate environmental resources, i.e. to give a "correct" monetary assessment of the destructive nature of their use.

Upon reaching a certain level of sustainability, the company "slowing down", revives the environment, i.e. uses more modernized equipment, machinery, new technological processes. This process of "revival" of nature must be implemented on a subconscious level. This negative manifestation appeared because of poor planning from the beginning. The managements of the enterprises made multiple mistakes - first deteriorating the environmental situation, and then trying to restore it, which will require even more investments. Business leaders in linking production activities should link two processes: reduction or some stabilization of natural resources, pollution, on the one hand, and growth of economic indicators (production and marketing) through improved technologies, low-waste and resource-saving production, use of secondary waste - on the other.

Both of these areas involve a radical restructuring of the enterprise in favour of nature conservation and ecological system social system economic system Stimulation and growth Stimulation and growth conservation science-intensive activities, as well as for the benefit of mankind. If we do not immediately eliminate such a detrimental attitude towards the environment, it can result in total collapse after some temporary profits.

It should also be noted that society needs to pay more attention to the management of environmental education and environmental education of young people and remember that environmental resources are not limitless. We need to appreciate and protect the environment, cover management issues in the media, publish articles in journals, develop new approaches to the interaction of man and nature. Management of environmental education should be non-linear, flexible, open, stimulating. Everyone should realize that the most important thing is to preserve human health, that pollution of the environment with toxic substances, lack of raw materials is a problem of humanity.

In context of the Glasgow Climate Pact companies should pay attention not only to their or corporate sustainability, but also to cooperation across sectors in order to effectively confront climate change and adjust transition. It provides specific actions to improve coherence and focus on ocean and land protection, and to encourage local, national and cross-sectoral partnerships. As part of the United

Nations Special Envoys for Climate Change Action "Towards Zero" campaign, nearly 8,000 non-state actors, including 1,049 cities, 5,235 companies, 441 financial institutions, 1,039 educational institutions and 52 healthcare organizations, have pledged to halve emissions by 2030. In addition, the Under2 coalition, whose membership accounts for 50% of the economy and 1.75 billion people committed to keeping global temperature increases below 2°C, updated membership criteria at COP26 in line with the 1.5°C target. C. Seventy of its members have already updated their commitments to achieve net zero emissions by 2050, and work is underway to ensure that the rest of the members follow suit.

2.2 Methodology

The methodological challenge that refers to the estimation of the corporate sustainability is based on the fact that every company may have its own sustainability goals. That's why there are many approaches how to measure its level or estimate the company's progress in achieving individual level of sustainability (Süß, Höse & Götze 2021). This variety of methods complicates the formation of the standardized measurement system (incl. indexes and indicators) and choosing an effective method for quantitative and qualitative evaluation as individual business so comparison of different companies, the success of their sustainability-oriented business models.

While analyzing methods for assessing the corporate sustainability in EU and in Ukraine we found out essential differences, first of all in scope of assessment. Thus, we suggest following classification of existing methods for assessing the corporate sustainability:

- methods based on the application of the theory of stability of systems, interpret the mathematical indicators of stability, designed to take into account the impact of external and internal environments;
- techniques based on the principles of the systems approach, which determine the integrated indicator of stability, unifying, which allows to evaluate different subsystems;
- methods based on the analysis of financial statements of enterprises, assess the structure of assets and capital;
- complex methods, combining quantitative and qualitative economic indicators, allow to identify factors that threaten the stability of the system.

In our theoretical model we suggest an algorithm that allows, on the one hand, estimating the corporate sustainability level and, on the other hand, progress in achieving of sustainable development goals as part of the UN Special Envoys for Climate Action's Towards Zero campaign. The metrics has been developed that, for the first time, enables cities, regions, companies and investors to measure their progress towards building climate resilience for 4 billion people most at risk by 2030. As part of the Windows on Resilience program, more than 7,000 people attended the Climate Resilience

Center at COP26, providing an opportunity to amplify the voices of people on the front lines of the fight against climate change and to discuss common challenges and solutions.

3 Results

3.1 Theoretical model

The theoretical model covers the complex analysis of following components of corporate sustainability: financial performance, efficiency as well as environmental, social and legal factors. It is based on the previous research while developing the author's approach to assessing the sustainable development of the enterprise on the basis of a four-factor model: economic factor, social factor, environmental factor, and legal factor (Teleshevskaya 2015).

As mentioned before, formulation of company's goals is an important stage on the way for corporate sustainability. Companies develop own goals, which can be classified as fundamental and auxiliary goals. The important requirement is that the goals are interrelated and non-contradictory and aimed at one end result, thus to achieve a high state of sustainable development by the industrial enterprise. The theoretical model includes an approximate set of the goals. The fundamental goal of the enterprise should be formed as follows: it is conditionally endless operation of the enterprise and its progressive development with high economic performance, normal social status of employees and a stable environmental situation. Guaranteeing goals that ensure sustainable development have two directions: 1). maintaining the existing stability of the enterprise (its indicators) and preventing the deterioration of the situation, which allows organizations to exist in the future, i.e. preventing the deterioration of the environmental situation, maintaining a stable level of economic and social systems; 2). rational use of resources owned and used by the enterprise to maintain economic, environmental and social sustainability of enterprises. Contributing goals, i.e. goals that will allow the company to maintain such a special state as sustainable development and will create an obstacle to the transition of the economic system into a state of instability. Contributing goals include creating conditions in which employees can and should exist. They support the vital parameters of society, being its components. Also conduct to the promotion of environmentally friendly products to meet consumer needs. The last, and no less important, component of this goal is the resumption of ecologically, economically and socially conditioned transformation of the system of sustainable development of the enterprise. This is an important task that the head of the companies must take on. The realization of ancillary goals is the key to the success of the enterprise, which is achieved through conservation, i.e. preservation of nature, minimizing the negative impact of enterprises on the environment, as well as limiting the limit of human intervention in nature. The latter is achieved through the development and compliance with environmental standards, standardization of living and working conditions. But this is only one part of the problem. The other is related to the restructuring of human's technological basis. The fact is that if humanity continues to inefficiently use existing

resources, as is happening now, no environmental standards and restrictions will save ecosystems from harmful human-made impacts. The technological systems used by the enterprise must be improved so that their eco-destructiveness decreases as the population grows, the number of enterprises and products increases. In other words, there must be a constant "movement forward" - improving the efficiency of the socio-ecological and economic system.

The fundamental goal is the conditionally continuous functioning of the enterprise and its progressive development with high economic indicators, the normal social status of its employees and a stable environmental situation.

Guaranteed goals:

- maintaining the existing stability of the enterprise (indicators) and preventing the deterioration of the situation, which will allow the organization to operate in future;
- rational use of resources owned and used by the enterprise to maintain economic, environmental and social sustainability.

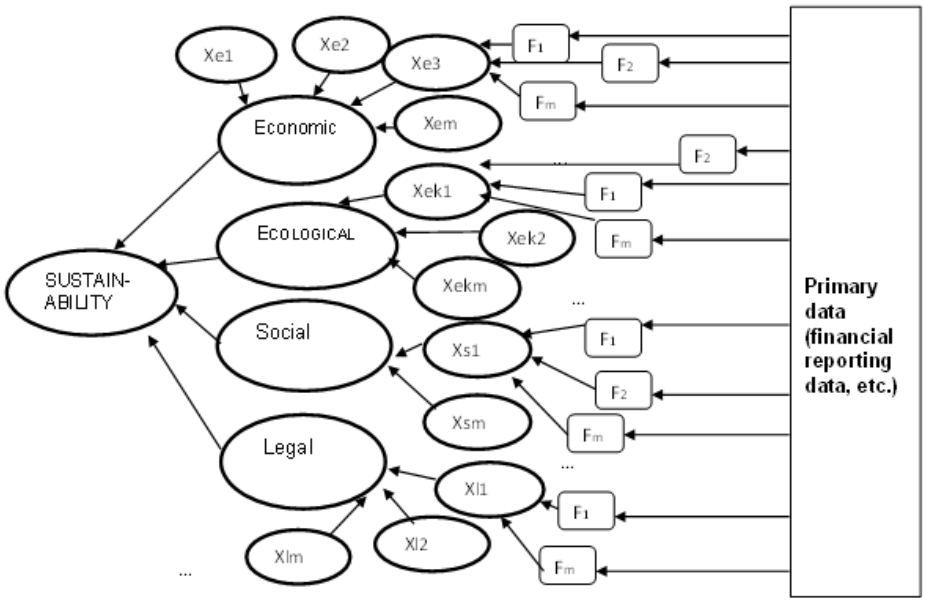
Contributing goals:

- resumption by the heads of the enterprises of the conditions in which employees must work;
- production of environmentally friendly products to meet consumer preferences;
- resumption of ecologically-economically-socially conditioned transformation of the system of sustainable development of the enterprise.

To develop a methodology for assessing the sustainable development of industrial enterprises developed the following algorithm (Fig. 1), which is based on a comprehensive system approach to research, which allows to present sustainable development of industrial enterprises as a multicomponent phenomenon in the form of sustainable development factors.

Figure 1

The scheme of interaction of hierarchical levels of the structure of the concept of sustainable development of the enterprise



Level 1 of the hierarchy	Level 2 of the hierarchy	Level 3 of the hierarchy	Level 4 of the hierarchy	Level 5 of the hierarchy
sustainable development index	factors	group indicators	coefficients/ primary factors	initial data

Economic and social systems seek development, growth, striving for the top, which is understandable, because the purpose of any enterprise is to make a profit, which in turn raises the social level. The ecological system must be fixed at a sustainable level, on the one hand the system seems to "stretch" to the bottom, oppose the other two systems, fighting for its place at the top of the pyramid, and on the other hand, continues its natural development. Obviously, the pyramid begins with the economic system: the economy is the basis, the basis of enterprise development. The top of the pyramid is the ecological system - if the functioning of the enterprise itself will cause harm to nature so in this way it can affect humanity. It is senseless to develop such organizations if that will cause irreparable harm to humanity.

Given the current situation in the country, namely fierce competition between producers, due primarily to the instability of the external environment, including inflation, rising unemployment, difficult political circumstances, lack of payment ability of the population, the future vector depends on the right vector. The activity of any organization is manifested in constant development, activity, discovery of something new and new opportunities, opening of existing potential, which allows increasing its income.

Properly chosen vector of the company's development is an integral part of its organization, which can ensure the viability of the organization, and this can only contribute to a comprehensive and in-depth assessment of sustainable development of the enterprise, which will identify vulnerabilities and develop a set of measures to overcome negative consequences of developed sectors of the structure.

3.2 Practical implementation of the model

The procedure for calculating the integrated sustainable development index has five levels of hierarchy. The weights of the indices were obtained using the method of expert estimates. The final formula for calculating the sustainable development index for the bakery industry is:

$$I_{yp} = 0{,}36 \times F_{ec} + 0{,}23 \times F_{cc} + 0{,}19 \times F_{ек} + 0{,}22 \times F_{n} \quad (1),$$

I_{yp} – index of sustainable development,

F_{ec} - index of economic stability,

F_{c} - index of social stability,

$F_{ек}$ - index of environmental sustainability,

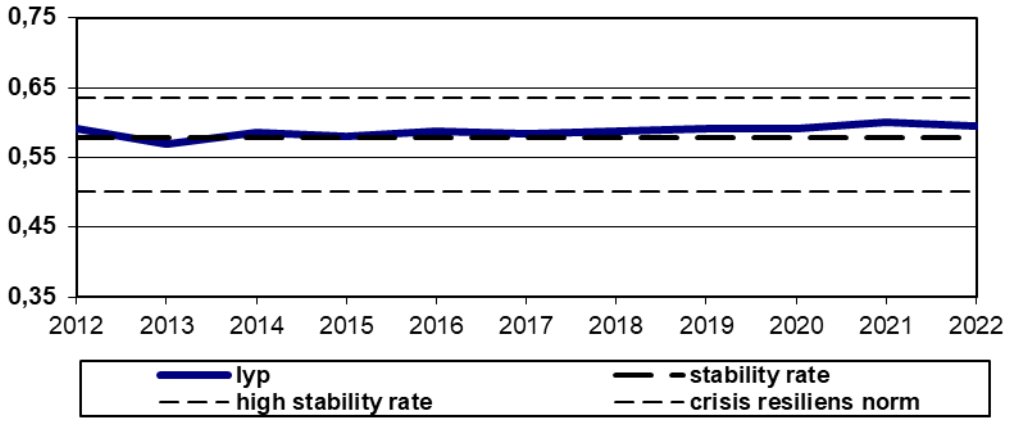
$F_{пу}$ - index of legal stability.

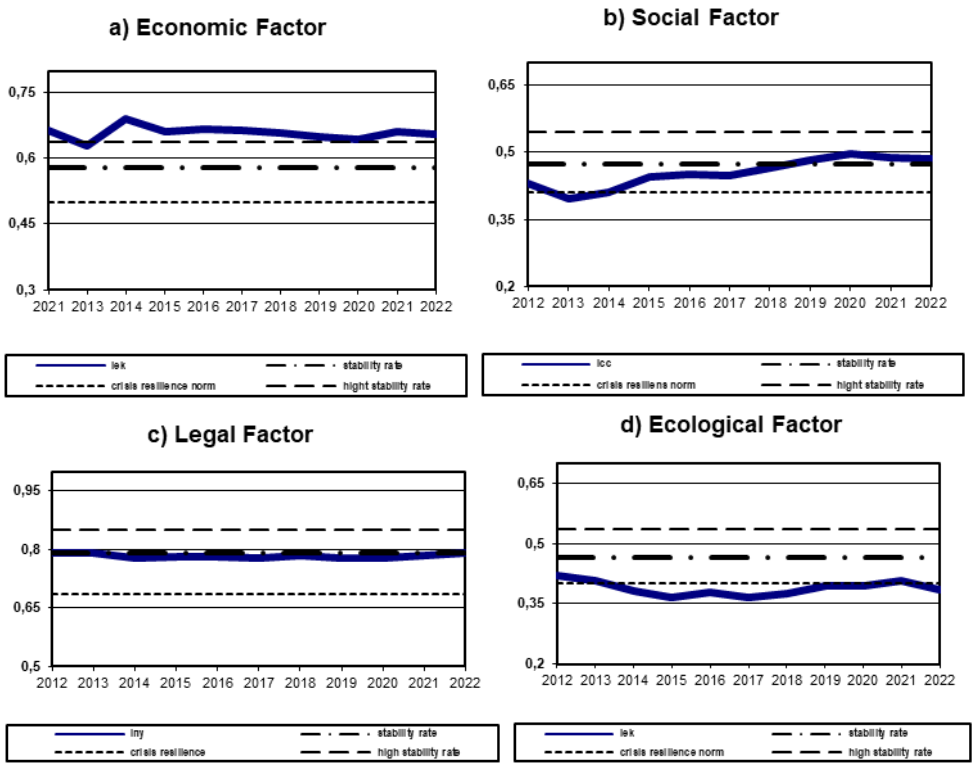
Thus, at the first stage, the primary data is processed, the coefficients are formed using the appropriate formulas, and then the normalization of these coefficients is carried out. In the second stage, using the normalized coefficients, we calculate the weights of the coefficients, and only then we obtain group indicators. The third stage is calculated by analogy with the previous one. At the fourth stage, having received the factors of sustainable development, using weight factors, we find the integrated index of sustainable development.

This method was tested for the enterprises of the baking industry of Ukraine. For example, we present the results of the assessment of the level of sustainable development for one of the sample enterprises. Novovolynsk Bakery located in Volyn Oblast in Ukraine and it is characterized by a small run-up in the sustainable development index over the years under study. Thus, the mean deviation D = 0.006.

Figure 2

Rating of PJSC "Novovolynsky bakery" of the Volyn region. according to the level of the sustainable development index 2012-2022





Novovolinsk bakery is the most stable enterprise in terms of sustainable development comparing to other Ukrainian bakeries which were investigated in the same period of time. That at the beginning and at the end of the reviewing period the values of sustainable development index were slightly above the norm. There was even a slight increase of sustainable development index.

Therefore, the economic factor was in the zone of high sustainable development, and its fluctuations in one direction or another were insignificant. The company had a stable profit, a stable increase of capital, a stable high paying capacity. Thus, the economic component of the enterprise was developed quite strongly.

The environmental factor of the enterprise also has small fluctuations, but its values are on the verge of transition from instable to crisis, as the company's activities are accompanied by high expenses of resource conservation, low product quality and low environmental culture.

The value of the legal factor can be characterized as deviating from the normalized value because of small administrative fines.

The social factor of the enterprise grew throughout the study and moved from the zone of unsustainable development to the zone of sustainable development. There was an increase in social activities, improving the level of skills and stability of the personnel system.

In general, high value of the economic factor is compensated by low value of the environmental factor, so that is neutralizing the growth of the social factor, however as a result we are getting stable values for the relevant characteristics of the enterprise.

Thus, the proposed method of estimating the integrated index of sustainable development has a

number of significant advantages, comparing to existing methods. The methodology developed by us to normalize the values of the coefficients uses an individual approach to the normalization of each coefficient depending on its calculation formula, which completely eliminates the defects of normalization.

Discussions

The transition to sustainable development is a strategically important direction and with the right approach is an extremely effective means of achieving the goal of humanity: economic development while maintaining the environmental situation and a decent social status. Thus, the sustainable development goals are their figurative motivation for action that comes from all countries - poor, rich, middle-developed. The role of policy makers is to combine economic growth with educational and social protection, climate change, environmental protection, and energy sustainability.

The functioning of the enterprise can be compared with the vital activity of a living organism: proper care and attention will lead to its healthy and normal development. Some aspects, traits belonging to the organism should be developed, and some, on the contrary, should be kept at a certain level. Thus, the paper analyzes the existing methods of assessing the corporate sustainability level, identifies their advantages and disadvantages. On the base of the sustainability criteria we developed the adopted methodology for estimation of the corporate sustainability level and corresponding integrated sustainability index. The special feature of the proposed methodological approach is a four-factor model, which represents the corporate sustainability as a multicomponent phenomenon in the form of a set of factors and corresponding indicators to shape them.

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Determinants of agricultural SMEs´ development within clusters

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Abstract

Small and medium-sized enterprises are at a great disadvantage compared to large companies, they are not able to take advantage of, for example, economies of scale, they do not have sufficient capacity and resources for research, training of their employees, obtaining information, etc. Therefore, participating in such innovation clusters helps them survive and prosper for a long time. In essence, the cluster helps to increase specialization, encouraging governments to invest in the industry and the region at the same time. This, of course, has such a positive effect as regional development. For appropriate cluster identification, we have opportunity to use various methods, quantitative and qualitative, too. We have mainly focused on quantitative methods with the perspective to directly determinate achieved outcomes. Our objective in this this paper was to find possibilities of cluster creation and their identification in the area Slovak eight regions. With this aim we have used Location Quotient. Statistical data has been provided from statistic database and they were compared then with the real clusters operating in selected 8 regions within area of Slovakia. Identification of the economic opportunities of tourism clusters creation in individual regions is the precondition of the originality of this paper as the starting point for formation of clusters and cluster initiatives within the regions of Slovakia.

Keywords: *Small and medium businesses, agricultural production, clusters, sustainability*

1 Introduction

Clustering has several advantages for companies, including reducing their business constraints, which depend on their size. Clusters are usually perceived as an extremely important regional economic factor that supports the inflow of foreign direct investment, creates an environment conducive to innovation and knowledge creation (for this reason, regions with strong clusters are considered to be innovation leaders). Clustering can be called a merger of previously legally and economically independent enterprises into larger economic units, usually within a region, without having to remove the legal autonomy of such enterprises.

Michael Porter is the first to introduce the concept of cluster in The Competitive Advantage of Nations (1990). However, historically as early as 1890, Alfred Marshall was the first person to

characterize the geography of economic activity and cluster analysis in his publication: Principles of Economics (1920, revised edition). The term cluster and its theoretical definition can be further found in the works of economists such as Perroux (1950), Hirschman (1958), Jacobs (1961) and Krugman (1991), (Breschi and Malerba, 2006).

2 Methods

For appropriate cluster identification, we have opportunity to use various methods, quantitative and qualitative, too. We have mainly focused on quantitative methods with the perspective to directly determinate achieved outcomes. Our objective in this this paper was to find possibilities of cluster creation and their identification in the area Slovak eight regions. With this aim were have used Location Quotient. Statistical data has been provided from statistic database and they were compared then with the real clusters operating in selected 8 regions within area of Slovakia. Identification of the economic opportunities of tourism clusters creation in individual regions is the precondition of the originality of this paper as the starting point for formation of clusters and cluster initiatives within the regions of Slovakia.

3 Results

The development of agricultural as well as other types of clusters can be seen in all corners of the world, including Europe. The concept of clusters is perceived as a specific area in the field of agriculture. The development and support of agricultural clusters can be used to eliminate size disadvantages in rural areas and can help businesses respond to increasing competitiveness, globalization and sectoral challenges. An agricultural cluster can be a local or regional network made up of farmers, suppliers, cooperatives, producers, transporters, universities, export associations, research institutions, research parks and associated initiatives. Rosenfeld (1997) emphasizes the need for cluster actors who have active channels for business transactions, support dialogue and information exchange. The geographical element of the clusters is preserved but is a non-limiting factor in the number of activities such as information, exchange of data and knowledge between cluster members, etc.

Barriers to the development of agricultural clusters include physical and technical infrastructure constraints, lack of capital and problems in accessing finance, lack of skilled labor, lack of organizational structure and lack of information channels and problems with information flow. The limited use of new technology is one of the most significant problems facing businesses in rural areas. A significant obstacle to the development of agricultural clusters is the lack of a suitable business concept between businesses. For many years, farms have been accustomed to

conducting their business autonomously and independently. Due to the changing nature of competition, many companies are unable to trust other companies and tend to expect problems from cooperation.

In the context of the Europe 2020 strategy and the general objectives of the Common Agricultural Policy for the period 2014-2020, three long-term strategic objectives for EU agricultural policy have been identified:

1. Strengthen the competitiveness of agriculture

2. Ensure the sustainability of natural resource management and climate activities, a

3. Achieve a balanced territorial development of rural economies and communities, including growth and employment retention.

In this context, Member States are invited to formulate their policies on the basis of at least four of the six policies:

1. Strengthening knowledge transfer and innovation in agriculture, forestry and rural areas;

2. Strengthening the viability / competitiveness of all types of agricultural production and promoting innovative farming technologies and sustainable forest management;

3. Support for food chain organization, animal health and risk management in agriculture

4. Restoration, protection and strengthening of ecosystems related to agriculture and forestry;

5. Promoting resource efficiency and supporting a low-carbon and climate-stable economy in the agricultural, food and forestry sectors;

6. Promoting social inclusion, poverty reduction and economic development in rural areas.

Clusters can be identified by the very perception of the existence of clusters. Clusters, on the other hand, can be identified by their integration into five basic types: natural clusters, technology clusters, clusters based on historical know-how, low-cost industries and knowledge-based service clusters. Natural clusters arise in regions that have a comparative advantage due to a certain natural factor. This can be the soil, natural resources, the availability of the human factor and the size of the population of a particular nation or region. In the case of agriculture, wine-growing clusters in areas where there are natural conditions for growing vines could be such an example.

Technology clusters are clusters with a high concentration of technological production. These clusters are usually associated with universities, research institutes, etc. An example in this area could be clusters in the field of animal husbandry with a high share of technological

production of milk, meat, etc.

Historical know-how clusters are clusters that perform traditional activities. Traditional techniques are the result of many years of experience and knowledge of previous companies in this field. An example of such a cluster could be e.g. traditional growers in crop production.

Low-cost manufacturing clusters are clusters that occur in developing countries within specific sectors. The driving force is the availability of cheap labor and the geographical proximity of consumers. Examples are poultry farms e.g. within the countries of Eastern Europe.

Knowledge clusters of services are similar to low-cost manufacturing clusters that are emerging in developing countries. These clusters are characterized by the availability of low-cost skills and experience. Such clusters meet the growing global demand for electronics, software development, analytics services, etc. Within agriculture, it could be the production of machinery and equipment for agricultural machinery. Thus, we can speak of four types of clusters, which can be identified by their various forms: geographic clusters, horizontal clusters, vertical clusters and sector clusters. Geographic clusters exist for geographical reasons, the location of certain types of resources attracts businesses that need this type of resources for their production processes. Horizontal clusters mean the interconnection between companies and industry at the horizontal level, it is a division of resources and knowledge. Vertical clusters are clusters with interconnections between companies and industry at the vertical level, usually the supply chain is castrated, a sector cluster is a cluster in which companies cooperate within the same sector. This type of cluster can occur both horizontally and vertically.

4 Discussion

Methods for identifying clusters and cluster initiatives can generally be divided into qualitative and quantitative. The first group, which is much more demanding on the processing itself, requires primarily experienced experts to evaluate the results, consisting of qualitative analyzes, which include expert assessment or the interview method. The second group mainly uses available data on the number of employees, value added, sales by industry, or is based on an input-output matrix.

Qualitative methods are often used to supplement the results of quantitative analyzes. These include, in particular, interviews, surveys and case studies.

1. Interviews with experts and business representatives - Regional experts and industry representatives are important sources of information on regional economic trends, strengths and weaknesses of the sector or their specific characteristics. These are people who know the industry in the region from their practical experience, supply chains, current investment patterns

and potential opportunities for new products. Representatives can be considered to be representatives of the relevant employers' association (association), independent experts / consultants from the field, university teachers or workers in a field related to the research institute. Interviews with industry can take two forms:

- personal interviews with representatives of selected companies
- organization of round tables and seminars with representatives of selected companies

Interviews need to be well prepared in advance and based on mutual trust.

2. Surveys - are used to survey regional companies in order to identify local and non-local business features, cooperative alliances, etc. however, survey-based methods for industrial cluster analysis are very rare. Surveys are costly and the level of detail required in the survey documents (it is almost always impossible to fully clarify intercompany characteristics and informal links).

3. Case studies - an important component of qualitative analysis is the analysis of existing clusters using Porter's diamond as a framework for analyzing the competitiveness of local production structures. These case study analyzes examine the impact of clusters on the development of other regions.

Quantitative methods - their choice depends on the specific type of cluster and links between members. Frequently used procedures are localization coefficient determination and input-output analysis

1. Input-output analysis - this method does not examine the concentration of a particular industry in the region, but focuses on identifying links to other industries, thus obtaining a structure of interconnection of the department in the region. The most frequently sought-after sectors are supply and demand, and mutual relations are then quantified. Quantitatively, the relationships between industry inputs and outputs are described, ie. production from the industry. The disadvantage of this method is the considerable computational complexity and the limited database, because the input data are often unavailable for individual regions and are presented in a highly aggregated form. The application of graph theory is based on a similar principle, the output of which is an overview of significant links between industries.

2. Location quotients - this is a relatively simple method suitable for statistical search of local and regional clusters. Its advantages include the fact that recalculations can usually be based on available statistical sources. Localization coefficients, on the other hand, cannot express the interconnectedness of businesses. The localization coefficient (LQ) expresses how many times the share of the sector in employment in the region is higher than the national average.

$$\mathbf{LQ = (x/X) / (y/Y)}$$

LQ - employment localization coefficient in the region

x - number of employees working in the sector in the region

X - total number of employees in the region

y - number of employees working in the sector in the country

Y - total number of employees in the country

If the LQ is greater than one, it means that the industry is over-represented in the region. Localization coefficients exceeding 1.2 are then perceived as initial evidence of regional specialization in the industry. The disadvantages of localization coefficients are that they do not offer any deeper insight into the interdependencies between sectors, which is often considered an unsystematic approach.

3. Other methods - other methods of cluster identification can be used quantitatively, such as Shift-share analysis, Gini localization coefficient, Ellison and Glaeser agglomeration index or Maurel-Sédillot index (Žižka 2006).

The localization coefficient, despite being attributed to an unsystematic approach in examining cross-sectoral interactions, is one of the most widely used and simplest tools to identify a region's potential for clustering in a given sector. For this reason, we used this method in the analysis of the potential of individual regions (regions) of Slovakia for the creation of clusters in the field of Agriculture, Forestry and Fisheries.

Our goal was not only to determine the localization coefficient for a certain period but also to monitor the development of this coefficient year-on-year. We have decided for the last three years, i. 2011-2013, for which we had data from the Statistical Office of the Slovak Republic (hereinafter also the Statistical Office of the Slovak Republic). The results were as follows:

Table 1

Agriculture, Fischery and Forestry

	LQ2019	LQ2020	LQ2021	Modificiation 2019-2020	Modification 2020-2021
BA	0,28	0,24	0,24	-0,04	0,00
TT	**1,69**	**1,55**	**1,66**	-0,14	0,11
TN	0,84	0,87	0,82	0,03	-0,05
NR	**1,93**	**1,69**	**1,79**	-0,25	0,10
ZI	0,92	0,81	0,96	-0,12	0,15
BB	**1,32**	**1,23**	**1,49**	-0,09	0,25
PP	**1,37**	**1,29**	**1,44**	-0,08	0,15
KE	0,70	0,90	0,88	0,20	-0,02

Note. Own processing from data reached from Statistical office, 2021

It can be seen from the table that the localization coefficient is greater than 1 in three regions (Trnavský, Banskobystrický and Prešovský), even in these regions it is possible to speak of regional specialization on the basis of LQ> 1.2.

Conclusion

Employment within individual EU regions in the field of agriculture is thus a prerequisite for the emergence of such types of clusters in these localities. A prerequisite for the effective long-term functioning of clusters, as well as the emergence of new clusters within regions, is the correct identification of the potential for the emergence of such clusters. Several analyzes were performed in Slovakia, the aim of which was to map the potential of individual regions for clustering, but their results mainly reflect the operation of large companies in the regions and therefore we decided to analyze the potential of regions for clustering separately. Within the agricultural sector, we wanted to examine the potential of this sector, which in our opinion is suitable for the creation of clusters within Slovakia not only for the development of the regions themselves but also the municipalities associated with them.

Agricultural production has changed considerably within individual countries in recent years. It is no longer a traditional crop and animal husbandry, individual regions are increasingly characterized by peculiarities for the emergence of production, which is a specialization of the region or municipality, encourages governments to invest in the industry and the region at the same time. Clusters are evaluated by several experts in theory and practice as a significant microeconomic factor. A prerequisite for the creation of clusters is also the fact that small and medium-sized enterprises, unlike large ones, are not able to take advantage of, for example, economies of scale, do not have sufficient capacity and resources for research, training of their employees, obtaining information, etc. For this reason, it is appropriate for them to create clusters as a potential for their own development within the region. The adequacy and possible use of regions for the creation and existence of clusters is the subject of many studies and analyzes.

As part of our contribution, we examined the agriculture, forestry and fisheries sectors. Using a localization coefficient that can clearly identify the region's potential by comparing employment within the department, we not only determined the coefficient for the sector itself, but also tried to compare the development of this coefficient over a three-year period to eliminate any "accidental occurrence". . From the results we presented, it is possible to more or less accurately determine the potential of the regions of Slovakia in terms of regions for the creation of clusters in this area. In many cases, it makes sense to form clusters by bringing together several sectors that can support and influence each other. That is why, in our view,

further research in this area is particularly appropriate and necessary.

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An alternative economic mechanism for the development of the corporate sector

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Abstract

The main purpose of the article is to consider the strategy of development of the corporate sector in the broad historical context of the process of global capital accumulation. The methodological basis of research is a non-equilibrium approach to the analysis of the economy. The result of research is the theoretical model of a new economic mechanism for the development of the corporate sector. As an example of this alternative mechanism, the article uses a theoretical model for creating such an investment system in Ukraine with the active support of the international community. This model was developed at the Odessa National Economic University on the basis of the fact that the mechanism, which was not used under normal conditions can be used in extreme conditions of post-war time. At the center of the system is a development institution that actually acts as a central investment bank which does not issue loans, but buys shares in new corporate enterprises, thereby financing their creation, and then, when they start working, sells the enterprises into private hands.

Keywords: *corporate sector, capital accumulation, new corporate enterprises, investment system, war in Ukraine, post-war reconstruction.*

1 Introduction

The main purpose of the article is to consider the strategy of development of the corporate sector in the broad historical context of the process of global capital accumulation. As is known, the accumulation of capital means first of all an increase in real fixed capital. Therefore, the main methodological meaning of the analysis of capital accumulation as a unity of savings and investment is to shift the focus to real investment. Such a methodological approach is important in practical terms, as it can help justify a strategy for the development of the corporate sector.

2 Methods

The methodological basis of this article is a non-equilibrium approach to the analysis of the economy. Its application is due to many reasons, including general scientific ones, related to the development of modern so-called post-classical science, represented primarily by synergetics, the theory of complex systems and chaos theory.

If postclassical science is usually understood as a non-equilibrium paradigm, then the classical methodology of science . on the contrary, it is equilibrium in nature and goes back to classical

mechanics. The mainstream of modern economic theory is still neoclassical, which is a logically complete form of manifestation of the equilibrium paradigm. Its culmination is the general economic equilibrium model (Schmitt-Grohé; Uribe).

The classical school is an earlier manifestation of the equilibrium paradigm in economic theory (Schumpeter 1955 [1987], 297). Generally speaking, the accumulation of capital is a category of classical theory, which considers savings and investment in their immediate unity (Herrendorf; Rogerson, Valentinyi). In the classical model, the unity of these two sides of a single process is supported by the capital market through the formation of an equilibrium interest rate (Alvarez; Lippi; Oskolkov; Buera; Kaboski; Shin). This rate is equilibrium because it balances aggregate savings and investment (Hanson; Lucca; Wright). Thus, thanks to the capital market and interest rates, the market system automatically maintains their balance (Gopinath; Stein). Their aggregate values can not be significantly separated from each other, because the market interest rate can not significantly and permanently deviate from the equilibrium level (Lehn; Winberry; Keynes 1936 [2018], 175).

However, the modern mechanism of the relationship between savings and investment differs significantly from the picture of their almost complete unity, which is painted by the classical and subsequent neoclassical theory of capital accumulation (Fisher 2005, 87). It is obvious that the fact of long-term global surplus savings, which is characteristic of the modern world economy, does not fit into the framework of the classical model (Suranovic 2015; Landau 2011). The merit of the famous American economist B. Bernanke is that he posed the problem of global surplus savings. which means dangerous for the world economy violation of the unity of the two sides of the capital accumulation process (Abel; Bernanke; Croushore 2020, 157; Mian; Straub; Sufi; Coppola; Maggiori; Neiman; Schreger). Therefore, naturally, the question arises as to whether it is possible to restore this broken unity?

Of course, it is much easier to answer this question in the negative than to find a positive answer. Nevertheless, it seems that such a positive answer is in principle possible.

3 Results and Discussion

The result of the article is an attempt to find such a positive answer, which may be associated with the creation of a new economic mechanism for the development of the corporate sector. To illustrate this economic mechanism, one can use as an example a theoretical model for creating such an investment system in Ukraine with the active support of the international community, based on the fact that the mechanism, which was not used under normal conditions can be used in extreme conditions of post-war time.

Scheme of the New Investment System. Statistics show that the savings rate in Ukraine was extremely low even before the events of 2014. In 2004, it reached 31% of GDP, by 2008, despite

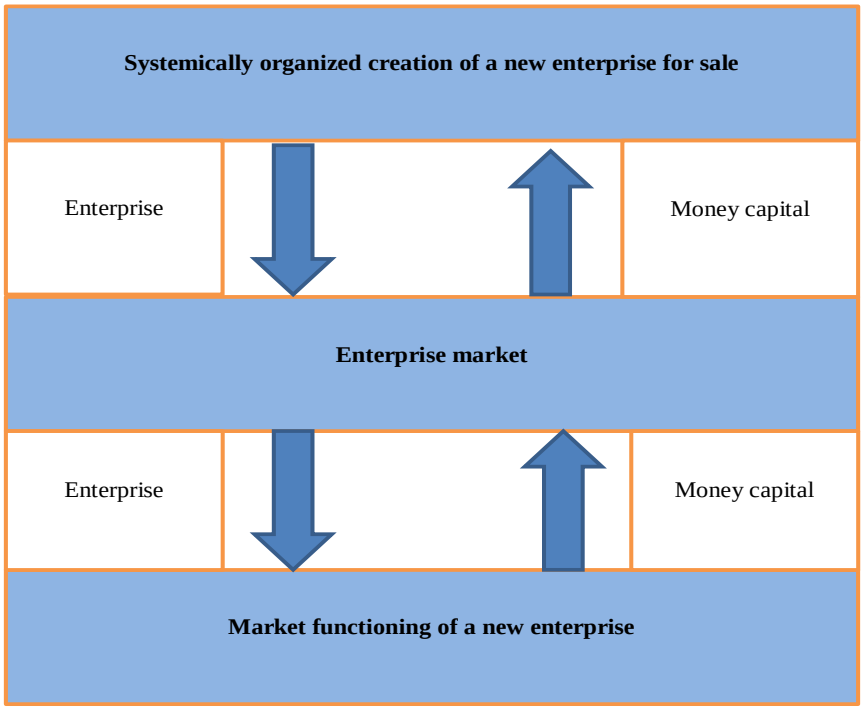
the growth of GDP, it had fallen to 21%, and by the end of 2013, according to official data, it fell to 6% of GDP. This is significantly less than the global average savings rate (25%), significantly lower than in Western Europe (17-19%), as well as Poland and Romania (21-22% of GDP) (Geyets 2014, 7-8). In 2013, approximately USD 600 per capita was invested in Ukraine against USD 2.5 thousand in Poland or USD 2.1 thousand in Romania (the analysis was stopped for 2013 to exclude the force majeure effect of subsequent events affecting the domestic economy) (Geyets 2014, 9). Meanwhile, foreign aid to Ukraine was used inefficiently. The IMF credits were "eaten away" without having a stimulating effect on the economic development of the country. There was practically no modernization of the economy, since there are virtually no economic entities and driving forces for the technological modernization of production in the country. Neither private business nor the state is capable of fulfilling this economic role. All this indicates the need for a significant change in the economic mechanism of international support for Ukraine after the current war.

One of these alternative models, being developed at the Odessa National Economic University, provides for the creation of a unified investment system for the development of the corporate sector. At the center of the system is a development institution that actually acts as a central investment bank. He does not issue loans, but buys shares in new corporate enterprises, thereby financing their creation, and then, when they start working, sells the enterprises into private hands. In the future, these corporate enterprises can operate on a private basis and compete with other enterprises in a market economy. Thus, in such a system, the central investment bank takes on the "lion's share" of uncertainty and frees private investors from this burden (Knight [1921] 2006).

The money received from the sale of corporate enterprises is again invested in the creation of more and more new enterprises. There is a vicious cycle of circular movement of capital. Such an investment system is capable of providing a vigorous modernization of the economy based on the repeated use of the same initial capital. At the same time, the closed cycle reduces the need for additional financial injections, which means significant capital savings.

Figure 1

Circulation of Systemic Capital in the Proposed Investment System



But where to get this initial capital? At this stage of Ukraine's development, the main hopes for creating seed capital for a central investment bank can be placed primarily on international financial organizations: the World Bank, the European Bank for Reconstruction and Development, the European Investment Bank and other international financial institutions. Such hopes are not as naive as they might seem at first glance. If the economy gets back on its feet in this way, it will need less and less external support and will be able to earn money on its own. As a result of the considered capital saving mechanism, the total costs of the international community for supporting and modernizing the Ukrainian economy may turn out to be an order of magnitude less than the flows of annual financial assistance in the form of international loans.

Such a system would provide the international community with gigantic capital savings. Loans go to unproductive purposes, and the threat of default looms over Ukraine like a "sword of Damocles". And the proposed system does not increase the public debt by a cent. And the result will be different – a real technological modernization of the economy. As the process of modernization approaches completion under the control of the international community, the state will be able to gradually buy shares in the central investment bank from international institutions. In the meantime, to limit corruption, foreign managers can manage the bank under the direct supervision of those international organizations that are its shareholders.

Protecting Against Corruption. But the main thing is that an economic mechanism is built into such an investment system, which objectively limits corruption. It is connected with the fact that new corporate enterprises are created in such a system for sale in the market. Therefore, the sale

of new enterprises in such an investment system should not be associated with privatization in the post-Soviet economy. Such an analogy would be too superficial.

First of all, one should take into account the very technical, technological and organizational level of new corporate enterprises created specifically for subsequent sale. Most Soviet enterprises were built and equipped several decades before their privatization. Already at the time of their creation, the equipment, technology and organization in many of them did not correspond to the world level, and by the 1990s, when mass privatization began, they were completely outdated. It is not surprising, therefore, that it was objectively impossible to sell such hopelessly outdated enterprises in the post-Soviet period.

As for the new enterprises created in this two-tier investment system, their sale may well be profitable, since these are new, modern enterprises, and not factories built decades ago. They are sold shortly after their creation and due to this they simply do not have time to become technologically obsolete. There is no that spanning several decades between creation and sale, which is typical for ordinary privatization.

The absence of a long gap in time between the creation and sale is important not only in technological, but also in economic terms, since this allows you to directly compare the income from the sale of corporate enterprises with the costs of their creation. Due to this, the two-tier investment system limits the possibility of abuse. There is a clear market test of the effectiveness of spending money here, which is not the case for centralized capital investment and other government spending. This relatively accurate market criterion is connected precisely with the fact that enterprises are created as goods for sale on the market. Therefore, the ratio of sales price to costs is a kind of “litmus test”. Ultimately, all the mistakes, abuses and possible crimes in the process of creating and selling a new corporate enterprise are displayed here, as on a monitor screen. The market of new corporate enterprises acts here as the most strict, objective and incorruptible auditor.

This applies to abuses in the process of not only creating, but also selling corporate enterprises. If the sale price is artificially low, then when compared with the amount of investments, the loss will be visible to within the yuan. In contrast to post-Soviet privatization, the possibility of economic price-to-cost matching will force the system to make the sale of enterprises as competitive as possible.

However, to the extent that assistance from international financial institutions may prove insufficient, the National Bank of Ukraine can, in principle, safely finance the creation of the capital of a central investment bank without much regard for inflation. After all, the issue of money for the development of production is accompanied by a balanced growth in commodity coverage and therefore is not of an inflationary nature. Due to the balanced growth of production and the

money supply, this system, in principle, does not conflict with the requirements of the IMF.

Area of Primary Application. Implementing this program can be start from the agro-industrial complex. As is known, in the structure of the Ukrainian agricultural exports, the "lion's share" is occupied by vegetable raw materials. On the contrary, imports of agro-industrial products are concentrated on finished food products with high added value (Dunska 2021, 38). In this regard, the literature discusses the question: why, in parallel with the increase in grain production, not to engage in their processing, that is, the creation of added value? The point is that from grain, in addition to flour and cereals, you can get a large number of valuable components used in many industries. Today, Ukraine exports grain, and imports processed products – modified starch, gluten, organic acids, feed additives, etc (Bobko 2021, 75). The processing of agricultural products is not only the creation of added value, but also the diversification of risks associated with the sale of products and fluctuations in world prices for grain, the introduction of new technologies and know-how in the country (Kuznyak 2020, 83). In the future, the new investment system will make it possible to consistently move from relatively simple to more complex and high-tech projects, including those involving the use of Ukraine's considerable IT potential.

Conclusions

Perhaps such a system for the development of the corporate sector, in the event of successful operation of its economic mechanism in Ukraine, could later become a model for the global investment system, designed to find productive use for the global excess of savings and restore the broken unity of the capital accumulation process.

Thus, the main conclusion is that a new economic mechanism for the development of the corporate sector can become a condition for restoring the broken unity of the two sides of the global process of capital accumulation. The creation of such investment systems with the help of the international community will stimulate the accumulation of real capital on a scale that can absorb the main massive savings surplus. Therefore, it is better for the international community to help Ukraine after the war not so much with money as with real capital.

This article outlines only a contour sketch of the principles of operation of the economic mechanism of the proposed system. At the same time, however, many theoretical and practical issues of its creation and functioning remain open. The fact is that the creation of such a system at the global level involves a radical change in the principles of the activities of international financial organizations, which were originally intended for completely different purposes. All these complex institutional questions are still waiting for their answer, as well as the question of the degree of generality of the model under consideration, of its practical applicability in various specific circumstances. This article is limited only to the formulation of these extremely complex scientific problems. This formulation opens up broad prospects for further theoretical and applied

research.

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Cycling industry from the perspective of green economy: current situation and the development of the industry

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Abstract

The aim of the paper is to analyze and evaluate the current trends in the cycling industry and the current dynamics of the industry as a whole. The intention is also to specify the key factors influencing developments in the cycling industry and to assess possible future opportunities and risks. For the purpose of fulfilling the research aim, mainly data and materials of global economic institutions or consulting companies were used. Worldwide green incentives, popularity of environmentally friendly transportation modes or increased demand for bicycles were the main driving factors that helped the industry to grow in the economies on all continents. Moreover, based on current political, economical or environmental situation, we expect further expansion of the cycling industry, as the full potential of the bicycle transportation has yet to be reached.

Keyword: Cycling industry, Green economy, Environment

1 Introduction

Current incentives by countries around the world are closely linked to minimizing greenhouse gas emissions. Transportation sector, as one of the sectors with the greatest negative impact on the environment, is currently going through a turbulent period. Perhaps the most noticeable changes are visible within the automotive industry, where most investments are directed to electromobility or alternative fuels. Other forms of mobility which are environmentally friendly, especially cyclomobility, have also gained traction (Neun, Haubfold, 2016). This increase in popularity was particularly noticeable during pandemic times in 2020, and the entire cycling industry was riding this positive wave. Increased demand for bicycles was evident, and the number of bicycles sold reached historic highs. Overall, however, the cycling industry has faced, and is currently facing, several complications stemming from unstable global economic situation. In this paper, we address key aspects of the cycling industry from a global perspective and describe key factors that will affect its future direction.

As the central topic of the article is the cycling industry, we consider it is important to further

specify this term. Cycling industry or bicycle industry is a sector of the economy that deals with the production or use of bicycles and bicycle components. Blondiau et al. (2016) state that the cycling industry mainly includes the following groups of companies:

- bicycle manufacturers
- bicycle parts manufacturers
- bicycle accessories manufacturers.

There are also other subjects interested within the industry. For optimal function of whole sector, following groups of subjects are also important (Blondiau, 2016):

- distributers
- retailers
- cycling organizations
- organizers and promoters of cycling events
- bicycle service shops.

Companies operating in the cycling industry create complex supply chains. This kind of cooperation is very important, and any disruption of cooperation causes problems on the market – for example, the current shortage of final products (including bicycles) due to the negative effects of the COVID-19 pandemic (Zhang et al., 2018).

The cycling industry as one of manufacturing industries relies heavily on the production, sale and also use of bicycles. There is a generally accepted opinion that bicycle transportation has demostrable positive effects, from different perspectives. The study, entitled "The Benefits of Cycling", states that cycling and bicycle transportation generate benefits worth 150 billion EUR a year worldwide. The vast majority of calculated benefits (90 billion EUR) are positive externalities for the environment, human health and a comprehensive mobility system. On the contrary, the European Commission's states the opposite in relation to motorized road transport, where negative externalities of EUR 800 billion per year have been estimated. The benefits of cycling mobility are most often divided into three major categories (Bullock et al., 2017):

- environmental benefits
- economic benefits
- social benefits (or socio-economic benefits)

Environmental benefits include environmental and climatic conservation, more efficient use of energy resources and positive effects on human health. Economic benefits are associated with opportunities in the business environment, investing in modern technology and saving time and space. Social benefits stem from the improvement of the social ties of the population, greater

flexibility in the field of mobility, or even the interconnection of different cultures.

Figure 1

Positive impacts of cycling mobility

Note: according to ECF (2018)

Steenberghen (2007) defines specific measurable indicators to identify the value-added of cycling and bicycle transportation:

- reduction of greenhouse gas emissions, especially carbon dioxide
- reduction of total air pollution,
- noise reduction,
- saving fuels,
- higher life quality and better health of population,
- reduction of work absences due to illness,
- support of bicycle sales and a positive stimulus for the cycling industry,
- development of cycling tourism,
- improvement of road traffic flow and traffic jams reduction,
- saving resources in building and maintaining road infrastructure intended primarily for motorized transport.

2 Methods

The aim of the paper is to analyze and evaluate the current trends in the cycling industry and the current dynamics of the industry as a whole. The intention is also to specify the key factors influencing developments in the cycling industry and to assess possible future opportunities and risks. For the purpose of fulfilling the research aim, mainly data and materials of global economic institutions or consulting companies were used. These data were subsequently analyzed and discussed with respect to the defined objective of the paper.

The methodological procedure is primarily based on the use of general scientific methods –

namely analysis, comparison or synthesis. In order to meet the defined aim, it was necessary to obtain relevant research data. The most important documents for the research were professional studies and databases of renowned institutions operating in the field of economics, management or market research – studies by the European Commission, Eurostat, PwC and others. The processes of analysis, comparison and synthesis were then executed, which was followed by a summary and evaluation of the current situation from the perspective of the global cycling industry development.

3 Results

3.1 General development of the industry

People use bicycles for several purposes, especially commuting or sports activities. Increasing awareness of the health benefits of cycling has contributed to increased demand for bicycle transportation. Current trends in the field of green transportation and sustainability motivate the public to use environmentally friendly forms of transport, including cycling. Industry stakeholders (mainly manufacturers) are forced to innovate their products (especially bicycles) as they need to meet the needs of a wide range of customers. The growing popularity of bicycle transport has resulted, among other things, in the expansion of shared services (bikesharing) – platforms that help to meet the growing demand for bicycle transport (Handy et al., 2017).

Consumer demand for sporting goods was extremely strong during the pandemic in 2020, especially the demand for bicycles. Transport restrictions also contributed to this – due to lockdowns around the world, there were restrictions on train, bus or public transport, which forced customers to find an alternative mode of mobility.

In 2019, the US bicycle market was worth more than 65 billion dollars. The impact of the pandemic crisis has caused unprecedented changes in the industry, with the most significant being the positive demand shock in countries around the world. Based on analyzes, the global bicycle market grew by 48.55% in 2020 (Grand View Research, 2021).

3. 2 Driving factors in the industry

One of the essential factors of cycling industry development is the support of sharing services in the field of cycling. This trend is evident mainly in the US and Europe. Adequate infrastructure is being built, which is becoming a prerequisite for even more intensive use of such services. The promotion of sharing mobility will ultimately affect the growth of the whole cycling industry. Analysts predict that urbanization will be another driving force for the cycling industry. Urbanization is a global phenomenon, and moving of people from the city centres to its suburbs favours bicycle transport as a suitable mode of transport – speed, simplicity, time

savings, health, environment are the main motives for the use of bicycle transport (PWC, 2021).

The growing popularity of cyclomobility is also reflected in the innovations of the final products – bicycles. Global manufacturers are currently focusing on their ability to offer bicycles for a wide range of users, regardless of age or fitness. The result of innovative processes is primarily the introduction of automatic drive in the bicycle, specifically electric. It was the electric bicycles which enabled the manufacturers to open up a new market segment, and also to target customer groups that they had not been able to reach before. Sales of electric bicycles have become an important pillar of manufacturers' success due to growing consumer demand. However, manufacturers are also emphasizing other aspects, in particular the continuous improvement of security systems to prevent bicycle theft, improvement of bicycle functionality and design innovations (Maier, 2021).

3.3 Constraining factors of the industry

One of the limiting factors of bicycle transport expansion is wide availability of alternative forms of mobility. Current transport options, such as the use of a car, bus or train, most significantly limit the development of cycling, and are expected to continue to be a limiting factor for cycling.

Another threat for the cycling industry are disruptions of global retail chains, caused by several aspects. One of them is restriction of the trade on some markets. These restrictions have affected countries around the world and have negative impact on the production processes of manufacturing companies (Li, 2019).

The development of the cycling industry may also be limited by the current prices of products – especially bicycles. Consumer demand, trade restrictions, a pandemic situation or uncertainty have caused record prices of bicycles as well as electric bicycles. Their price is too high for many potential customers to accept it and buy the product (Bullock et al., 2017).

An important fact is the quality of electric bicycles, especially electric drive capacity and battery life. Since the electric bicycle also uses battery power, it is clear that this energy must then be recharged. Charging is most often done by connecting to the power supply. Recharging an electric bicycle may not be a problem for users at home, but complications occur when the user is in the field. The potential solution could be a long-term investment in infrastructure and charging stations for electric bicycles, but at present the number of charging stations is very small, which is also proving to be an obstacle in the minds of potential customers (Liu et al., 2019).

3.4 Global markets situation

In the Asian region, the value of cycling industry reached almost 23 billion USD in 2019, mainly due to the fact that there are countries with large production capacities in Asia – China, India or Japan. In addition to production potential, the growing demand for bicycles from Asian consumers also plays a role. The Ministry of Economy, Trade and Industry of Japan (METI) reports that the value of bicycle production increased from 556.6 million to 579.6 million USD between 2017 and 2018, what is 4,1% increase (UNIDO, 2019). National and continental federations also play a role in promoting cycling - for example, the Asian Cycling Federation (ACCASIA) seeks to promote cycling through sporting and recreational cycling events and thus increase the motivation of the population to use bicycles for transport purposes (Fortune Business Insight, 2021).

Also in Europe there are growth expectations for the entire cycling industry over the next decade. In some European countries, a positive attitude of government institutions to the development of the necessary infrastructure can be observed. Building of cycle paths or construction of charging stations for electric bicycles are nowadays evident especially in Norway, Germany or the United Kingdom. It was in the British Isles in 2020 when the government proposed a massive investment into the cycling infrastructure worth of 2 billion, reflecting on the public demands in the context of the growing popularity of recreational and outdoor activities. Such investments are expected to further support the cycling industry as a whole, as cycling opportunities will be more accessible again (Fortune Business Insight, 2021).
The growth of cycling industry in the North American region is currently heavily driven by consumer demand. In the USA and Mexico in particular, an increase in customer consumption of outdoor equipment and bicycles can be observed. According to data presented by US government economic institutions, the outdoor equipment market reached a value of almost 460 billion USD in 2019. A separate category is the electric bicycle market, which is expanding rapidly in Canada and the United States and is an important pillar for the expansion of the whole industry. (PWC, 2021)
In South America, the growth of the cycling industry is based on imports, mainly to Argentina and Colombia. Between 2017 and 2018, the volume of bicycles imported to Argentina increased from 17.1 to 22.1 million units. Similar trend has also been reflected in Brazil, where bicycle transport is already preferred option for urban transport, and where the sales of folding city bicycles increased rapidly (Fortune Business Insight, 2021).

3.5 Bicycle production in the EU countries

In 2019, a total of 11,4 million bicycles were produced in the countries of the European Union. This is a 5% increase compared to 2018 and a 10% increase compared to 2014. In the last decade, the highest number of bicycles were produced in 2015 – a total of 13,7 million units, which was 17% more than in 2019 (Eurostat, 2022).

Among the EU countries, the largest producer in 2019 was Portugal, where 2.7 million units were produced. Italy ranks in the second place with the production of 2,1 million units while Germany follows as the third biggest producer with 1,5 million units of bicycles. Poland (0,9 million) and the Netherlands (0,7 million) complete the elite five countries from perspective of bicycle production. The following table clearly illustrates the development of bicycle production in the countries of the European Union in recent years (Eurostat, 2022).

Table 1

Bicycle production in selected countries of European Union

Country	2015	2016	2017	2018	2019
Portugal	1 458 523	1 859 132	2 050 261	1 915 612	3 142 187
Italy	4 781 054	3 422 818	3 551 883	2 235 235	2 089 277
Germany	-	-	-	-	1 519 387
Poland	1 135 194	1 102 527	1 077 681	1 082 690	973 982
Netherlands	1 062 788	887 131	830 751	765 240	716 989
Bulgaria	947 534	902 659	752 778	775 735	633 469
Romania	564 959	563 380	492 960	457 706	524 900
Czech republic	419 209	425 811	362 747	406 930	472 974
Spain	232 913	225 724	236 489	251 525	239 732
Hungary	208 296	166 121	208 025	135 127	128 924
Slovakia	73 762	61 892	60 183	79529	104 667
EU28	13 800 000	12 600 000	10 000 000	10 988 000	12 100 000

Note: according to Eurostat (2022)

The data show that the situation in the monitored countries has been changing over the last 5 years. A big change can be observed in Portugal, which is the current leader in bicycle production. While in 2015 Portugal produced 1,5 million units, in 2019 it was over 3,1 million units, what means that production volume increased more than 100%. We can also see a

significant expansion of production between 2015 and 2019 in Slovakia, where it was an increase of almost 42%. Same applies also for Czech Republic – the volume of bicycles produced between 2015 and 2019 increased by about 13%.

While production has increased in the above-mentioned states, there are also countries with opposite trend – and most notably Italy. In 2015, Italy was by far the largest producer of bicycles with more than 4,7 million manufactured units. In the following years, there was a significant slump to 2,1 million units in 2019, which means an almost 56% decrease in production volume. Among the other countries where the production has decreased there is Poland, Netherlands, Bulgaria, Romania and Hungary – we can see that the number of bicycles manufactured has decrased, but the decline is not as sharp as in the case of Italy.

4 Discussion

Cycling industry has found itself in unstable times, which bring together wide variety of opportunities but even threats. The numbers of global bicycle sales, however, support the optimistic view to the future, and we think that there is still a lot of potential for market saturation. Nowadays, potential customers have many opportunities for bike purchase, and even people with health problems may use electric bicycles. Global pressures for increased use of green transportation modes caused that electric bicycles emerged as potentially the strongest segment of cycling industry, which also translated into higher popularity of cycling transportation (Wrighton, Reiter, 2016).

Although we are currently observing an increase in sales of electric bicycles, expectations of experts to the future still favour using of conventional bicycles (without automated propulsion). The production of conventional bicycles is much less demanding than the production of electric bicycles, especially in terms of costs involved. Moreover, conventional bicycles are associated with lower repair and maintenance costs (Van den Steen et al., 2022).

However, the electric bicycle segment will continue to grow, mainly due to the increased availability of technologically modern electric bicycles on the market. The application of new technologies and innovations to electric bicycles means an increase in attractiveness from the point of view of potential customers – modern electric bicycles significantly reduce the effort expended and they may be used not only for transport but also for recreational activities.

Cycling industry development has been influenced by many factors, but among those with the highest impact we could include following (PWC, 2021):

- consumer' investments to bicycle and accessories
- open-air leisure as part of healthy lifestyle

- investments to dedicated cycling lanes and infrastructure
- increased preference of endurance sports
- bike sharing systems diffusion

All of previously mentioned factors partially contributed to cycling industry change, especially after critical year of 2020, when the outbreak of pandemic disrupted well established processes. During the COVID-19 pandemic people avoided public transportation and were encouraged to use alternative transportation modes, including cycling. Thus, the demand for bicycles and accessories increased and people started using bicycles more frequently. Cycling, together with some other outdoor activities gained traction in times of social distancing, when the majority of sport facilities were closed (for example gyms). Preference for cycling is a consequence of current lifestyle, as people are negatively affected by screen-time fatigue – cycling is a way how spend time open-air and escape from computers or other devices. Bike-sharing saw an increase in cities worldwide, partially to avoid public transport but also to use sustainable transporation modes. All things considered, we can state that cycling industry as a whole is on of the sectors, which were positively impacted by COVID-19 outbreak (Maier, 2021).

5 Conclusion

In the paper, we characterised specifics of cycling industry and presented the current situation on various markets. The main objective of the paper was to determine and discuss key factors influencing the development of the industry. We can conclude, that despite turbulent times, cycling industry is among the sectors which were not seriously harmed by the spread of COVID-19 pandemic. Worldwide green incentives, popularity of environmentally friendly transportation modes or increased demand for bicycles were the main driving factors that helped the industry to grow in the economies on all continents. Moreover, based on current political, economical or environmental situation, we expect further expansion of the cycling industry, as the full potential of the bicycle transportation has yet to be reached.

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Change management at enterprises: basic elements for ukrainian enterprises

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Abstract

Military actions on the territory of Ukraine, the consequences of limiting the activities of economic entities in wartime require a new approach to enterprise management, which would be able to respond flexibly and adapt to changes in operating conditions, seek ways and sources of resumption to meet the urgent needs of the state and further accelerating the recovery of the national economy. This paper examines the theoretical approaches to change management in enterprises and considers the basic elements of change management. Drawing on a mixed-methods design, the paper examines algorithm of the change management formation. The paper explains basic elements and goals of the change management for Ukrainians` enterprises. The paper contributes to change management by explicating the components of the change management system. It is proposed to present the general management system of adaptation of the enterprise as a cyclical movement. The management system of enterprise adaptation to change is a combination, of a system of principles, functions, tools, methods and tools of the most successful, effective management concepts, formed separately for each of the four components: organizational and economic, legal, technological and social, based on analysis and assessment of the preconditions for the formation of such a system using an integrated approach to analysis and evaluation. The change management system is based on a combination of elements of system, functional and process approaches, which allows the company to combine techniques and management methods for the components of the components of the change management system.

Keywords*: changes, management, enterprises, adaptation, system.*

1 Introduction

Negative phenomena in the structure of the modern Ukrainian economy requires Ukrainian enterprises to implement and use effective management systems that will create the basis for improving the efficiency of activities aimed at developing all sectors of the economy and improving living standards in the country.

The scientific basis for the possible development of modern enterprises is the formation of theoretical and methodological basis for creating a management system for adaptation to changes in their activities, substantiation on a scientific basis of principles, factors, methods and tools of management, taking into account market conditions.

The effective operation of any enterprise must take into account modern components of the world in the formation of management systems. These components are the basis for the formation of a

management system for adaptation of enterprises to change, which should be based on the assessment of the prerequisites for such adaptation, taking into account all options for possible changes. It is the simplification and generalization of the procedure for assessing the prerequisites for adaptation, the availability of opportunities for various types of change, gives the company one of the main advantages in today's business world - time. The time that the company can spend not on the analysis and evaluation of its capabilities, but on the formation of a management system and its implementation. Time gives benefits.

2 Methods

Any enterprise is an open system that connects activities outside and within the enterprise. Considering the spheres of activity of modern enterprises, it should be noted that in recent years there has been an intensive increase in the volume of activity in the non-productive sphere. However, in such conditions it becomes especially important to solve the problems of enterprises in the manufacturing sector.

One of the main problems in the study of the environment of the enterprise is the lack of a systematic approach to the collection and analysis of information in modern enterprises. Research is conducted on individual components of the operating environment, does not take into account the relationships between the action of factors and does not form a comprehensive approach to the formation of a management system for adaptation to change.

The change is a possible movement of any elements of the system. Such a movement can have a positive or negative effect on the company, it can be predictable or unpredictable, controlled or uncontrolled, etc.

Changes accompany the activities of the enterprise at all stages of its life cycle.

Changes affect the level of fitting people to their jobs (Caldwell, 2011,2017). People are attracted to jobs that align with their values (Arieli S. et al., 2016; Knafo A. et al., 2004; Sagiv L., 2002; Schneider et al., 1995). Change recipients are likely to view a change initiative that changes work to the degree that it corresponds to the opposite values in the value structure negatively because it has negative consequences for the attainment of their values (Långstedt et al., 2021).

After the pandemic eases, longer-term strategic changes may be needed to navigate the competitive landscape arising in the ‘New Normal’ which has resulted from technological, socio-political, and institutional changes (Ahlstrom D. et al., 2020).

This New Normal is unlikely to be a static equilibrium, because the pandemic shock has triggered another unexpected dynamic (Hitt et al., 2020).

Organizational hybridity, which is an integration of different strategies, logics, and structural forms (e.g., structural flexibility) to manage complex problems, may be required to manage resources and stakeholders more effectively in the post-pandemic era. Additionally, firms need the agility to design

and implement strategic changes effectively, which requires fluidity, speed, and mindsets that encourage innovative thinking and resilience (Hitt et al., 2020)..

The influence of groups of environmental factors on the preconditions for change at the enterprises that detected:

- environmental factors: cyclical factors and chaotic factors (macro-environment and micro-environment factors)
- factors of the internal environment.

Thus, the main groups of factors influencing the preconditions for changes in the activities of any enterprise were identified. It was observed that the external and internal environment of the enterprise may depend on the objective and subjective processes occurring in the economy.

In the modern scientific literature there are two classes of mechanisms for changing the system (Мельник Л., 2005; Чорнобай Л., 2013).

1) adaptive mechanisms - characterize the changes that allow the system to adapt to the dynamic changes of external and internal factors without losing system integrity;

2) bifurcation mechanisms - characterize the changes in which the organization as a system does not maintain integrity and while maintaining acquires a new quality.

Considering and interpreting the concept of "change", modern scientific schools do this in three main ways:

- external changes,
- internal changes,
- administrative changes.

Thus, modern enterprises need to take into account the levels of management of external, internal and administrative change. However, the possibilities and effects of the bifurcation mechanism of system change should always be taken into account, although this approach somewhat narrows the issue of detecting changes.

Some scholars identify "change" and "development." In our opinion, the concept of "development" has positive consequences for the enterprise. And the concept of "change" can have both positive and negative consequences for the enterprise. Therefore, the concept of "change" is somewhat broader than the concept of "development".

Generalization and systematization of theoretical developments in the field of classification of existing types of changes are presented in table 1.

That is, during the operation of the enterprise is faced with both predictable and unpredictable changes. Such predictable and unpredictable changes can occur both in the external and internal environment, positively or negatively affecting the activities of the enterprise. Management functions can cause changes related to planning, organization, motivation, control and coordination, which is

inversely related to the emergence and response to changes in the external and internal environment of the enterprise.

3 Results

Taking into account the main features of change in the formation of a management system for adaptation to change is the key to their clear understanding, timely detection and development of measures for effective adaptation. However, a significant number of signs of possible changes create obstacles to the formation of a simplified and unified approach to the analysis of such changes. It should be emphasized that in the study of environmental factors of enterprises should be given primary attention to the analysis of cyclical and chaotic factors of the macro- and meso-environment of the enterprise.

Significant among the signs of possible changes for the purposes of adaptation of the enterprise, in our opinion, are: the level of impact of change, the emergence of changes in management functions, the scope of change and the mechanism of change. These signs of change are the basis for further research and formation of a management system for adaptation of enterprises to change.

The adaptation of the enterprise to change, as one of the main subsystems of the overall management system of the enterprise, is a complex system with its own components and relationships between elements of the system. It consists of combination of system, process and functional approaches to management.

Within the system approach, the change management system is considered to be a combination of management and control systems through the relationships that accompany the management activities in this system and the mechanism for managing adaptation to change.

Table 1
Classification of changes in the enterprise

Sign of classification	Types of changes
The level of change	environment; internal environment
Functional direction of origin	changes in finances; changes in marketing; changes in staff, etc.
By management functions	changes in planning, changes in the organization; changes in motivation; changes in control; changes in coordination
By target orientation	operational; tactical; strategic
The level of impact of change	indirect impact - changes in the macroenvironment, mesoenvironment ; direct impact - changes in the microenvironment
Areas of change of indirect influence	economic; political; legal; social; technological
Areas of change of direct influence	suppliers; consumers; competitors; state and local authorities; credit and financial institutions; foreign economic partners
The level of interdependence of change	changes are dependent and related; changes are independent and unrelated
The level of assessment of the possibility	objective; subjective

of change	
The complexity of change	simple (concerning one aspect of the enterprise); complex (concerning several aspects of the enterprise)
Information on changes	uncertain; identified
Systematic occurrence of changes	systematic; unsystematic
Mechanism of action of changes	adaptive; bifurcation
By the nature of change	revolutionary: controlled and uncontrolled; evolutionary
By level of predictability and planning	unpredictable; planned
Depending on the elemental orientation of the organizational management system	changes focused on: goals (goal management); tasks (management by results); organizational structure (structural management); technology (technological management); staff behavior (management of organizational behavior); experience (control through control behavior - benchmarking)
By type of development	extensive; regressive
By direction of development	progressive; regressive
According to the probability of occurrence	predictable; unpredictable
Depending on the shape	frontal; group; individual
By scale of coverage	local; complex; integrated
By degree of risk	risk-free ; risky

Source : (Гринько Т et al., 2013; Кузьмін О. et al., 2017; Кучеренко В. et al., 2010, 2013; Мильнер Б. et al., 2008; Kuzmin O. et al., 2021).

In the context of the process approach, the management system of adaptation to change is seen as one that forms and regulates management measures for business processes of the enterprise.

Summing up the research in this case, it is necessary to generalize and systematize the existing possibilities of using methods of economic and mathematical modelling for the needs of forming a management system for adaptation of enterprises to change (Table 2).

Table 2

Economic and mathematical methods and models for the components of the management system of adaptation of enterprises to change

Methods of analysis and evaluation		**Data analysis models**	**Business models**
Empirical methods	**Statistical methods**		
Expert evaluations PEST analysis SWOT analysis	Absolute and relative averages Panel data Index method Fourier series analysis Taxonomic analysis Cluster analysis Harmonic analysis Factor analysis Elimination Balance method Graphic method Tabular method Method of integrated evaluation	Linear regression *VAR* models *VECM* models DSGE Scenario modeling	Canvas *STOF* *CSOFT* *VISOR*

It is revealed that economic-mathematical methods and models by components of the management system of adaptation of enterprises to change can be divided into three main groups:

- methods of analysis and evaluation (empirical and statistical),
- data analysis models,
- business models.

That is, the formation of the unit for assessing the prerequisites for the formation of a management system for adaptation of the enterprise to change should be carried out in three main stages:

- analysis and evaluation of information by empirical and statistical methods;
- modelling of data analysis to identify projected trends and directions of development of components of the management system of adaptation of the enterprise to change;
- formation of business models for the components of the management system of adaptation of the enterprise to change.

The existing economic and mathematical methods and models for identifying the prerequisites for the formation of a management system for adapting enterprises to change were studied and systematized; the existing approaches to the formation of business models of the management system of enterprise adaptation to changes in the main components are studied and systematized. Such systematization made it possible to formulate an economic and mathematical basis for the formation of a methodological approach to assess the prerequisites for the formation of management systems for adaptation of enterprises to change and development of models for system components as one of the possible elements of instrumental support.

In determining the basic economic and mathematical models and methods suitable for the formation of components of the management system of adaptation to change, should take into account a combination of systemic, process and functional approaches to enterprise management.

4 Discussion

It is proposed to present the general management system of adaptation of the enterprise as a cyclical movement, consisting of the following stages:

- analysis and assessment of the conditions of the enterprise in the external (including the study of cyclical factors) and internal environment of its operation;
- identification of weaknesses and bottlenecks in the operation of the enterprise;
- identification of strengths and capabilities of the enterprise;
- forecasting the directions of enterprise development;
- formation of the mechanism of reaction of the enterprise to possible negative changes in the external and internal environment of functioning;
- formation of innovative approaches to enterprise management under the existing and projected conditions of enterprise operation;
- development and implementation of mechanisms for managing the adaptation of the enterprise

to changes at the level of organizational and economic, legal, technological and social components;

- monitoring and control over the main stages and elements of the management system of adaptation of the enterprise to change;

- adjusting the management system of adaptation of the enterprise to changes with changing operating conditions.

The management system of enterprise adaptation to change is a combination, of a system of principles, functions, tools, methods and tools of the most successful, effective management concepts, formed separately for each of the four components: organizational and economic, legal, technological and social, based on analysis and assessment of the preconditions for the formation of such a system using an integrated approach to analysis and evaluation.

The change management system is based on a combination of elements of system, functional and process approaches, which allows the company to combine techniques and management methods for the components of the components of the change management system.

It is revealed that the use of modern theoretical and empirical economic-mathematical models of the management system of adaptation of enterprises to changes within the system itself can be justified only by the specifics of a particular enterprise. The use of theoretically sound models allows the selection of components for the functioning of the enterprise and building on their basis an empirically sound model. This approach allows the company to take a comprehensive approach to the formation of a management system for adaptation to change, using the world's theoretical achievements in this field and taking into account its own practical differences.

The combination of several approaches to the formation of economic and mathematical models of enterprise management system of adaptation to change will give enterprises the opportunity to form a truly effective management system of adaptation to change, which will take into account the prerequisites in the environment.

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Facts and Thoughts on Organizational Change Management

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Abstract

Change management is an organized strategy to ensure that changes are implemented completely and smoothly, as well as producing long-term advantages. Change management focuses on the larger implications of change, particularly on people and how they behave as they transition from one state to the next. The change could range from a modest process alteration to a huge system overhaul in order to maximize the business potential. There are two major philosophies of change management. They are investigated from several perspectives with the goal of determining whether they can be utilized as an appropriate analytical instrument to thoughtfully probe contemporary challenges in businesses.

Keywords: *Organizational Change Management, Organizational Behavior, Behavioral Change, 3-Step Model (KL), 8-Step Model for Leading Change*

1 Introduction

Change refers to a shift in a company's strategy, structure, technology, or culture as an outcome of changes in the environment, structure, technology, or people. If there were no changes in these areas, a manager's job would be quite simple and uncomplicated. Change management is a skill that good managers possess. Changes in job design, breadth of control, authority relationships, and coordination methods are examples of these changes. Changes in equipment, work procedures, or work methods, as well as in workers' behaviors, perceptions, expectations, or attitudes, are all possible. Change is becoming an ever-present characteristic of organizational life, against a backdrop of rapid technological development, a growing knowledge workforce, and the shifting of accepted work norms (Huschbeck & Schnödewind, 2021, pp. 126-128). However, whilst many organizations appreciate the need for change, a lot

of the change programs do not achieve their intended outcomes. As the importance of organizational change grows, there is a growing corpus of literature examining the concept and procedures of change management, as well as the elements that influence its effectiveness. This literature has been regarded as abounding in intricacies and holding numerous contradicting and perplexing theories and study findings, as it draws from a wide range of disciplines and theoretical viewpoints. One of the most significant perspectives within the so-called 'planned approaches' to change is that of Lewin, who stated that change occurs in three phases. The first phase is the unfreezing of the existing behavior, then the shift to the new behavior and finally the freezing of the new behavior (Lewin, 1953, pp. 63-73). Although popular, Lewin's original theory has been criticized for being under-differentiated (Ruf et al., 2020, p. 233). As a consequence of these concerns, the 'emergent approach' to organizational transformation was established as an alternative to planned procedures. Organizational change, according to an emergent approach, is so fast and unexpected that it cannot be managed from the top down. Change, it is said, should be viewed as a learning process in which the organization adapts to internal and external environmental changes. Despite not advocating for pre-planned procedures for change, numerous proponents of the emergent school have proposed a series of acts that organizations should do to improve their chances of success. Creating a vision, fostering a feeling of urgency, developing strong leadership, and empowering employees are just a few of the suggested actions, which vary in quantity and type. Emergent theories assume that managers must have a thorough awareness of the organization, its structures, tactics, people, and culture in order to respond to change. Understanding these will enable managers to select the most effective change strategy and identify elements that may function as change facilitators or barriers. The increasing prominence of organizational development (OD) as a paradigm for thinking about change is consistent with this focus on the organization as a whole entity when discussing change (Chin & Benne; 2021, pp. 383-385). Critics of the emergent approach have questioned the use of broad-natured action sequences and their application to specific organizational situations. They prefer a (de)centralization of organizational structures (Buchheit, 2020, p. 91). Others have advocated for a more 'situational' or 'contingency' approach, saying that an organization's performance is highly influenced by situational

elements (Huschbeck & Schnödewind, 2021, pp. 121-124). As these vary from organization to organization, managers' reactions and change strategies must also vary. In this context, the following scientific question is examined in more detail:

- What impact do situational variables have on organization's performance?
- To what extent can organizational managers influence this?

2 Resistance to Change

It goes without saying that understanding the organization's change process needs a comprehension of the organization itself. When people engage in a structured or organized fashion to achieve a stated purpose or objective, they form an organization, and this type of group requires management (Döhler, 2019, pp. 18-19). It is necessary to have someone who is responsible for the organization as well as the control and coordination support. If there are more than 10 people in the organization, there must be a structure in place for their actions to avoid anarchy. The assignment of responsibilities, the grouping of workers' activities, and the coordination and supervision of these are all fundamental parts of the structure of an organization. Any structure must serve the aim of achieving the organization's objectives. The acceptance of change by employees is critical to the effectiveness of organizational change. In this context, it may be stated that when faced with a loss or change, all humans go through five phases of 'grief' (denial, anger, bargaining, depression, and acceptance). This has been recognized as important and has been applied to the management of organizational change. This concept can be helpful that people communicate more effectively and support during a period of transition, and it should be personalized to the employees' current stage of change. Employees, for example, require information to deal with their rejection after receiving the news of change. They will require various types of help once the knowledge has sunk in and they have experienced rage, bargaining and sadness. Employees require a vision to commit to once they have begun to accept the situation. Others take a more individualist approach to researching resistance to change, saying individual’s emotions are highly complicated and vary substantially. In addition to personality factors influencing the level of resistance caused by organizational change, situational variables were discovered to play a major influence (Huschbeck & Schnödewind, 2021, p. 118). The importance of good management skills

throughout a period of change was found to have a particularly substantial effect on affective, cognitive, and behavioral resistance, highlighting the importance of good management skills throughout a period of change. Various subject matter experts, on the other hand, discovered that providing folks with more information about the change resulted in a lower opinion of the change and a greater desire to act against it. This last conclusion suggests that there may be a limit to how much information can be supplied before employees get overwhelmed. In a similar vein, if the change had bad consequences for the individual, it would not be surprising if learning more about it raised opposition to it. This conclusion emphasizes the critical role of management, in this case in terms of communication strategy. It might also be claimed, in accordance with emergent theory and OD proponents, that in-depth understanding of the organization's strategy, structures, personnel, and culture is essential to make successful decisions about such challenges. Involving employees in the change or empowering them to make changes themselves is one technique for minimizing employee resistance that has been highlighted extensively in organizational transformation literature (Griffin et al., 2020, p. 1). Empirical research has backed up the efficacy of this technique for successful change implementation, particularly among the general population. However, employee involvement is not enough; managers must also play an import role in encouraging and rewarding creativity as well as showing support for the change. Some academics agree with this viewpoint, recommending firms to involve employees throughout the transformation process and at all stages, while also highlighting the need of a supporting and involved management team. Others advocated for a more emergent approach to dealing with employee opposition, claiming that the circumstances of the change and the content of the change will differ greatly different firms, and that this should dictate the proper reaction (Errida & Lotfi, 2021, p. 6). They describe when and when to use a variety of tactics, from education to compulsion, to lessen resistance, as well as the benefits and drawbacks of each. It is important emphasizing right now that when thinking about change management tactics, it is a good idea to think about the many personality 'categories' that employees may fall into. There is a substantial corpus of literature on the subject on personality types, as well as a variety of frequently used tests for detecting which type someone is, however all have their detractors. From the perspective of organizational

transformation, it is important examining whether a specific group of employees is more likely to have a certain personality type and adjusting change management tactics accordingly. However, any group of employees is likely to have a variety of personality types, implying that a variety of techniques may be required, and that managers at the individual line management level must carefully examine how an employee would react to change.

3 Implementing Change

What was true over 2,000 years ago holds true today as well. We live in a world that is always changing. New projects, project-based working, technological advancements, and keeping up with the competition are all factors that influence how we work (Lauer, 2019, p. 116).

As internal and external conditions change, processes and work regulations are altered, new equipment is introduced, product lines are discarded and the workforce is adjusted. Confronting the unknown scenario and loss of familiarity entails change, which is describe as putting something in a new form than its original location (Errida & Lotfi, 2021, p. 5).

You understand that change is required, but you are not sure how to go about bringing it about. So, where do you begin? Who are you going to enlist? How are you going to see this through to the end? Many theories exist regarding how to 'do' change. John Kotter, a leadership and change management specialist, is the source of many of them. In his conception of 'Leading Change', an eight-step change process is particularly advantageous (Kotter, 2011, p. 35, as cited in Kotter et al., 2021, p. 6).

3.1 Step 1: Instill a sense of urgency in your audience

When it comes to change, it helps if everyone in the firm is on board. The implementation of the theme mentioned in the heading may assist you in igniting the first drive to start things going on (Kotter, 2011, p. 38, as cited in Kotter et al., 2021, p. 6). It is not merely a matter of showing dismal sales data or citing increasing competition. Open a direct and persuasive discussion about what is going on in the market and with your competitors:

- Look for possibilities that should or could be taken advantage of.
- Present compelling explanations in order to get people talking and thinking.
- Enlist external stakeholders, and industry experts to strengthen your case.

3.2 Step 2: Organize a Strong Coalition

Persuade others that they must change (Kotter, 2011, p. 49, as cited in Kotter et al., 2021, p. 6). This frequently necessitates strong leadership and visible backing from important members of your team. It is not enough to manage change; you must also lead it. Effective change leaders can be found throughout your organization, and they do not always follow the typical organizational structure. Your 'change coalition' must work as a unit after it has been formed:

- Determine who your organization's true leaders are.
- Require and encourage the emotional involvement of these important people.
- Examine your team for flaws and make certain you have got a decent mix of employees from different departments and levels within your organization.

3.3 Step 3: Make a vision for the future

Everyone can comprehend why you are questioning them to accomplish anything if you have a clear vision (Kotter, 2011, p. 66, as cited in Kotter et al., 2021, p. 6). When others can see what you are seeking to accomplish, the instructions you offer them tend to make greater sense. When you initially start thinking about change, you will probably come up with a lot of amazing ideas and solutions. Connect these ideas to a broader vision that people can understand:

- Decide on the values that are at the heart of the transformation.
- Create a synopsis that summarizes your vision and your plan.
- Make sure your change coalition can communicate the vision in less than five minutes.
- Frequently practice your 'vision speech'.

3.4 Step 4: Make the vision clear

To express your vision, don not only hold special gatherings. Instead, talk about it whenever you have the opportunity (Kotter, 2011, pp. 77-78, as cited in Kotter et al., 2021, p. 6). Use your vision to make judgments and solve problems on a regular basis. People will remember to it if you keep it fresh in their thoughts (Kotter, 2011, p. 80, as cited in Kotter et al., 2021, p. 6.). It is also crucial to 'walk the walk' when it comes to leadership. What you do matters considerably more - and is far more credible - than what you say. Demonstrate the type of behavior you want others to exhibit:

- Talk about your change vision a lot.
- Openly and honestly address people's problems and anxieties.
- Set a good example.

3.5 Step 5: Obstacles must be removed

Removing roadblocks might help you empower the individuals you need to carry out your vision and bring the change forward (Kotter, 2011, p. 91, as cited in Kotter et al., 2021, p. 6). Is there, however, anyone who is opposed to the change? Are there any procedures or structures that are obstructing it? For this reason, the following considerations should be made:

- Identify or hire change agents with a track record of success.
- Check to determine if your company's structure, job descriptions, and performance and compensation methods are in line with your objectives.
- Recognize and identify those who have helped to bring about change.

3.6 Step 6: Create Wins in the Short Term

Success motivates people more than anything else. Early in the transition process, give your business a taste of success (Kotter, 2011, p. 102, as cited in Kotter et al., 2021, p. 6). You will want to have some 'quick wins' that your employees can see in a short period of time. Without it, naysayers and pessimists may sabotage your growth. Make short-term goals rather than a single long-term aim. Each smaller goal should be attainable, with limited opportunity for error:

- Look for projects that are sure to succeed and that you can undertake without the support of any staunch opponents of the change.
- Early aims that are costly should be avoided.
- Analyze the potential benefits and drawbacks of your targets thoroughly.
- Reward those who assist you in attaining your goals.

3.7 Step 7: Build on the Progress

Each victory allows you to construct upon on what worked well and discover areas where you can improve. It is fantastic employing a new system to create a new product (Kotter, 2011, p. 114, as cited in Kotter et al., 2021, p. 6). However, if you can launch ten products, the new system is up and running. To get to that tenth success, you must continuously look for ways to improve:

- Analyze what went well and what needs to be improved after each victory.
- Set goals to help you maintain the momentum you have gained.
- Discover the concept of kaizen, or continuous improvement.
- Bring on new leaders and change agents to keep your change coalition's ideas fresh.

3.8 Step 8: Make it Last

Finally, in order for any change to persist, it must become a part of your organization's core. Because organizational culture typically impacts what gets done, every vision's values must be visible in day-to-day work (Kotter, 2011, p. 126, as cited in Kotter et al., 2021, p. 6). Continuous efforts should be made in order to ensure that the change is permanent. This will aid in embedding the change in the organization's culture (Kotter, 2011, pp. 128-129, as cited in Kotter et al., 2021, p. 6). It is also critical that the company's management remain committed to the transformation (ebd.). This comprises both current employees and newly hired leaders. If these people's support wanes, the process will have failed, and you may find yourself back where you started. There are two sides to the major transformation. Resistance is prevalent, even when employees understand that doing things differently is required due to new opportunities, mergers, acquisitions, reorganizations, crises, or an alliance. The most difficult aspect of leading through resistance is detecting its numerous disguises. When resistance is overt, it shows up as unpleasant interactions with people, ignoring requests, or outright unwillingness to change. Even the most astute CEOs and executives, however, sometimes overlook signs of subtle resistance. This is because everyone looks to have good intentions, therefore pinpointing the source of the difficulties can be difficult. Employees, for example, may agree to take on new initiatives or follow new policies or procedures at first, but then get increasingly preoccupied with other concerns or forget to do things differently. In the end, progress comes to a halt. While each company is different, there are certain best practices that can aid in overcoming resistance to new business strategies and resuming development, regardless of the kind of resistance (Errida & Lotfi, 2021, p. 6).

4 Discussion

Implementing new practices is one aspect of changing organizations; nevertheless, evidence suggests that 'initiative decay', or the loss of gains from change due to the abandonment of new practices, is common (Pisecky, 2020, p. 138). As a result, thinking about how to keep change going is clearly an important part of the change management process. Surprisingly, while there has been a lot of research and theory on implementing change, there has been relatively little research on the question of sustainability (Senior et al., 2020, p. 77). This could be attributed to the high cost of longitudinal study, as well as the widespread impression of stability as 'inertia'

and a lack of reactivity to changing circumstances. After reviewing the evidence, it is clear that there are multiple elements that influence sustainability, and that the more of these factors that are addressed, the greater the possibility of long-term improvement. Furthermore, these elements can be further expanded into a preliminary model that shows both the relative weighting of these aspects in terms of importance to organizational change sustainability, as well as their interaction with one another. The substance of the change, the implementation process itself, and temporality are all important factors in sustaining change. Regardless of the establishment of a broad model of sustainability, it is crucial to note that the interplay of contextual variables will vary based on the specific scenario of each company.

5 Conclusion

Behavioral change is the subject of a large corpus of research. However, a few significant elements from that review that are pertinent to the difficulties discussed in this study are worth highlighting. To begin with, the variety of behavior change theories presented suggest that it can be difficult to persuade people to change their behavior, even when there are compelling reasons to do so and the change is clearly beneficial to the individual. While the psychological contract provides a compelling analytical framework for explaining why employees may resist change if they do not believe the new 'bargain' is fair, the general literature on behavioral change suggests that even if managers address those concerns and employees believe the new exchange is fair, there can be resistance to change (Turgut & Neuhaus, 2020, p. 178).

Comprehensive behavioral change theories suggest that a variety of elements influence an individual's ability to change that are not related to their logical, conscious mental processes. Unconscious urges and fears, as well as conditioned behavior and thought, are examples. External factors such as the degree to which conduct is socially desired and the degree to which someone believes a given action is attainable will both influence their intention to change, regardless of their own thoughts about it. The understanding from systems thinking that changing a specific set of behaviors or a section of a system may necessitate fundamental modification of the system itself is linked to this, but at a higher level. This is due to the fact that systems thinking has proved that a system is bigger than the sum of its parts, and that changing one component of the system may not result in change because other aspects of the system are ready to restore the system to its prior state. This may appear abstract, but its

practical application to challenges like obesity and reforming the health-care system suggests that it is relevant to any complex organization seeking to make significant change. Finally, even if all other barriers have been removed, there may be very practical, but very significant, impediments such as time and resource constraints that prevent behavioral change from occurring. Organizational development is concerned with in fact, the rapid pace of change is now recognized as a leading cause of stress (and distress) for senior managers nationwide. So, it is not surprising that compensation levels across the country have begun to reflect the pivotal role that change managers have assumed in keeping companies competitive. The speed and unpredictability of events in the corporate environment need frequent and rapid organizational change. Change must become an intrinsic component of a company's strategy if it is to endure. This means a never-ending improvement.

6 Limitation

There is seldom a good reason for a transformation process to start. For the most part, change procedures are triggered. New regulatory requirements, increased competition, or internal factors are just a few examples. Top management spends a lot of time talking about these triggers. This raises awareness of existing issues as well as the need for change. Change is often seen as unnecessary by the lower-level management and his or her personnel. In a company, new leaders try to safeguard workers from disruptions and issues in order for them so that they can be more productive and work uninterrupted. This protection or buffering is sometimes misunderstood. It is doubtful that workers will support the change process if they do not have a clear picture of the company's predicament. The most common blunders occur in the field of communication. Communication frequency is generally too low at the start, throughout, and after changes are implemented, according to experience. Information events and, on occasion, discussion forums are required as part of the change process. It is even worse if the required information is released in stages. In IT projects, the desire to engage personnel in a 'eat or die' mentality is common. Employees must work with new software or hardware in such a project, regardless of whether they were involved in its implementation or not. Ignoring objections or counterarguments, making public statements about opposing doubts, and presenting inaccurate information in support of the desired change are all examples of unsuitable procedures or 'poor style' that should be avoided. This conduct is counterproductive, and it is frequently

reciprocated by those affected like a boomerang, by purposefully delaying or failing to implement the desired changes. To thrive in today's markets or in the organization's environment, every business and organization must continually adapt to changing general conditions and factors. The tone of change processes is frequently determined by external variables. Changes are frequently implemented too soon or noticed too late. At any given time, people can only tolerate a certain level of change. People will not continue if this amount is not increased. This may not be readily apparent from the outside. It can manifest as a lack of motivation. If a change process is started, it is important to consider the long-term viability of the desired changes. During installation, too little control attention is applied. It might be difficult to assess the success of an implementation, especially when employee behavior must be considered. It is possible to include the issue of accountability.

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The Relationship between the Workplace Support Infrastructure and the Role of Satisfaction Nurse Managers and its Moderators

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Abstract

The orientation of hospital management to the role of nurse satisfaction is important for increasing the quality of health care perceived by patients and is also reflected in many other outputs of health care facilities. The paper explores the moderating effects of work community and prosocial motivation on the relationship between workplace support infrastructure and the role of satisfaction nurse managers. We surveyed 132 head nurses from 5 university hospitals in Slovakia. A series of regression analyzes, and ANOVA analysis of variance were used to verify the formulated hypotheses. Significant but slightly direct effects of the supporting work infrastructure on the roles of satisfaction of head nurses. From these, managerial support has the most significant effect. The moderating effect of the working community is high and significant. The moderating effect of prosocial motivation is significant but low. The importance of managerial support in the role of satisfaction nurses managers with orientation towards building a work community. The prosocial motivation of head nurses has only a low strengthening effect. In the managerial position, it is suppressed by other factors.

Keywords: *Job satisfaction, Nurse Managers, Practice Management, Support groups*

1 Introduction

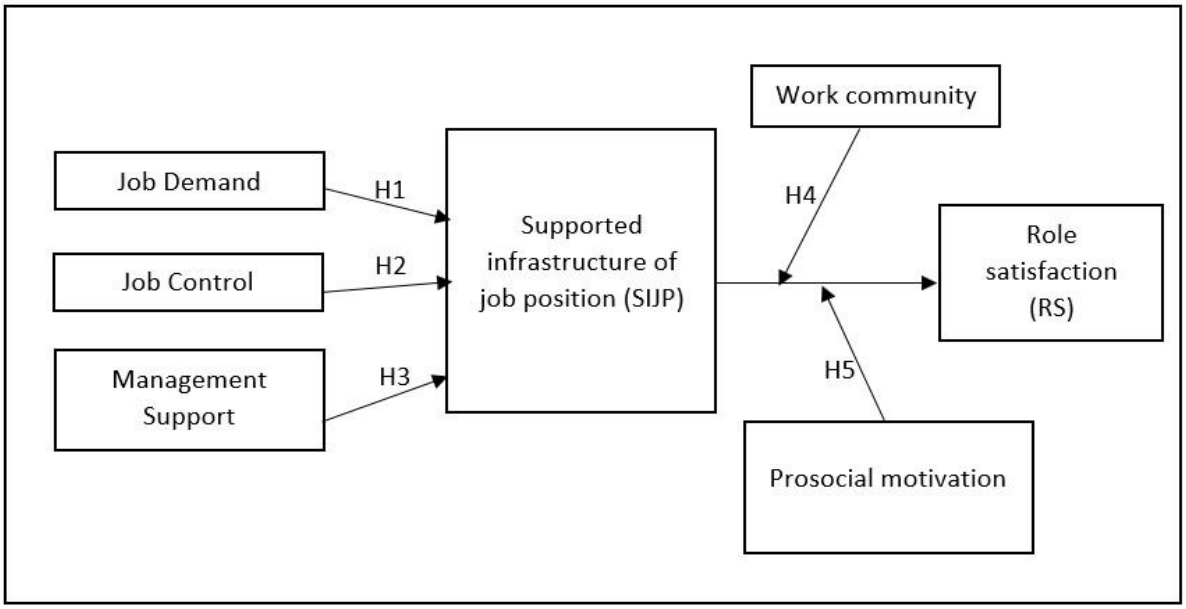
Many studies present findings on factors influencing the job satisfaction of nurses. Very few of them focus on the direct management of nurses, which is the basis for the successful operation of departments. Within the structure of hospitals in Slovakia, these are senior nurses, responsible for the operation of the department, for creating a healthy work environment (Boev, 2012; Galura, 2020), for patient satisfaction (Tsai et al., 2015; Wong & Cummings, 2007) and the effective functioning of interdisciplinary teams (Nelson, 2017). The paper has three goals,

which are based on the effort to draw attention to this topic. First, we present a relatively brief perception of the role of nurse satisfaction (NS) and the factors that affect it. We deliberately address the role of satisfaction, which better describes the job satisfaction of the head nurse than the manager. Subsequently, we focus on the mechanism of action of these relationships by examining the factors that can strengthen the direct relationship, respectively weaken. The third goal is to identify the implications for hospital management in an area that receives little attention and is significant.

Satisfaction with the role, as defined by Krishnaveni and Ramkumar, represents the degree of satisfaction of psychological needs in one of the tasks in an organization (Krishnaveni & Ramkumar, 2006). Factors presented influencing the role of lead nurse satisfaction include work environment (Djukic et al., 2017), structural empowerment and degree of decision-making autonomy (Gatti et al., 2017; Morsiani et al., 2017), organizational commitment and support (Laschinger et al., 2006; Lu et al., 2005), psychological empowerment and workplace empowerment (Jang & Oh, 2019; Nelson, 2017; Yarbrough et al., 2017), professional commitment (Chang et al., 2017), job stress (Lo et al., 2018; Masum et al., 2016), patient satisfaction and patient-nurse ratios (Lu et al., 2005) and senior leadership style (Lawson & Fleshman, 2020; Wong & Laschinger, 2013).

Obviously, the mechanism of action of various factors on satisfaction roles is complex. For this purpose, we have developed a comprehensive indicator integrating several elements of the supported infrastructure of job position (SIJP), linked to the work environment, and based on existing studies, we assume its positive relationship with the role of nurse satisfaction (H1, H2 and H3). This direct effect can be influenced by both individual and organizational factors, so we examine the moderation processes of the work community (WC), in which head nurses perform their work and their prosocial motivation (PM) (H4 and H5)(Figure 1).

Figure 1 The moderation model and the tested hypothesis



2 Methodology

2.1 Data Collection and Sample

The research was conceived as a cross-sectional study. Data collection took place in 5 Slovak university hospitals in September and October 2020. Line managers at the first level of management were contacted, i.e., those, who are in a direct relationship with nurses and are their direct superiors. In Slovakia, they are head or station nurses. Line managers were from different types of clinical areas. At sending the questionnaire, they were explained the meaning and purpose of the study, ensuring anonymity and voluntary participation. By sending the completed replies, they also confirmed their consent to the processing of data. A total of 132 responses were obtained from managers with an average age of 48.4 years (min. = 31, max. = 66, SD = 10.11), with an average management experience of 13.47 years (min. = 2 years, max. = 33 years, SD = 8.51). 12% of them had a secondary education, 37.7% had a baccalaureate degree and 50.3% had a master's degree, 31.1% had completed and completed a specialized study in management.

2.2 Measures

The SIJP item is operationalized as a score, given by nurses managers to 14 items within three indices: (1) job demand (5 items such as workload, work pace, decision latitude and competence), (2) job control (4 items, measuring to what extent an individual can influence how the work will be carried out and decisions affecting her work) and (3) managerial support

(5 items measuring managerial support and appreciation and help in developing an individual professional competencies) (Johnson, 1986; Karasek & Theorell, 1992). The scales are well established with excellent psychometric properties (Cronbachs alpha od 0.73 po 0.88). Responses to individual items within the PWF characteristics were scaled on a 5-point scale (1 = ‘‘totally disagree “to 5 =‘‘totally agree“). After reliability analysis, the Cronbach’s a of the PWF was 0.88 (14 items).

The role of satisfaction as a dependent variable was measured by items taken from the Alienation from Work scale by Aiken and Hage (Aiken & Hage, 1966). Because the authors measured dissatisfaction with employee roles, our items were reversed scored to measure satisfaction (Patrick & Laschinger, 2006). The variable contains 6 items, which are rated on a 5-point Likert scale (1 = very dissatisfied to 5 = very satisfied.). Examples of items are "I have sufficient authority to perform work tasks", "I am satisfied with my job compared to similar positions in other facilities", "I see progress in achieving goals", "I am accepted as a professional", "Expectations to start they fulfilled me "," I am satisfied with the current work ". The reliability of the examined scale in previous studies ranged from 0.85 to -0.86, measured by Crobach alpha. In our study, Cronbach's alpha was 0.86 (6 items).

The moderating variables were work community (WC) and prosocial motivation (PM). The measurement of the work community variable is based on the pressure management indicator, which was developed by Williams and Cooper and validated in many studies (Williams & Cooper, 1998). One of the subscales in this questionnaire is the community subscale, containing 5 items that are rated on a 5-point Likert scale (1 = disagree to 5 = agree.). Examples of items are "It is quite natural in our team to ask colleagues for help", "Within the team I get a lot of support from colleagues" (Laschinger & Finegan, 2005). The reliability of the scale examined in previous studies ranged from 0.75 to 0.80, as measured by Crobach alpha. In our study, Cronbach's alpha was 0.80 (5 items).

The measurement of prosocial motivation is based on a 4-item scale developed by Grant (Grant, 2008) and validated in other studies (Moynihan et al., 2015; Van der Voet et al., 2017). The items are "It is important for me to do good for others through my work", I care about benefiting others through my work "," I want to help others through my work "," I want to have a positive impact on others through my work”. After reliability analysis, Cronbach alpha was 0.89 (4 items).

The control variables were age (in years), length of practice, education (0 = secondary, 1 =

university 1st degree, 2 = university 2nd degree), completed specialization in management (0 = no, 1 = yes) and span of control. These were selected as control variables given their theoretical relevance.

2.3 Data analysis

All data was analyzed using the SPSS 24.0 software package. Cronbach's Alpha coefficient, AVE and CR was used to assess the internal consistency of the scale's reliability. Descriptive statistics and hierarchical regression analyze were performed to test the established hypotheses. We used Jeremy Dawson excel templates to construct moderation effects graphs (Dawson, 2014). The ANOVA variance analysis was used to analyze multiple dependencies. We have worked with a 5% significance level.

3 Results

Relationships between individual variables were determined using a correlation matrix, which also includes control variables (Table 1). Table 1 also provides basic descriptive statistics for the file.

Table 1 Descriptive statistics of variables and correlation matrix

Variable	Mean	SD	RS	JD	JC	MS	SIJP	WC	PM	Age	practice	educat	spec
RS	3.04	0.39	-										
JD	3.23	0.65	0.620**	-									
JC	3.30	0.49	0.683**	0.666**	-								
MS	3.25	0.54	0.853**	0.714**	0.759**	-							
SIJP	3.33	0.82	0.795**	0.880**	0.906**	0.911**	-						
WC	3.14	0.44	0.862**	0.674**	0.730**	0.771**	0.805**	-					
PM	3.49	0.53	0.933**	0.447**	0.560**	0.748**	0.646**	0.772**	-				
Age	48.37	10.11	-0.071	0.129	-0.137	0.023	0.001	-0.091	-0.098	-			
practice	13.47	8.51	-0.339**	-0.008	-0.314**	-0.194**	-0.195**	- 0.318**	- 0.351**	0.832**	-		
Educat.	1.39	0.75	0.750**	0.288**	0.459**	0.591**	0.494**	0.577**	0.765**	- 0.430**	- 0.608**	-	
Spec.	0.54	0.50	0.802**	0.388**	0.459**	0.638**	0.546**	0.623**	0.850**	- 0.144**	- 0.391**	0.876**	-
Span	27.31	4.44	- 0.7152* *	- 0.341**	-0.541**	-0.569**	-0.537**	- 0.636**	- 0.690**	0.540**	0.781**	- 0.710**	- 0.631**

*Notes: RS=role satisfaction, JD= job demand, JC= job control, MS= managerial support, SIJP= supported infrastructure of job position, WC= work community, PM= prosocial motivation, education (high school=0, bachelor's degree=1, master's degree=2), specialization in management (no=0, yes=1), span= span of control, **p > .05.*

It is clear from the correlation matrix that there are significant positive correlations between all the variables examined, indicating the use of further analyzes. In a simple correlation relationship, RS is most influenced by social motivation nurses' managers with a correlation coefficient of up to 0.933 at zero significance and by the work community with a correlation

coefficient of 0.862. SIJP has a lower correlation coefficient (0.795), within which it shows the highest dependence of managerial support (0.853).

For control variables, significant correlations were found for all variables except age. Negative correlations are in the length of practice and span of control, i.e., a higher role of satisfaction (but also other examined variables) is associated with a smaller number of years of practice and lower span of control. There are positive correlations in education and specialization, i.e., higher education and completed managerial specialization in further education are significantly related to higher RS. Also, for the PM variable, the correlation coefficients are high for both control variables. The hypotheses were tested using multiple and moderated multiple regression analysis. The results are shown in Table 2.

Table 2 Results of regression analyses for variable SIJP and moderated regression analyses (dependent variable RS)

	Hypothesis 1 (JD-RS)	Hypothesis 2 (JC-RS)	Hypothesis 3 (MS-RS)	Hypotheses 1, 2 and 3 (SIJP-RS)
Constant	2.77	2.76	2.19	2.25
Main variables				
JD	0.22**			
JC		0.21**		
MS			0.38**	
SIJP				0.34**
Control variables				
Age	0.01**	0.01**	0.01**	0.01**
Practice	0.01**	0.01**	0.01**	0.01**
Education	0.21**	0.19**	0.11**	0.16**
Spec. in management	0.10**	0.13**	0.14**	0.12**
Span of control	-0.05**	-0.05**	-0.04**	-0.04**
R2 adj.	0.85	0.85	0.88	0.87

	Moderator WC	Moderator PM
Constant	3.00	2.98
Control variables		
Age	0.01**	0.00**
Practice	0.01**	0.00**
Education	0.19**	0.13**
Specialization study	0.12**	-0.04
Span of control	-0.03**	-0.02**
Main variables		
SIJP	0.08**	0.17**
WC	0.19**	
PM		0.39**
SIJPxWC	0.23**	
SIJPx PM		0.14**
R2adj.	0.92	0.95

*Notes: RS=role satisfaction, JD= job demand, JC= job control, MS= managerial support, SIJP= supported infrastructure of job position, WC= work community, PM= prosocial motivation, education (high school=0, bachelor's degree=1, master's degree=2), specialization in management (no=0, yes=1), span= span of control, **p > .05.*

When separately monitoring the direct effect of predictors, each of the variables (JD, JC and MS), as well as SIJP as their aggregate variable, had a significant relationship with RS nurses' managers. Although the coefficients are significant, they are not high (β ranges from 0.21 to 0.38; the total coefficient for the SIJP variable is 0.34). Hypotheses 1, 2 and 3 were confirmed based on the obtained results. Of the control variables, all variables were significant in all regression analyzes. The highest coefficients were recorded for the variable's education and managerial specialization.

The effects of the SIJP predictor on RS nurses' managers are moderated by both moderators. The nature of these effects is shown in the following figures (figures A.2 and A.3), which gradually plot 2 interaction effects. The first moderator is work community nurses' managers. The moderation is significant with a positive coefficient of 0.23, indicating that the WC variable strengthens the relationship between SIJP and RS. At higher values of the WC variable, the slope of the line increases significantly. The second moderator is the variable prosocial motivation. The moderation effect (0.14) is significant but is lower than for the WC factor. The strengthening effect of the PM variable is more even for both lower and higher SIJP.

Figure 2

Moderating effect of community on the SIJP-RS relationship

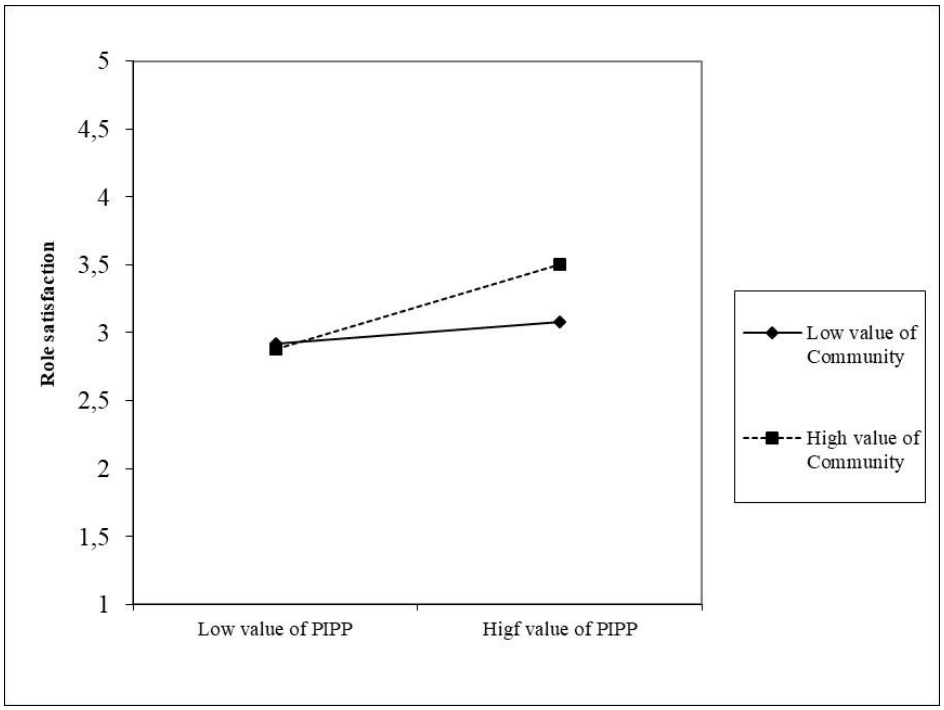
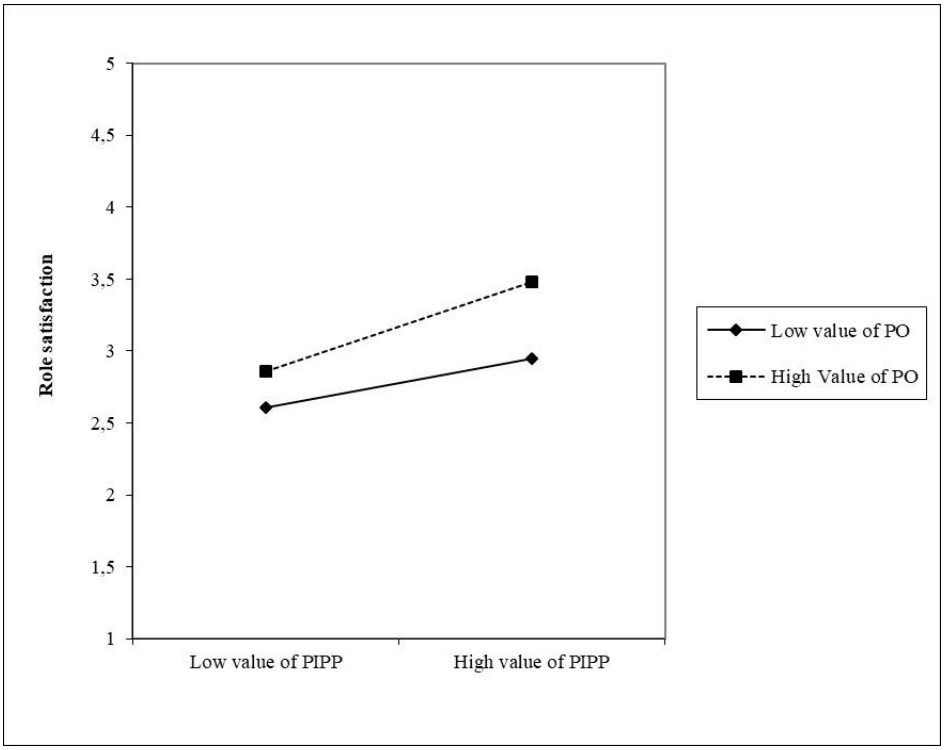


Figure 3

Moderating effect of prosocial orientation on the SIJP-RS relationship



4 Discussion

The obtained results show that the role of satisfaction of head nurses is directly related to the work background in which they perform their work. Of the elements that create the work background, the most significant relationship is the satisfaction of head nurses with the support they receive from their superiors. Valuation and support in the development of competencies are an important tool that can help senior nurses to feel their own satisfaction with their role and subsequently to ensure the satisfaction of their subordinates as well as positive organizational results. This finding supports the results of Galura and Tsai (Galura, 2020; Tsai et al., 2015).

The results also point to the fact that the relationship between the work background and the satisfaction of nurses with their role can be strengthened through the work community. These findings are consistent with the results of the study by Djukic et al., which also confirmed the importance of the quality of working relationships, the opportunity to learn and gain support from colleagues for the satisfaction of nurses‘managers (Djukic et al., 2017). The working community shapes the attitudes of NMs (Nevalainen et al., 2018), provides many opportunities for learning and self-development (Bjørk et al., 2013; Govranos & Newton, 2014) and has

significant potential to enhance NMs‘ satisfaction with their role. The influence of this factor on the strength of the relationship between SIJP and RS is more pronounced than in the prosocial motivation of head nurses, but this individual characteristic was the same as in the studies of Van der Voet et al. and Kjeldsen & Andersen identified as important for the perception of NMs‘ satisfaction with their own role (Kjeldsen & Andersen, 2013; Van der Voet et al., 2017). Taking it into account in the process of selecting head nurses as well as creating suitable conditions for feeling the benefits of one’s own work for individuals and the community can contribute to increasing their sense of satisfaction with the role.

The findings also point to the fact that the prosocial motivation of nurses is related to their higher qualifications and specialized studies in management, which suggests that in the process of education, nurses‘ managers strengthen their orientation to perceive the usefulness of work for society and other people. Prosaically motivated individuals, according to Van der Voet et al. try to act prosaically and it can be expected that their ability to achieve this in their jobs will affect their job satisfaction (Van der Voet et al., 2017). It is the process of educating head nurses that seems to be the factor that has the potential to provide them with enough competencies to achieve the desired results and perceive their work as useful.

Satisfaction is perceived more strongly by senior nurses working in an environment with lower span of control. A smaller number of directly managed nurses give their managers the feeling that they manage their role better. This result supports the findings of Nelson and shows that the current trend of reduction of first-line managers, which leads to an increase in span of control in healthcare facilities, is not optimal. The result is a higher rate of adverse patient events as well as lower job satisfaction and a higher rate of fluctuation (Nelson, 2017).

The fact that nurses with shorter experience perceive satisfaction with their own role more intensively may be related to the complexity of this key medical position and the onset of burnout in those nurse managers who hold their position for a long time. On the contrary, higher education and completion of specialization studies are the factors that support senior nurses in the qualified performance of their work and increase satisfaction with their demanding role.

Strengthening the role of the head nurse’s satisfaction is essential for the provision of quality health care as well as for maintaining staff satisfaction and commitment. An important implication of our study is that the support infrastructure (job demands and job control) contributes to the satisfaction of senior nurses, but it is perceived more as a matter of course and part of the normal working conditions of a managerial position. The only aspect that

contributes to increasing their satisfaction within the support infrastructure is managerial support. If the head nurses feel and really receive this support in the form of the development of their competencies and appreciation of the work done, their satisfaction increases. Another implication of the study for hospital management is the focus on building a work community, which significantly strengthens the effects studied. The prosocial motivation of head nurses has only a low strengthening effect. In the managerial position, it is suppressed by other factors.

Our study also has some limitations. The primary limitation is the use of a cross-sectional research design. The obtained results prove the existence of relationships between the examined variables, but do not confirm the relationship between cause and effect. The research used and the convenience sample of organizations was to recruit lead nurses, but each organization had responses rates of 50% to 100%, because of which we can assume that the data reflected the group level phenomenon that were examined. In consideration, generalizability may be limited. Another limitation may be the fact that all data were collected using self-administered surveys. Response bias may have partially skewed the answers.

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Evaluation of Product Recall Activities from the Perspective of Customers and Retailers

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Abstract

The main goal of the paper is to evaluate the product recall activities from the perspective of customers and retail representatives. To achieve this goal, primary quantitative research has been carried out, which examines consumers' attitudes towards the environmentally responsible activities of organizations and towards activities supporting the recall of unnecessary products. The survey was performed between November and December 2020 and involved 4,888 Slovak consumers. Respondents were selected to meet a representative sample for gender, age, education, size of residence, and income. Clearly, there is room for improving the awareness of ultimate customer on the market. The fact that quite a high number of customers would be willing to behave desirably, however they “forget”, appears positive. It is therefore a task of a number of entities involved in the modern marketing management (for-profit organisations, non-profit organisations, civil initiatives, educational institutions at several levels, state apparatus, etc.) to sufficiently communicate the purpose of the reverse distribution in order to clarify the role of the driving force for ultimate customers.

Keywords: *Customer behaviour, Distribution Channels, Sustainable distribution*

1 Introduction

The production of excessive amount of waste can causes serious problems within the distribution channel and can contribute to the creation of additional costs (financial or nonfinancial). Waste is produced at almost every point in the distribution channel. In the past, the members of distribution channel tried to "got rid of" waste in the closest possible way, and at the same time in the same way. These activities very often caused various damages to water, soil, and air. Linear distribution channels are capable of increasing toxic substances in the biosphere – they participate in the reduction and elimination of the efficiency of natural systems, as well as in harming people and their quality of life. Other products that make the distribution channels unsustainable is the fact that the production of waste can cause the organization of high costs. Costs arise during the production of waste, as well as during its disposal. However, with proper management, the amount (volume) of produced waste can be eliminated, or converted into a source of income.

The concept, or the cradle-to-cradle philosophy (Harris, 2007; Shaw, 2003; Braungart, 2021) assumes that all industrially produced waste can and should be eliminated by having its components serve as biodegradable components in natural systems (biosphere) or can be reclaimed in human technological systems (technosphere). The certification, which confirms that the organization adheres to the concept of "cradle to cradle", helps organizations to create such products that are reabsorbed into nature without causing harm or reintroduced into the technosphere through recycling. Manufacturers who respect and comply with the terms of this concept and certification produce their products using renewable energy sources, with an effort to reduce, for example, water consumption or more efficient consumption (Osuntuyi & Lean, 2022) and treat human resources (whether employees or customers) with a sense of responsibility. The concept "from cradle to cradle" will manifest itself in the distribution channel in the form of a reduction in the amount of produced waste, and customers (from the market of final customers, respectively from the market of organizations) will become suppliers of many raw materials needed for further production processes. However, it is necessary to emphasize the fact that the ability to (re)obtain recycled product components also depends on the design of the product (Fan, 2022; Santor, 2020). The design of the product respecting its decomposition enables a simplified reduction of the product to components (for example in the form of materials) after the end of its life cycle.

Reverse logistics (Shamsuddoha, 2022; Sun, 2022) involves the systematic transfer of produced waste in the distribution channel in order to transform it into usable raw materials. Solid waste recycling should be the main ecological goal of organizations (Haase & Becker & Pick, 2018). Recycling is technologically feasible, changing material flows in distribution channels therefore presents managers with a challenge and an opportunity for change. In such an approach, the motivation of the customer is extremely important – he/she must be motivated enough to understand his role as a "producer" and to actively behave in this way, as the customer is the driving force in the reverse distribution channel (Chamberlin & Boks, 2018). One of the ways in which the concept of reverse logistics can be realized is the activities of retailers, or other members of the distribution channel consisting, for example, in taking back recyclable materials, or products after the end of their life cycle. For the implementation of this strategy, material return flows must become common activities within the distribution channel, thus transforming distribution channels into distribution cycles in which customers or end users of the product play the role of suppliers of raw materials and components to processors and manufacturers (Sheth & Sisodia, 2005).

2 Methodology

The main goal of the paper is to evaluate the product recall activities from the perspective of customers and retail representatives. To achieve this goal, primary quantitative research has been carried out, which examines consumers' attitudes towards the environmentally responsible activities of organizations and towards activities supporting the recall of unnecessary products. The survey was performed between November and December 2020 and involved 4,888 Slovak consumers. Respondents were selected to meet a representative sample for gender, age, education, size of residence, and income. Description of the sample based on socio-demographic factors can be found in Appendix A.

The answers were collected in order to evaluate the complex view on current marketing management and contains several questions related to the researched issue of thte paper. In them, we asked respondents if they think that companies in Slovakia are trying to reduce the impact of business on the environment, in which areas they perceive such activities and what are the reasons that companies include environmental and socially responsible activities in their strategy. The next part of the questionnaire was focused on the activities of companies that try to motivate customers to bring unnecessary products to the store. We are interested in whether such activities have been noticed at all and, if so, where. We also want to find out if customers used this opportunity and brought the products to the store and also what their motivation was to do so. We have also linked three hypotheses to these questions, examining whether demographic parameters such as gender, age and education have an impact on customers taking advantage of product recall. The hypotheses are as follows:

H0: There is no statistically significant effect of gender/age/education on whether customers use the option to recall unnecessary products.

H1: There is statistically significant effect of gender/age/education on whether customers use the option to recall unnecessary products.

We test hypotheses at a significance level of alpha = 5% using the Chi-Square test, which is suitable for categorical variables. We hypothesis H0 if the p-value is less than 0.05 and we accept H1. The conditions of the Chi-Square test are met due to the fact that each of the questions was mandatory, so the individual observations ins the PivotTable are independent and at least 80% of the cells in the PivotTable have an expected frequency of more than 5, which is verified by testing the hypotheses in SPSS at the end of each Chi-square table listed for each hypothesis. Detailed results from the SPSS software can be found in Appendix B.

Other methods that were used to evaluate the data were descriptive statistics and analysis of contingency tables.

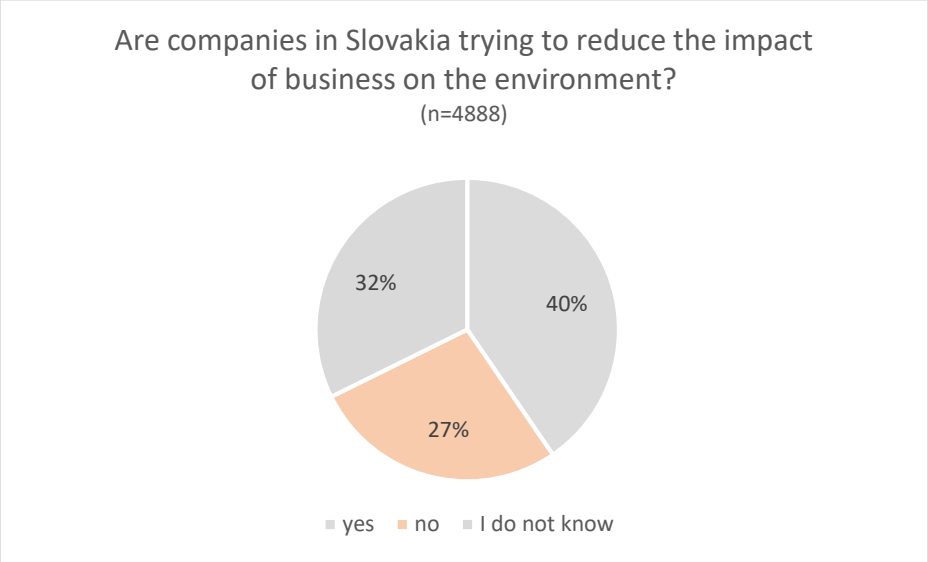
3 Results

Environmental behavior of companies from the perspective of consumers

First of all, we asked the respondents if they think that companies in Slovakia are trying to reduce the impact of business on the environment. It turned out that two-fifths of respondents did not have an opinion on the issue. The rest of the respondents were more in favor of a positive answer, although the difference is not significant – 32% of respondents answered "yes" and 5 percentage points fewer respondents answered "no" (see Chart 1).

Chart 1

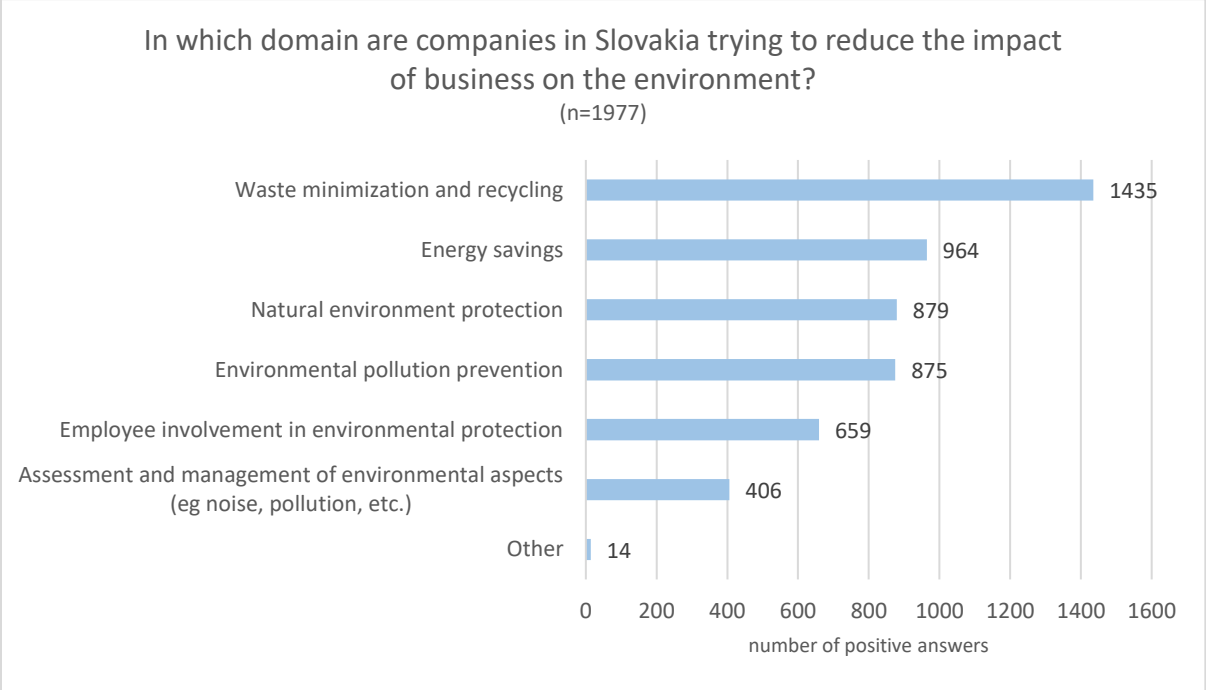
Consumer views on companies' efforts to reduce their environmental impact



Respondents who answered "yes" to the previous question identified waste minimization and recycling as the main domains in which Slovak companies are trying to reduce their impact on the environment. As many as 1,435 respondents identified this answer, which is almost three quarters of respondents who notice the companies' efforts to reduce their impact on the environment. The second most frequently marked answer was energy savings, followed by environmental protection and pollution prevention with a similar number of responses. One third of respondents think that the involvement of employees in environmental protection is a domain in which companies in Slovakia are trying to reduce the impact of business on the environment. The least indicated answer was the assessment and management of environmental aspects (such as noise, pollution, etc.), which indicated about 20% of respondents (see Chart 2).

Chart 2

Domains where are companies in Slovakia trying to reduce the impact of business on the environment



It turned out that 69% of respondents think that the reason why companies include environmentally and socially responsible activities in their strategy is mainly the image and reputation of the company. The second most frequently mentioned reason was the visibility of the company followed by adaptation to new market trends. Approximately 38% of respondents also identified the company's social awareness as a reason for environmentally and socially responsible activities, followed by a profitable investment to increase the company's profit and economic results with a similar number of responses. Interestingly, just over 30% of respondents identified real interest in the environmental environment as a reason why companies incorporate environmentally responsible activities into their strategy. Respondents included cost reduction and training and building employee loyalty and loyalty among the least frequently marked answers (see Chart 3).

Chart 3

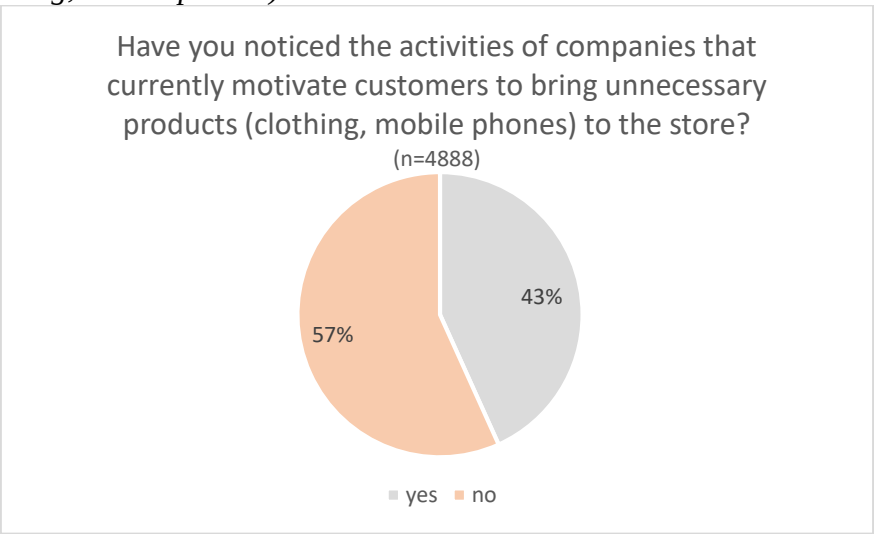
Reasons why companies include environmentally and socially responsible activities in their strategy

Evaluation of product recall activities from the perspective of customers

The basic question is whether consumers even notice the activities of companies that motivate customers to bring unnecessary products to the store. Surprisingly, less than half of consumers have registered such activities, only 43% of respondents (see Chart 4).

Chart 4

Noticing activities of companies that currently motivate customers to bring unnecessary products (clothing, mobile phones) to the store



We asked the respondents where they noticed activities of companies that currently motivate customers to bring unnecessary products to the store. In this open question, telecommunications

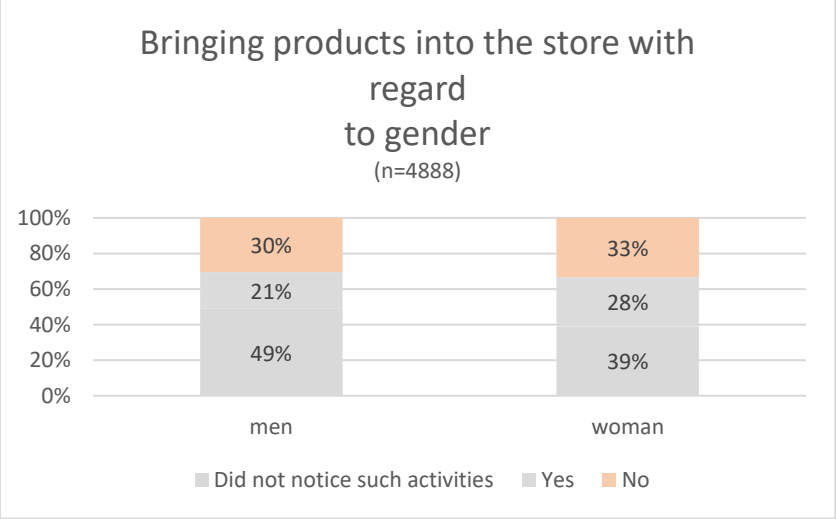
companies were the most common, where customers can hand over old mobile phones and get a bonus. By far the most mentioned company in this area was the company Orange, which gives extra data for the old telephone or a discount to the bookstore. The second major category mentioned by respondents was clothing stores, with the most frequent respondents mentioning the H&M chain. The third large group of stores mentioned by the respondents were electronics stores, where it is possible to bring unnecessary electronics. Namely, the most frequently mentioned stores were Nay, Okay and iStores.

However, if we look at how many of those consumers who have noticed such activities have actually taken such products to the store, consumers are more inclined to answer "no". Of those who noticed the activities of companies motivating customers to bring unnecessary products to the store, only 43% of them actually brought products to the store.

If we look at the hypothesis whether there is a statistically significant relationship between men and women in bringing unnecessary products to the store, based on the Chi-square test, where the p-value came out less than 0.05, we can reject hypothesis H0 and can state that there is a statistically significant difference between the attitudes of men and women. While almost half of men have not seen such activities, there are 10 percentage points fewer responses among women. If customers have already noticed the activities of companies trying to motivate customers to bring unnecessary products to the store, more women than men have done so (see Chart 5).

Chart 5

Bringing products into the store with regard to gender

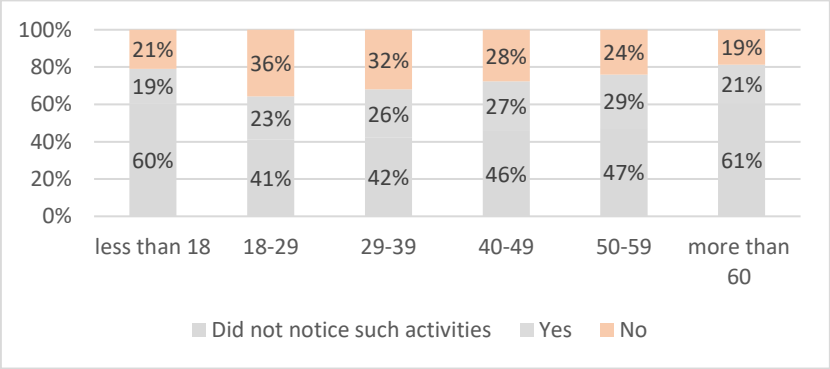


Education has also proven to be a significant parameter in whether customers recycle unnecessary products in stores (p-value is less than 0.001, so again we can reject hypothesis H0). We've found that customers over the age of 60 and under the age of 18 are the least likely

to see an opportunity to bring products to the store. Although consumers between the ages of 18 and 29 noticed such activities of the companies to the greatest extent, 36% of respondents in this age group did not use the opportunity to bring unnecessary products into the store. The most respondents who took the opportunity to recycle products in the store were between the ages from 50 to 59 (see Chart 6).

Chart 6

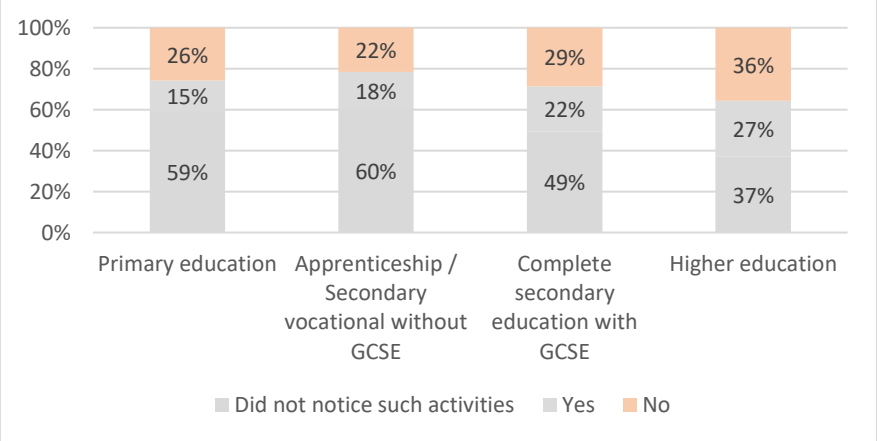
Bringing products into the store with regard to age



Last but not least, we analyzed whether education divides consumers into statistically significantly different groups in terms of the use recall activities in store. It turned out that the activities aimed at product recall were most often noticed by consumers with a higher education, who also most often indicated that they also took the opportunity of such activities. On the other hand, three-fifths of respondents with primary and secondary vocational education without GSCE did not register activities aimed at promoting recycling and bringing unnecessary products to the store. Of these educational groups, there are also the least responses declaring the use of such a product recycling option (see Chart 7).

Chart 7

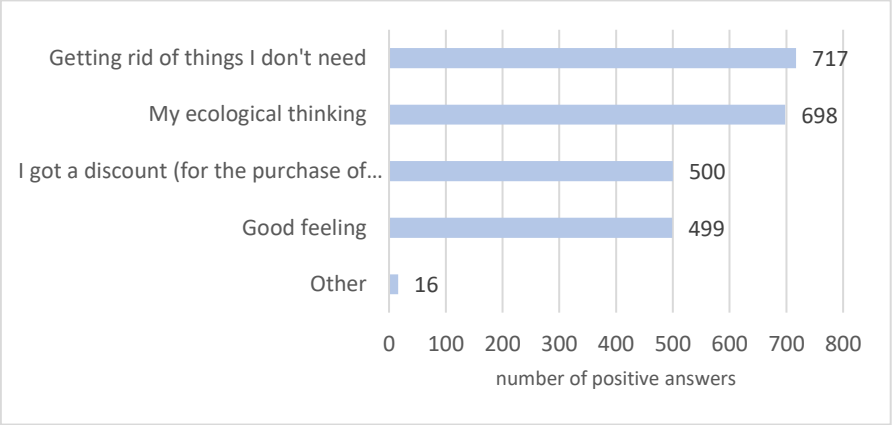
Bringing products into the store with regard to education



The most common reason why respondents took the opportunity to bring unnecessary products to the store was to get rid of things they didn't need. Only a few respondents less indicated the answer that their ecological thinking led them to do so. The following two answers – getting a discount on the purchase of another products and feeling good – were the reason for bringing the products to the store for about 42% of those who have ever done so (see Chart 8).

Chart 8

Reason for bringing unnecessary products into the store



4 Discussion

In the secondary data analysis, focused on identifying the preparedness of retail institutions for the product recall activities, retail institutions were selected.

Table 1

Particular product recall activities of selected retailers

Retailer	Specification of the product recall activity
NAY (electronics retailer)	The disposal of small quantities of electronic waste, with the external dimension of up to 25 cm, and lighting waste (bulbs, fluorescent lamps and small electrical household appliances such as toasters, hair dryers, kettles, shavers, smart phones, etc.). Customers can bring these anytime to the point of sale, where they will be accepted and their disposal in an ecological manner will be ensured. The disposal of other electronic waste delivered to the point of sale by customers (vacuum cleaners, refrigerators, TV sets, etc.) Based on the legislation these can be only accepted upon the purchase of a new appliance of the same kind. The disposal of other electronic waste and its transport from home. The removal is ensured upon delivery of a new appliance of the same kind within the service "Comfortable Transport Home" (paid service). Based on the legislation, these can be only accepted upon the purchase of a new appliance of the same kind. The customer does not have to carry their old appliances downstairs, a worker will do it for them within the service "Comfortable Transport Home". The organisation will subsequently ensure their disposal in an ecological manner.
Dr. Max (network of pharmacies)	Dr. Max is constantly seeking new ways and procedures how to be helpful in the area of social responsibility. As they care about environment they have engaged in the environmental project in support of the waste management. In cooperation with the civil association organisation EKOrast, they help people separate waste properly by means of a mobile application Green Bin. The application offers navigation for different types of waste. Dr. Max has engaged in the support of collection of old unused medicines. By means of the

	GPS application Slovak citizens are offered the nearest Dr. Max pharmacy, where they can return the medicines. Proper recycling of medicines and environmental protection are ensured by the support of returning old medicines back to pharmacies.
Orange Slovensko (mobile operator)	"I want to get the best from my old mobile phone." The customer is able to return their old mobile phones to the store, thus ensuring their recycling in an ecological manner and contributing 50 cents for each to families in need.
Intimissimi (clothing company)	"Intimissimi loves environment and is therefore environmentally friendly." In cooperation with I:CO it gives a second chance to discarded textiles by creating material for further use after their recycling. The customer receives a voucher (with a value ranging from EUR 1 to 3) for every returned piece (no purchase necessary).

The following conclusions were drawn from the gained results. Clearly, there is room for improving the awareness of ultimate customer on the market. The fact that quite a high number of customers would be willing to behave desirably, however they "forget", appears positive. It is therefore a task of a number of entities involved in the modern marketing management (for-profit organisations, non-profit organisations, civil initiatives, educational institutions at several levels, state apparatus, etc.) to sufficiently communicate the purpose of the reverse distribution in order to clarify the role of the driving force for ultimate customers.

It can be concluded from the perspective of the analysed organisations, respectively their representatives selected especially with the view to the market shares that they respect the obligations prescribed by law; only one of the analysed organisations provided financial rebates to customers upon returning unnecessary products (clothes in this case) to the store. With regard to the fact that the modern marketing management system is currently comprehensive and interconnected, such entities will probably have to take certain responsibility in educating the ultimate customers on the basis of their position in the reverse distribution.

As materials remain in closed distribution cycles, they become resources for further production processes (instead of waste) and thus their value increases. This approach brings financial benefits to customers, but also to other members of the distribution channel, thanks to careful management of resources, unification and return to the distribution cycle. However, in many cases, customers do not demand direct monetary compensation (for example, for waste recycling), but for example, savings on collection bins, on fees for the disposal of hazardous waste - this is possible for electronics, light bulbs, medicines, toxic materials (motor oil, batteries) , which require special care for safe recycling.

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Appendix A

Socio-demographic composition of the examined sample

	Frequency	Percent	
Gender	Men	2123	43%
	Woman	2765	57%
Age	less than 18	91	2%
	18-29	2492	51%
	30-39	1198	25%
	40-49	652	13%
	50-59	338	7%
	more than 60	117	2%
Size of residence	less than 2000 inhabitants	489	10%
	2000-5000 inhabitants	551	11%
	5000-10000 inhabitants	488	10%
	10000-20000 inhabitants	401	8%
	20000-50000 inhabitants	604	12%
	50000-100000 inhabitants	457	9%
	more than 100000 inhabitants	1898	39%
Monthly income	less than 330€	109	2%
	331-500€	98	2%
	501-660€	167	3%
	661-900€	550	11%
	901-1330€	1074	22%
	1331-1660€	792	16%
	1661-1990€	630	13%
	1991-2320€	498	10%
	2321-2660€	295	6%
	more than 2661€	675	14%
Education	Primary education	116	2%
	Apprenticeship / Secondary vocational without GCSE	218	4%
	Complete secondary education with GCSE	1804	37%
	Higher education	2750	56%

Appendix B

Chi-square test results from SAS software

Crosstab

			Gender		
			Men	Woman	Total
Bringing products into the store	Did not notice such activities	Count	1038	1077	2115
		% within Gender	48,9%	39,0%	43,3%
	Yes	Count	438	763	1201
		% within Gender	20,6%	27,6%	24,6%
	No	Count	647	925	1572
		% within Gender	30,5%	33,5%	32,2%
Total		Count	2123	2765	4888
		% within Gender	100,0%	100,0%	100,0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	54,447[a]	2	,000
Likelihood Ratio	54,629	2	,000
Linear-by-Linear Association	27,013	1	,000
N of Valid Cases	4888		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 521,63.

Crosstab

			Age						
			18-29	30-39	40-49	50-59	more than 60	less than 18	Total
Bringing products into the store	Did not notice such activities	Count	1025	506	298	160	71	55	2115
		% within Age	41,1%	42,2%	45,7%	47,3%	60,7%	60,4%	43,3%
	Yes	Count	579	310	174	97	24	17	1201
		% within Age	23,2%	25,9%	26,7%	28,7%	20,5%	18,7%	24,6%
	No	Count	888	382	180	81	22	19	1572
		% within Age	35,6%	31,9%	27,6%	24,0%	18,8%	20,9%	32,2%
Total		Count	2492	1198	652	338	117	91	4888
		% within Age	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	58,490[a]	10	,000
Likelihood Ratio	59,152	10	,000
Linear-by-Linear Association	44,561	1	,000
N of Valid Cases	4888		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 22,36.

Crosstab

			Education				
			Primary education	Apprenticeship / Secondary vocational without GCSE	Complete secondary education with GCSE	Higher education	Total
Bringing products into the store	Did not notice such activities	Count	69	131	891	1024	2115
		% within Education	59,5%	60,1%	49,4%	37,2%	43,3%
	Yes	Count	17	40	398	746	1201
		% within Education	14,7%	18,3%	22,1%	27,1%	24,6%
	No	Count	30	47	515	980	1572
		% within Education	25,9%	21,6%	28,5%	35,6%	32,2%
Total		Count	116	218	1804	2750	4888
		% within Education	100,0%	100,0%	100,0%	100,0%	100,0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	106,771[a]	6	,000
Likelihood Ratio	107,040	6	,000
Linear-by-Linear Association	80,002	1	,000
N of Valid Cases	4888		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 28,50.

Current Trends in Corporate Responsibility and Sustainability Reporting

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Abstract

Basic aspects of responsible and sustainable activities. The essence of the ESG pillars. Differences between ESG, CSR and SDGs. General rules for reporting on responsible behaviour. Principles of GRI reporting. ESG reporting methods and tools. Relevant information for ESG management communications and reporting. Implementation of ESG reporting. Implementation of ESG reporting according to OECD. 3 pillars of Research Design. Fuzzy Logic and Metta Analysis. Object of research UN Global Compact member companies in the sector "Software & Computer Services" in the V4 countries. Research objective - Status Quo of ESG in IT companies. Benefits of management and ESG reporting in leading companies.

Keywords: *reporting, corporate responsibility, sustainability*

1 Introduction

Reporting in the context of institutionalizing of the corporate strategy has long been one of the important tools for shaping it. In the context of corporate responsibility, it provides a comprehensive assessment of the performance of ethical business, mainly through a corporate responsibility report or adequate information on a website. An important part of this is information on the fulfilment of the objectives set in the previous period, but also the setting of new objectives for the next period in the form of operational or tactical objectives (Sedlácek, Suchánek, Spalek, & Stamfestová, 2011).

The aim of the scientific paper is to present the current trends in the reporting of responsible and sustainable activities, to get acquainted with the most important approaches, methods and tools used in reporting. To clarify the issues, it also includes a practical application of ESG reporting (Lašáková, Remišová, Bohinská, 2020).

- **2 Key aspects of responsible and sustainable activities**

Before addressing reporting itself, we consider as necessary to define the distinction between

responsible and sustainable activities for the sake of clarity and proper understanding (Rybárová, Majdúchová, Štetka, Luščíková, 2021).

- **CSR (corporate social responsibility)** - responsible business, which includes various activities of responsible companies, primarily in three areas: economic, social, and environmental.
- **ESG (environmental, social and governance)** - Sustainable entrepreneurship includes business behavior that addresses the environmental, social and governance (ESG) impacts of its activities (Cho, Y. 2022).

ESG ratings are used to assess businesses for sustainability, assigning a score to each business. For example, the following factors are considered in the rating (Kudla, 2021):

- "***environmental:*** *carbon emissions, raw material sources, product carbon footprint, toxic emissions and waste, biodiversity and land use, renewable energy opportunities,*
- ***social:*** *labor management, health and safety, labor standards, racial diversity among employees, women in the workplace, equal career opportunities, community outreach,*
- ***corporate:*** *diversity of leadership, executive remuneration, shareholder relations, disclosure of truthful information*".

- **3 General rules for responsible behaviour reporting**

The requirement to report responsible activities is based on the adopted Directive 2014/95/EU of the European Parliament and of the Council of 22.10.2014. Based on this Directive, an amendment to Act No. 431/2002 Coll. on Accounting was adopted in 2015 in the Slovak Republic. According to it, it is necessary to publish - report the first information on corporate responsibility in 2018, as it came into force on 01.01.2017.

The obligation to disclose information on responsible activities applies to companies in the public interest with more than 500 employees, such as banks, insurance companies, asset management companies, etc. For publicly listed companies over 250 employees, there is an obligation to disclose diversity policies.

Companies may submit a report for the whole group, and it is not necessary that the report is also prepared by subsidiaries if information concerning subsidiaries can also be obtained from the report. That information shall be disclosed in the annual report. The method or methodology is not precisely defined, so it is up to the company itself to choose it (Remeňová, Kintler, - Jankelová, 2020).

Principles of reporting

In terms of reporting, it is essential to respect the basic principles of the specific reporting guideline or methodology. The most used methodologies include GRI standards, SASB standards, Down Jones Sustainability Indexes, Integrated Reporting, and we will explain them in more detail under reporting methods.

The best known and most widely used tool for preparing corporate responsibility reports is the GRI Standards, which can be provided free of charge to any company. They define 10 basic principles that allow companies to make ongoing decisions in terms of defining the content, scope and quality of reporting in the annual report.

Table 2

GRI Reporting Principles

PRINCIPLES OF REPORTING GRI	
I. CONTENTS	
1. Principle **STAKEHOLDER INCLUSIVENESS**	* the reporting company should make a systematic effort - all stakeholders must be actively involved in improving the quality and focus of the report
2. Principle **SUSTAINABILITY CONTEXT**	* the reporting company should report on its activities in the context of:- economic - social - environmental - other facts - in the context of the impact of its activities on the surrounding area
3. Principle **MATERIALITY**	* refers to the importance assigned to an aspect, indicator or information, the line beyond which the information is sufficiently important to be included in the report
4. Principle **COMPLETENESS**	* the report should contain all the information needed to assess - economic - environmental - the social performance of the company * each within a given time period and within defined boundaries and scope
II. QUALITY	
5. Principle **BALANCE**	* the report should avoid imbalance in the selection and presentation of information * provide a balanced view of the reporting company's performance
6. Principle **COMPARABILITY**	* data published in the report - comparable with the data: - for the previous period - with data published by other organisations
7. Principle **ACCURACY**	* provide accurate information with a low error rate - so that it is reliable and can be used for decision making
8. Principle **TIMELINESS**	* report - issued periodically over a period of time, usually one year * publish the report together with the financial report
9. Principle **CLARITY**	* the message should be written clearly and comprehensibly - so that it can be understood by the target groups for whom it is intended * adapt the language to as many readers as possible, but the data should not be distorted for this reason
10. Principle **RELIABILITY**	* the report should be as reliable as possible * indicators: - qualitative form - quantitative form * rule - the most important indicators and the highest reliability

Source: https://www.globalreporting.org/standards/

There is a simple rule for reporting according to GRI standards: The performance of all entities that the company controls or has a decisive influence over should be included in the report.

Reporting methods

Reporting methods are generally the tools that companies use to disclose important financial or non-financial information (Maciková, Smorada, Dorčák, Beug. & Markovič, 2018 and Puškárová, Vašková, 2021). Standards set out specific and detailed disclosure requirements that help organizations determine what specific metrics or indicators need to be disclosed for each topic. In terms of reporting on responsible and sustainable activities, the following standards are used.

Table 2

Relevant reporting methods for responsible and sustainable activities

STANDARD	FOCUS	WHY REPORT	SCORING	WHO REPORTS	REPORTING PERIOD
CDP DISCLOSURE INSIGHT ACTION	GHG emissions as well as governance actions and business strategies to mitigate climate change and deforestation and promote water security.	CDP holds the largest repository of GHG emissions and energy use data in the world. In 2021, more than 590 investors with over US$110 trillion in assets requested companies disclose through CDP. CDP's transparent scoring methodology helps respondents understand exactly what's expected of them.	Companies are scored based on four criteria: Disclosure, Awareness, Management, and Leadership. CDP recognizes top scoring companies in the Carbon Disclosure Leadership Index (CDLI).	Cities and companies	For companies, CDP's online reporting system opens in early April and responses are due in late July.
Dow Jones Sustainability Indexes	Industry-specific criteria considered material to investors, including economic, social, and environmental indicators	Members of DJSI represent the top 10% of the 2,500 largest companies in the S&P Global Broad Market Index. The Corporate Sustainability Assessment (CSA) brings a sector-specific focus and need-to-know simplicity to disclosure for public companies.	Companies receive a total Sustainability Score between 0-100 and are ranked against peers. Those with scores in the top 10% are included in the index.	The 2,500 largest public companies in the world.	April 6 - July 13
GRI	Corporate social responsibility with an equal weight on environmental, social and governance factors. Heavy on stakeholder engagement to determine materiality	GRI was announced as the official reporting standard of the UN Global Compact, making it the default reporting framework for the compact's more than 5,800 associated companies. It's among the oldest, most widely adopted and most widely respected reporting methodologies in the world. Its thorough focus on social and governance aspects of ESG is unparalleled.	The GRI Standards - A constantly updated set of guidelines focusing on transparency and accountability rather than a set score. Designed to give a high level look as well as a more detailed breakdown depending on your organization's material topics	Public and private companies, cities, government agencies, universities, hospitals, NGOs	Anytime, but typically integrated into a company's traditional annual report
GRESB	Environmental, social and governance performance in the global commercial real estate sector only. Includes asset- and entity-level disclosures	Private and public institutional investors look to GRESB's annual survey as the barometer of sustainability performance in the commercial real estate industry. Its niche target audience allows it to give deeper and more accurate insights into industry performance and reveal "investment grade" results.	Responses scored out of a possible 100 points distributed across three data components which are then divided into multiple aspects. More weight is attributed to performance and development components.	Commercial real estate owners, asset managers and developers.	April 1 - June 30
SASB	SASB aims to align organizations and investors on the financial impacts of ESG. Industry-specific standards focus on material aspects of an organization's sustainability performance.	SASB offers disclosure standards for more than 75 industries to ensure information disclosed is most relevant to the financial performance of an organization's industry. The standards focus on financially material aspects so that the disclosure can help drive business and investment decisions.	SASB Standards offer guidelines on material information to report and can be used in conjunction with other frameworks.	Any corporation can use SASB to guide its disclosure.	No specific reporting period, but this framework may be complemented by other organizational disclosures.

Source : https://www.measurabl.com/the-top-five-sustainability-reporting-frameworks-you-should-know/

ESG reporting in the context of sustainability

In the context of the sustainability concept, ESG reporting is coming to the fore in reporting. This report is issued by organizations dealing with the environmental (Environment), social (Social) and governance (Governance) impacts of their activities, under the single title of "Corporate Social Responsibility."

It includes qualitative disclosure of key themes, but also the quantitative data needed to measure how the business is performing in managing risks, exploiting opportunities, and implementing defined strategies in these areas.

"*ESG reporting is an ideal and effective means of enabling companies and organizations to bring together in a single document the answers to the various questions that may come from stakeholders*" (PwC, 2021 - https://www.pwc.com/sk/sk/esg-zodpovedne-podnikanie/esg-reporting.html.)

Creating an ESG report - a sustainability report - requires compliance with the terms of the relevant methodology and must contain balanced information from each area. At the same time, companies must specify how the relevant information is to be communicated and which information or indicators from the areas to disclose, within the ESG management framework (Potkány, Gejdoš & Debnár, 2018):

Figure 1

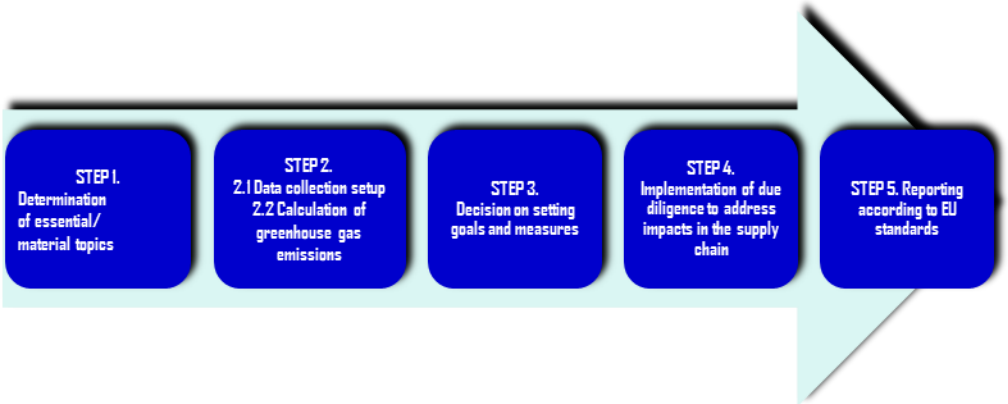
ESG Program Development

Source: https://corpgov.law.harvard.edu/wp-content/uploads/2020/09/esg-article-pic.png

The implementation of ESG reporting will be carried out according to the following procedure:

Figure 2

Standard procedures for implementing ESG reporting

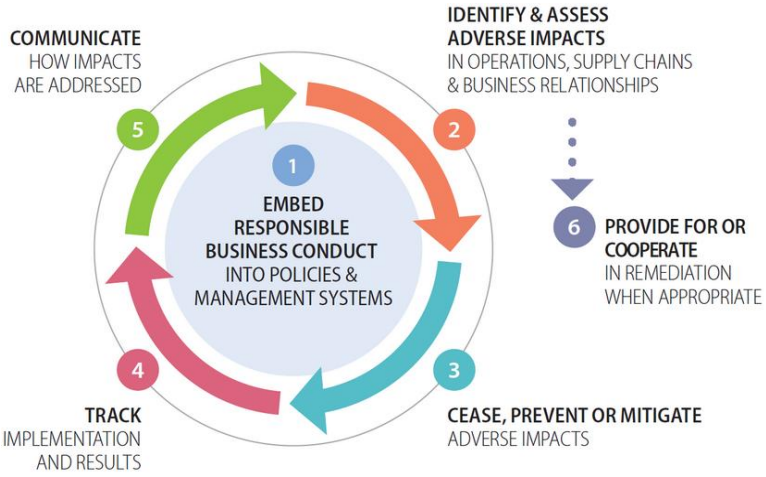


Source: Own graph based on: https://en.frankbold.org/our-work/campaign/eu-directive-non-financial-reporting-and-corporate-governance

It is important to accept the general principles of proven processes for implementing OECD recommended practices:

Figure 3

Validated processes for implementing OECD recommended practices



Source: https://www.oecdguidelines.nl/oecd-guidelines/due-diligence

4 Research Design

In our research activities, we have implemented the application of a three-dimensional perspective logic to the research process:

Figure 4

A three-dimensional perspective on the research process

Source: Own figure

A/ Research objective

The main objective of the research is to find out the status and reasons for ESG responsible corporate behavior of UN Global Compact members in the "Software & Computer Services" sector in the V4 countries, declared primarily in ESG/CSR/SDG reporting.

B/ Subject of research

The subject of the study is corporate behavior according to ESG attributes declared in ESG/CSR/SDG reporting, corporate official websites, and financial databases. The research was conducted:

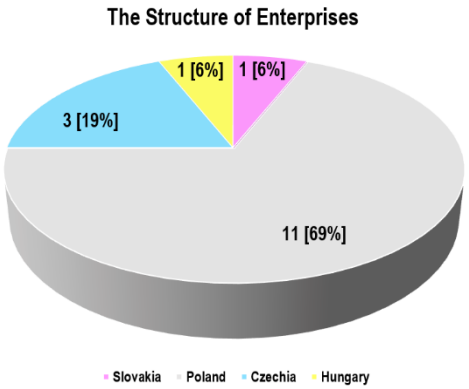
- on UN Global Compact member companies

https://www.unglobalcompact.org/interactive

- in the sector "Software & Computer Services"
- in the V4 countries

Figure 5

The Structure of Enterprises



Source: Own elaboration

C/ Research methodology

Due to the complexity and integrality of the specific attributes of the topic, a combination of several relevant methods was used that is adequate to achieve the challenging objectives (for reasons of space, we only list the most relevant ones). The Fuzzy Logic method is dominant, since we have a low-numbered research object (Giuffrida, Dupuy-Chessa, Poli, & Céret, 2021) and a meta-analysis, while the data for the treatment of the topic are mainly obtained through available and relevant Internet sources, media, and background information from recent lectures by experts in the field.

Table 3

Adequate scientific research methods used in the research

APPLICATION OF A COMBINATION OF METHODS FOR RESEARCH PURPOSES	
General methods	**Specific methods**
▪ analysis- synthesis	▪ Fuzzy logic
▪ induction - deduction	▪ Meta-analysis
▪ abstraction- concretization	▪ benchmarking
▪ analogy	▪ situational analysis
▪ Synergy	▪ graphical methods
▪ Observation	▪ simulation modelling
	▪ application of information and communication technologies
Synergy (interaction)	

Source: Own table

The Fuzzy logic method is applied with the following value scales for the 5 most relevant and predictable indicators:

Indicator	Scales of values
I. The extent to which the company implements environmental behaviour → the indicator informs about the extent to which the company successfully applies tools to mitigate negative environmental impacts in a comprehensive manner	Amn = 50 p.: a company whose strategy in operational activities not only applies but also successfully applies available tools (legislative, standards, code of ethics, ...) of high-quality environmental behavior to all stakeholders
	Amn = 37 p.: a company whose strategy successfully applies available tools (legislation and standards) for quality environmental behavior in its operational activities
	Amn = 24 p.: a company whose strategy partially applies the available tools (legislative and standards) of standard environmental behavior in its operational activities
	Amn = 11 p.: a company partially applies legislative instruments of standard environmental behavior in operational activities, problematically
	Amn = 0 b.: a company shows non-compliance with legislative requirements for standard environmental behavior
II. The extent to which the company implements social behaviour → the indicator informs about the extent to which the company successfully applies the tools of prosocial behaviour in a comprehensive way for the benefit of the company's human capital	Amn = 50 p.: a company whose strategy in operational activities not only applies but also successfully applies available tools (legislative, standards, code of ethics, ...) of high-quality social behavior to all stakeholders
	Amn = 37 p.: a company whose strategy successfully applies the available tools (legislative and standards) of quality social behavior in its operational activities
	Amn = 24 p.: a company whose strategy in its operational activities partially applies the available instruments (legislative and norms) of standard social behavior
	Amn = 11 p.: the company partially applies legislative instruments of standard social behavior in its operational activities, problematically
	Amn = 0 b.: the company does not comply with the legal requirements for standard social behavior
III. The extent to which the company implements corporate governance → the indicator informs about the extent to which the company successfully applies corporate governance synergy tools in a comprehensive manner	Amn = 50 p.: the company applies economic and management tools responsibly and successfully for the benefit of all stakeholders
	Amn = 37 p.: the enterprise applies economic and management tools responsibly, with minor problems in financing and/or corporate governance
	Amn = 24 p.: the company is responsibly applying the tools of economics and management, with problems in financing and/or management of the company, with impact on the internal environment
	Amn = 11 p.: the company applies the tools of economics and management responsibly, with problems in the financing and/or management of the company, with implications for both the internal and external environment
	Amn = 0 b.: the company is irresponsible in applying the tools of economics and management to all stakeholders
IV. The extent to which the company raises social awareness of ESG → the indicator informs about the extent to which the company successfully applies education, popularization and dissemination tools/methods in a comprehensive manner	Amn = 50 p.: the company purposefully applies education, popularization and dissemination tools/methods strategically for the benefit of all stakeholders
	Amn = 37 p.: the company purposefully applies tools/methods of education, popularization and dissemination selectively according to stakeholders
	Amn = 24 p.: the company purposefully applies tools/methods of education, popularization and dissemination selectively according to the problem/critical situation of the external environment
	Amn = 11 p.: the company applies tools/methods of education, popularization and dissemination spontaneously
	Amn = 0 p.: the company does not apply tools/methods of education, popularization and dissemination
V. Long-term sustainable behaviour rate → indicator characterising the long-term (declared) implementation of activities ESG	Amn = 50 p.: implementation over 5 years
	Amn = 37 p.: implementation in the interval of 3 to 5 years
	Amn = 24 p.: implementation at intervals of 2 to 3 years
	Amn = 11 p.: implementation between 1 and 2 years
	Amn = 0 p.: implementation within 1 year

Legend: Amn - value of the independent variable XM in the nth observation

Source: Own elaboration according to https://www.mdpi.com/journal/mathematics/special_issues/fuzzy_2021

5 Research Results and Discussion

The results from the Fuzzy Logic application, which are included below, reflect several interesting facts.

Table 4

Fuzzy logic method results

Indicator / Company/	I.	II.	III.	IV.	V.	∑	%	Order
ANASOFT APR, s.r.o.	50	50	50	50	50	250	100	1 to 2
ASTEK Poland	37	50	50	37	37	211	84	5 to 9
Atmoterm S.A.	37	50	50	37	37	211	84	5 to 9
BFirst.Tech sp. z o.o.	37	50	24	37	24	172	69	13 to 14
Business Logic s.r.o.	37	50	37	50	37	211	84	5 to 9
Funktional sp. z o.o.	37	50	37	37	37	198	79	10 to 11
Grupa AF sp. z o.o.	37	50	37	37	24	185	74	12
GS Services limited liability company	24	50	24	37	24	159	64	15 to 16
IBA Group	37	50	50	50	50	237	95	3 to 4
Netguru S.A.	37	50	37	50	37	211	84	5 to 9
SAP Poland	50	50	50	37	50	237	95	3 to 4
Solvit SA	50	50	50	50	50	250	100	1 to 2
T1 Solution, s.r.o.	37	50	37	37	37	198	79	10 to 11
Ten Square Games S.A.	37	50	50	37	37	211	84	5 to 9
Vestiacom Sp. z o.o., Sp. k.	24	50	24	37	24	159	64	15 to 16
Zen Heads Kft.	37	50	24	37	24	172	69	13 to 14
Average value	***38***	***50***	***39***	***41***	***36***	***205***	***82***	
The most frequent value	**37**	**50**	**50**	**37**	**37**	**211**	**84**	

Slovakia Poland Czechia Hungary

Source: Own table

Companies in the sector "Software & Computer Services" show a high interest in human capital, given the values of 50 for each of the companies. This is natural, since IT services are very demanding from the personnel perspective, they also require adequate interest and appreciation. With less interest, companies approach environmental activities and implement only legislative obligations in the majority.

This standardized behaviour is generated, on the contrary, by the low intensity of environmental measures compared to other sectors of the economy. Behaviour in the aspect of corporate governance - strategic goal-oriented CSR management - appears problematic, especially for companies with shorter membership in the UN Global compact. This is also visible in the declaration of anti-corruption behaviour in company information. This fact also implies a relatively low score for indicator V. Raising social awareness of ESG - which is a moral obligation to the community and population to purposefully apply tools/methods of education, popularization, and dissemination strategically for the benefit of all stakeholders. It is extremely beneficial to ensure sustainability.

Indicator V. - Long-term sustainable behavior rate is the lowest of all 5, and these are predominantly companies with not only a short membership of the UN Global Compact but

also primarily a shorter-term strategic interest in ESG for sustainability. The aggregate representation is in the form of a retransformation matrix:

Table 6

Retransformation matrix

Evaluation interval		Verbal expression	Number of companies
[body]	[%]		
(185, 250>	(74, 100>	A company whose strategy in operational activities not only applies but also successfully applies available tools (legislative, standards, code of ethics, ...) of high quality environmental and social behaviour to all stakeholders, and also successfully applies tools of economics and management. The company strategically applies tools/methods of education, popularization, and dissemination in a targeted manner for the benefit of all stakeholders. ESG activities are implemented sustainably over 5 years.	7
(120, 185>	(48, 74>	A company whose strategy in operational activities successfully applies the available tools (legislative and standards) of quality environmental and social behaviour, as well as responsibly applies the tools of economics and management, with minor problems in financing and/or corporate governance. The company purposefully applies tools/methods of education, popularization, and dissemination selectively according to the stakeholders, with the implementation of these ESG activities at an interval of 3 to 5 years.	9
(55, 120>	(22, 48>	A company whose strategy in operational activities partially applies available tools (legislative and norms) of standard environmental and social behaviour, and purposefully applies tools/methods of education, popularization and dissemination selectively according to the problem/critical situation of the external environment, with the implementation of these ESG activities at intervals of 2 to 3 years.	0
(0, 55>	(0, 22>	The company partially applies legislative instruments of standard environmental and social behaviour in operational activities, problematically. The enterprise also applies economic and management tools responsibly, with major problems in financing and/or corporate governance, with impact on both internal and external environment. the enterprise applies tools/methods of education, popularization and dissemination spontaneously and implements these ESG activities at intervals of 1 to 2 years.	0

Source: Own table

7 companies (44%) have the characteristic of the highest position in the ESG behavioural assessment and 9 (56%) have a lower position. This is an excellent state of the relationship with sustainability based on the application of ESG strategies, as there is no company with a score of 159 (64%).

Conclusion

In conclusion, we would very much like to present the benefits of ESG management reporting, both specifically, as perceived by business leaders, and aesthetically in a graphic form (Del Giudice, Rigamonti, 2020).

1/ Manulife Funds focused on the benefits of strategic management of ESG investing (Koundouri, Pittis, Plataniotis, 2022)

Figure 6

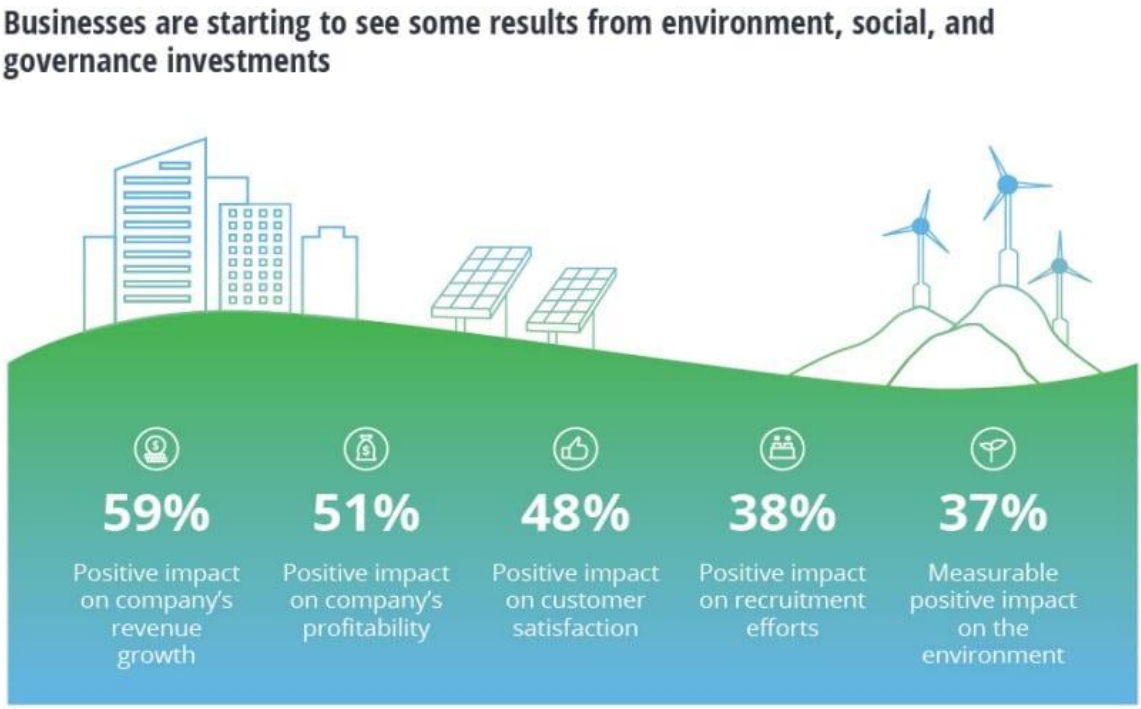
Benefits of ESG Investing in Manulife Funds

Source: https://www. manulifefunds.com.hk/en/insights/5-benefits-of-esg-investing.html

2/ Deloitte strategies focused on the benefits of successful ESG investment management (Górka, Kuziak, 2022)

Figure 7

Benefits of ESG Investing in Deloitte



Source: https://www2.deloitte.com/xe/en/insights/topics/strategy/cfo-benefits-esg-investment.html

3/ Benefits of successful ESG management in TAUW GmbH (Jain, M. - Sharma, G. D. -

Srivastava, M. 2019)

Figure 8

Benefits of ESG Management in TAUW GmbH

Source: https://www.tauw.de/news/blogs/the-benefits-of-esg-management.html

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Renewable Energy Sources and Its Impact on Employment in Slovakia

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Abstract

Today, sustainable energy is the centre of attention in climatic change agenda and economic growth, attracting concerns from around the globe about approaches of designing pathways for a sustainable transition of energy and energy transitions are being carried out with different processes. With respect to resources and technologies, different methods of energy production including geothermal energy, wind technology, electricity and salinity gradient technologies, and solar heating and cooling have been considered. Sustainable energy policies also contribute a significant part in energy transitions as they can act as the driving force behind innovations in renewable energy. Additionally, they are a prerequisite in assembling finance that is an essential factor in achieving climate goals. Thus, the use of policies and regulations can have a positive impact on the outcomes of sustainable energy in the long run. The aim of the paper is to assess the impact of renewable energy sources on employment in Slovakia and its sustainability. Results of the regression analysis showed that there is a strong correlation between the overall employment in Slovakia and the employment in Renewable energy sources in Slovakia (0.864).

Keywords*: Renewable energy sources, sustainable employment, Slovakia, European union*

1 Introduction

Increasing the EU economy's energy efficiency is one of the main pillars for reaching an affordable, reliable, sustainable and modern energy system as envisaged in SDG 7. Efficient energy systems reduce consumption and costs, decrease energy dependencies and diminish the environmental and climate impacts linked to energy supply and use (Augutis et al., 2014; Baranes, Jacqmin & Poudou, 2017). As a consequence, the EU aims to improve energy efficiency along the whole energy supply chain.

Renewables are an important part of a country's energy mix as they are an alternative to fossil fuels that contributes to reducing greenhouse gas emissions, diversifying energy supplies and reducing dependence on unreliable and volatile fossil fuel markets, especially oil and gas, as the energy produced from RES is sourced from within the country's own territory. Some technologies (e.g. water, solar, wind, etc.) do not even produce any emissions during operation. Increasing the share of RES thus contributes to reducing environmental pressures and thus also

to reducing negative impacts on human health. In addition to the benefits mentioned above, the use of RES also entails certain risks. The most significant risk stems from the nature of these sources. The generation of electricity from solar and wind energy is characterised by fluctuations in production which negatively affect the security and reliability of the operation of the electricity system (Sher, Curnick & Azizan, 2021). Another risk is that electricity becomes significantly more expensive. In addition to these risks, there are also negative environmental impacts adversely affecting the appearance of the landscape, the impact on habitats and ecosystems, watercourses, etc. These negative impacts can be minimised by careful site selection and consideration of all possible negative impacts of the RES technology. The positives of using RES outweigh the negatives and the use of RES is one of the priorities of the energy policy of the Slovak Republic.

EU legislation on the promotion of renewable energy sources has evolved significantly over the last 15 years. The 2009 Renewable Energy Directive stipulated that 20% of the EU's energy consumption must be covered by RES by 2020. In addition, all Member States were obliged to achieve a 10% share of RES in transport. In addition to the common target, the Directive set binding national targets for the overall share of RES in gross final energy consumption for each EU country, taking into account their baseline situation and overall RES potential. Member States were obliged to prepare National Renewable Energy Action Plans setting their national targets for the share of RES in three sectors: electricity generation, heating and cooling and transport. Progress towards the national targets was measured every two years when EU Member States published progress reports on RES energy. In order to promote electricity production from RES, Act No 309/2009 Coll. on the Promotion of Renewable Energy Sources and High Efficiency Combined Production was adopted in the Slovak Republic in 2009. The Act improved the functioning of the electricity market in the RES sector and created a stable business environment. It ensured a long-term guarantee of feed-in tariffs for 15 years and also set a direction for electricity production from RES, as it favoured the construction of small and decentralised plants. The law also guarantees priority transmission and priority distribution of electricity from RES. Since 2014, a change in legislation has significantly simplified the process of connecting small sources up to 10 kW for households that cover a large part of their energy consumption with the electricity they generate.

In 2018, the revised Renewable Energy Directive came into force as part of the Clean Energy for All Europeans package, which aims to help meet emission reduction commitments under the Paris Agreement. The Directive sets a new binding EU RES energy target for 2030 of at least 32% of final energy consumption and includes a clause allowing for an upward adjustment

of this share by 2023 and an increased target of 14% for the share of renewable fuels in transport by 2030.

The Slovak Republic has signed up to the commitment to achieve carbon neutrality by 2050. This has led to the adoption of the Integrated National Energy and Climate Plan, which updates the 2014 Energy Policy of the Slovak Republic and defines the 2030 targets. The optimal use of RES is one of the key factors for achieving a low-carbon economy, and the focus will be on the development of RES, especially in heat production. The planned SR target for 2030 is 19.2%.

In December 2019, the European Green Deal was adopted as the overarching framework for EU clean energy policy. It is a new growth strategy that aims to make Europe the world's first climate-neutral continent in a fair, resource-efficient, cost-effective and competitive way. Energy production and use is responsible for more than 75% of greenhouse gas emissions in the EU. Decarbonising the EU's energy system is therefore crucial to achieving the 2030 climate targets and the EU's long-term strategy to achieve carbon neutrality by 2050.

As part of the implementation of the European Green Deal package of measures, in July 2021 the Commission published a new legislative package on climate and energy entitled "Fit for 55": meeting the EU's 2030 climate target on the road to climate neutrality. The package represents one of the most comprehensive sets of proposals on climate and energy ever put forward by the Commission. Among other things, it will contribute to the development of the clean energy system over the next decade by stimulating innovation, investment and creating new market demand in the EU, while ensuring a socially just transition (Pekaslan et al., 2020; Radzka, Rymuza & Michalak, 2019). The package also includes a proposal to revise the RES Directive in order to align its RES energy targets with the new climate ambitions. In order to reach the 2030 target, the Directive proposes to increase the overall binding target from the current 32% to a new level of 40% RES energy in the EU energy mix. This effort will be complemented by indicative national contributions showing how each Member State should contribute to the collective target. The post-2030 energy policy framework is currently under negotiation.

The share of energy from RES has increased slowly since 2005. As a share, the increasing share has not always reflected the actual increase in RES energy, expressed as gross total RES consumption or gross final RES consumption in the case of the RES energy share in the sectors. Over the period 2005-2019, the total share of RES energy produced increased to 16.9%. Slovakia is thus on track to meet the target of a 14% share of RES in final energy consumption in 2020, as the share of RES was already higher in 2019. However, the share of RES stagnated

around 10-12% in 2010-2018 and meeting the national commitment seemed unlikely.

This was mainly due to the year-on-year increase, where the share of RES increased by 5.0 percentage points in 2018 compared to the previous year. This overall increase reflected a significant increase in the share of RES in the heating and cooling sector, where gross biomass consumption almost doubled. While in 2018 renewables accounted for 10.6% of heat and cooling production, in 2019 the share was already 19.7%. On the other hand, the share of RES in the other two sectors under review grew relatively less significantly: in the transport sector by 1.3 percentage points to 8.3% and in electricity generation by 0.5 percentage points to 21.9%. SR was very likely to meet the 14% target in previous years as well. However, incomplete data were sent to Eurostat, which did not include, for example, energy produced by heat pumps in households in addition to biomass consumption in households.

The increase in the share of renewable energy over the period under review is a positive signal for meeting the renewable energy targets (Praene et al., 2021). Another positive development is the increasing diversity of RES used. Nevertheless, the amount of energy from RES in the Slovak Republic is largely dependent on suitable hydropower conditions and biomass consumption.

The European Union's binding target for the share of energy from renewable sources in gross final energy consumption is at least 32% by 2030. In order to achieve this binding target, Member States' contributions for 2030 to this target from 2021 are in line with the indicative trajectory of this contribution. The directional trajectory reaches a reference point of at least

a) 18% by 2022,
b) 43% by 2025,
c) 65% by 2027 of the total increase in the share of energy from renewable sources between that Member State's binding 2020 national target and its contribution to the 2030 target.

The Slovak Republic proposes a target of 19.2% in 2030, which is an increase of 5.2 percentage points compared to the target set for 2020. Based on the requirements in Article 4(2) of the Regulation, the reference points in the indicative trajectory for 2022, 2025 and 2027 are set at 14.94%, 16.24% and 17.38% for the 19.2% target.

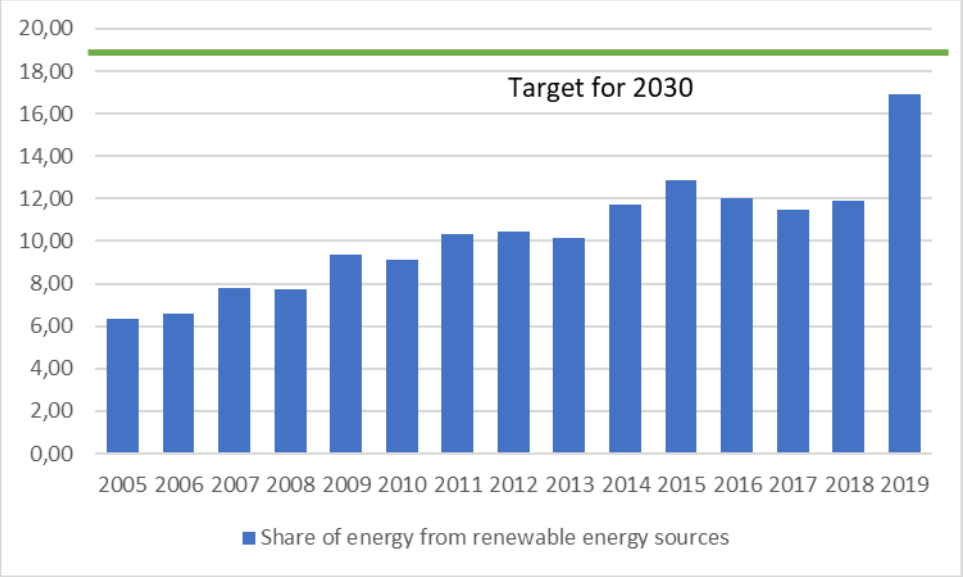
The total investment costs to achieve the RES targets are estimated at EUR 4.3 billion. These investment costs include the electricity and heating sectors. They are based on the estimated increase in installed capacity for generating electricity and heat from RES and the investment intensity per unit of output.

Slovakia had a target for renewable energy sources set at a minimum of 14 %. According to Eurostat data, the share in gross final consumption in 2020 was at 17.35 % (Fig. 1). This means

that Slovakia has comfortably met the target. However, this was preceded by an adjustment of the data on biomass consumption in households. Thanks to this change, the share of renewable energy increased from 11.9 to 16.9 % between 2018 and 2019.

Figure 3

Development of Energy from Renewable Energy Sources



Source: Eurostat

2 Methods

The aim of the paper is to assess the impact of renewable energy sources on employment in Slovakia and its sustainability.

The conceived research questions were following:

- Research question no. 1 – What is the impact of the renewable energy sources on overall employment in Slovakia?
- Research question no. 2 – What is the impact of the renewable energy sources on the economic development of Slovakia?

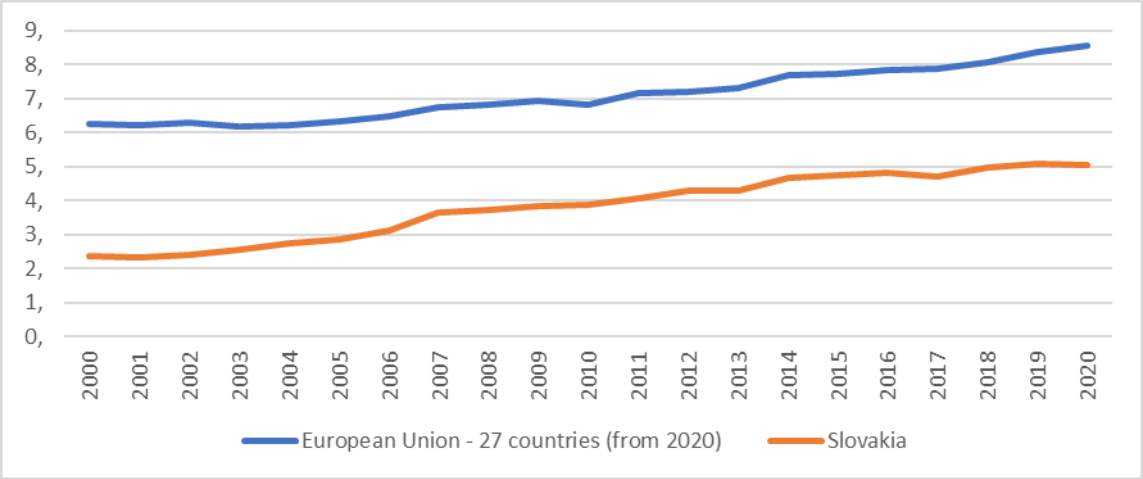
In the research paper, the descriptive statistics for all the variables were examined to make sure they fell within acceptable range and skewness is one such statistic that was carefully looked at. Histograms were obtained for all the variables whose skewness statistic was greater than 1 to have a pictorial view of the distribution of the variables.

To characterise the sector of renewable energy sources, we chose the various indicators. The indicator Energy productivity measures the amount of economic output that is produced per unit of gross available energy. The gross available energy represents the quantity of energy

products necessary to satisfy all demand of entities in the geographical area under consideration (Fig. 2).

Figure 2

Development of Energy Productivity (euro per kg of oil equivalent)



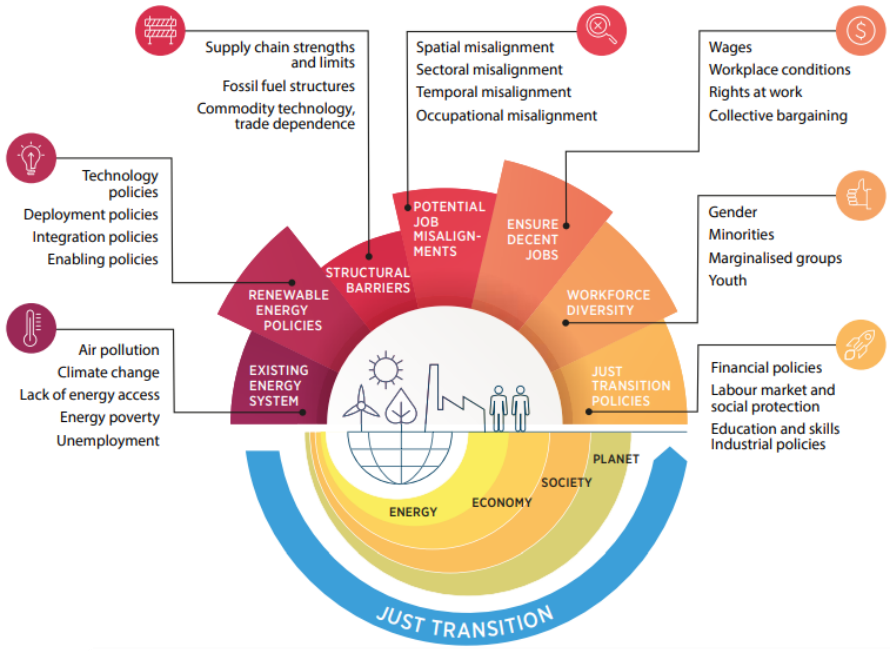
Source: Eurostat

3 Results and Discussion

Transitioning toward an energy system dominated by renewable energy and energy efficiency will be imperative for achieving sustainable development and urgent climate objectives (Fig. 3). Energy transition planning must exploit the close linkages between the energy system and the wider socio-economic structures in which it is embedded. As research studies (Henriot, 2015; Kozioł & Mendecka, 2015; Kurek et al., 2021) have indicated, effective planning depends not only on access to good current information on job numbers and job quality, but also on continued tracking of the transition's impact on employment so as to shape and seize opportunities to localise value chains, advance gender equity, expand energy access, and improve local livelihoods.

Figure 3

Renewable Energy Sources Ecosystem

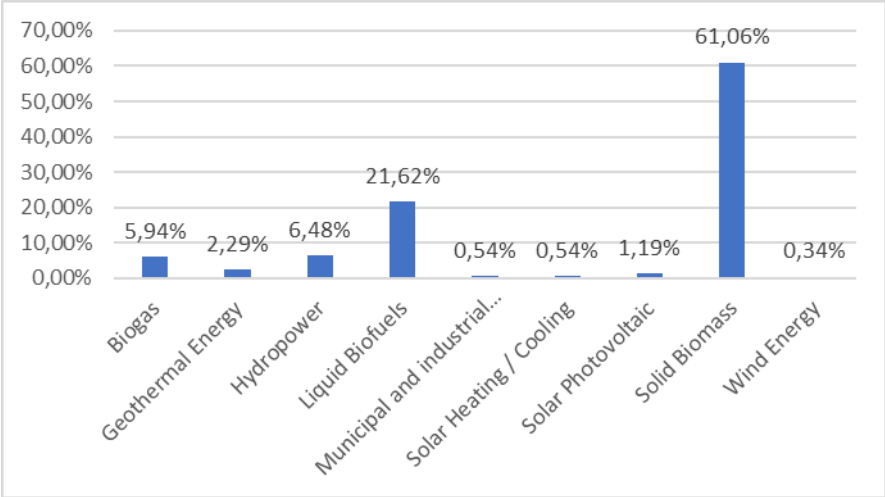


Source: IRENA

More than 61% of employees in the Renewable energy sources sectors are employed in Solid biomass sector (Fig. 4). The second largest group of employees are working in the Liquid biofuels sector.

Figure 4

Employment by Technology in Slovakia (2020)

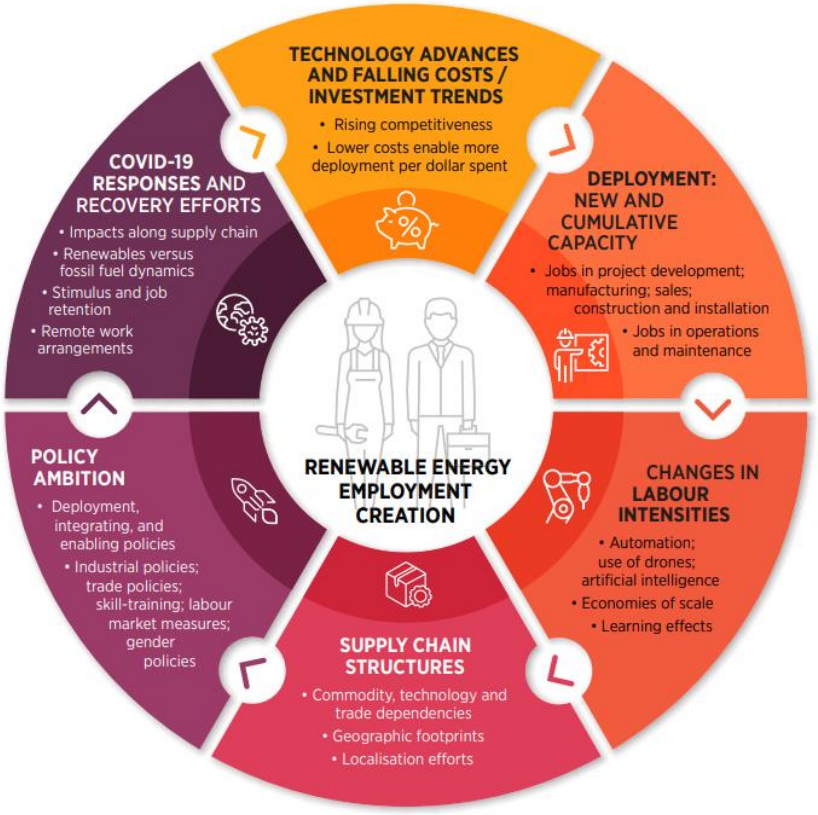


Source: Autor's calculations according to IRENA

The employment trends are shaped by a multitude of factors (Figure 5). Key among them is the rate at which renewable energy equipment is manufactured, installed and put to use (largely a function of costs and overall investments). Costs, especially of solar and wind technologies, continue to decline. With relatively steady annual investments, lower costs have translated into wider deployment (Moreno & López, 2008; Muniyoor, 2020). An increase in investments would boost future job creation, even allowing for growing labour productivity (Wei, Patadia & Kammen, 2010). Policy guidance and support remain indispensable for establishing overall renewable energy roadmaps, driving ambition, and encouraging the adoption of transparent and consistent rules for feed-in tariffs, auctions, tax incentives, subsidies, permitting procedures and other regulations.

Figure 5

Factors influencing renewable energy employment



Source: IRENA, 2022

As one can see, the p- value is lower than 0.001 in both linear regressions. In our case it is 0.864, which is close to one. This means that there is a very strong relationship between our variables (Table 1). R Square is the coefficient of determination. 74.7% of dependent variable (Total employment) is influenced by the independent variable (RES employment). The answer

to research question 2 is following: there is a very strong positive relationship between RES employment and GDP (p value under 0.001 and R coefficient is 0.939).

Table 1

Results of the linear regression

Model Fit Measures

Model	R	R^2
1	0.864	0.747

Model Fit Measures

Model	R	R^2
1	0.939	0.882

Model Coefficients - Total employed

Predictor	Estimate	SE	t	p
Intercept	2.68e+6	60044.12	44.66	< .001
RES Employed	-21.4	2.54	-8.42	< .001

Model Coefficients - HDP

Predictor	Estimate	SE	t	p
Intercept	162317.68	8064.149	20.1	< .001
RES Employed	-4.58	0.341	-13.4	< .001

Source: Autor's calculations according to Datacube

Despite positive trends and recent developments, skills gaps and shortages are increasing and likely widespread across countries unless proactive measures are taken. In high income countries, including those even with well-developed skills anticipation systems, a lack of both technical and transferable core skills remains a significant recruitment barrier for employers, while developing countries are especially challenged by deficiencies at higher skills levels. Many of the most significant changes in skills and occupations in the green economy are taking place at higher skill levels, requiring university education. This represents a critical barrier for many low-income countries, where university graduates and high-level skills in general tend to be in short supply. These may constitute a constraint on the net-zero transition.

4 Conclusions

Due to inertia in the dynamics of the education system, insights into the future evolution of the labour force's occupational patterns need to be carefully considered to ensure that the appropriate skills are developed. Further, the implied fluctuations in skills demand need to be managed carefully so as not to upend people's educational and career choices. This is one of several areas where public policy needs to be highly proactive and include a strong social protection component to ensure a just transition.

As one can see, the p- value is lower than 0.001 in both linear regressions. In first case R coefficient is 0.864, which is close to one. This means that there is a very strong relationship between our variables (RES employment and Total employment). To answer the second

research question, we have identified that there is a very strong positive relationship between RES employment and GDP (p value under 0.001 and R coefficient is 0.939).

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Consumer Behaviour and Food Consumer Market: The Case study of Slovakia

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Abstract

The aim of the research paper is to investigate the influence of relative changes of food prices to the consumer behaviour, to study the peculiarities of the socio-economic aspects of food demand. Consumer markets have a significant share of daily demand. Therefore, the article analyses the behaviour of consumers of agricultural products. It describes many factors that affect consumer behaviour. The research study argues that consumer behaviour is not only affected by price and income factors. There are dozens of external factors that affect consumer behaviour. Several studies have shown that many factors can influence consumer choices, from social factors to psychological factors. The research paper graphically describes consumer behaviour under the influence of these factors and also provides information on per capita consumption and market prices of agricultural products in Slovakia.

***Keywords**: Consumer behaviour, Agricultural market, Slovakia, European union*

1 Introduction

The Slovak Republic spreads over an area of 49 036 km² of which around 48% is agricultural land and 40% is covered by forests. Agricultural land is composed of around 71 % arable soils and 28% permanent grassland; 65% of agricultural land is classified as affected by natural constraints limiting its production potential. Slovakia has 5,4 million inhabitants, of which 88% live in the predominantly rural and intermediate regions which cover 95% of the Slovak territory.

Slovakian agriculture is characterized by a dual farm structure, with a high proportion (80%) of small farms up to EUR 15 000 of standard output, and a small number of large farms (1 180) with standard output higher than EUR 250 000. All together, the agricultural production is characterized by low added value of primary agricultural production mostly oriented to cereals and oilseeds production. Although the Slovakian agriculture and food industry are able to

produce high quality products, increasing exports of raw primary agricultural production and imports of finalized food products result in only 65% of domestic production being processed in Slovakia. Labour productivity in agriculture and in food industry is very low, respectively 46% and 39% of the EU average. The continuous decrease of employees in agriculture ranks Slovakia among the countries with the lowest share of agricultural workers from total employees (half the EU average). The high forest coverage in Slovakia (40%) makes forestry an important sector in the rural economy, although the forest roads network needs substantial investments. The forestry sector is also concentrated on primary production rather than further processing and highly depends on the turnover (80%) from timber harvesting.

The Slovakian countryside with its mountainous and sub-mountainous areas and lowlands and different climatic conditions is rich in biodiversity. The highly extensive agriculture leads in some areas to land abandonment and loss of grassland biotopes, 69% of which are not sufficiently managed. 20% of the agricultural area is of high nature value while NATURA2000 areas cover 16% of agricultural land and 46% of forests.

The unemployment rate in rural areas remains above the EU level (8,4%, EU: 6,3%). The marginalized Roma communities are mostly located in rural areas, where the offer of job opportunities is persistently low. Redressing the unfavourable situation will require investments in infrastructure, in diversification of the rural economy and in increasing human capital (Zhang, Choi & Cai, 2022).

Consumers use the information given on food products to make informed choices (Dolšak, Hrovatin & Zorić, 2020, Heise & Theuvsen, 2017, Bangsa & Schlegelmilch, 2020, Liobikienė, Grincevičienė & Bernatonienė, 2017). Since indication of origin is a credence attribute whose true level cannot be evaluated by consumers either before or after consumption, labels have become important communication tools about origin identification (Muñoz-Céspedes, Ibar-Alonso & de Lorenzo Ros, 2021, Thøgersen, 2021, Zeynalova, & Namazova, 2022). Furthermore, people often feel misled by labels and fear they will be cheated by retailers (Verbeke, 2005, Vanhonacker & Verbeke, 2009, Nguyen & Johnson, 2020).

2 Research Methods

The aim of the paper is to investigate the influence of relative changes of food prices to the consumer behaviour, to study the peculiarities of the socio-economic aspects of food demand.

For a deeper analysis of the research aim, the following research questions were formulated:

- Research question no. 1 – What is the impact of the inflation on the food demand in Slovakia?
- Research question no. 2 – How consumer preferences related to the food market have

changed over the last 10 years in Slovakia?

The article analyses the factors affecting the amount of goods consumed by the consumer in the market. Attention was paid to the economic and social impact of the factors. Attention was drawn to changes in consumer demand under the influence of both price and non-price factors. In addition, nonprice factors and psychological factors that determine consumer behaviour were identified. For this purpose, mathematical, statistical, analysis, synthesis, logical methods were widely used. The tables containing statistical data in the article are based on the data of the Statistical Office of Slovak Republic and Eurostat.

To characterise the agricultural market in Slovakia, we chose the various indicators. In 2017, the Statistical Office of the Slovak Republic carried out a revision of the price indices of agricultural products on the basis of a Eurostat decision, which consisted in: change of the base period (previously 2010, from 2018 2015= 100), a change in the weighting system (previously based on the monthly average of sales for the years 2009-2011, at the same time based on the monthly average of sales for the years 2014-2016), updating and expanding the number of respondents to about 500. Prices of agricultural products are surveyed monthly by the State Statistical Abstract Prices of Agricultural Products NC 1 - 12 in a selected set of agricultural producers regardless of the form of ownership (cooperative, state and private organizations).

The main agricultural products in the specified quality classes were selected for the price survey. Vegetable products, including fruit and vegetables, and animal products, including fish, are included in the returns.

Prices are taken as unweighted arithmetic averages of all major business cases of the organization occurring in the reference period up to the time of sending the statement. The prices are net of value added tax. The average prices of the agricultural products monitored are calculated as the arithmetic mean of the individual producer prices for the Slovak Republic or regions. Price indices are calculated from the observed prices of 85 selected products - price representatives.

3 Results and Discussion

According to preliminary data for 2020, gross agricultural production increased in current prices by 3.99%. The increase in gross agricultural output was influenced by a 6.12% increase in the value of gross crop production and a slight increase in 0.56% in the value of gross livestock production. In the structure of gross agricultural output in current prices, there was an increase in the share of crop production by 1.3 percentage points to 63.1%, while the share of livestock production fell to 36.9%.

Gross agricultural output at constant 2010 prices recorded an increase of 3.62%, with gross crop

production rising by 5.92% and gross livestock production declining slightly by 0.23%. The structure of agricultural production at constant prices changed in favour of the share of crop production, which rose to 64.9%

Agricultural input prices decreased by 3.6% year-on-year. The agricultural input price index was mainly influenced by a significant year-on-year decline in prices of motor fuels (26.4%) and fertilisers and soil improvers (9.1%). They mainly increased prices of electricity (8,3 %) and tractors (5,3 %).

Agricultural commodity prices increased by 0.4% year-on-year. Prices of crop commodities rose by 0.2%, with the most significant increases being for fruit, up by 10.8%, vegetables and 5.7% and oilseeds 5.0%. Cereal prices fell by 3.5%.

Statistical figures show the change in agricultural production in Slovakia over the past two years (Table 1). The change in the volume of basic agricultural products in 2020 compared to 2019 is calculated and noted in the last column. Looking at statistical figures production has increased significantly in various areas over the last two years. Among them, the production of potatoes, milk, grapes, fishes and nuts has increased significantly. During this period, only a decrease in fresh fruit, alcoholic and non-alcoholic beverages production was observed, which is due to a comparative advantage. The consumption of fruit and fruit products increased by 2.5 kg (3.7%) to 69.6 kg compared to 2019. The highest share in increase of fruit consumption had oranges (higher by 1.5 kg) and apples (higher by 0.7 kg) and grapes (higher by 0.6 kg).

Table 1

Food market – Consumption

Kind of foodstuff			**Index**
	2019	**2020**	**2020/2019**
Meat in total (in carcass weight)	69,3	69,9	100,9
Fishes in total (in dead weight)	5,6	5,9	105,4
Milk and dairy products			
(in terms of milk of without butter)	173,6	180,1	103,7
Milk and dairy products			
(in terms milk without butter)	168,7	174,8	103,6
Milk for drinking	45,4	50,0	110,1
Milk for drinking	44,1	48,6	110,2
Cheese in total	14,6	14,7	100,7
Eggs	224,0	229,0	102,2
Edible fats and oils in total	21,7	21,9	100,9

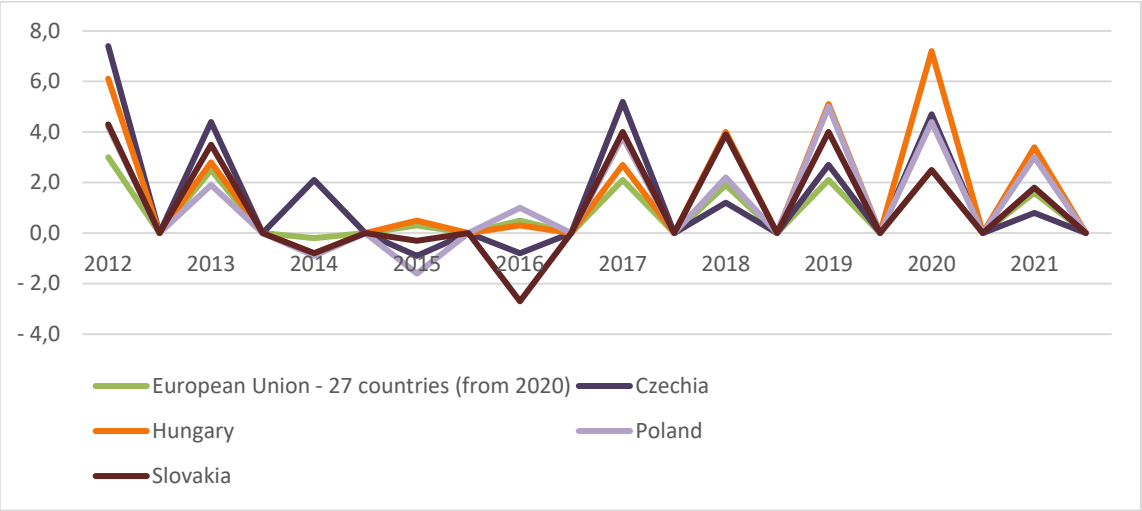
Edible fats and oils in total (in terms of net fat)	18,3	19,3	105,5
Sugar	31,7	32,1	101,3
Cereals in terms of grain	98,5	99,9	101,4
Cereals in terms of flour	77,0	77,9	101,2
Potatoes	52,8	54,2	102,7
Edible pulses	1,5	1,5	100,0
Vegetable and vegetable products			
(in terms of fresh)	106,9	107,0	100,1
Fresh vegetable	76,4	75,3	98,6
Fruit and fruit products			
(in terms of fresh)	67,1	69,6	103,7
of which			
Tropical and Subtropical	39,1	41,0	104,9
Grapes	4,4	5,0	113,6
Fresh fruit	45,0	44,7	99,3
Nuts in shell	2,8	3,0	107,1
Nuts in terms of kernel	1,5	1,7	113,3
Alcoholic beverages in total			
(in terms of net spirit)	8,8	8,5	96,5
Alcoholic beverages in total	101,0	94,0	93,1
Non-alcoholic beverages in total			
(in terms of drink)	231,7	225,5	97,3

Source: Datacube

Food prices can be an important driver of euro area headline HICP inflation, as food accounts for almost 20% of the HICP consumption basket and food price inflation is highly volatile (Figure 1). In the second quarter of 2020 the contribution of food to HICP inflation was around two-thirds of a percentage point, making it larger than the contribution of services or non-energy industrial goods. As food items are also a prominent example of frequently purchased out-of-pocket goods, their price movements are generally thought to have an important bearing on consumers' perception of inflation (Rajagopal, 2020, Straughan & Roberts, 1999, Tanner & Wölfing Kast, 2003). The April 2020 surge in euro area food prices was strong even in the light of food prices having been volatile in the past. The month-on-month increase in total food prices reached an exceptional 1.1% in April, a rate almost never observed since 1999.

Figure 1

HICP for Food products - annual rate of change (2012-2021)

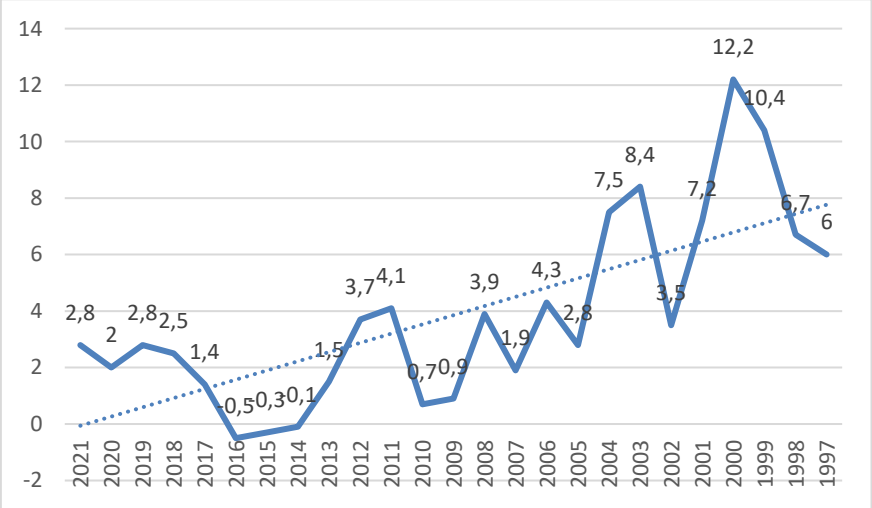


Source: Autor's calculations according to Eurostat

The development of inflation is shown in Figure 2. In 2021, the average inflation rate in Slovakia increased about 2.83 percent compared to the previous year.

Figure 2

Inflation - annual rate of change (1997-2021)



Source: Autor's calculations according to Datacube

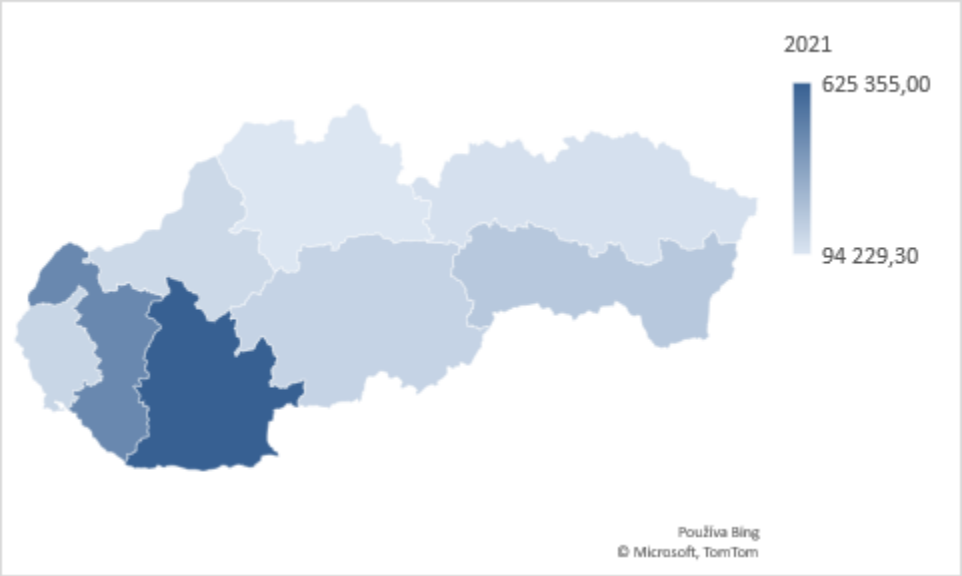
The market of agricultural consumer goods provides the realization of the majority of products with a high share in daily consumption. Especially at a time when economic crises are replacing each other in the world, the impact of the pandemic on the economy is expanding, and the population is constantly growing, it is necessary to reliably meet consumer demand for food. It is known that the agricultural consumer market is affected by changes in fuel and equipment of production. This leads to more or less fluctuations in commodity prices in the consumer market.

Changes in market prices of goods lead to a reduction in the volume of products consumed by low-income people. Such consumers are encouraged over time to consume a close substitute for those products. However, substitute products often do not have the same quality as previous products. As a result, in the face of high prices, the consumer is forced to consume low quality products.

Figure 3 shows the turnover distribution of food market according to the regions in Slovakia. Highest turnover was generated in Nitra region, the lowest was in Žilina region.

Figure 3

Turnover of Food Market in Slovakia (2021)



Source: *Source*: Autor's calculations according to Datacube

As one can see, the p- value is higher than 0.001 in the provided linear regression. This means that there is no statistically significant relationship between our variables (Table 2). The answer to research question no. 2: there is no statistically significant relationship between level of inflation and overall turnover of food market in Slovakia (p value equal to 0.308).

Table 2

Results of the linear regression

Model Fit Measures

			Overall Model Test			
Model	**R**	**R^2**	**F**	**df1**	**df2**	**p**
1	0.233	0.0545	1.10	1	19	0.308

Model Coefficients - Turnover_Food market

			95% Confidence Interval			
Predictor	**Estimate**	**SE**	**Lower**	**Upper**	**t**	**p**
Intercept	1.56e+6	68769	1.41e+6	1.70e+6	22.66	< .001
Inflation	-19096	18245	-57283	19092	-1.05	0.308

Source: Autor's calculations according to Datacube

4 Conclusions

It describes many factors that affect consumer behaviour. The study argues that consumer behaviour is not only affected by price and income factors. There are dozens of external factors that affect consumer behaviour. Studies show that many factors can influence consumer choices, from social factors to psychological factors. The article graphically describes consumer behaviour under the influence of these factors. The article also provides information on per capita consumption and market prices of agricultural products in Slovakia.

To answer the second research question, we stated that there is no statistically significant relationship between level of inflation and overall turnover of food market in Slovakia (p value equal to 0.308).

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Ethical challenges for sustainability management in the current crises

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Abstract

The study presents a basic identification of current ethical challenges for sustainability management. The challenges are particularly marked by the consequences of the covid pandemic and Russian aggression in Ukraine. Other factors influencing the ethical professional debate are the energy, financial, and leadership crises. The ethical dimension of the study follows the SDG framework and the complexity encompassing economic, social, environmental dimensions including the future dimension. The author names the core areas and their relevance for further research and management education.

***Keywords*:** sustainability, ethics, responsibility, society, environment.

1 Introduction

It is natural that the identification of ethical challenges in times of various crises depends on a certain perspective. The extent of the ethical perspective depends on the author, his education, his focus, his experience and the scientific intent he uses. It is probably impossible to produce a completely objective assessment of the current crises facing the world and business. Even the conferences on the subject themselves are influenced by current events and the environment in the midst of the European Union. Every ethical naming, description and evaluation depends on the concept of values and ethical criteria. In the following conceptual study, the aim is to identify the main threats, critical phenomena and challenges for the management that has accepted the task of striving for the sustainability of its activities in a company or any organization. Every manager is exposed to basic ethical challenges that evaluate what is good and what we identify as bad and harmful for the future. Ethical challenges include several dimensions. It is certainly not some cheap moralism. On the contrary, we are thinking about the existential questions of our society. These certainly include the economic and financial dimensions. However, the current professional debate agrees that we must also include the social and environmental dimension in the ethical analysis of society and business. The complexity and intricacy of the managerial task of contemporary society is perhaps the fundamental starting point for this study. The task is also not simple because we must be

concerned with the future and be able to evaluate the consequences of our thinking and actions for future generations. All this stands and falls on managerial personalities. In strategic decision-making, we even expect a leader who is able to perceive the moral and ethical framework of his or her responsibilities. Finally, we question the purpose of management education and the role of business schools.

2 Method

The study is based on basic data on the current crisis of society, which it documents in selected literature. From the literature sources we identify significant crisis areas and challenges for sustainability management. We describe the selected phenomena, outline a brief interpretation and finally we have to attempt an ethical - value assessment.

Sustainability is a philosophical position of the field of economics and management that is focused on the future. It refers to the continuation of desired development according to a particular conception of values and priorities (Kučera, 2022c). Internationally, the Agenda of Sustainable Development Goals is well-known, which contains 17 chapters (Norman, 2017).

Philosophically, it is clear that such a perspective cannot be based on the empirical scientific method or just on statistics based on the past. Neither the past nor the present is an absolute criterion for the future. Experience is interesting, but sustainability management points beyond the current experience and feelings to a time that has not yet arrived, and no one knows exactly what will happen and what the consequences of our actions will be across the breadth of the business environment. Yet sustainability management has the ambition to develop strategies and plans that will come to fruition in the years or decades to come. The challenge is difficult in that no one knows exactly what will happen in the future and what all the consequences of our decisions today will be. However, the principle of accountability calls for precisely that managerial imagination and forethought in our actions for all stakeholders who will be living in a situation we do not actually know (Jonas,1985).

In the environment of CEE countries, we need to remember that we cannot start from either materialism or Marxism, a philosophy that has defined post-Soviet countries for almost a century and has naturally found deep roots in society. Thus, in sustainability management we cannot start from what is and what is evident and real (Kučera, 2021, 2022b). The future is not evident; it cannot be examined, measured or compared today. We try to predict the future, but we are never quite sure what it will actually be. This leads sustainability management to be somewhat humble about its claims and cautious about its strategies. As humans, we can only imagine, guessing from current developments the future one. We can have wishes, dreams, visions. We can pursue a mission, plan and managerially prepare for the imagined future

according to our criteria.

The comprehensive method of sociological analysis is based on Myrdal's concept described in the study: "Value in Social Theory: A Selection of Essays on Methodology" (Myrdal, 1960). His next study, "Objectivity in social research" (Myrdal, 1969), where he demonstrates that social and ethical positions will never be objective. On the contrary, we must always describe our backgrounds, philosophy, conditions and environment of work. Studies dealing with the stability of the European society, which has an unfortunate impact on the business sector and the European economy (Kučera, 2022a), are topical. Therefore, it is necessary to base the analysis on certain values. This is based on the work of a group of authors, "Central Values of Government and Business: differences, similarities, and conflicts" (Wal, Hubersts, Heuvel, and Kolthoff, 2006).

We rely on military analyses (Antušák, 2009) and their updates (Rayment; Smith, 2013) designed specifically for Business Schools to identify the underlying crisis phenomena in society. We can make use of the crisis management section.

The ethical dimension of the study is based on a fundamental contribution to the topic, which formulates not only the aforementioned dimensions of managerial responsibility, but also the corresponding character profile of the manager, who wants to contribute to the sustainability of the organization's activities through both ethical and moral training and the use of spiritual intelligence (Schüz, 2019; Kučera, 2015). Studies on managerial sustainability require a managerial personality that is based on a particular anthropology. The personality and character of the manager is important in order to be able to identify ethical dilemmas associated with management, to be able to evaluate them correctly, to choose the right ethical school, and finally to make the right decisions. In addition to utilitarianism, we know the deontological approach, and on a personal level, virtue ethics.

The final task of the manager is to be able to communicate his conclusions to his team and convince (motivate) them to take the right actions that will have positive consequences for the future. The ethical dimension must encompass both the economic and the social dimension - the social and human dimension, the environmental dimension and finally the dimension of future development in the expected quality of the declared values.

Naturally, the author's own previous studies and the experience of his many years of managerial and academic practice are also used in this area. The methodological approaches and results of the study are discussed in comparison with the current professional discussion in the field.

3 Results

The results of the study can be described on several levels:

Identification of basic crisis phenomena. In 2022, we are still seeing the effects of the Covid pandemic, which has affected the priorities of many countries around the world, disrupting the smooth running of businesses, services, supply, logistics and human resources. The European Council summarised the impacts of Covid 19 on many levels. The financial amount to support the EU's recovery has been agreed at €1 824 billion for the period 2021-2027 (European Council, 2022).

Further critical analysis of policy measures, economic consequences, and ethical challenges of leading persons in organisations is available (Enste, Potthoff, 2020). The authors of the study cover the full range of impacts of the risky treatment of the power and financial interests of certain laboratories. The consequences of the pandemic impacted the economy, business, personal lives, psychological distress, depression, health risks and mortality. All of these are still being experienced by managers today.

Russian military aggression against Ukraine. The second major event of the current year is the invasion of Ukraine by the Russian army. Once again, many countries in Europe and the European Union as a whole have had to react with many measures, caused by the migrant crisis, the energy crisis, the security crisis and the political crisis. For many nations, Russian aggression also means facing a food and logistics crisis (G7 statement, 2022). For businesses, this means changes in supply-customer relationships, loss of markets, production capacity, logistics routes, more expensive energy and the search for new energy sources.

In addition to these two current crises, management has long been confronted with a number of other critical phenomena and threats. Military experts (Antušák, 2009) summarize them in the following points:

Enlarged society. Basically, it means the complex consequences of globalization associated with the complexity of business and management. In the meantime, the field is already again discussing the "end of the globalization" and the rise of economic restrictions that protect individual states and territories at the expense of globalization, which, especially after the financial crisis and now after the covid 19 pandemic, has found itself in an untrustworthy position (Belke, Gros, 2019). For decades, the best-known sociologists have been referring to our society as a risk society. It is up to managers to start taking sociological studies seriously (Beck, 1992).

Turbulent environment. It is not easy to plan for sustainability when political realities, economic expectations, security upheavals and the rise of war and terrorism are changing so fundamentally. Henry Kissinger referred to the new reality as "change of the world order"

(Kempe, 2022).

Limited resources. Recent global conferences focused on the ecological situation and critical developments have highlighted the limits of economic growth coupled with the ecological instability of our country (Lamperti, Bosetti, Roventini, A. et al., 2019).

Change of work paradigm. Sociological studies warn of the loss of the meaning of work, the rise of utilitarianism and hedonism. Management expects effective work engagement, but labour seeks comfortable work, more holidays, home-office, more insentives, better pay conditions. The problem was already addressed by Daniel Bell, who referred to it as "cultural contradictions" (Bell, 1996). Nowadays, in perhaps every democratic country, one can find current sociological analyses that are, with a few exceptions, alarming (Geiselberger, 2017).

Another challenge is the fact that on the one hand, management expects economic growth, innovation, development and stability, while on the other hand, for example, only European countries are facing unemployment or a shortage of workers. This is based on the family crisis, the lack of children, the economic unsustainability of young families with children, the lack of housing, etc. The author deals mainly with Czech analyses of the labour market, the crisis of the pension system, the problem of schooling and education, etc. (Prokop, 2020).

Unintellegible, unpredictable world. This is a major challenge for sustainability management, because we would need to plan for the future and have a reliable baseline. However, society does not show such reliability - a large percentage of the population, and therefore of employees or even managers, do not understand current developments and cannot navigate through the fast-moving events and conflicting media reports (Prokop, 2020).

Pathological role of media. The current state and popular media primarily use marketing shallowness rather than a thoughtful strategy for the future (Kučera, 2018). The viewer is exposed to emotional shortcuts, clips, fragments, emphasis on visuals, kitschy and unreal idols.

Growing of fatigue. All of these phenomena are met with an unprepared employee and probably also an unprepared management. Sociological and psychological studies warn of increasing fatigue, escape into entertainment, scepticism - perhaps not nihilism. To cite one study from the workplace among many (Orchard, 2021). All of these phenomena have negative implications for sustainability management. Special ethical challenges are directed at the social and psychological impacts of robotics and automation on individual employees, who find themselves under increasing pressure for efficiency and increasing control (Sauppé and Mutlu, 2015).

Ethical concerns are growing take from the great optimism over the development of Artificial Intelligence (Kučera, 2019). Studies are emerging that think more deeply about the implications

of digitalization and the focus on data. The well-known trends of Industry 4.0 are already having a negative impact on people's everyday life, thinking and everyday work (Mayer-Schönberger & Cukier, 2014).

What is the task of Universities and Business Schools? The preparation of the young management generation and executive education should know all critical phenomena, talk about them, recognize specific ethical dilemmas and try to face them correctly (Rayment, J.; Smith, J. (2013). In addition to the above mentioned critical phenomena (Antušák, 2009), authors Rayment and Smith state the following:

Large areas of extreme poverty and hunger in the world.

Domination by corporations.

Toxic childhood/protection.

Obesity

Lack of education/lack of basic numeracy and literacy.

The crisis of capitalism. This is a separate point because it touches on the world economic system itself. On the one hand we deal with managerial sustainability within capitalist society (Mattick, 2011), on the other hand we encounter criticism of the capitalist system itself and its crises. On the one hand there are publications explaining why they think capitalism is in crisis (Foroohar, 2022), on the other hand there are specific studies dealing with specific fallacies of capitalism, such as "The Myth of Market Neutrality", which ignores the increasingly important social and political element of economics and banking (Klooster and Fontan, 2020). Finally, there are well-known studies that are currently looking for professionally but also ethically defensible starting points (Davis, 2021).

4 Discussion

The ethical challenges themselves are discussed again on several levels: purely ethical in the area of management and business, the human conditions in the enterprise, the environmental consequences of the enterprise and again the impact on future generations. Naturally, the expert community agrees on the complex responsibilities of management in line with the SDGs (Norman, 2017).

Notable is the view of legal responsibility of management, which from the perspective of US and European law expects much from managers - economic, social, environmental and sustainable management, failure to comply with which is punishable (Andreisova and Kučera, 2017). Ethical challenges are, for example, corporate compliance program, a programme that includes the prevention of managerial failures in payments, accounting and the threat of corruption. (Dubcova & Kunz, 2016).

The deeper meaning of work is discussed, which already goes far beyond the classical focus on the financial performance of management (Rehwaldt and Kortsch, 2022). The ethical challenge concerns job satisfaction and sustainable stability of workers in companies.

Expert discussion naturally continues on ethical issues in general in management - the role of personality, the importance of proper communication in times of crisis, the resolution of ethical dilemmas (Keller-Krawczyk, 2010). International business studies have published extensive research regarding business ethics in recent months (Arnold, 2021)

Ethical challenges in times of crisis for management require additional new managerial perspectives and new philosophical foundations for an ethical and responsible future direction (Kučera, 2022). The questions relate to what philosophy to cultivate to be able to equip leaders for sustainability management?

The final challenge is therefore the quality of managerial personalities and leaders. What kind of leaders do we need to deal with all the problems and challenges outlined? (Day & Miscenko, 2015). Researchers call for improving the interrelationships between leaders and team membersv within all contexts of today's corporate practice.

In this sense, critical factory and ethical challenges of contemporary sustainability of management are presented.

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Development of selected economic indicators in Slovakia due to COVID-19

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Abstract

The development of the business environment in Slovakia in economic and financial terms is influenced by the consequences of the pandemic and the war in Ukraine. The economic damage caused by the coronavirus crisis would be significantly higher without in-time interventions and reactions by governments, central banks or regulatory authorities. Various forms of incentives and concessions in favor of businesses and households have significantly helped the shortfall in revenue and income to have only a limited effect on bankruptcies and rising unemployment, which would weaken the economy's potential for a long time. In this article, we analyze selected indicators of the Slovak economy with an impact on the development of the price level and subsequently predict the development of macroeconomic and financial indicators.

***Keywords*:** economy, pandemic, economic indicators, real GDP in the V4 countries, development, macroeconomic scenarios.

1 Introduction

A Slovak economy is constantly looking for qualitative factors of economic growth. The Turbulent development of world trade, demographic change, the challenges of robotization and automation in industry and services and also the impact of climate change in year 2020 has been supplemented by COVID-19 pandemic. This new situation has brought science and research to the forefront as positive factors in the progress of civilization. COVID-19 restrictions highlighted the need, but also detect the possibilities and limitations of digital infrastructure across the economy and society.

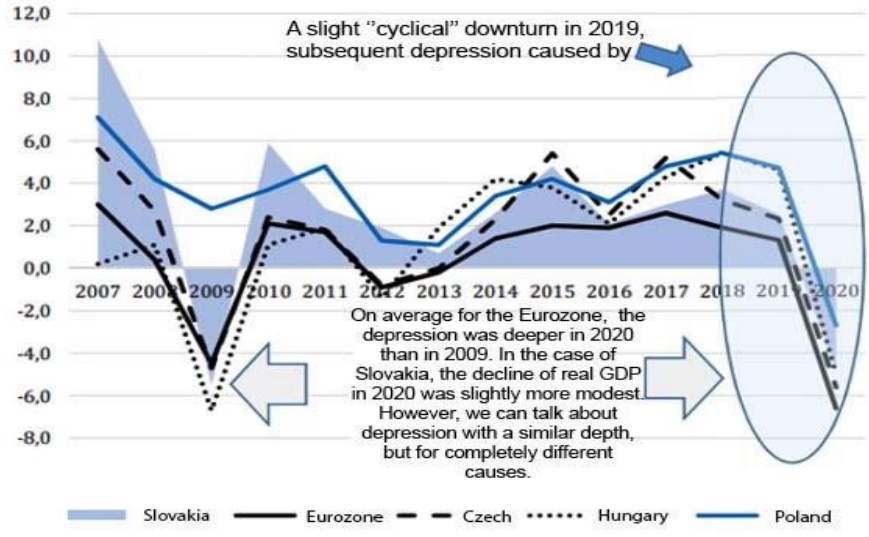
2 Current State of the Solved Problem at Home and Abroad

While the 2009 economic depression has an economic origin in the form of a shock in global financial markets, the depression in 2020 had non-economic origin (pandemic protection limited some economic activities and also limited labor use). Pandemic restrictions on the workforce have brought a large shock to the supply side of economy. However, the second unused workforce meant limited household resources and resulting negative shock for the demand side of the economy as well.

The rate of decline in real GDP 4.8% was lower in Slovakia than average for the Euro area. As

early as 2019, there was a slowdown in economic growth, which was more related to standard cyclical and structural changes – and had non connection with coming depression (Denník N, 2021).

Figure 1
Change in real GDP in the V4 countries and the Euro area on average



Source: Ministry of Finance of the Slovak Republic, 2022

The first case of a new coronavirus in Slovakia was confirmed on March 6, 2020. The pandemic restrictions to suppress it, also had significant consequences for Slovak economy. The government has also made several efforts to mitigate these adverse effects. As early as March, the government presented 13 measures to help companies and their employees in a situation of limited economic activity due to pandemic. The aim was, among other things, to negotiate with banks on the possibility of deferring loan repayments without an entry in the debtors register, securing short-term low-interest loans for companies in selected sectors, adjusting the possibility of depreciation of tax losses for longer periods or postponing the tax return deadline by three months for all companies. (TASR, 2020)

Restrictions against the spread of the new coronavirus led to a reduction in several economic activities. Society is limited to closing schools with compensation, and that leads to distance learning. Employees are forced to limit their presence in the workplace, and work has largely transformed into a home office in those professions that allowed it. Before all restrictions in Slovakia, home office was not widespread and this benefit can be considered typical for higher-income professions. In February 2020 in Slovakia, nine out of ten Slovaks never worked on home office. The possibility of at least occasional work from home was the sixth most requested

benefit and the third most sought after non-financial benefit beyond the law.

3 Research Design

Global and Slovak scientific capacities agree that the current crisis will be the worst on a global scale since World War II. The consequences of preventing measures against a spreading pandemic will be enormous. Many industries do not have the ability to provide their goods and services without physical customer contact. The sectors are therefore affected asymmetrically. Hairdresser, beauticians and also doctors and nurses are at greatest risk of infection. The least risky professions are considered to the areas of mathematical or statistical specialists and also the professions of forests or logging. (Jankovič, 2020)

The aim of an article is the analysis of selected indicators of the Slovak economy, the impact of the coronavirus crisis on the development of wages and prices and the prediction of economic financial development for the current period.

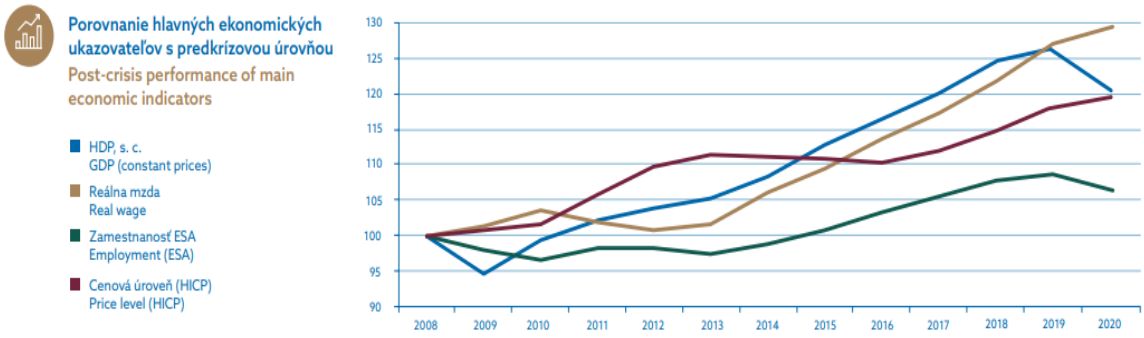
Methods of analysis, synthesis, induction and deduction were used in the processing. Graphic and tabular methods are also part of the processed article. The data were obtained mainly from Internet sources.

4 Result of the Paper and Discussion

Developments in the economic sphere mainly affect the development of the pandemic situation. However, the second wave of coronavirus was significantly milder in terms of its impact on the economy. The first wave was a significant and especially very sharp shock to the economy. However, 2020 eventually ended with a smaller-than-expected economic downturn. Several important sectors have seen a relatively rapid recovery. The second pandemic wave, which hit in autumn and winter was much more massive from an epidemiological point of view, but its impact on economic development was much milder. The main difference compared to the first wave was the different impact on individual sectors. While some sectors were less affected, others faced almost the same deterioration as in the first wave. The second wave of the pandemic also had a milder impact on the financial sector. Compared to the first wave, banks approached lending more freely. After the tightening following the pandemic, credit standards returned to almost their pre-crisis level, especially in retail. Banks, despite uncertainty, have been supportive to finance corporate shortfalls. The flow of corporate loans hit the first wave only temporarily, in the second wave it was even slightly faster than before the crisis.

Figure 2

Development of the main economic indicators from 2008 to 2020



Source: Eurostat, 2022.

By closing a large part of the economy, the government was forced to take restrictions to partially reduce the negative effects of the lockdown. The First Aid project (later called First Aid plus, ++ etc.) was intended for employers and self-employed person, who had to close their services or reduce their activities based on a decision of the Public Health Office of the Slovak Republic. The aid was also intended for employers who retained jobs in the event of a break or reduction in their activities during a declared emergency.

The Slovak economy is currently suffering mainly from:

- lack of components in industrial production, especially in car production,
- low vaccination coverage (5th lowest in the EU).

The Slovak export-oriented economy suffers from different and hardly predictable pandemic restrictions of countries, to which we export a significant part of our production. It is expected that most of the outages are likely to catch up with the economy later in the 2022. Low vaccinations cost Slovakia a lot of money. The lagging of vaccination, compared to Western Europe, has caused a drop out in short-term consumption, especially in the services sector, amounting to up to 1 Billion € total for the years 2021 and 2022.

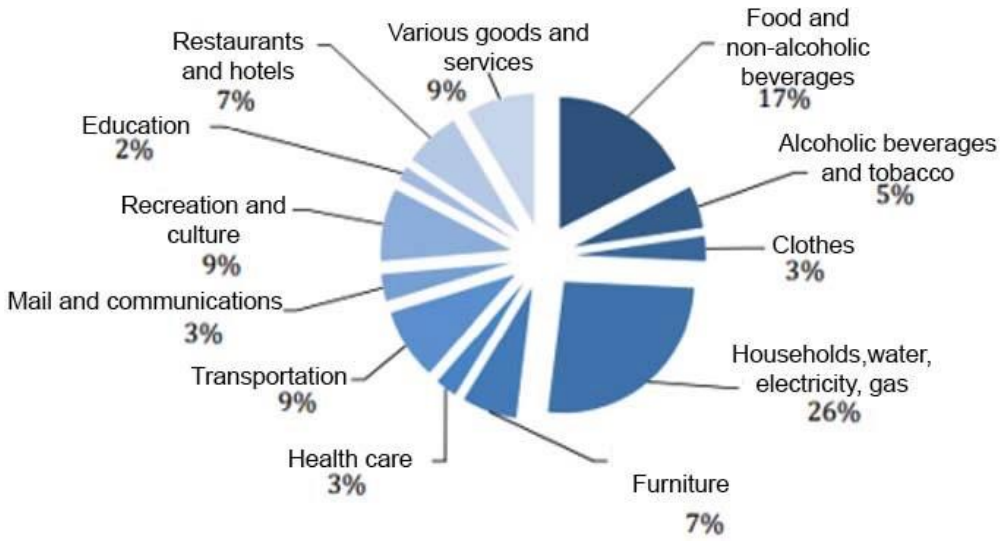
Economic development in the autumn of 2021 significantly affected the faster growth of prices. The reason is that for the COVID-19 pandemic, global supplies of components and raw materials has been stuck, the rise of energy prices was also partly affected by the transition to green energy, which will cause not only the expected rise in food prices but also industrial goods. According to the National Bank of Slovakia predictions, price growth was expected to peak in the spring of 2022, with inflation expected to peak at the beginning of the 2022 at around 5 -6%. Wages of the population were also expected to increase in the coming years.

The crisis had a major impact also on the price development level. Initial inflationary pressures, which pushed up modest price increases in previous years, disappeared with the incoming global pandemic. Overall demand fluctuated, as demand has increased in areas such as food, while in other sectors, as a result of the restrictions mentioned above, effective demand fell to almost zero. The overall level thus increased by 1.9% on an annual average, when measuring the CPI, by 2.0% according to the HICP.

These factors can be described as important for the development of the price level (National Bank of Slovakia, 2021):

- a gradual slowdown in food prices,
- an absolute drop in oil prices,
- growth of regulated prices at the beginning of the year,
- fading base effect.

Figure 3
Year-on-year change in the price level in the categories of the consumer price index in 2020



Source: Macroeconomic database of the national bank of Slovakia, 2021

In 2020, the wage quota reached the highest value (49,7%) in the history of the Slovak Republic, despite the fact that the growth in the volume of employee remuneration slowed down significantly. But with the decline in total value added, even weak employee compensation growth was sufficient for the wage quota to increase by almost two percentage points year-on-year to a record level.

Table 1

Parameters of wage development and wage quota

Parameter/ Year-on-year change in %	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Nominal wage	2,9	3,3	4,6	6,2	7,8	3,8
Real wage	3,2	3,8	3,3	3,6	5,0	1,9
Average employee remuneration	3,7	2,2	5,1	5,9	6,8	3,3
Remuneration of employees	6,3	5,1	7,9	8,4	7,7	1,3
Gross value added	4,3	1,7	3,7	5,7	4,9	-2.3
Wage quota	42,3	43,7	45,5	46,6	47,9	49,7

Source: Eurostat, 2022

Analysis and prediction of macroeconomic and financial development

For the purposes of assessing the risks of the financial sector and estimating the effects of economic developments on the financial sector, two scenarios of economic development were used in the Financial Stability Report. While the baseline scenario envisages an economic downturn only in 2020, with a gradual economic recovery expected in 2021, the unfavorable economic scenario assumes a continued economic downturn in 2021 with a subsequent, only gradual recovery in economic growth in the coming years.

Table 2

Macroeconomic scenarios

Indicator/change in %	**Reality**	**Baseline scenario**			**Unfavorable scenario**		
	2020	2021	2022	2023	2021	2022	2023
GDP	-5,7	4,7	4,6	3,9	-0,9	2,5	3,1
Employment	-1,9	-1,0	0,9	1,0	-3,3	-1,1	0,3
Unemployment rate	6,8	8,0	7,7	6,9	10,0	11,4	11,3
Inflation	2,0	0,6	1,7	1,9	0,5	1,5	1,5
Real disposable household income	-0,5	2,0	2,6	2,4	-0,9	0,8	0,9

Source: National Bank of Slovakia, 2021

The baseline scenario of economic development assumed that after the economic downturn in 2020, there would be a recovery in the next period. The economic recovery should be driven by both domestic and foreign demand. Successful elimination of the coronavirus spread and gradual end of anti-pandemic restrictions should ensure that the economy reaches its pre-crisis level by the end of 2021. The labor market situation will stabilize with some delay compared to economic developments, as a result of which the unemployment rate will continue to rise in 2021 and will not approach the 2020 levels until the end of the modeled horizon (i.e., 2023). (Frank & Morvay, 2021)

According to this scenario, wages were to maintain a stable year-on-year growth rate. As a result of this development, real household disposable income was expected to recover after last year, with a positive impact on household consumption.

The unfavorable scenario of economic development takes into account a longer and only gradual end to the ongoing crisis. This could happen, for example, in the case of slower and less successful vaccination, the occurrence of a new mutation or other waves of a pandemic, so it would not be possible to proceed with a gradual freeing of the restrictions. (Novák, 2021). As a result, the economy would decline in 2021 as well, then a subsequent recovery of the economic activity will be very slow. The economy would not reach its pre-crisis level by the end of the modeled horizon. The unfavorable situation would also be reflected in the labor market - while the unemployment rate would reach double-digit levels, at which it would remain until the end of the projected period. However, even relatively stable wage growth would not be able to prevent the decline in household disposable income in 2022 and 2023. It would only recover gradually at the end of the modeled horizon, as a result of which households would only gradually contribute to economic growth through their consumption. (National Bank of Slovakia, 2021)

However, the impact of the war in Ukraine is not taken into account when estimating economic developments in the Financial Stability Report.

5 Conclusion

The economic recovery will not be easy after two difficult years affected by the COVID-19 crisis. The war between Russia and Ukraine will not bring anything positive to our country. For several months now, we have been seeing an increase of oil prices on the world markets. EU sanctions against Russia largely predict rising prices for all goods and services. The financial sector, which has been one of the supporting pillars for the quick recovery of the economy over past two years, is now raising mortgage interest rates. Forecasting will therefore depend on ending the dramatic situation in Ukraine.

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Share of Intellectual Property Rights on Innovation Activities in Creative Industries in Slovak and Czech Republic

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Abstract

The aim of this paper is to identify specific problems of intellectual property rights protection in creative industries and to identify the current state of this protection in the Slovak and Czech Republic. The results presented in this paper are based on the official statistics of the Czech and Slovak Statistical Offices, which conduct two-year cycles of surveys of innovative activities of companies. In June 2020 data for 2016-2018 were published. A harmonized Eurostat model questionnaire was used for data collection by all EU countries, thus ensuring comparability of the data gathered. These results are interpreted with the ambition to suggest appropriate solutions. The proposed paper is also reflecting the current state of digitalization and digital transformation currently identified in creative industries and is raising relevant questions, such as: How can intellectual property rights be enforced in the digital environment to prevent infringements of intellectual property rights and to limit the legitimate use of copyright exceptions? How to find a balance between strong IPR protection and the ability of businesses to exploit the creative potential of the knowledge economy? How can consumer and competitor rights be transferred from analogue to digital context? Do we need new categories of intellectual property rights? Can we create a system of rights that ensures that the scope and duration of rights do not create obstacles to the expansion of creativity?

Keywords*: intellectual property, innovation activities, creative industry, trade secrets*

1 Introduction

The creative industry (CI) is located between art and technology and in its whole context it creates the creative economy (Caves, 2002). We associate this concept with human ingenuity, which can be the source of any economic activity. UNCTAD and the United Nations Development Program (UNDP) see it as an evolving concept based on creative activities, encompassing a diverse set of knowledge-based economic activities.

It consists of industries that focus intensively on the creation and use of intellectual property products, such as music, publishing, filmmaking, theatre, photography, video production, but also industries that focus on providing creative services between companies,

including advertising, public relations and direct marketing as well as industries that bring added value to the economy in the form of research, development, software, etc. The creative industries are thus at the border between human creativity, ideas, culture, intellectual property, knowledge, and technology (EY, 2015).

The process of creating and implementing innovations in CI is often an interdisciplinary process, in which many entities are involved, while their goals, motives and needs do not have to be identical (Majdúchová & Barteková, 2020). The process of creating innovation in these sectors is often the result of partnerships between many actors because creativity most likely arises because of interactions and exchanges between different social actors (Wolff, 1993; Uzzi and Spiro, 2005; Tchsmuck, 2006). The technological sectors are also actively involved in this process. As an example, the production of a commercial or video game requires the participation of various experts such as engineers, screenwriters, musicians, game designers, actors, psychologists, etc (Cohendet & Simon, 2007).

CI thus becomes a source of innovative ideas and influences and contributes to the innovation potential of the economy and to the creation of new products and services (Lessig, 2001). CI companies offer services and products that can be an input to the innovation activities of other companies, both within and outside the creative industries, and are intensive users of technology, thus stimulating this segment to constant change and innovation impulses. CI companies are cross-cutting entities that influence other industries through their activities. The role of the creative industries for the innovative performance of the economy is twofold. Creative enterprises can develop and implement innovation as part of their business activities and thus directly contribute to the innovative performance of the economy. Such innovations include new products and services offered to customers (product innovations) as well as new management and business practices that increase the efficiency or quality of their outputs (process innovations). While creative companies also support innovation in other companies through creative inputs. These can be downstream i.e., creativity created in a creative enterprise is used by its customers or upstream i.e., creative companies use creative inputs from their suppliers e.g., technology manufacturers.

Intellectual property rights play an important role in the development of the creative economy (DCMS, 2001; DCMS, 2011). They protect creativity and control the commercial use of scientific, technological and cultural products.

Table 1

Creativity protection through intellectual property rights

Copyright for authors of original works and related rights for intermediaries who make works available to the public
• Books, music, pictures, games, architecture, software • Performers, sound producers, broadcasters
Intellectual property rights that protect creativity through reputation
• Trademarks • Certifications confirming production standards • Designation of origin and geographical indications
Intellectual property rights that protect creativity in product design
• Industrial designs • Textile design, clothing design, shapes of smartphones and of other devices, ornaments, and elements of architecture, etc. • Technical solutions protected by patents or utility models

2 Specifics of intellectual property rights protection in creative industries

It is necessary to realize that the protection of intellectual property rights, as we currently know it in most advanced economies, was originally developed and applied mainly in the field of technological innovation for the analog age. Its aim was to find a balance between the interests of creators, investors, and users. However, the creative economy is increasingly relying on digital technologies. Electronic platforms, file sharing, music streaming have led to new business models. Applying the system of protection of intellectual property rights in the environment of the digital society thus becomes a great challenge. Given the specifics of the activities of IC entities, building creative dynamics requires maintaining a delicate balance between exclusion and openness. The impact of information technology (IT) further complicates maintaining this balance (Shapiro & Varian, 1998). E.g., in the music industry, to maintain the incentives for creators to create new works, it is important to protect new songs through copyright and to prevent them from being copied and downloaded from the Internet as much as possible (Landes & Posner, 1989). Yet, the influence of information technology leads to the rapid and mass distribution of new songs, almost for free, which increases the value of new songs (Benkler, 2006). Thus, it is possible to identify a discrepancy between an approach that favors strong content protection and an open access approach (Lessig, 2004). Due to IT, content usage control has become difficult, and peer-to-peer exchanges have led to the development of a free using culture. Illegal distribution reduces producers' profits and thus the amount of cash they could invest in the development of new works. It is therefore logical that rights holders emphasize the need to legally prevent such phenomena and to limit the illegal exploitation of someone's work and rights through legal regulations. Yet, some actors

emphasize the need to simplify the protection of creative content and seek to make copyright-protected content more accessible so that it can be shared. Sharing has an impact on the dissemination of cultural diversity, creative ideas and thoughts. For many businesses, exercising IP rights may not be the only form of protection. Some welcome the possibility of open cooperation, building networks and gaining network effects, and compatibility with complementary products. If the ancillary assets are the sole property of the original creator, the provision of a free original product could increase entrepreneurs' profits from these ancillary assets. In other words, it is possible that artists do not sell their reproductions directly but earn from additional services combined with an open access product (Kabanda, 2014). Valorization of new products may not always require a strategy of exclusion and total appropriation through IP rights.

Violation of IP rights in Ci entities is a very complex problem and a challenge for stakeholders since in the current era of digitization and the advent of artificial intelligence, copying and imitation is very simple. In the current era of the Internet, where most works of art can be digitized and exchanged and shared on the web almost free of charge, IP rights are priorities in rewarding system of creators who have been involved in the creative process and who have invested cash, time, energy, and own know-how. The protection of IP rights is a matter of survival for these entities, as otherwise the motivation for their creators, to have an incentive to operate in the given sectors and to create relevant innovations, is lost. IP rights protection regimes were originally developed for the analog age. Their basic aim was to create an appropriate balance between the interests of creators and users. However, in a digital environment, it is much more difficult to create and maintain this balance.

This raises several questions:

- How can intellectual property rights be enforced in the digital environment to prevent infringements of intellectual property rights and to limit the legitimate use of copyright exceptions?
- How to find a balance between strong IPR protection and the ability of businesses to exploit the creative potential of the knowledge economy?
- How can consumer and competitor rights be transferred from analogue to digital context?
- Do we need new categories of intellectual property rights? Can we create a system of rights that ensures that the scope and duration of rights do not create obstacles to the expansion of creativity?

3 Research design

The aim of this paper is to identify specific problems of intellectual property rights protection in the creative industry entities and to identify the current state of this protection in the Slovak and Czech Republic.

The results of the protection of intellectual property rights in the Czech and Slovak Republics are be based on the official statistics of the Czech and Slovak Statistical Offices, which conduct two-year cycles of surveys of innovative activities of companies. In June 2020 data for 2016-2018 were published. A harmonized Eurostat model questionnaire is used for data collection by all the EU countries, thus ensuring comparability of the data gathered.

In the final part of the paper, the results are interpreted with the ambition to suggest appropriate solutions.

4 Results and discussion

Even though innovation is a concept that is conceptualized in many science schools and has a significant impact on the level of the economy, it is also a concept that is difficult to quantify in terms and rates. This is true not only in the technology and manufacturing industries, but even more in creative industries. The situation is also complicated by the fact that most of the research carried out in the field of innovation processes is focused on the science, technology, engineering, and mathematics, which limits its applicability in the service sector or in creative industries. (Jaaniste, 2009). The creative industry itself is perceived as something new and innovative, and the ideas, products, and processes that the creative industry develops affect productivity not only in these sectors but also in other sectors (Cunningham, 2013).

In the following part of the paper, we present the results of creative industry companies in the use of intellectual property rights in the Slovak and Czech Republic for the period of 2016-2018. The selection of creative industries is based on SK NACE and CZ NACE classsification. These classifications were prepared according to the International Statistical Classification of Economic Activities in accordance with Regulation No 1893/2006 of the European Parliament and of the European Council (EC). The classification considers technological developments and structural changes in the economy over the past 15 years and is relevant in relation to economic development and ensures comparability with other international classifications. The industries 58-63 Information and communication; 71 - Architectural and engineering activities; 72- Scientific research and development; and 73-Advertising and market research were selected. This selection is in accordance with the European Commission's classification of the

creative industries.

In the Slovak Republic, from the analyzed set of companies with innovation activity, the Information and Communication sector was the most represented, while most companies were in the size category from 10 to 49 employees i.e., small businesses. In terms of the type of innovation, companies did not focus on just one type, but combined product and process innovation. Companies in the sector have focused most on the use of copyright, followed by the use of trade secrets and trademark registration. The use of patents and utility models was relatively modest.

A similar pattern can be seen in the sector of Architectural Services and Advertising. An exception is the Scientific Research sector, in which 9 companies out of 24 companies with innovation activities applied for a patent.

In the Czech Republic, companies in the Information and Communication sector as well as in Scientific and Technical sector preferred a combination of product and process innovation. In the information and communication sector, intellectual property rights were focused on the registration of trademarks, copyrights and keeping the trade secrets. The exceptional position of the Scientific and Technical Activities sector in the field of protection of intellectual property rights has also been confirmed in the Czech Republic. All the kinds of registered intellectual property rights were recorded by this sector.

Based on the above analysis, it can be stated that in the creative industries, companies prefer less formal and more easily accessible forms of protection of intellectual property rights. The use of concluded agreements on the protection of trade secrets proved to be important. Trade secrets are not classic intellectual property rights. Trade secrets may be of a technical nature, such as drawings and designs, prototypes, manufacturing processes, unpatented inventions, know-how, formulas or recipes, genetic materials, and fragrances. Trade secrets can consist of customer and supplier lists, business models and strategies, as well as price information. It is therefore a very wide range of data and information that companies consider to be important and are trying to protect them. They can value them as much as patents or inventions.

The advantage of trade secrets is that it does not need to be registered, thus eliminating the associated costs, it can be used in combination with other types of intellectual property rights, it is not necessary to publish it (unlike the invention), its term of protection is unlimited i.e., it depends on the company's decision and its use is suitable for the initial stages of the innovation process, when the effect of the created and implemented innovation is not known yet. It is also necessary to distinguish the disadvantages of trade secrets, mainly because it is not an intellectual property right and therefore it is not covered by specific protection rights. It requires

expenditures on internal corporate control of its protection, especially in relation to employees (the need of contracts that contain explicit non-disclosure and non-compete clauses), which can reduce employee mobility. The application of trade secret laws is also uncertain, and remedies vary across the jurisdiction.

The following table presents the share and the structure of enterprises with innovation activity in the Slovak Republic. It includes the frequency of using either product innovation or process innovation or both innovation activities. This table was created for creative industries only and is presenting the frequency separately for each type of business activities.

Table 2

Share of enterprises with product or process innovation activities in the Slovak Republic

Slovak republic	Sizeclass (by number of persons employed)	Share of enterprises with innovation activity						Number of non-innovative enterprises	% of all enterprises
		number total	% of all enterprises	with product innovation only	Enterprises with business process innovation only	Enterprises with product and business process innovation	Enterprises with abandoned or ongoing innovation activities or with R&D only		
58 - 63 Information and communication	Between 10 and 49	146	34,75	20	17	74	35	275	65,25
	Between 50 and 249	54	49,27	8	8	23	14	55	50,73
	250 or more	20	66,67	1	5	13	1	10	33,33
	Total	220	39,29	29	31	111	50	340	60,71
58 Publishing activities	Total	8	16,08	4	1	2	1	39	83,92
59 - 60 Motion picture, video and television program production, programming and broadcasting activities	Total	4	23,53	0	1	3	0	13	76,47
62 Computer programming, consultancy, and related activities	Total	162	43,47	25	24	74	39	211	56,53
63 Information service activities	Total	27	35,73	0	4	17	7	49	64,27
71 Architectural and engineering activities; technical testing and analysis	Total	114	34,28	6	63	14	31	218	65,72
72 Scientific research and development	Total	24	61,19	0	13	4	7	15	38,81
73 Advertising and market research	Total	67	25,80	6	29	32	0	192	74,20

The following table presents the share of intellectual property rights in creative industries in the Slovak Republic. It is horizontally structured by the kind of intellectual property rights and vertically by the type of business activities.

Table 3

Share of intellectual property rights in creative industries in the Slovak Republic

Slovak republic	Total number of enterprises	Number of enterprises with innovation	Share of innovative enterprises which						Sizeclass (by number of persons employed)
			Applied for a patent	Applied for a European utility model	Registered an industrial design right	Registered a trademark	(copyright) Claim copyright	Use trade secrets	
58 - 63 Information and communication	421	146	0	3,42	0,00	11,87	40,93	18,44	Between 10 and 49
	109	54	0	0,00	0,00	48,17	27,90	11,92	Between 50 and 249
	30	20	0	0,00	0,00	15,00	45,00	35,00	250 or more
	560	220	0	2,33	0,00	21,07	38,10	18,35	Total
58 Publishing activities	47	8	0	0,00	0,00	37,52	94,03	1,00	Total
59 - 60 Motion picture, video and television program production, programming and broadcasting activities	17	4	0	0,00	0,00	50,00	50,00	1,00	Total
62 Computer programming, consultancy, and related activities	373	162	0	3,17	0,00	21,27	34,00	16,09	Total
63 Information service activities	76	27	0	0,00	0,00	3,70	8,57	13,94	Total
71 Architectural and engineering activities; technical testing and analysis	331	114	4	7,22	3,20	4,02	13,87	19,12	Total
72 Scientific research and development	39	24	38	25,64	0,00	10,22	19,62	14,39	Total
73 Advertising and market research	259	67	0	0,00	0,00	0,00	17,26	8,87	Total

The following table presents the share of each type of innovation being introduced by entities operating in creative industries in the Czech Republic (Czech Statistical Office, 2020), esp. product or process innovation or both.

Table 4

Share of types of innovations introduced in creative industries in the Czech Republic

Czech Republic	Total			Enterprises that successfully introduced innovation in the monitored period											
				Total			according to the type of innovation introduced								
							Product and process			Product only			Process only		
	Number	% [1]	% [2]	Number	% [1]	% [2]	Number	% [1]	% [2]	Number	% [1]	% [2]	Number	% [1]	% [2]
Information and communication activities – J /58-63/	1 045	65,2%	100,0%	1 012	63,2%	96,9%	694	43,3%	66,5%	114	7,1%	10,9%	203	12,7%	19,5%
Scientific and technical activities – M /71-73/	707	41,2%	100,0%	662	38,6%	93,7%	315	18,3%	44,5%	76	4,4%	10,8%	271	15,8%	38,4%

The following table presents the share of intellectual property rights in creative industries in the Czech Republic (Czech Statistical Office, 2020), horizontally structured by the kind of intellectual property right and vertically structured by the type of business activities.

Table 5

Evaluation of resources according to the summary of values of VRIQ criteria and after including the degree of their development

Czech Republic	number of innovating enterprises	Share of innovative enterprises which						NACE
		Applied for a patent	Applied for a Eurtoopean utility model	Registered an industrial design right	Registered a trademark	Claim copyright	Use trade secrets	
58 - 63 Information and communication activities	1045	6	4	2	26	24	21	58 - 63 Information and communication
71-73 Scientific and technical activities	**707**	16,60	13,00	6,10	16,00	13,00	17,7	72 Scientific research and development

5 Conclusion

To maintain their competitiveness in the market, companies invest funds, human and material resources in research, development, and innovation. Companies use formal intellectual property rights such as trademarks, patents, designs, or copyrights. But this is not the only possible approach. There is also the protection of access to knowledge and information that is not generally known, but at the same time very valuable for the company itself. This information and know-how are referred to as the trade secret. It is not only about knowledge and information directly related to the technical components of the business, but also about customers, suppliers, business models and strategic plans.

Companies operating in creative industry use the informal protection of their innovation process more than other businesses. The framework of intellectual property rights thus takes on a very broad dimension, which gives countries considerable flexibility in terms of the creation of the intellectual property rights legislation, especially in the current digital age. We also acknowledge a certain scientific and academic gap in guiding the issues we have raised at the beginning of this paper. We therefore face the challenge of ensuring strong protection for intellectual property rights yet enabling the legal dissemination of knowledge and expertise as much as possible, especially in developing countries. They need to build their capacity to develop and make full use of the intellectual property system to support their creative industries, which are indeed a key driver of economic growth and international competition.

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Environmental Education as Part of Lifelong Learning

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Abstract

While the issue of environmental protection and sustainable development has been richly explored in theory, the practical implementation of the rules and principal into social life and enterprise practice has remained neglected. The paper focuses on environmental education, whose aim is the changeover in thinking and attitudes of the present-day economically active population and that of the young generation. Environmental education is to be understood from the conceptual aspect as an organic part of the entire complex of education and training, not excluding further professional education. Environmental education is not the most recent issue: formal education has been dealing with the nature protection and care for the environment since the 1970-ies. Environmental education is promoted in all types of schools, either in direct in-class instruction or indirectly through special interest (hobby) education. It is essential to pass from the theoretical analysis and discussions about environmental problems to their utilisation in practice. An important role in this process is played by managers. The focus of our empirical research is on attitudes, opinions and environmental thinking of line managers. The paper is a partial outcome from the nation-wide research project scheme VEGA, No. 1/0328/21: "Post-pandemic Business Management: identification of temporary and sustainable changes in sequential and parallel management functions in the context of the COVID-19 pandemic".

Keywords: *Sustainable development, environmental education, environmental management, managers' attitudes, pro-environmental attitude*

1 Introduction

The development of knowledge-based society and a gradual digitalisation of working and societal life and the ensuing changes in the structure of society are accompanied by the impact into the living environment. As a result of an extensive extraction of natural resources, degradation of water purity or the shortage of quality foodstuffs is beginning to pose a threat to the stability of modern human society (Pironti et al., 2022; Jabiol et al., 2022; Zhu et al.; 2020). It is therefore understandable that a natural pressure on exerting the strategy of permanently sustainable development is increasing on various institutional levels. The exploitation of biosphere by man, we have been witnessing in recent years, often endangers its natural

ecological balance or even the very existence of mankind. Environmental threats facing the present-day society are nowadays also reflected in the activities focused on adopting policies and programmes setting forth the application of sustainable development principles in all the spheres and areas of life. (Ukaga et al., 2019; European Environment Agency, 2021). These developments are not only manifested in the efforts of national governments but also in the activities of the European Union (EU) implemented in this direction. One of them is the commitment of the European Commission in the European Green Deal to transform the EU to a modern and competitive economy, which utilises its resources effectively. The agenda of climate neutrality sets the target year of 2050 for achieving the net-zero value of greenhouse gas emissions. (On 4 March 2020 the European Commission adopted the proposal of the European Parliament Directive and that of the European Council, which determines the framework for achieving the climate neutrality and the EU Directive 2018/1999 {European climate legislation) [2020/0036 (COD)]} in which it is proposed to make the target of climatic neutrality by the year 2050 legally binding for the EU) (Council of the European Union, 2021; Williges et al., 2022). In accordance with the European Green Deal the economic growth will be separated from resource utilisation and will ensure that all EU regions and citizens engage in a socially just transition to a sustainable economic system. The European Green Deal also aims to protect, conserve and enhance the EU's natural capital and protect citizens' health and quality of life from environmental risks and impacts. (See: Alexander, & Schwandt, 2022). It will strengthen the EU's social market economy and help ensure that it is ready for the future and that it brings stability, jobs, growth, and investment. Given the socio-economic damage also caused by the COVID-19 pandemic and the need for sustainable, inclusive and equitable recovery, these objectives are extremely important. (Zhu et al., 2020; Yao et al.2020; Conticini et al., 2020; Culqui Lévano et al., 2022). For the successful implementation of the European Green Deal and the Sustainable Development Action Plan, it is crucial not only to provide sustainable funding, which is not addressed in our paper, but also to provide environmental education as part of lifelong learning. The "greening" of thought, feelings and perceptions of the population's everyday life will be projected in potential bearers of sustainable development principles in the performance of their professions. We recognize that the environmental awareness of the population will also facilitate the collection of actual data from enterprises and organisations concerning the risks to sustainability and posing a harmful impact on the environment and the future of the planet. (European Commission. Climate action. European Green Deal, n.d.; Bunescu, & Estermann, 2021; Commission of the European Communities, 2008).

In the empirical research, we focus on identifying the ideas, attitudes and opinions of line managers on environmental phenomena. We consider it important to capture their statements related to their relationship with nature and describe their opinions concerning their attitudes and environmental awareness. The starting point of our reflections on sustainability and environment was the idea of that environmental awareness as an active open system that can be shaped and further developed. People with a higher environmental awareness are motivated to be more environmentally friendly, have a wealth of information about the condition of nature and the environment, and are aware of the link between their behaviour and the state of the environment (Settimo et al., 2020; Matharu et al. , 2021).

By identifying the views of line managers, we would like to contribute to fostering the relationship between organisations and society by making organisations more responsible and transparent in terms of their impact on the environment. This is also connected with creating better conditions for the environmental data reporting, its application in sustainable development and the setting of greening needs in education. Favourable results can be expected in the application of digital technologies.

2 Methodology of Research

There are several standards and principles related to the living environment, environmental protection, and securing sustainable development which are recognized and respected by human beings and are projected to some extent into human actions. Our analysis of projecting these standards and principles of the environmental protection into the work action of line managers is based on the line managers' opinions. The aim of our empirical research was to identify the line managers' knowledge, attitudes, and opinions of environmental phenomena. We investigated managers' knowledge of the environment acquired through studies in formal education and further professional education, or via self-study; awareness of negative consequences of human activities and way of life to the environment and proposals for changes; and their activities of eco education and employee education at workplace. To achieve a pro-environmental behaviour on the part of line managers is the basis of inventions and innovations for the permanently sustainable development. The research was carried out by means of the interview method and the questionnaire method. The interview was used to better understand the views and experiences of the respondents. It was used in the implementation of the pre-research and in designing the questionnaire. The questionnaire method was used for practical reasons, as the research required a representative sample of respondents. The application of the questionnaire method makes it possible to collect information from a larger number of

respondents within a reasonable period of time and at a reasonable cost. Primary data were collected on the basis of questions from a questionnaire prepared in advance and distributed in person or electronically. The questionnaire consisted of two basic parts: the information part containing the basic data about the respondent and the professional part concerning the respondent(s)' opinions on the implementation of training in their companies and the general interest of employees in participating in the training.

Empirical research can be applied in all the branches listed in the industry classification of economic activities. Given a limited scope of the paper, we have chosen crucial sections in Slovakia's national economy in terms of the Statistical Classification of Economic Activities SK NACE Rev. 2. Respondents were selected from sections: Section A – Agriculture, forestry, and fishing, divisions: 01 – Crop and animal production, hunting and related service activities and 02 Forestry and logging. Section C – Manufacturing, divisions: division 10 – Manufacturing of food products, 11 – Manufacturing of beverages, 13 – Manufacturing of textiles, and 14 – Manufacturing of clothing and wearing apparel.

We used the random sampling method, i.e. each unit had an equal probability to be selected in the random sample. Line managers from enterprises of various sizes were then chosen without further limitations. Nominal and cardinal variables in the questionnaire were monitored. Nominal variables were described by means of codes created arbitrarily and subsequently allocated to individual categories. These variables indicated the size of enterprises. Cardinal variables were used on a broader scale, namely interval and ratio variables. When creating the questionnaire questions, we focused on the accuracy and reliability of the research tool. Reliability is affected by three factors: scope, homogeneity and a complex nature of the research tool. Scope of the research tool: the questionnaire consisted of fifteen questions, the first six questions concerned the identification data of the respondents and the remaining questions concerned further professional corporate team training. Homogeneity of the research tool: all questions in the questionnaire concerned the subject matter. Complex nature of the research tool: the sequence of questions fulfilled the requirement of logical arrangement; the terminology that might not have been understood by respondents was explained in greater detail. The questionnaire was designed as a combination of closed structured questions with multiple answers and open (unstructured) questions. In the case of open-ended questions, the respondents were able to express their opinions without restriction. The return rate of the questionnaires was 82.8%; out of a total of 1000 questionnaires, 828 questionnaires were returned, from which we deliberately selected respondents' questionnaires from Section A – Agriculture, forestry, and fishing (90) and Section C – Manufacturing (150), i.e. the total of 240

questionnaires. The exploration of the issue described necessitates both quantitative and qualitative research. The qualitative research was applied in the interview method, which was part of the pre-research and the basis for designing the questionnaire. The quantitative research was crucial in examining the issue. The research was conducted in the period from November 2021 until January 2022.

We analysed collected data in MS Excel, extended with the package of analytical tools (arithmetic average, modus, median, minimal value, maximal value, standard deviation, and the like). We also used a manual processing in which the bar code method was applied in some types of questions. For data analysis, we applied a one-dimensional descriptive statistics in the form of frequency tables and expressed respondents' opinions in percentage. Results of statistical processing are presented in tables and the findings are verbally interpreted.

3 Research Results

Our aim in the empirical research is to identify the knowledge, opinions and attitudes of line managers to environmental phenomena. We focus on their knowledge of the environment and behaviour towards the environment. In the light of the aim formulated in this way, we also formulate research questions on the basis of which we detected respondents' opinions. Specific results are presented in tables are interpreted in verbal descriptions.

Table 1

Education in Environmental Studies

	Formal education				Further professional education for environment			
	Mandatory		Special interest		Organised		Self-access	
	No.	%	No.	%	No.	%	No	%
Section A	83	92.2	29	32.2	3	3.3	15	16.7
Section C	9	6	0	0	2	1.3	8	5.3

Note. Results of empirical research (respondent opinions).

Table 1 shows that a large part of Section A line managers also attended courses in ecology and environmental protection during their formal education. Many of them were involved in the environmental protection in special interest (hobby) educational activities organized by educational institutions. As for the 90 respondents of Section A, we can state that line managers took parallel mandatory as well as special interest courses in environmental education during

the preparation for their profession. However, the situation is worse in the case of Section C managers despite the fact that we selected the divisions as manufacturing of food products and manufacturing of beverages. Only 9 managers out of 150 in this section replied they had also taken courses focused on environmental protection within formal education. These managers did not participate in special interest or hobby education in the given area. Managers participated in organised educational activities connected with environmental law and policy. Their self-access study contained the legislation that managers have to observe in their professions.

Table 2

Awareness of Negative Impacts of Human Activities on the Environment and Proposals for Changes

	Awareness of negative impacts of work activities		Awareness of the impact of own lifestyle		Proposal for changes					
					Less harmful manufacturing to environment		Mitigating the impact of manufacturing on nature		Development of environmental education in organisation	
	Abs. No	%	Abs. No	%	Abs. No	%	Abs. No	%	Abs. No.	%
Section A	90	100	78	86.7	90	100	35	38.9	53	58.9
Section C	150	100	139	92.7	150	100	41	27.3	82	54.7

Note. Own research results (respondent opinions).

As we can see from Table 2, line managers are aware of the negative impact of work activities on the environment. They are also aware of the negative impacts of their lifestyle on the environment. Whether they realize it or not, they need their current standard that has been achieved through material goods. Since they replied they were not willing to change their current values in their lifestyle, we did not even indicate that in the table. In their replies to questions about the need for an environment friendly way of life, they focused more on the work environment. All the respondents agreed that the issue needed to be addressed. The specific respondents' proposals mainly concerned the application of more environmentally friendly technologies and the utilisation of alternative energy sources. The respondents who did not comment on specific proposals were aware of the investment intensity, which would

currently significantly increase costs as a result of the low return on investment. The development of environmental education is supported by an absolute majority of respondents in both sections. Despite providing environmental education in their enterprises, many managers believe that their employees would not be willing to give up the achievements of the present; these problems mainly relate to the consumerist and materialistic way of life, automobile-dependent lifestyle, waste management, etc. According to line managers, current employees assume a superior attitude to the environment, as if they were its owners or even predators. Our way of thinking in this area must be changed in the future, because the people's present-day behaviour towards nature leads to self-destruction. It is for this reason that managers intend to deal with environmental education of their employees.

Table 3
Ideas of Line Managers of Employee Environmental Education

	Further professional environmental employee education in organisations							
	Improvement of technique and technology of manufacturing		Proposals for product change		Utilisation of alternative sources of raw materials		Change in employee personality traits and lifestyles	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%
Section A	41	45.6	0	0	47	52.2	53	58.9
Section C	56	37.3	39	26	69	46	82	54.7

Note. Results of empirical research (respondent opinions).

All the respondents who support the idea of environmental education – either those from section A or C – see the path to change through changes in the personality traits of employees and in introducing other lifestyle options. A certain part of the respondents believe the change may be achieved by adjustments to manufacturing technology or manufacturing processes. They consider it is necessary to provide a team learning training, when the employees themselves in their teams would be able to come up with concrete proposals for improvement. Respondents view the possibilities of proposing product changes only in section C, namely in the textiles and clothing and wearing apparel divisions. Only 2 respondents out of 39 were from the beverage production division. They are positive about the use of alternative sources; however, they are aware that this is also associated with additional investment. Given the need for pro-environmental behaviour, respondents consider that essential and important and are ready to

create discussion circles or project teams to look for ways of applying alternative sources of raw materials in the specific conditions of their organizations.

Line managers who participated in our research are aware of the need for addressing sustainable development issues via the identification and description of the most attractive environmental issues. Owing to their knowledge of the functioning of ecosystems and global environmental problems, they are aware of the need for protecting the environment and eliminating all negative impacts on nature. From the overall analysis of respondents' statements, we can consider that the line managers' declared positive attitude towards the environment as a pragmatic one. Line managers are able to identify the desirable attitude as part of their awareness, but their real proposals for changes to be made in their enterprises are largely general, and their feasibility is currently questionable.

4 Discussion and Conclusion

The environmental threats currently facing society are also reflected in the activities aimed at adopting policies and programmes that promote the application of the principles of sustainable development in all spheres of life. These activities are also required of business entities and managers in order to make effective management decisions on sustainable development. Likewise, the population of all age groups is expected to develop environmental awareness. What it takes is to change their lifestyle from consumerist, comfortable, fast, and artificial to one that is active, friendly and pro-environmental. Man's attitude to nature must focus on harmony and respect, which necessitates the development of lifelong learning educational activities. Their outcome is going to be an individual with a broad base of basic disciplines, for example, chemistry, ecology, geography, materials science, microbiology, atmospheric sciences, and environmental sciences. The ecological part is based on the pillar disciplines of zoology and botany, as well as the chemical composition of soil, atmosphere, surface water and groundwater with emphasis on soil contamination, air pollution and climate change, profiling the sustainable development of the region, biodiversity, and animal and plant interactions with the environment. (Conticini et al., 2020) The contemporary professional and scientific concept based on the original research in hydro-ecosystems and agri-ecosystems assumes a more precise scope with the profile to permanently sustainable development of the region, biodiversity, relationships between animals and plants to the environment. It also includes the application of modern information technologies, with the transfer of scientific knowledge and technologies gained through research and development into practice.

Our intention is that environmental education be provided at all types and levels of study in

formal education, ranging from primary, secondary to tertiary education. Based on the previous experience in formal education and practical requirements, it is generally accepted that future study programmes have to more deeply reflect the complexity of environmental issues. Even in the fields of study that do not prepare graduates to optimise and improve existing technological production systems to cope with new environmental challenges or to deal with the impact of environmental pollution, it is necessary to provide multidisciplinary and ethically oriented education while maintaining all the principles of sustainable development with the ability to work in multidisciplinary teams. A new space for educational activities related to environmental protection is also opening up for adult education institutions. We recommend the following topics for educational project proposals of the economically active population that has been in practice for a long time: Minimisation of energy and material sources in a closed circle. Reducing the environmental burden and optimisation of alternative approaches in product and process innovation. Eco-toxicology and environmental resources. Economy of resource utilisation. Environmental analytical systems and ecological efficiency. Ecological design for the waste reduction and waste recycling. Energy and environmental wastes. Environmental and security management. Environmental policy. Innovations and permanently sustainable development. "Green" innovations and technologies. Bioethics.

Recently, there has been an increasing need for understanding bioethics in a broader sense than in medical ethics. Thus, a traditional biomedical core of bio-ethics is recently being more and more associated also with the issues related to genetically modified organisms (GMO), their effect on human health and the impact on the environment in general, as well as with the issues connected with genetic testing and its potential abuse. Merging environmental and medical ethics is necessitated by the very nature of problems – human health is also influenced by environmental pollution. The relationship between medical ethics and environmental ethics is more complex than merely a mechanical merging of the two bio-ethical domains.

The acquisition of ecological literacy and environmental awareness by the public at large regardless the area of working activities is the task to be fulfilled by the entire mankind. This task should become the future challenge for all educational institutions in order to promote lifelong education in theoretical knowledge and practical skills in environmental management as the system of managing society, with deliberate focus on the protection and creation of the living environment pertaining to permanently sustainable development on global, regional, and levels.

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Behavioural Approach to Business Green Economy

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Abstract

In this paper, we examine the impact of behaviour with respect to the green economy, including within society. The main goal of the paper is to define the behavioural factors of employee behaviour, as well as taxpayers in the Slovak Republic within the global approach in the European Union. The first part of the paper is devoted to the analysis of theoretical background. It defines the basic terminology in the field of environmental policy. Describes the behavioural factors of tax behaviour in a global environment. The next part is devoted to the importance and behavioural approach to paying taxes based on the econometric model and indicators, respectively. environmental indicators. Innovations in companies need to be set up correctly and the chosen tools constantly evaluated with regard to the environment. Promoting innovation is particularly important for a successful transition to green growth. The international dimension of green growth is important for issues such as climate change mitigation. The second part deals with the research of taxpayers' attitudes to pay taxes and the impact of trust in the legal system on tax behaviour. It describes other aspects of the behaviour of taxpayers' willingness to pay taxes, which are a means of financing and innovation in companies. The result of the contribution and its significance is to find out the attitude of taxpayers to paying or not paying taxes and to point out that a higher level of tax liability exists if there is the right approach in companies within the framework of environmental policy.

Keywords: *behavioural factors, tax evasion, green economy*

1 Introduction

If we look at it simply, we consider politics to be collective decisions. We decide as a company. Governments are facing important decisions. They have a choice. They will either maintain their policy or propose the institutions needed to make the necessary change. Today, countries deal mainly with environmental responsibility and environmentally responsible behaviour in the pursuit of a higher quality of life and a healthier environment. We can consider sustainable development as a central principle of national environmental and economic policy. Environmental policy refers to government measures that affect or seek to affect the quality of the environment or the use of natural resources. Imagine the collective decisions of society on the enforcement of certain environmental goals and how to use a specific decision to achieve

them. There are various sets of laws and regulations that affect people's attitudes and behaviour and are responsible for implementing and enforcing the law. Environmental policy includes what governments choose to do to protect the environment and natural resources (Kraft, 2011). Environmental policy is therefore a policy aimed at achieving a goal through a set of measures that are designed to meet the goals usually defined by national governments (Park, 2013). These may include, for example, maintaining good air quality or water supplies. Some environmental policy mechanisms (Pinglin et al.,2020):

Moral beliefs: they seek to change the preferred functions of consumers and producers to take account of environmental impacts in private decisions. Many studies show that high social norms have stronger effect on tax compliance than deference strategies (Braithwaite, 2009); (Hofmann, et.al, 2008).

Legal regulation: involves the use of mechanisms such as laws, licenses, directives, permits and the like. Their task is to discourage pollution beyond pre-defined acceptable limits. For example, permit systems - under which companies can produce or locate only if they use approved production or purification. We are also talking about emission norms or standards. They specify permitted pollutants for fuels or equipment. This allows individual decision-makers to decide on the type of technology adopted.

Economic support: their aim is to remedy shortcomings in the allocation mechanism of the private market system. These could be, for example, subsidies by which the government contributes to the cost of capital investment in environmental pollution in order to relieve them of the financial costs of individual or municipal emission reduction activities (includes direct subsidies, guaranteed loans, rapid write-offs, tax breaks or tax breaks). from real estate to new pollutants by investing in emissions control). We can also include here direct charges in the form of emission charges, collected in proportion to the level of pollution measured in relation to the social costs of pollutants. We also talk about fuel taxes, which are levied on inputs into polluting processes and are therefore easier to measure.

Many national policies (environmental and other) have potential international implications. For example, some environmental policies may undermine comparative economic benefits, thereby affecting foreign trade flows and prospects, policy pricing, sectoral structure, resource allocation and industry location.

Behavioural economics emerged as a new scientific discipline after its publication in the journal Science in 1974, where there was an article by D. Kahneman and A. Tversky, after which it was introduced and made known to the broadest scientific community. And despite all the facts and factors and its official recognition of the Nobel Prize for Daniel Kahneman, behavioural

economics is considered a "minority genre" in economic theory (Baláž,2009).

Behavioural economics enhances the power of economics by also providing a psychological foundation. At the heart of behavioural economics is the belief that psychological knowledge can improve the field of economics that generates theoretical knowledge, thus improving the prediction of phenomena and using them to predict and propose better policies. However, it does not completely reject the neoclassical approach to the economy of maximizing utility and thus of assuming that rational individuals are only trying to maximize their utility. A neoclassical approach is useful. It provides economists with a theoretical framework that they can apply to almost any form of economic behaviour and make predictions (Loewenstein, 2004).

As economist Francis Edgeworth wrote in his 1881 book Mathematical Psychics: "The first principle of economics is that everyone is driven solely by self-interest." Centuries later, prospect theory improved these assumptions by showing that our behaviour is more complex, but sometimes we do less perfect work. The consequence of those rational assumptions is that we do not allow emotions to interfere in the decision-making process, which is not very realistic. It is clear that, for example, if we are affected by emotions such as fear or greed, then we are unlikely to make rational decisions (Orell,2021).

The field of behavioural economics, as we already know, combines ideas from psychology and economics and can provide valuable insight that individuals are not behaving in their best interests. It provides a framework for understanding when and how people make mistakes. Systematic errors or biases recur predictably in certain circumstances. We can use the lessons that behavioural economics shows us to create an environment that directs people to make smarter decisions, to live healthier lives, and to be more interested in the environment.

It is assumed that a rational person will correctly weigh the costs and benefits and calculate the best options for himself. A rational person is expected to know his preferences, whether current or future, and will never pass between two conflicting desires. And he can suppress impulses that may prevent him from achieving his long-term goals. Traditional economics use these assumptions to predict real human behaviour. The standard political advice based on this way of thinking is to give people as many opportunities as possible and let them choose the one they like best (with minimal government intervention). Because they know their preferences better than the government. Individuals are in the best position to know what is best for them. In contrast, behavioural economics shows that real human beings do not do so. People have limited cognitive abilities and great problems with self-control. They tend to choose the option that has the most immediate appeal at the cost of long-term happiness, such as the use of harmful

substances and the like. We have noticed that it will come as no surprise that we are inconsistent and misguided human beings (Heshmat,2017).

Climate change is one of the problems that behavioural economics can help address. Especially since the use of conventional techniques, such as logic, does not seem to work. For example, the current bias means that people are more likely to see global warming as a problem if we ask them on a warm day. On the contrary, the search for information that supports our views means that the climate debate is becoming increasingly acute. Instruments such as carbon taxes can be seen as a way to force people to reduce their carbon footprint. However, even these pushes run into resistance. One survey from 2019 found that Canadians are deeply concerned about climate change and are willing to make adjustments in their lives to combat it, yet paying extra money on taxes is unthinkable for many people. For change from economists, it is good to start with the economy itself, which has probably done more to prevent than help climate change by prioritizing economic growth above all, even when it comes to market failures such as pollution (Orell,2021). This paper will present an overview of current research on social norms and tax compliance, bringing together results from a variety of research traditions (Bobek et al., 2007). *The main aim of the conducted research of the paper is to identify respondents' attitudes towards tax compliance to define determinants of tax compliance behaviour.*

2 Method

2.1 Indicators

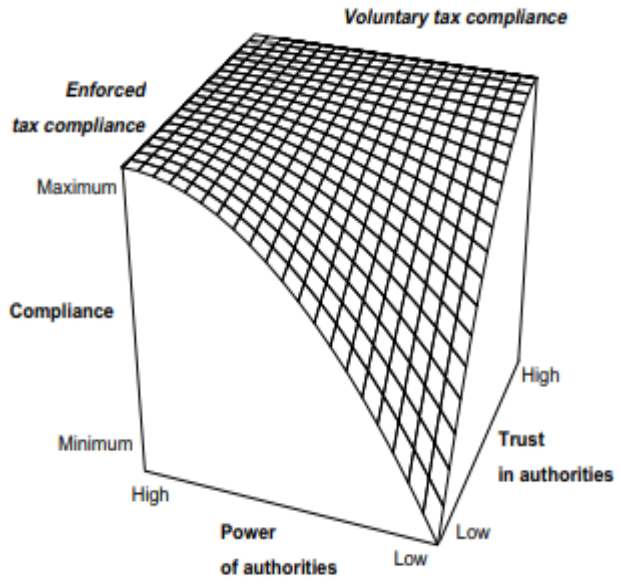
Indicators are measurable quantities, providing information on the development and trends of phenomena and processes, in quantitative and qualitative terms. This section is devoted to environmental indicators, or. environmental-related indicators as an important tool in the process of assessing the state and development of the environment towards the effectiveness of meeting the set environmental objectives, as well as sustainable development. They play an important role in planning, setting policy objectives, including monitoring their implementation, and developing follow-up measures and tools to achieve them in various policy and strategic documents. They are also a comprehensive source of information on the state and development of the environment and related aspects for the general public. They also provide an important basis for the subsequent elaboration of the relevant types of reports. The Slovak Environment Agency processes and regularly evaluates various sets of indicators, namely:

key indicators, sector indicators, sustainable development indicators, green growth indicators and resource efficiency indicators.

2.2 Procedure

Braithwaite (2009) considers deterrence tax politics to be device, since it may incite taxpayer aversion to oppression. Social norms are presented as patterns of behaviour that represent certain behaviour of members of the same social group and these are reflected in tax laws and tax morale (Frey and Torgler, 2007). Many studies show that high social norms have stronger effect on tax compliance than deference strategies (Braithwaite, 2009); (Hofmann, et.al, 2008). In countries like Estonia, Switzerland or Poland the electronic platform has been created to administrated tax return more efficiently (OECD, 2010). Braithwaite (2009) points out the importance of mutual trust and cooperation between taxpayers and tax authorities. Theory based on interactions between tax administrators and taxpayers that determines the trust of taxpayers towards tax regulations is model created by Kirchler, Hoelzl and Wahl (2008), known as the slippery slope. They pointed out the dependence between the degree of trust in the authority, the power of authority and forced or voluntary compliance towards tax regulations through the graphical three-dimensional model (see Figure 1). Their framework points out the close connections between these dimensions. The slippery slope model declares assumption that voluntary compliance with tax rules depends on trust in authority, in what case taxpayers are willing to pay taxes honestly and spontaneously. On the other hand, where there is a low level of trust in the authority, it is necessary to enforce tax compliance through the power of authorities. The good example of trust in authorities and consequent compliance to contribute their share is present in Switzerland (Feld & Frey, 2005).

Figure1
The Slippery Slope Model



Source: Kirchler, Hoelzl and Wahl (2008)

The empirical part of the paper is devoted to research of tax compliance behaviour among citizens of Slovak Republic, defining the objectives by methods of research, the description of conducted survey and subsequent evaluations based on the theory of taxpayer's compliance behaviour, the dependence between the degree of trust in tax authority and the attitudes of taxpayers to the paying taxes, the determination of selected factors influencing compliance behaviour and overall description of taxpayers attitudes towards tax compliance and tax evasion.

Table 1

Descriptive statistics of participants

	Number	Percentage
Age		
20 – 29	51	41,5%
30 – 39	29	23,6%
40 – 60	34	27,6%
60+	9	7,3%
Gender		
Man	46	37,4%
Woman	77	62,6%
Social status		
Student	26	21,1%
Full-time employed	62	50,4%
Part-time employed	3	2,4%
Self-employed	21	17,1%
Retired	4	3,3%
Other (maternity leave…)	7	5,7%
Education		
Secondary education	35	28,5%
Bachelor degree or equivalent	26	21,1%
Master degree or equivalent	55	44,7%
Higher level of education	7	5,7%

Source: own processing, dissertation Tomečková.

The Table 1 provides and overview of age, gender, social status and level of education together with percentage portion of the total amount of all participants. In the survey the answers of 123 respondents were collected. The Table 1 provides and overview of age, gender, social status and level of education together with percentage portion of the total amount of all participants. *The data from questionnaire was processed using mathematical and statistical methods. For better clarity, the results are expressed using tables and figures. For research purposes, there are several research methods*. The questionnaire method was considered as the most favourable alternative. The advantage of using this method is the anonymity of the respondents since the sensitivity of the questions in the questionnaire.

3 Results

Behavioural Aspect of Indicators: As a part of this section the research questions have been set together with expected hypotheses. Question 1: What factors affects mostly the tax compliance

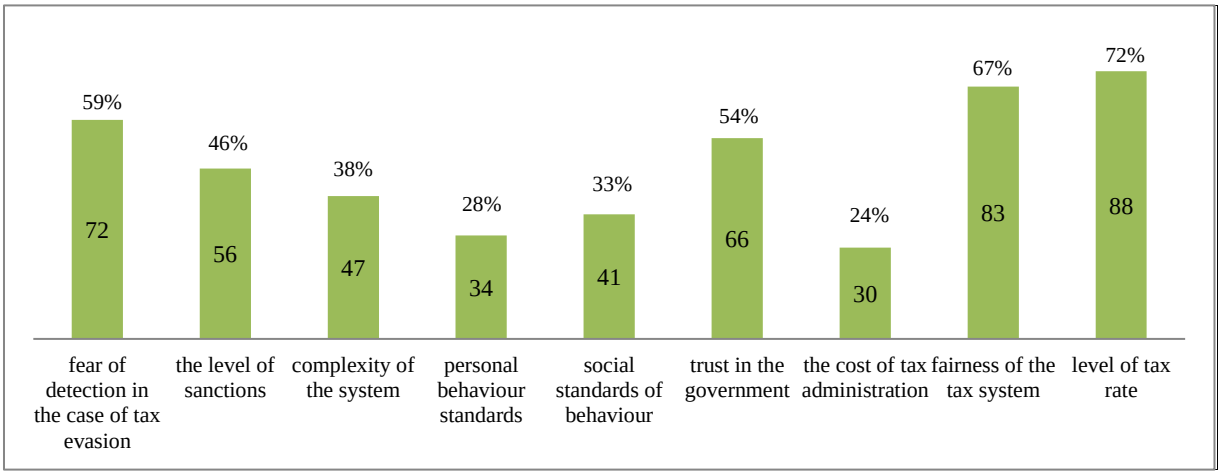
of taxpayers in Slovak Republic?

Question 1: ***Factors of tax compliance behaviours.***

The last questions were devoted to other factors that affect tax compliance behaviour. The results are expressed in the Figure 2. Most of the respondents found level of tax rates, fairness of the tax system and fear of detection as the most influencing.

Figure 2

Question: Which of these factors, in your opinion, affects the willingness/unwillingness to pay taxes?

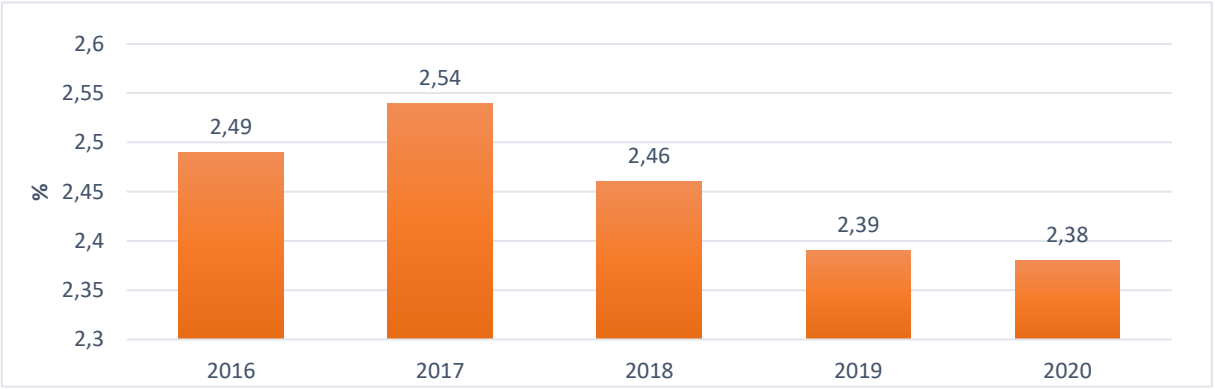


Source: own processing.

Simular studies which confirmed that analysis matters for asset pricing too (Sedliačiková et al., 2015).

Figure 3

Share of environmental taxes in GDP for 2016 - 2020



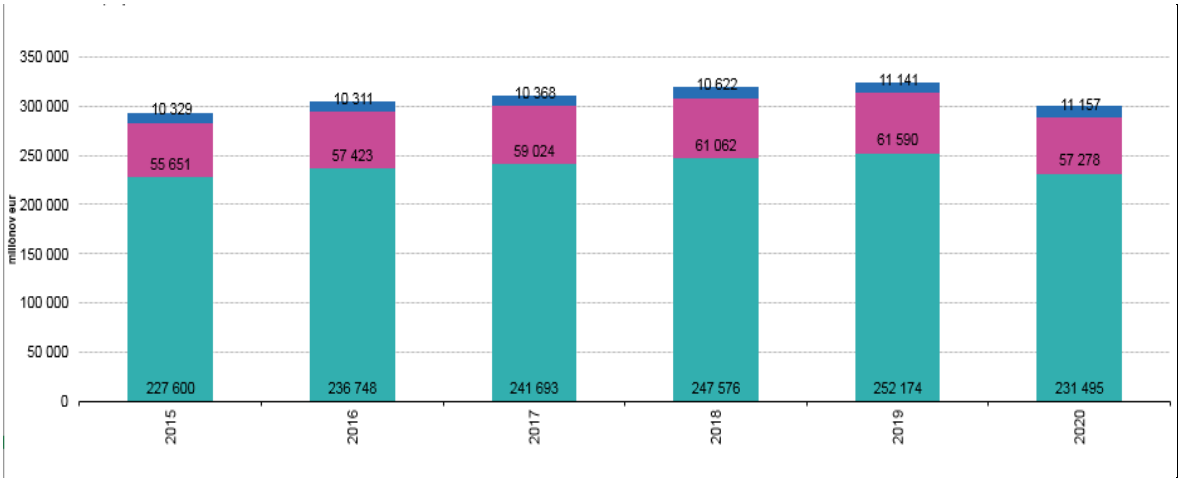
Source: own processing**,** Taxes with an environmental aspect [online]. https://www.enviroportal.sk/indicator/detail?id=361

The European Union has environmental taxes as one of its environmental policy instruments. As already mentioned, we divide them into four different categories, namely taxes on energy, transport and resource pollution. The following chart looks at the European Union's revenue

from environmental taxes and how it has changed over six years.

Figure 4

Revenues from environmental taxes by category in the EU for the years 2015 – 2020



Source: own processing**,** Taxes with an environmental aspect [online].

We can see from the graph that energy taxes have the largest share in environmental taxes. They have the largest share in each year from 2015 to 2020. In second place, they have the second largest share in total taxes with the environmental aspect of transport taxes over the whole six years. And they contribute the least to the revenues of environmental taxes, pollution taxes and resources. We believe that it is precisely the behavioural influence, the influence of company management, that environmental taxes should increase to a greater extent. On basis of the determined scientific objective, we decided to use quantitative methods in the empirical part of the research (Minárová et al., 2015).

4 Discussion

The aim of the paper is to analyzed the impact of the green economy in the company. We analyzed Slovnaft due to the behavioural influence of the residents and employees of the company itself. In the analyzed company Slovnaft with we may have noticed that they are working to improve environmental policy. Thanks to the pressure of legislation and residents of the nearby building where they conduct their business. The environmental policy of the given company Slovnaft, joint-stock company has in its portfolio business activities that we can consider as not very beneficial for the environment. Such as the production of motor fuels, which in turn pollute the environment. Society, however, recognizes the principle of sustainable development and seeks to mitigate its impact on pollution. They also do not forget to support, for example, education or culture. They also largely support environmental protection.

Slovnaft, a. with. is close to residential areas in Slovakia, making them even more sensitive.

The company is part of a member state of the European Union. The issue of environmental quality is becoming increasingly important and a priority for the European Union. Legislative requirements are stricter. Considerable care of the environment is required. On the one hand, there is pressure from legislation and, on the other hand, pressure from residents of nearby residential areas close to society. The company decided to integrate the principles of "Environmental, Social and Management". At the meetings of the team, which was established on the basis of these principles, they identify the possibilities of reducing waste from the business activities of their company and strive to reduce the impact on the environment.

The company also set the main strategic goals of the company. We are talking about the years 2016 to 2020 in the mentioned area of sustainable development, climate change and the environment. The set strategic goals are, for example:

Reducing direct and indirect greenhouse gas emissions through energy efficiency programs;

Reduction of air emissions by 5%;

Identify projects with respect to the environment outside legal requirements;

Reducing the risk of soil and groundwater pollution;

The company also does not forget to inform the population about the quantities of pollutants discharged from business activities. In the annual report issued by Slovnaft, a. with. it shall annually supplement the component on its environmental impact assessment.

1. Waste management

For the company, the main prevention is the generation of waste in their waste management. "Slovnaft strives to minimize the generation of waste as much as possible and to constantly increase the rate of its recovery. For example, the recycling rate of waste catalysts is 99%. Employees also participate in the separate collection introduced by Slovnaft". To give you an idea, we can say that every year several tons of plastics, paper, etc. are concentrated. The separate collection will be resold to an external organization. The external organization takes care of the waste management. The company Slovnaft. In 2020, it also fulfilled the obligation to collect, recycle and recover packaging and non-packaging products placed on the market in the Slovak Republic, in accordance with the objectives and applicable waste management limits for packaging and non-packaging products.

In the area of waste management, the company disposes of all oil sludges generated from operational activities and maintenance by incineration or co-incineration with external suppliers, as the energy content of these sludges is predestined for the given processing.

The total amount of waste fell by a quarter in 2020. In the refinery itself, waste generation has halved, which can be attributed to completed investment projects.

2. Air protection

The air and its quality is monitored around the company. We can talk about 3 monitoring stations. In the given localities, frequent transport and the nearby municipal waste incinerator also contribute to the air quality. The company seeks to reduce emissions from its air pollution sources by investing in technologies that contribute to less environmental impact. We can mention, for example, the replacement of burners in process furnaces with low-emission burners, more efficient and new equipment for liquefaction of hydrocarbon vapours.

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The impact of environmental pressures on the sustainable development of regions in SR

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Abstract

Currently, there is a large number of polluted sites in the Slovak Republic, which are unused and continue to contaminate their surroundings. Such areas are referred to as 'environmental burdens'. Many of these burdens can be transformed into objects and sites after initial larger investments, with significant benefits and the use of sustainable development of the regions. Some of them even have the potential to be a source of future profits that will ensure a high return on the cost of revitalising them with significant support for sustainable development. This article refers to the actual state of occurrence of environmental burdens and in close interaction describes the model of categorisation of the use of these sites for the promotion of sustainable development on the basis of explicit quantification of interaction relationships based on the calculation of the weights αi of the occurrence of environmental loads in the Slovak Republic. In conclusion, the article presents a categorisation of environmental burdens in the processes of sustainable development based on explicit quantifications of interaction relationships of negative and positive determinants.

***Keywords**: Sustainable environment, Slovakia, European union*

1 Introduction

In industrialised areas, hazardous substances that directly or secondarily contaminated water, soils and subsoil rocks were commonly handled in industrial production. Production and industrial sites were commonly located in sites with a high sensitivity of local natural conditions to foreign and dangerous substances handled or even the result of the production process. Many of these substances have not been considered harmful in the past, but scientific research in recent years has proven their toxic, carcinogenic, mutagenic, or teratogen-related effects. The use of many of these substances and health-threatening substances is currently prohibited, but in the environment, which in the past, thanks to ongoing industrial production and other anthropological activities, has reached, persists, contaminates its constituents and poses a major

threat not only to environmental quality, but also to the health of the local population as well as the populations of adjacent areas.

These contaminated sites are currently referred to as environmental burdens, which can in principle be understood as pollution, i.e. contamination of a particular territory caused by anthropogenic activity that poses a serious risk to the health of the population or the environment in the context of both the current and future use of the site.

1.1 Literature review

Environmental burdens can generally be understood as an anthropogenic input into the environment which has historical origins with consequences persisting to this day in the form of a significant source of contamination of groundwater and surface water, rock environments and soils, which may endanger environmental health and the stability of ecosystems by different exposure routes [1] and not considered as an environmental burden [2]:

- odour, radioactivity,
- decline, landslides,
- waste water outlets,
- solids of waste, unless it is a source of contamination itself.

The environmental burden is, within the meaning of Act No 569/2007 on geological works [3], 'contamination of the territory caused by human activities which poses a serious risk to human health or to the rock environment, groundwater and soil, with the exception of environmental damage'. The following two terms are further defined in that law:

- **Probable environmental load** — a potentially contaminated site considered as a load only on the basis of indications, i.e. taking into account the state of the area where the presence of the environmental burden is reasonably assumed, while the individual indications of the likely EAW include [4]:

  - on the records of state or self-government bodies on pollution of the components of the RU or on inappropriate management of the environment,
  - older archive information on pollution,
  - data from selected environmental databases,
  - manifestations of damage to the landscape — e.g. dead organisms, changes in vegetation, odours, presence of foreign substances, etc.

- **Environmental load —** survey-confirmed load.

The environmental burden, even with its consequences, represents a modern form of risk to both environmental quality and human health, i.e. they create environmental risk aspects for individuals, communities, businesses, as well as for the whole anthropogenic society [5], in which their social nature is becoming increasingly profound, so social risks can also be considered [6]. As the environmental burden is a source of risks, it requires systematic assessment and management, which is currently implemented by a risk analysis method consisting of the two parts set out below [7]:

• **Health risk assessment**- determines the qualitative or quantitative level of human health hazards to a given risk factor, considering also potential adverse effects on human populations.

• **Environmental risk assessment**- determines the likelihood of adverse environmental effects occurring due to stressor activity.

In the light of the foregoing, it can be concluded that the elimination of environmental burdens promotes the sustainable development of regions, which, under Section 6 of Act No 17/1992 Coll. on the Environment [8], can be defined as 'development which preserves the possibility for present and future generations to meet their basic life needs while not reducing the diversity of nature and preserving the natural functions of ecosystems'. that eniro-non-monetary burdens are an integral part of the environment of individual regions, whose presence negatively affects the environmental quality, health of the population or economic activity [9], it is necessary to eliminate their real occurrence and to focus on the environmental burdens themselves in interaction with their re-use [10]. In view of the above, we consider that sustainable regional development with implemented systemic use of environmental burdens can be characterised as a strategic, comprehensive and synergistic process determining the socio-economic, environmental and institutional aspects of regional development itself, profiling the functional model of anthropogenic society, which eliminates interventions that threaten, damage or devastate living conditions, adequately exploit natural resources and protect cultural and natural heritage[11].

We can date more serious interest in solving environmental burdens in Slovakia to the 1990s and to the beginning of the 21st century. As we have already mentioned, in the years 2006-2008 there was a full-public systematic identification of environmental burdens, when 1 819 affected sites were identified. Of these, about 1,200 posed some risks to human health and the environment, of which about 100 sites were high risk sites. The occurrence of such a number of environmental burdens has been preceded by long decades of uncontrolled and often hidden

releases of hazardous substances to individual environmental compartments. At present, many of these sites are abandoned and therefore have no one to implement corrective measures, as the responsible person no longer exists or is not known (in the past, there was no law prohibiting contamination of the environment, nor any measurements or monitoring that would demonstrate the contamination of the environment and its impact on other parts of the country). In some companies, however, production activities are still ongoing, but owners are not interested in correcting the wrong situation or sufficient funds to remediate. On the other hand, there are also companies that, after privatisation, accepted responsibility for the environmental burden and stood up actively to solve the problem until the end of the remediation. At these sites, all contaminants have either been completely removed or the risk of pollution has been reduced as far as possible and the areas are being monitored today.

On the basis of the available information from the Environmental Burdens Information System, we found that there are currently 2033 environmental burdens on the territory of the Slovak Republic, of which 914 are registered as likely environmental loads, 302 as confirmed environmental loads and 817 as reclaimed environmental load (Table 1.).

Table 1. Environmental burdens

Region	Probability	Confirmed	Reclaimed	Σ	Percentage
BA	84	38	83	205	10.1 %
TN	93	36	99	228	11.2 %
TR	71	37	67	175	8.6 %
NI	119	41	106	266	13.1 %
TA	119	33	85	237	11.7 %
BB	130	44	107	281	13.8 %
PO	207	34	138	379	18.6 %
KE	91	39	132	262	12.9 %
Σ	**914**	**302**	**817**	**2033**	100.0 %

Source: Own processing

From the information available, we found that environmental burdens are likely to account for the number of all registered environmental burdens in the Slovak Republic at present and have increased by 41 sites compared to 2010 and are registered for the RES — Part A on the basis of direct or indirect indications of contamination on the site. Since 2012, when the law came

into force. 409/2011 Coll. on certain measures in the field of environmental burdens and amending certain acts, it is possible to register the site in the RES — Part A also on the basis of the so-called "Communication on the existence of environmental burdens", which forms Annex c). 2 of the law. The share of likely environmental loads in the municipal or industrial waste landfills of which is 479, accounting for more than half, i.e. 52 % of the total number in the register of likely environmental loads [12]. Compared to 2010, when 256 environmental burdens confirmed by the geological survey were registered in the REZ — Part B, their number increased by 46, i.e. to the current 302 environmental loads, but some of them were confirmed only by an indicative geological survey and therefore it is necessary to carry out a detailed survey of environmental burdens, including the preparation of a risk analysis of the contaminated area on the basis of the MFA SR Directive of 28 January 2015. 1/2015-7 for the preparation of the risk analysis of the contaminated site, the final report of the above-mentioned works is the basic basis for the preparation of the remediation project. The sites are registered in the IS EZ, RZ — C. Compared to the year 2010 when 682 recultivated locations were registered, the number of sites increased by 135, i.e. the current 817 locations (Table 2); remediation means those where the source of contamination has been eliminated and the remediated sites are those where new structures and functions of the territory have been created through an appropriate concept of restoration and creation of a new landscape with a view to creating an environmentally balanced and aesthetically impressive landscape and environment [1]. The inclusion of a site in a RES-C does not automatically mean that a given site has been or is an environmental burden, i.e. a contaminated site, but that the site/object has already been carried out or is undergoing remediation or remediation.

There are also sites that are recorded in two parts of the RES at the same time, namely in the REZ — Parts A and C — C, respectively, for REZ-part B and REZ-part C. This situation occurs in the case of sites with environmental burdens where remediation or remediation works have already been carried out or are being carried out. In the event of completion of proven remediation or reclamation, such sites are consequently not considered to be an environmenal load and are further registered only in the REZ-part C.

From a detailed analysis of the occurrence of environmental burdens in individual regions of the Slovak Republic, we could conclude that the largest number is located in the Prešov region up to 379, i.e. 18.6 % of the total number of registered environmental loads in the territory of the Slovak Republic, which also ranks first in the number of likely (207) and remediated (138) environmental loads. The high contamination of the territory of Prešov region can be seen already when compared to the second most burdened region — Banskobystrický, in the territory

of which there are 281, i.e. 13.8 % of the total number of registered environmental burdens on the territory of the Slovak Republic. Banskobystrický kraj is also the second in the case of likely environmental burdens, where it again lags behind the Prešov region by 77 contaminated sites. However, in the number of confirmed loads, the Banskobystrický kraj is the "best" in Slovakia with a recorded number of 44, which is 10 more burdens than in Prešov region, which is surprisingly also due to the total amount of load within its territory, in this statistical indicator in the penultimate place. On the other hand, it should be borne in mind that in the statistics of confirmed burdens, we found the slightest differences between the individual regions, as there are only 11 confirmed environmental loads (Figure 1.) between the first Banská Bystrica region and the last Žilina region. The share of individual regions in the number of environmental burdens.

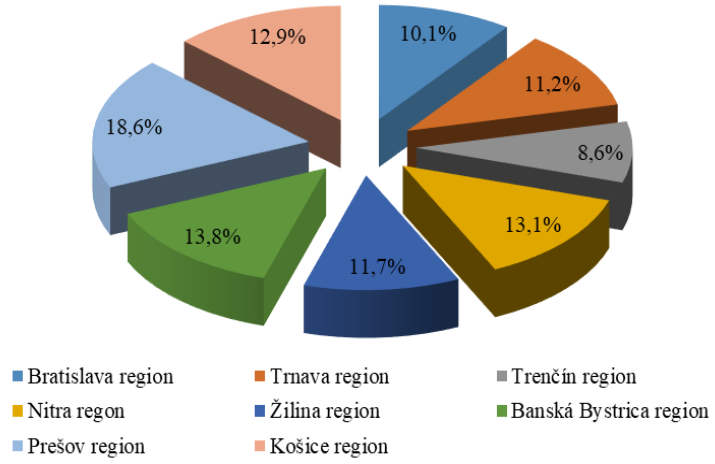

Figure 1. The share of individual regions in the number of environmental burdens.
Source: Processed according to EAW IS, 2021

In the light of the detailed analysis of the occurrence of environmental burdens in Slovakia, we also monitored the evolution of the change index, which statistically expresses the evolution of the state of environmental burdens during the reporting period in interaction with the comparison of the current state with the state in selected years. Based on the quantification of the 2021/2008 change index, we could conclude that this showed an increase in all observed indicators, with the largest increase in remediated environmental loads (1.19 %, i.e. an increase of more than 130 rehabilitated environmental loads), which can be considered a very positive fact. The 2021/2012 Change Index has seen a much smaller increase in the monitored indicators, in addition to likely environmental burdens (0.96 %, i.e. a decrease of almost 40

sites), while the difference between confirmed environmental burdens can be considered negligible, as the change index was only 1.03 %, i.e. by 8 such sites.

The most significant disparity of the monitored indicators was observed in the observation of the 2021/2017 Change Index, with the highest increases in likely environmental burdens (3.03 %) and the most pronounced decrease in confirmed environmental loads (0.33 %, which can be described as a positive trend), with stagnation observed in the area of remediated/rehabilitated environmental loads (1.0 %), possibly pointing to stagnation in the development of exploration and remediation of environmental burdens in the recent period (Table 2.).

Table 2. Index of changes in EAW occurrence in selected years compared to 2021

section/year	2008	2012	2017	2021	index 2021/2008	index 2021/2012	index 2021/2017
A	878	953	302	914	1,04	0,96	3,03
B	257	294	914	302	1,18	1,03	0,33
C	684	713	817	817	1,19	1,15	1,00

Source: Own processing

2 Methods

For the purposes of defining the prioritisation of the determinants of the implementation of environmental burdens in the process of sustainable development of regions, we have created a tabulated overview in two areas — positive determinants and negative determinants of the process of sustainable development of regions. For all determinants, we have determined the numerical value of the αi weights, accepting the generally applicable condition $\Sigma\alpha_i = 1$ [13]. The value of the αi weights was quantified according to the principles and principles of the Saaty matrix, whose dimensions m x n, where m = 1... i and n = 1...j, were given by the number of rows and columns, while respecting the condition m = n. This symmetrical shape of the matrix also corresponded to the fact that the method is based on an interactive comparison of all defined determinants of the same order with the rating in Table 3.

Table 3. Factor evaluation

Value of criterion	Characteristics of the compared criteria
1	criterion i and j are equivalent
3	criterion i is slightly preferred before j
5	criterion i is strongly preferred before j
7	criterion i is very strongly preferred over j
9	criterion i is absolutely preferred over j

Source: Own processing

After the evaluation of individual factors, we created partial conjunctions of the rows in the matrix according to the relation, where f is a number of factors and Sij – individual factors:

$$S_i = \prod_{j=1}^{f} S_{ij} \quad j = 1, 2, 3 \ldots\ldots f \qquad (1)$$

We further quantified the value of Ri for each criterion, i. e. row of created matrix according to formula:

$$R_i = (S_i)^{\frac{1}{f}} \qquad (2)$$

Based on such calculations, we created the sum Ri, in the sense of which we quantified the final value of individual weights αi reflecting the mutual interactions of the compared criteria. We further assigned points from the cardinal rate <1,5> to the individual criteria according to the evaluation below:

1 – meets significantly below average

2 – meets below average

3 – meets average

4 – meets above average

5 – meets significantly above average

Based on the calculations made in this way, we create the amount of R_i, according to which we quantify the final value of the individual αi weights reflecting the interactions of the comparated determinants, including their prioritisation in a system approach to support sustainable development.

3 Results

In the light of clearly defined sustainable development and the above-mentioned facts on environmental burdens, it was possible to define their negative and positive determinants for implementation into a systemic approach to promoting the sustainable development of regions. Due to the need for prioritisation in the process of sustainable development of the regions, we quantified the weights of αi in accordance with the principles and principles of the Saaty matrix and subsequently constructed the final matrix of comprehensive assessment of the use of environmental burdens in sustainable development processes (Table 4). where positive determinants prevailed over negative ones, and in terms of categorisation of the use of environmental burdens in the field of sustainable development and in terms of the proposed categorisation taking into account interaction links, the environmental burden can be considered highly useful, since it is in Category II (Table 5)

Table 4. Final matrix for a comprehensive assessment

Indicator/Interaction	Determinant	Partial score	Score	Scoring ratio
Attenuation of the socio-economic performance of the region due to the occurrence of environmental burdens (D1)	-	12,64	49,01	1,04
Competition of additional land with no environmental burden in close allocation (D2)	-	3,46		
Reducing the aesthetic nature of landscapes due to the occurrence of environmental burdens (D3)	-	1,30		
Threats to environmental health (D4)	-	10,19		
Insufficient return on investment in regeneration of environmental burdens (D5)	-	3,26		
Possibility of likely environmental burdens and associated additional investments for their remediation in the region (D6)	-	5,74		
Occurrence of degraded production sites within the environmental load area (D7)	-	2,56		
Lack of use of environmental sites in the development of the region (D8)	-	2,10		
Reducing the territorial ecological stability system (D9)	-	7,76		
Sustainable use of areas with environmental burden elimination in the region (D1)	+	0,00		
Promoting social development as a result of the removal of environmental burdens (D2)	+	2,33		
Increasing employment in the region as a result of the removal of the environmental burden (D3)	+	3,85		
Promoting economic development as a result of reclamation of environmental burdens and their reuse (D4)	-	4,70		
Improving environmental quality by eliminating environmental burdens (D5)	+	2,72	50,99	
Increasing the purchasing power of the population due to the elimination of environmental burdens (D6)	+	4,92		
Increase in the average wage in the region (D7) due to the elimination of environmental burdens	+	5,15		
Support for small and medium-sized enterprises in the region (D8)	+	3,43		
Improving the competitiveness of the region concerned (D9)	+	9,23		
Growth of tax revenues of affected municipalities in regions (D10)	+	7,28		
Improving environmental health (D11)	+	7,39		

Source: Own processing

Positive determinants prevailed over negative ones, and in terms of categorisation of the use of environmental burdens in the field of sustainable development and in terms of the proposed

categorisation taking into account interaction links, the environmental burden can be considered highly useful, since it is in Category II (Table 5.).

Table 5

Categorisation of environmental burdens

Category of usefulness of the environmental burden in regional development		**Degree of Usefulness**
I. Category	very high utility	Over 1.80
II. Category	high utility	1,79-1,30
III. Category	average utility	1.99-0.80
IV. Category	low utility	0.79-0.30
V. Category	very low utility	0.29 and less

Source: Own processing

In terms ofquantified prioritisation of negative and positive determinants, it was found that the highest priority in preventing the use of environmental burdens, i.e. negative determinants, was represented by the reduction of the socio-economic performance of the region due to the occurrence of environmental burdens (29.26 %) and the threat of environmental damage (24.26 %) and the absence of use of environmental sites in the development of the region (4; 18 %) and the incidence of degraded production sites within the environmental burden area (4.91 %), with the highest priority among the positive determinants of the use of environmental burdens being the use of these sites for the benefit of the region's competitiveness (17.60 %) and the improvement of environmental health (14.30 %) and the lowest sustainable use of areas with the elimination of environmental burdens in the region (3.58 %) and resistance to social development due to the removal of the environmental burden (4.45 %) (Figure2).

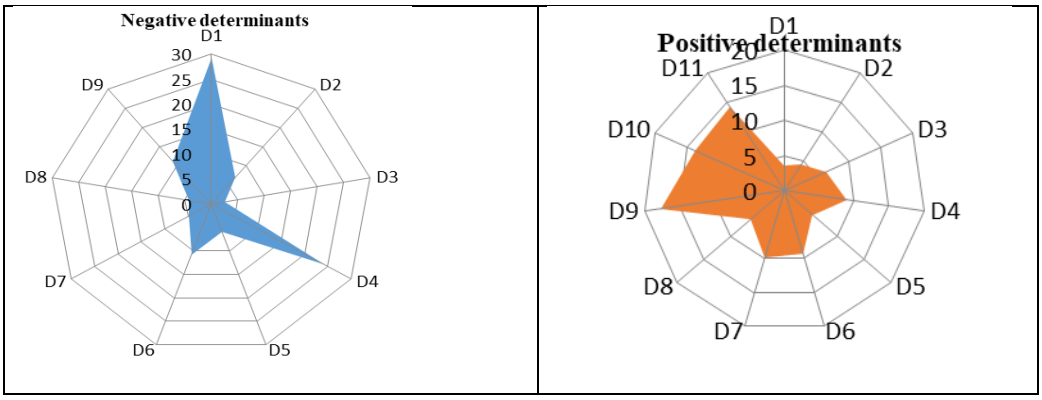

Figure 2. graphical representation of the prioritisation of negative and positive determinants.

Source: Own processing

Conclusion

The elimination and use of environmental burdens in the sustainable development of regions requires a thorough analysis of the polluted area itself, while also taking into account the most efficient way of remediation and remediation, taking into account future land use and available funding. At the same time, in the context of remediation of polluted areas, it is necessary to carefully assess the natural conditions of the site, taking into account the most appropriate purpose of reuse of the land under the conditions of sustainable development of the regions.

Acknowledgement

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The impact of Industry 4.0 on the structure of the workforce in the production and in the logistics

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Abstract

As a result of the introduction of new technologies, it is now possible to observe changes in the labour market. In this paper, we have tried to analyse the impact of introducing new technologies and innovations on the structure of the labour force in the Slovak Republic. Manual work will be gradually automated with the help of robots. Automatic and programmed production equipment will prevail in production areas. Humans will be the ones who will take over the management and control activities over them. The increase in the number of skilled workers with higher education, combined with the increasing productivity of production, demonstrates the impact of Industry 4.0 elements. It can be expected that further innovative changes will also require higher numbers of more skilled workers. At the same time, other labour market opportunities will have to be found for the less-skilled workers.

Keywords*: workforce, production and logistics, Industry 4.0*

1 Introduction

As a result of the introduction of new technologies, it is now also possible to observe changes in the labour market. In this paper, we have tried to analyse the impact of introducing new technologies and innovations on the structure of the workforce in production and logistics in the Slovak Republic. The results of the survey showed us the following facts. Over the past period, there has been an increase in the proportion of persons employed in industry who have attained a second-level university degree. Conversely, a decline can be observed for employees with lower education. Introducing new innovative and technological elements into production reduces the number of low-skilled labour. Over the coming years, this group will be the most vulnerable employees in the most developed countries. However, replacing low-skilled labour with mechanical and robotic elements brings the opposite effect - a higher need for experts and specialists not only in introducing these elements into the production process but also in using them after implementing them.

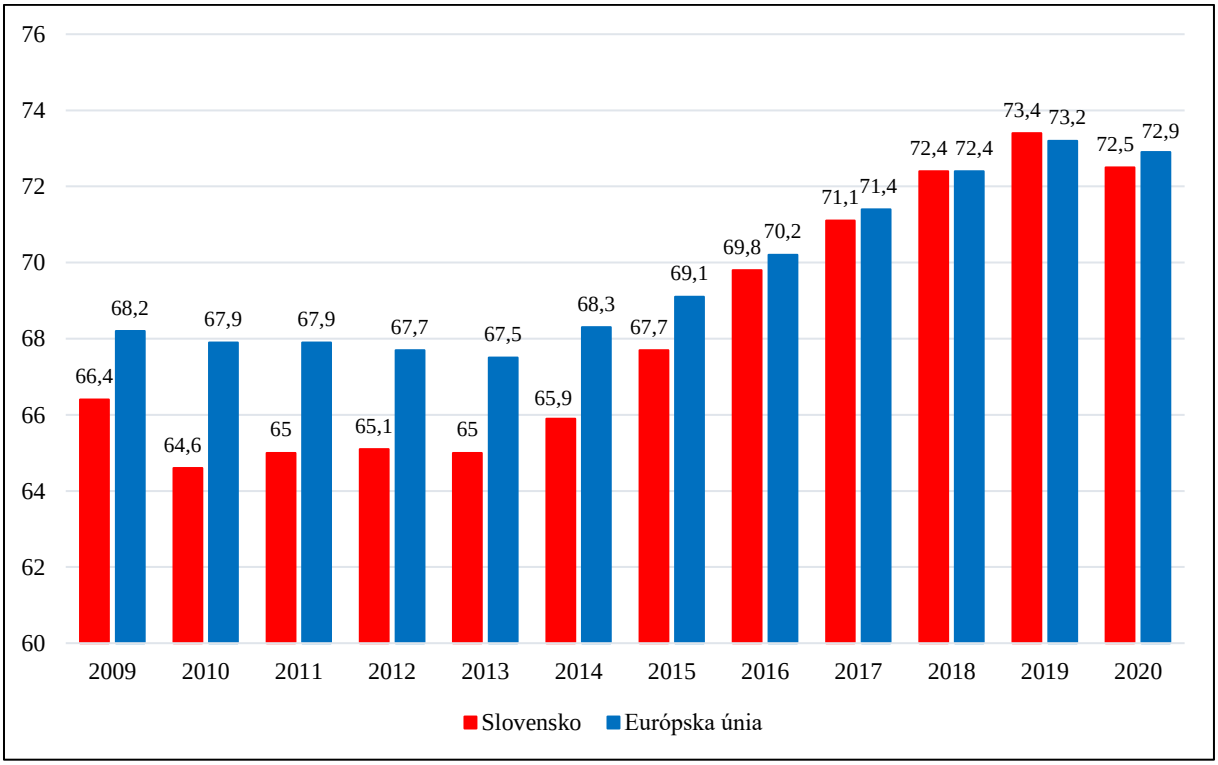
2 Current state of the art on a national and international level

The Slovak economy has been significantly affected by the global pandemic associated with Covid-19 in the recent period. As consumer demand has fallen sharply, many employers have been forced to cut costs, even at the expense of laying off their staff. Since the pandemic's start,

the most significant decline in employment has been registered in April and May. In April 2020, the unemployment rate reached an all-time high. In the following two months, the pace was gradually slowing down. In Slovakia, the number of employed persons has decreased by more than 50 thousand in 2020, which means a 2% year-on-year decline. The most affected sectors were accommodation and food services. The exception was the Trnava region, where even a slight increase in employment was registered during the crisis.

The following chart shows the evolution of employment in Slovakia and the average of the EU Member States between 2009 and 2020 in percentage terms. The chart above shows that Slovakia's employment level caught up with the standard of the EU countries in 2018. Slovakia marked its highest employment level a year later when the employment rate reached 73.4%. This year the largest Slovak employers were Volkswagen Slovakia, a. s., Železnice SR, Slovenská pošta, a. s., Schaeffler Slovensko, s. r. o. and U. S. Steel Košice, s. r. o.

Figure 1
The following chart shows the evolution of employment in Slovakia and the average of the EU Member States between 2009 and 2020 in percentage terms.

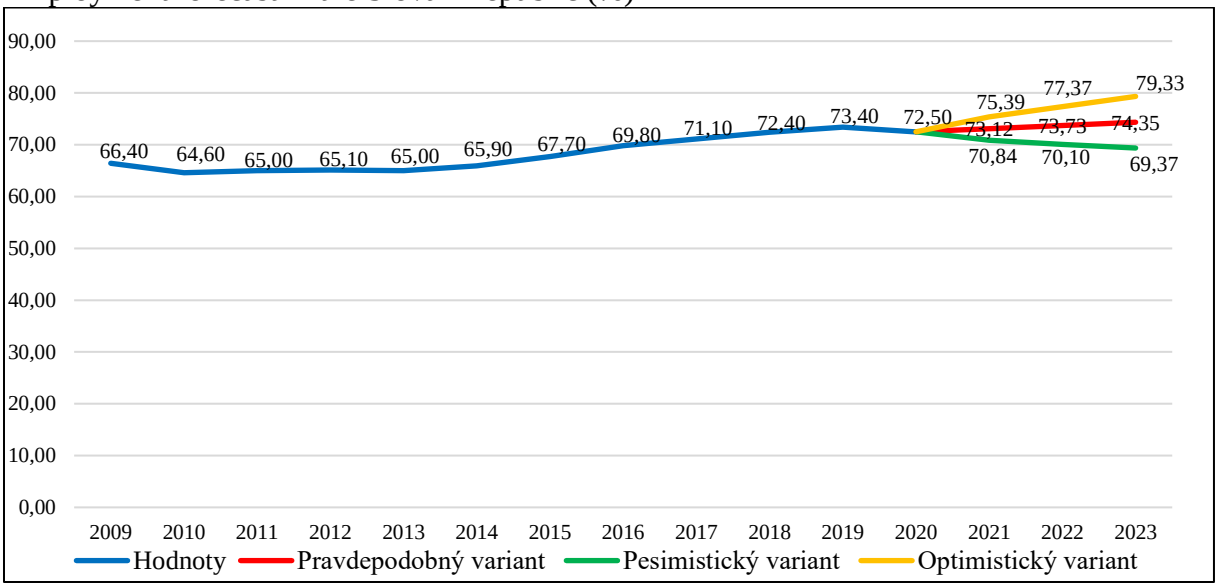


Source: Based on EUROSTAT. Employment: Annual Statistics. [electronic source]. 2020.

An exploratory forecasting approach was applied to selected employment statistics in Slovakia. This method predicts the prospects for developing a given parameter based on the current and past state. The following chart shows three expected employment scenarios in Slovakia. The most expected development scenario is the likely scenario where the employment rate will be

74.35% in 2023. In the case of a more favourable economic development of the country, it would be possible to consider the optimistic scenario, which would have a 4.98% higher value than the plausible scenario. On the contrary, in a persistent pandemic situation and economic crisis, employment in Slovakia would fall to 69.37%, which illustrates the pessimistic scenario.

Figure 2
Employment forecast in the Slovak Republic (%)



Source: Based on EUROSTAT. Employment: Annual Statistics. [electronic source]. 2020.

In recent years, the automotive industry has been the driving force of the Slovak economy. Slovakia ranks among the world leaders in the number of cars produced per 1,000 inhabitants. This is mainly due to the openness of the Slovak economy. Yet the industry has been losing its dominant position over the last ten years. The decline in employment in the previous 20 years has been even more pronounced in the agricultural sector. On the other hand, trade is doing well, with the number of employees almost doubling in the last 20 years. Employment in the labour market is the best in the service sector. Due to rising incomes, consumer behaviour has changed, impacting the labor market's structure from agriculture, industry, and mining to services. Among other things, technological progress and globalization are the factors that will accelerate the transition from an industrial to a service-based economy. These factors also influence the structure of employment. Unskilled or unsuitably skilled labor will gradually be pushed out of the labour market. On the other hand, the demand for highly skilled workers is growing, as well as the proportion of people who decide to study at the university.

3 Research results and discussion

Technological advances, influenced by steam power in the 19th century, electricity in the early 20th century, and automation in the 1970s, transformed industrial production but did not reduce

overall employment. In manufacturing, the number of jobs has decreased, but the demand for new skills has grown. Today, another wave of technological advances is emerging in digital technologies, artificial intelligence, automation, and robotics. It is the fourth wave of the industrial revolution, which is referred to as Industry 4.0. The question is: How has this wave affected industrial development? Also, the other questions are: What will the impact on the workforce structure in companies be like? Which jobs will disappear and which will be created due to the new industrial revolution?

The coming period will bring further changes that will significantly impact production and logistics. The current era heralds several key trends in which new technologies, particularly manufacturing, will play an indispensable role. Logistics can be classified as a "market" industry. There are conditions under which the results of the enterprise's work depend only on the efficiency of its activities: the enterprise does not have state support, is not influenced by the market for raw materials, it is not one of the industries producing essential goods, etc. This is precisely the case for logistics. The work's success depends entirely on the ability to find and keep customers and provide them with the highest quality service. The situation is complicated because many businesses are used to storing and transporting goods. To gain a new customer, it is often first necessary to convince them that it is beneficial for them to delegate these logistics processes to an external company.

The new technological revolution - Industry 4.0 - has permeated everyday business activities, from product manufacturing to customer service. According to research by the World Economic Forum, 75 million jobs will be lost by 2022 due to the Fourth Industrial Revolution. By 2030, robots will replace up to 800 million workers worldwide. However, the same survey also pointed out that 133 million new jobs will be created over the estimated period. Based on these facts, it is possible to observe the changing skill requirements of the workforce. These will mainly require employee creativity, teamwork, critical thinking, and emotional intelligence. In line with the growth of advanced technology, the need for manual labour in production and quality control of outputs with the help of human power is decreasing. Furthermore, higher technological, cognitive, social, and emotional skills will be needed to perform individual work activities. The McKinsey Global Institute also examined these parameters. The following table compares the change in workforce skills due to automation over the two periods under review, in 2016, with a view to 2030.

Table 1
Changes in the required skills of the workforce due to Industry 4.0

Skills compared	2016	2030	Decline / Increase
Physical and manual skills	48%	35%	↓27 %
Core cognitive skills	12 %	10 %	↓17 %
Higher cognitive skills	17 %	21 %	↑24 %
Social and emotional skills	12 %	16 %	↑33 %
Technological skills	12 %	19 %	↑58 %

Source: Processed by ELLINGRUD, Kweilin. Building the vital skills for the future of work in operations. [electronic source]. 2020.

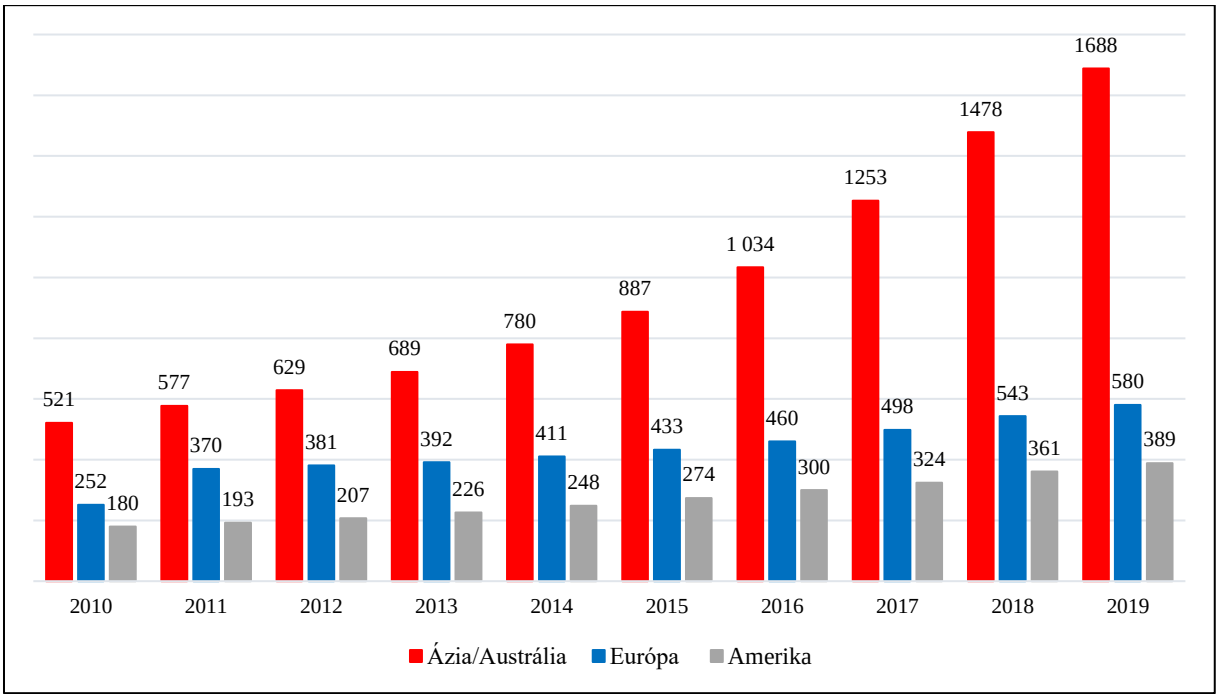
Therefore, it can be assumed that heavy manual work will gradually be automated with the help of robots. The production areas will be dominated by automatic and program production appliances. The people will be the ones who will take the lead and control them. This is a demanding intellectual activity for humans, through which they will look for ways to simplify the control of machines. M. Morháč (2018), Chairman of the Board of Sova Digital, expressed this by saying: "It will be necessary to teach people how to teach machines." Such advances can make employees stressed after the initial euphoria, according to J. Dugacek (2018). There will be pressure on people to master the required quality from continuous learning. It may happen that a modernised enterprise will not have enough qualified employees.

Automation and robotics are new trends affecting the entire business unit, from production systems to employees. Automation is characterised by production, control, and management activities performance by technical devices with minimal workforce intervention. It is important to note that the product type influences production process automation. Flexible automated production systems are more prevalent in the piece and small batch production, while complex automation is more prevalent in large batch and mass production. Complex mechanical production systems include specialised automated means for operative manipulation, so-called robots. Robotization is particularly commonplace in the automotive industry. Robots are mainly used here in the assembly stage of engineering products and electronic appliances. The introduction of automation and robotics in enterprises increases labour productivity and product quality and reduces production costs, labour costs, and occupational injuries. In addition to the advantages mentioned above, introducing automated and robotic technological production systems also brings several weaknesses. These include, in particular, high initial costs, a more extended payback period for the investment, and the need to up-skill the workforce.

According to the latest information from the International Federation of Robots annual report, the number of industrial robots in companies around the world reached an all-time high

in 2019. A record of 2 657 million robots worked in factories, an increase of 12% from the previous year. Asia is the most robust market in the long term. The number of robots installed here in 2019 reached a level of up to 1 688 million, accounting for 63.5% of the world's supply. Europe marked 580,000 robots in the year under review. The highest densities of robots were registered in Germany, Sweden, and Denmark. On the contrary, the lowest number of industrial robots - 389 thousand - was registered in America, of which more than 293 thousand robots were used in US factories. The following chart shows the evolution of the global number of robots from 2010 to 2019.

Figure 3
Evolution of the global number of robots from 2010 to 2019 (in thousands)



Source: Processed according to EC.EUROPA. World Robotics Report 2020 by International Federation of Robots. [electronic source]. 2021.

The Covid-19 pandemic has accelerated the automation and revolution of robotics. It caused a crisis in workplaces that had to respect the physical distancing. These changes have been reflected in the skills requirements of the workforce, from the increase in teleworking to the need for employees to operate new production equipment and respect health and safety requirements. Two types of changes in the structure of the workforce will be unavoidable for businesses in the future:

1. upskilling, through which the workforce acquires new skills to cope with current challenges,

2. retraining, employees must acquire new skills to cope with new tasks.

Retraining of employees will be primarily needed in manufacturing, logistics, retail, and

sectors linked to operations, such as maintenance, claims to process, and warehouses. Companies will need to employ people to carry out tasks designed to develop, manage and maintain automated equipment and digital processes. Machines cannot replace such labour.

Automation, robotization, and digitalization play a key role in today's manufacturing environment. The company will achieve higher production volumes, labour productivity, and better-quality outputs thanks to the modernization of production systems. Ultimately, modern technology will bring businesses greater production efficiency, lower costs, more excellent safety, lower defect rates, and, most importantly, the opportunity to succeed in a challenging competitive environment.

4 Conclusion

This paper aims to analyse the impact of Industry 4.0 on manufacturing and logistics in the Slovak Republic, focusing on changes in the structure of the workforce. Regarding changes in the workforce's required skills, research shows that higher cognitive, social, emotional, and technological skills can be expected to increase in the future. Conversely, physical and manual skills, as well as basic cognitive skills, will see a decline. Manual work will gradually be automated with the help of robots. The production areas will be dominated by automatic and program production appliances. The people will be the ones who will take the lead and control them. The increase in the number of skilled workers with higher education combined with rising manufacturing productivity demonstrates the impact of the elements of Industry 4.0. Further innovative changes can also require high numbers of more skilled workers, while other labour market opportunities will have to be found for the less-skilled workers.

Acknowledgement

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Innovation and entrepreneurship

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Abstract

Nowadays, companies without innovation activity have only a low probability of success in domestic and global markets. More and more, demanding customer requirements, growing competition, advances in technological development and globalization in a constantly changing business environment are becoming driving forces for innovation. However, innovation goes hand in hand with entrepreneurship, as who conveys it are mostly the entrepreneurs. The article presents situation in the area of innovation and entrepreneurship in Europe, with a special attention on Slovakia, and also distribution of enterprises for seven different innovation profiles across the Europe.

Keywords: *innovation, entrepreneurship, competitiveness, creative industry, sustainability, development*

1 Introduction

Innovations are considered to be one of the driving forces of the economic and social development of enterprises, regions and national economies. They enable companies to create new markets, increase their competitiveness, efficiency and ensure higher growth for companies. As such, there is a direct relationship between entrepreneurship and innovation and that on the other hand the economic growth is to a certain extend related to innovations.

Innovation is essential to build demand for higher-skill and better-paid jobs and limit potential inequality from the adoption of new-frontier technologies. Innovation is traditionally fuelled by scaling investments, and it generates better rewards if targeted toward rising sectors and assets. At the firm level, innovation generates new markets and builds stronger competitiveness. At the aggregate level, innovation creates additional knowledge spill overs and increases favourable industrial dynamics that lead to greater efficiency and higher growth. In general, innovation benefits go beyond productivity and can improve welfare through channels such as lower morbidity and longer longevity; about one third of the increase in longevity in Europe, for instance, is due to pharmaceutical innovation. (Bughin et. al., 2019)

Across the literature, there are different definitions of term innovation. Nevertheless, for the purpose of this article, it is used a definition presented in the Oslo Manual (2018, p. 1), which

distinguishes between innovation as an outcome (an innovation) and the activities by which innovations come about (innovation activities). As such, **innovation** is defined as "a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)".

European Commission (2021) see innovation in a similar way as a highly diverse activity, where enterprises can innovate through product or business process innovation, with the latter including process, marketing and organisational innovation. Further on, enterprises can adopt new technologies developed by other enterprises or they can engage in intensive in-house research and innovation activities.

As can be seen, this definition of the European Commission implies the interconnection between innovation and entrepreneurship, therefore this relationship can be considered as two-way street, as without companies, or in other words, entrepreneurs, there would not be innovation.

Interconnection between innovation and entrepreneurship can be found also in the definition of an entrepreneur presented by Schumpeter (1942), according to whom the entrepreneur destroys the existing economic equilibrium with innovation, an act of "creative destruction" where aging industries give way to young industries, leading the socio-economic system towards progress.

There are different methods of innovation, conveyed by entrepreneurs while the most popular is "lean start-up", which is essentially based on feed-back loops. The process does not have a beginning and an end, but a part of a continuous cycle starting with a minimum viable product that must offer sufficient value to satisfy the final customer (Ries, 2011). This method is also the most popular in Slovakia. Another innovation management approach is "effectuation", in which the starting point of the project are the entrepreneurs, with their personality, knowledge and relationships, which constitute the basic means and allow them to determine what they can do (Ousghir, Daoud, 2022). Yet another approach is "design thinking" that uses the sensibility, tools and methods of designers to enable multidisciplinary teams to innovate by matching consumers´ expectations technological feasibility and economic viability (Brown, 2008).

According to Chatzinikolaou et. al. (2021) at the heart of the concept of entrepreneurship there is always the corresponding dynamics of innovation, which means sustainability and competitive advantage by fulfilling customer needs, in addition, entrepreneurship means taking risks and creating innovative products and services. Entrepreneurship combines and incorporates labour, capital, and natural resources to produce economic good and profits (Sloman et. al., 2019). However, what cannot be forgotten is the fact, that special attention

needs to be paid to innovation signals stemming from an extremely influential group - customers.

2 Method

Literature review was chosen as the main research method, as it best meets the objective of this article. At first, the relevant studies were review and selected, taking into account chosen area of research. Relevant papers were selected from the international abstract databases such as Research Gate, SSRN, Web of Science and Google Scholar. As the concept of innovation is constantly evolving and changing rapidly, the research included papers published from the year 2008 onwards. There is only exception while defining the term entrepreneurship.

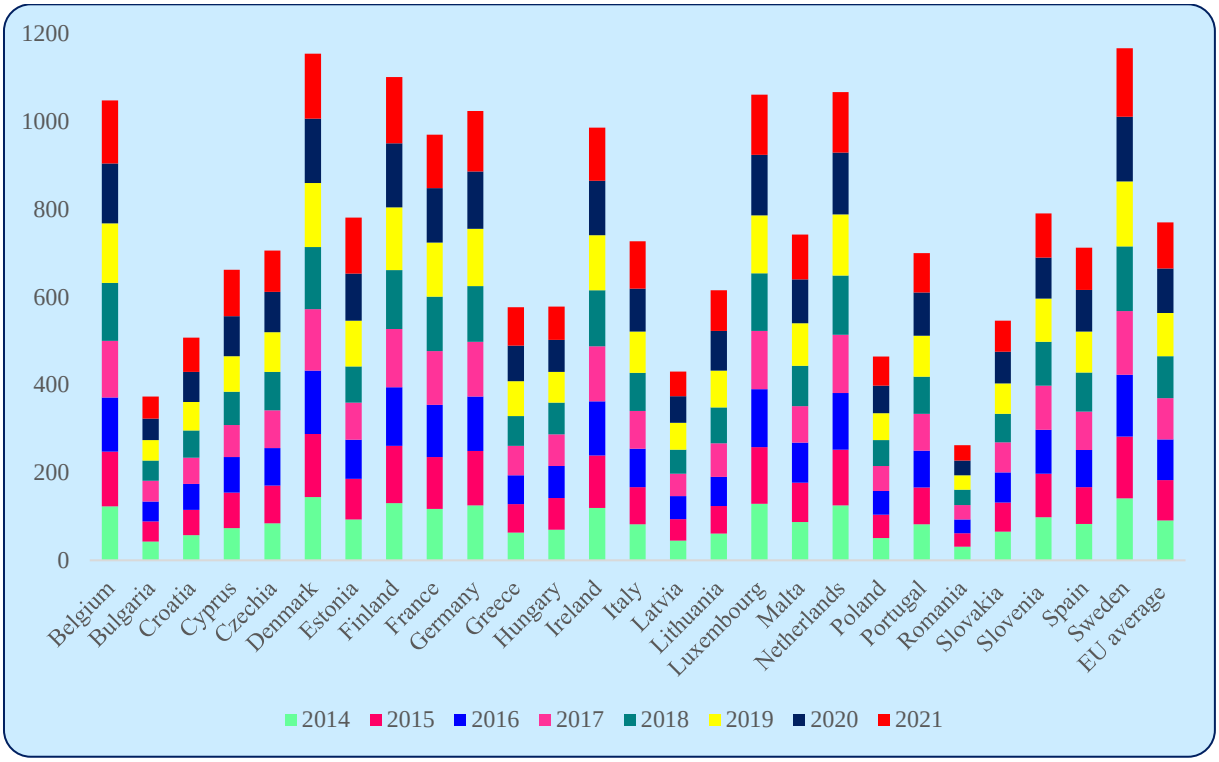
Further in the study, there were also used data from the Slovak Statistical Office, from the European Commission and European Council in order to make analysis of recent development in the area of innovation and entrepreneurship. Another method used was analysis, synthesis, and deductions.

3 Results

Innovation

According to European Innovation Scoreboard 2021, that provides a comparative analysis of innovation performance in EU countries, on average, the innovation performance of the EU has increased by 12.5 percentage points since 2014, in particular due to strong performance increases in the following indicators: broadband penetration, venture capital expenditures, and international scientific co-publications. Since 2014, innovation performance increased in all EU Member States. Performance has increased the most in Cyprus, Estonia, Greece, Italy and Lithuania. The process of convergence within the EU, where lower performing countries are growing faster than higher performing countries, has continued in 2021. Unfortunately, as one can see from Figure 1, Slovakia is well below the EU average and it is lagging behind the most developed EU countries.

Figure 1
European Innovation Scoreboard over the years



Source: Adapted from European Commission, 2021

In global terms, the EU has a performance lead over Brazil, China, India, Russia, and South Africa, and a performance gap with Australia, Canada, Japan, South Korea and the United States. Between 2014 and 2021, the EU has improved its relative position towards 6 of its global competitors: the performance gap with Australia and Canada has become smaller and the performance lead over Brazil, India, Russia and South Africa has increased. However, the EU has seen a worsening of its relative position towards 4 of its global competitors: the performance gap with Japan, South Korea and the United States has increased and the performance lead over China has become smaller. (EC, 2021)

Similar opinion expressed also Bughin et. al. (2019), according to whom Europe is falling behind in growing sectors as well as in areas of innovation such as genomics, quantum computing, and artificial intelligence, where it is being outpaced by the United States and China. While a century ago Europe was the global powerhouse of innovation, today, despite some notable exceptions, most innovation and innovative companies are found elsewhere.

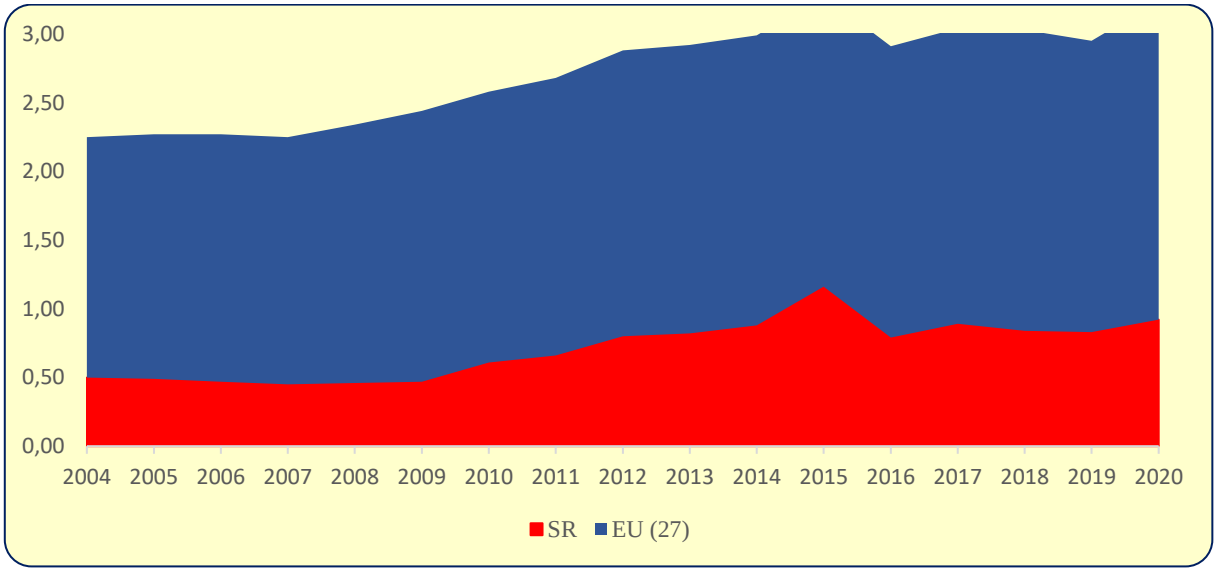
As it was mentioned earlier, Slovakia is not only positioned below the average of EU countries in terms of innovation but it also lags behind most of the OECD countries. This slow pace in innovations, technological development, and poor capital availability are considered another main reason for lagging behind in technology transfer too. For example, start-ups in

Slovakia, but also within Europe, lag behind in access to international financial capital compared to companies operating in the USA. Equity finance as a key driver for innovation and digital investment remains underdeveloped, with 90 percent of the European Union's venture capital funding concentrated in only eight member states (EIB, 2018).

However, the reason behind the week innovation activities of Slovak entrepreneurs is also given by low institutional support, or macro-policies, as can be seen in Figure 2, where there is presented a comparison between the level of expenditures on research and development in Slovakia and an average of EU countries. On the top of that, as Ivanová and Masárová (2016) stressed in their study, the ability to execute innovation policy objectives in the context of national and regional innovation system has an impact on increasing regional competitiveness. Unfortunately, this ability is another factor that is clearly missing in case of some regions in Slovakia, especially in Eastern part of the country.

Figure 2

Expenditures on R&D (as % of GDP) in Slovakia and EU (27)



Source: Adapted from Slovak Statistical Office

Further it should be point out, that globalization has also an impact on innovations as it enables an extremely rich transfer of information, communication, business opportunities, but gradually this leads to "localization" or in other words, to the emergence of new business activities that use unique local conditions in each country. Thus, the relationship between globalization, local development and innovation is very interconnected.

Entrepreneurship

As it was mentioned earlier, enterprises can innovate through product or business process

innovation, with the latter including process, marketing and organisational innovation. Enterprises have option to adopt new technologies developed by other enterprises or they can engage in intensive in-house research and innovation activities. Bellow, there is presented a Table 1, which contains data related to distribution of enterprises among seven innovation profiles that European Commission is using for evaluating EU countries.

Table 2

Distribution of enterprises for seven innovation profiles

	Share of enterprises			
	Small	**Medium**	**Large**	**Total**
In-house product innovation with market novelties	8.5%	16.1%	29.4%	10.7%
In-house product innovations without market novelties	11.2%	15.2%	19.4%	12.3%
In-house business process innovators	10.7%	12.2%	11.0%	11.0%
Innovators that do not develop innovations themselves	11.1%	13.8%	12.0%	11.6%
Innovation active non-innovators	3.0%	4.5%	4.3%	3.3%
Non-innovators with potential to innovate	21.5%	15.3%	9.3%	19.9%
Non-innovators without disposition to innovate	34.0%	22.9%	14.5%	31.3%

Source: Adapted from European Commission, 2021

Results for the whole EU, shown in Table 1, present data for all enterprises and for three different size classes, including small (10-49 employees), medium (50-249 employees) and large enterprises (250 or more employees). As can be seen 10.7% of enterprises are in-house innovators with market novelties. These enterprises are most frequent among large enterprises (29.4%). 12.3% of enterprises are in-house innovators without market novelties. These enterprises are also more common among larger enterprises (19.4%). In-house business process innovators account for 11% of enterprises. There are no significant differences in the relevance of this profile among the different size classes. Innovators that do not develop innovations themselves account for 11.6% of enterprises. 3.3% of enterprises are innovation active non-innovators. Overall, non-innovators account for more than half of EU enterprises. Among them non-innovators with potential to innovate account for 19.9% of all enterprises, and these enterprises are most frequent among the small enterprises (21.5%). The non-innovators without disposition to innovate form the largest group accounting for 31.3% of all enterprises, ranging from only 14.5% among the large enterprises to 34% among the small enterprises.

Based on this result, it can be concluded, that there is a space for innovation. In fact, according to a survey of Deloitte (Seeger et.al., 2019) European companies are being challenged to innovate more effectively to meet the rising expectations of customers and stakeholders. Overall, Europe is feeling competitive pressure from the new digital-savvy entrepreneurs in Asia and the United States who are using data analytics to churn out highly customised products and services at a rapid rate.

4 Discussion

In July 2020, European Council in order to fulfil pollical priorities of EU approved a budget, presented in Table 2, to be allocated for single market, innovation and digitalization, among other priorities, in order to build sustainable and resilient recovery after the Covid-19 crisis.

Table 3

Budget of the EU allocated for Single market, Innovation and Digital (In million euros)

2021	2022	2023	2024	2025	2026	2027
€ 19 721	€ 19 666	€ 19 133	€ 18 633	€ 18 518	€ 18 646	€ 18 473

Source: Adapted from European Council, 2020

As it was stated in the previous part, Europe is lagging behind Australia, Canada, Japan, South Korea and the United States in terms of innovation, so these investments should also provide additional support to promote innovations and digitalization of the single European market. This decision is also in line with findings of Bughin et. al. (2019) according to whom Europe notably lacks global digital platforms. Alongside the digital single market these authors identified five themes that could capitalize on recent trends and play to Europe's strengths:

- Europe could harness scale in its strong industrial footprint to enable firms to benefit from the diffusion of technologies across supply chains.
- Europe could rethink data and user access to level the playing field for innovative firms vis-à-vis global-scale data platforms, protect the data of citizens, and connect data pools.
- Europe could leverage its substantial scale of public-sector procurement to build up digital prowess.
- Europe could aim to compensate for fragmentation with greater openness, standardization, and mobility, including better connection of local ecosystems, and by benefiting from the geopolitical climate to attract high-skill immigrants.
- Europe could more actively leverage the scale of global firms to its benefit, creating conditions to attract a higher share of their activities and letting them

compete.

With regards to micro level of entrepreneurship and innovation Seeger et. al. (2019) after surveyed 760 European companies in 16 European countries found out that:

- Innovation is a strategic priority and 88 % of European companies want to increase budgets over the next two years and these companies are prepared to invest in the potential of new technologies.
- Technology is the main trigger for innovation in Europe.
- Investment in data analytics and cloud computing is already advanced.
- On the other hand, though, ecosystem innovation is not fully embraced by European companies.
- The biggest hurdles to innovation are cultural and resistance to change is still high.

Of course, priorities and intentions of European enterprises and governments have to be changed and/or postponed due to the Covid-19 pandemic, however, innovation is far from dead in Europe.

In the connection of above mentioned there is recognized that innovation is closed to creative industries that has been growing and developing in a lot of parts of the countries within the world, especially in developed countries. In addition to economic benefits, the cultural and creative industries also generate merit to people-centered value, sustainable urban development, development of creativity and culture, and contribute to the achievement of 2030 Agenda.

To conclude the article, below are presented some of the top tech trends in 2022 (Marr, 2022):

- **Computing power** – Computing power is expected to explode even more in 2022, as there is better cloud infrastructure and many businesses are re-platforming to the cloud. There is also better network on the horizon, as 5G that is starting to be rolled out by 6G. This implies even more power in the phones, cars and wearable devices.
- **Smarter devices** – Growing computer power is enabling to create smarter devices. There are more of the intelligent televisions, autonomous cars, and more intelligent robots that can work alongside humans to complete more tasks.
- **Quantum computing** – The trend of quantum computing — the processing of information that is represented by special quantum states – enables machines to handle information in a fundamentally different way from traditional computers and much faster. This can have a direct impact in logistics, portfolio management, and drug innovations.
- **Datafication** – Data is a key enabler for all of these trends. All of the digitization means

that there are enormous amounts of data available, and data has now become the number one business asset for every organization, as data can be used to better understand customers, research key trends, and get insight into what's working inside of organizations.

- **Artificial intelligence and machine learning** – Organizations and researchers are using all their data and computing power to provide advanced AI capabilities to the world, while one of the key trends in the AI world is machine vision. Presently, there are computers that can see and recognize objects on a video or photograph. Language processing is also making big advances, so machines can understand our voices and speak back to us.
- **New energy solutions** - The last hugely important trend is new energy solutions. With the climate change, there are continued advances in the batteries which are used in cars, as well as innovations in nuclear power and green hydrogen. These new trends will allow us to power ships, planes, trains and generate energy for the general public.

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Multi-criteria evaluation of start-up resources

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Abstract

The purpose of this article is to assess the resources of start-ups in terms of their usefulness, rarity, resistance to imitation, and quality, and thus understand the internal assumptions of start-ups for successful business making. A modified VRIO analytical method was used to evaluate the attributes of the resources. The research sample contained 112 start-ups. Each start-up was studied by a member of the research team, who personally recorded the founder's evaluations. Correlation and regression analysis were used to find the relationship between resources and business performance. People have the highest level of aggregate evaluation among the researched resources, but their less value of the business experience weakens them. The resource with the highest level of quality is technology, but it is weakened by a small rarity. The problem of all resources is low quality, which is evaluated from an international perspective. Start-ups are weakened by a lack of quality (smart) finance and external know-how. However, finance and external know-how are also relevant factors in the business performance of a start-up. The result of the research is a multicriteria evaluation of start-up resources, which provides a realistic assessment of empirical assumptions for successful business making. It is a good counterpoint to the prevailing research, which lacks evidence from practical business making.

Keywords: start-up, resources, value, rareness, imitability, quality, degree of development

1 Introduction

Start-up is considered an attractive business phenomenon, a space for business experiment and entrepreneurial self-realization. It is associated with the high expectations of ambitious individuals as well as various actors in social, political, and economic life. The demand for start-ups is also partially encouraged by superficial ideas about their possibilities, as most external observers do not have the opportunity to penetrate their essence and have no notion about their internal operation, which requires to gather and use a set of various resources. The nature, level, and degree of development of resources at least formally determine the business performance of the start-up, the originality of the business idea, and the minimum viability. The purpose of this article is to assess the resources of start-ups in terms of their value (usefulness),

rareness, resistance to imitation, and quality, and thus understand the internal assumptions of start-ups for successful business making.

2 Key resources of start-up and their context

Start-up. Start-up strives to achieve an extraordinary business goal while making considerable intellectual efforts and cultivating an unconventional corporate culture (Thiel, 2014, pp. 10-11). It is a small nascent company that is looking for a scalable and profitable business model (Blank and Dorf, 2012, p. XVII). Scaling is a prerequisite for enormous up to exponential growth. Start-up operates in conditions of extreme uncertainty with the intention of launching a new product or service (Ries, 2011, p.27). Newer concepts prefer lean start-ups (Dennehy et al., 2019), (Gutbrod & Münch, 2018), which are based on a minimally viable product (Stayton & Mangematin, 2019), agile fast feedback procedures (Silva et al., 2020), and fast learning (Leatherbee & Katila, 2020). It is characteristic of start-ups that their resources are extremely limited in volume and type because they are small and nascence companies. Their business making is experimental and therefore large and diverse resources would be exposed to high risks.

Types of start-up resources. The RBV (resource-based view) is a proven concept (Barney, 1991) that justifies the background of potential competitive advantage. Quality resources in the required amount are a necessary but not a sufficient condition for surviving and being successful in a competitive environment. Resources must also be adaptable and agile, interconnected to become dynamic capabilities (Seo, Lee, 2018), which significantly increase the achievement of competitive advantage. Elementary resources are the basis for the existence and minimum viability of a start-up. Marullo et al. (2018) against the background of the RBV concept, mention three main groups of start-up resources, namely finance, technology, and human capital. Petrů et al. (2019) found a knowledge in start-up research that a factor influencing sustainability is the acquisition of high-quality human resources. The identification and acquisition of appropriate resources in the establishment of a company shape its ability to design and implement a value-creating strategy (DeTienne & Cardon, 2008). Dalmarco et al. (2017) identified another source, which is knowledge management practices (KM practices). Internal knowledge is a company asset that contains not only R&D activities but also instructions for practical action.

According to Dhochak and Doliya (2020) not only internal resources but external resources too, which arise in business networks or are located with partners (Doblinger et al., 2019), have a significant and positive effect on the valuation of a new company. The resources that are a result

of different relationships are teamwork, which is considered a building block for cultivating capabilities in technology-based start-ups (Hernandez et al., 2018). All start-up resources are scarce and limited (Ghezzi, 2020) and make sense if a combination of internal resources and external phenomena can shape the business model. The combined use of R&D resources, internal financial resources, and scientifically skilled employees has an amplifying effect (Yang et al., 2017). The quality and quantity of start-up resources are limited, but nevertheless, according to Petrů et al. (2019), they rely only on their own resources and systematically fail, e.g. in the use of external marketing services. However, research by Riepe and Uhl (2020) found that start-ups primarily seek non-financial assistance in creating commercial networks, and non-financial assistance in approaching investors and retail clients is also vital.

Business idea - a special resource for the start-up. Due to the very limited material, financial and human resources of the start-up, a business idea can be included among the resources, which for some time, especially in relation to investors, is a proxy resource substituting temporary or permanent internal deficits and imperfections. It is a concentrated result of the work of other resources and at the same time a more or less valuable asset, which is a potential resource of difference and earnings. The business idea tends to influence the fate of the company in the long run after its nascence (Block et al., 2015). The consequences of initial strategic decisions are usually very lasting, and the novelty of a business idea, which the founder considers extraordinary, is generally perceived less exceptionally by customers (Kopera et al., 2018).

Multi-criteria evaluation of resources. Resources have a diverse nature and attributes, and therefore multi-criteria methods are suitable for their evaluation, which will allow assessing resources comprehensively and from several perspectives. The VRIO method uses four criteria (Barney, 1997), namely value, rareness, imitability, and organization. Its modification is the VRISA method, which uses five criteria, namely value, scarcity, inimitability, no substitutability, and appropriateness (Afuah, 2004). In particular, the VRIO method is a simple and well-applicable analytical tool that provides an objective knowledge of the internal environment of the start-up, relatively quickly and accurately enough.

The study of the literature shows that the basic sectioning of start-up resources is known but without a comprehensive examination of their matter-of-fact characteristics, which would express their measurable uniqueness and would be a favorable signal for partners and investors. There is a lack of empirical research about the attributes of start-up resources, which would provide knowledge about their true characteristics, and thus revise often exaggerated ideas and expectations. Finally, there is a lack of knowledge about the relationship between the attributes of resources and the business performance of a start-up, which would confirm the purpose and

meaning of resources in practical business making.

3 Research goal, research sample, and methods of work

The goal of the research is to expand and deepen knowledge about the characteristics of the startup's key resources, which are the basis of its existence and survival. The state of nascence and elementary entrepreneurship are circumstances that impart special characteristics to the resources of a start-up. The goal of the research is therefore to examine more deeply the structure and attributes of the start-up's resources and their consequences on the start-up's business performance.

The goal of the research is based on the working hypothesis that material, human and financial resources are an important condition for the viability and success of a start-up. The hypothesis is verified by the relationship between resource properties and start-up performance.

The research sample originally contained 187 companies, it was reduced to 112 start-ups because duplicate companies, companies with incomplete data, and companies whose nature did not correspond to the characteristics of the start-up were excluded. The studied start-ups were established in 2014 and later, with the exception of five start-ups established between 2012 and 2014. A start-up is considered to be a very small nascent company under the age of five (only exceptionally and reasonably more) whose business is based on (at least one condition that has to be met):

- novel, original technology, or
- significantly better use of existing technology, or
- discovering and satisfying a completely new need, or
- inventing/creating and satisfying a completely new need, or
- satisfying an existing need in a significantly better or cheaper way.

Each start-up was examined by one member of the research team, who personally recorded the evaluations/ answers of the founder/owner to the closed and open questions in the questionnaire and immediately explained any ambiguities. Field research took place in the period from September to November 2019 in the Slovak Republic and start-ups are mainly based in the capital Bratislava and its surroundings.

Methods. A modified VRIO analytical method was used to evaluate the attributes of resources (Table 1), which examines and evaluates company resources according to the criteria of value/usefulness (V), rareness (R), imitability (I), and organization (O). The last criterion (O) was omitted because it could not be objectively assessed and was replaced/supplemented by the quality criterion (Q). In addition, the criterion of the degree of development of the resource has

been added, as it is assumed that the start-up resources are not definitively qualitatively and quantitatively formed and are subject to development that affect their final evaluation. The levels of attributes of each resource are added up, and the result is a summary evaluation I. (Table 1), which is multiplied by the degree of development of the respective source, the result is a summary evaluation II. (Table 2), which is compared with the maximum summary evaluation of each resource (20 points), the result is the summary evaluation III (Table 2). VRIQ criteria are rated on the following scales:

* To what extent are the available resources **valuable**/useful **(V)**, resp. in line with the needs of the start-up?

Value/usefulness: 1 (completely unsatisfactory, min. useful) - 5 (completely satisfactory, max. useful)

* To what extent are available resources **rare (R)** (available)?

Rareness: 1 (fully available, min. rare) - 5 (completely unavailable, max. rare)

* To what extent are the available resources **imitable (I)**?

Imitability: 1 (fully imitable) - 5 (fully non-imitable)

* What is the **quality** of **(Q)** resources from an international perspective?

Quality: 1 - local, 2 - national, 3 - Central European, 4 - European, 5 - worldwide

The level of resources is expressed by the mean values of individual VRIQ attributes and by the distribution of the shares of VRIQ attributes in the interval 1 - 5 (Table 3 - 6). The degree of development of resources is expressed in % in the interval 0 - 100% divided into ten sections (Table 7).

A business idea is considered to be a source of special importance, which is evaluated according to its novelty and degree of development (Table 8). Start-up has extremely limited resources and its effort is presented externally almost exclusively by the novelty (quality) and the development of a business idea, which is the main argument for gaining investment and external know-how.

Correlation and regression analysis were used to find the relationship between resources and business performance. Dependent variables are the attributes and level of development of the resources examined, and independent variables are the number of users, the number of paying users (customers), and sales. The relationship between resources and novelty and the degree of development of business idea were also examined.

4 Research results

Resources are described according to the attributes that characterize their value/usefulness, rareness, imitability, quality, and degree of development. Table 1 shows that the resources with the highest value are technology, diligence, and perseverance of human resources, the rarest resources are internal knowledge, experience, and perseverance of human resources, and the most resilient resources against imitation are internal intellectual capacity, knowledge, and experience, the highest quality resources are technology. The most developed are human resources, their diligence, perseverance, intellectual capacity, and knowledge.

The key resources with the least value are external know-how, the least rare are technologies, the easiest to imitate is external know-how, and the least quality is finance, which is also the least developed.

The differences between the highest and lowest resource assessment according to one attribute are not very large, about one point, about 20%, but this distance is not negligible. The differences between the average values of the individual attributes are greater. The most valuable attribute of resources is value/usefulness, with a distance of about one point followed by rareness and imitability, but the quality is 1.2 points distant from value/usefulness. The differences inside the individual resources are even greater.

Resources that excel at least in two attributes are technology, knowledge, experience, and perseverance. Intellectual capacity and diligence excelled in one attribute.

The overall evaluation of the attributes of resources can be found by adding them (Table 1). In summary, resources excel which are carried by humans. It is their intellectual capacity, knowledge, experience, diligence, and perseverance. In the overall assessment, finance and external know-how have a weaker position. The functionality of resources is affected by the degree of their development. If the summed values of resource attributes are multiplied by the degree of their development, another summary view of the evaluated resources will be created (Table 2). Resources, carried by people, their knowledge, diligence, and perseverance, partially also intellectual capacity and technology, are coming to the fore again. After including the level of development, finances, external know-how, and in part also experience lag behind again.

The strengths and precedence of the studied start-ups lie in their knowledge, diligence, and perseverance, a little less in technology and intellectual capacity. The weaknesses and shortcomings of the researched start-ups are to be found in external know-how, financing, and, to a certain extent, in their business experience.

Table 1

Evaluation of resources according to VRIQ criteria

Resources	Value/ usefulness	Rareness	Imitability	Quality	I. Summary evaluation
finance	4.13	3.11	3.01	*2.43*	*12.68*
technologies	**4.32**	*2.73*	3.21	**3.49**	**13.75**
know how internal: - intellectual capacity	4.14	3.15	**3.49**	2.50	**13.28**
- knowledge	4.15	**3.20**	**3.48**	2.96	**13.79**
- experiences	3.86	**3.22**	**3.50**	2.86	**13.44**
know-how external	*3.15*	2.97	*2.89*	2.86	*11.87*
int. HR: diligence	**4.33**	3.12	3.21	2.59	**13.25**
int. HR: perseverance	**4.31**	**3.21**	3.25	2.62	**13.39**
(venues)	2.92	2.43	2.21	1.85	9.41
Average	3,92	3,01	3,14	2.68/2,79*	

The evaluation of resources carried out so far was based on comparing the attributes of resources with each other. A different view arises when comparing the values of the product (Summary evaluation x Degree of development) in Table 2 with the maximum values that resources can reach (4 x 5 points = 20 points). It is obvious that even the best resources only very narrowly exceed the value of 50% of the ideal target state, and in the range of the larger evaluation scale, the differences no longer seem so significant.

Table 2

Evaluation of resources according to the summary of values of VRIQ criteria and after including the degree of their development

Resources	Degree of development (%)	II. Summary evaluation x Degree of development	III. (Summary evaluation x Degree of development) /20 (%)
finance	*58.52*	*7,42*	*37.1*
technologies	72.59	9,98	49.9
know how internal: - intellectual capacity	**74.39**	9,87	49.35
- knowledge	**75.41**	**10,39**	**51.95**
- experiences	69.57	9,35	46.75
know-how external	60.55	*7,18*	*35.9*
int. HR: diligence	**77.12**	**10,21**	**51.05**
int. HR: perseverance	**77.34**	**10,35**	**51.75**
(venues)	62.00	5,83	29.15
Average	69,72		

Another view of the evaluation of resources will be provided by the distribution of shares (%) of start-ups in individual levels (1 - 5) of the VRIQ criteria. Table 3 shows a weaker position of the value of experience and external know-how, but about 50% of start-ups reach the highest level 5 in other criteria. Distribution is asymmetric with a predominance of maximum values. It can be seen in Table 4 that the centre of gravity of the resources is around 3 and the distribution is roughly symmetrical. The imitability of the sources in Table 5 also culminates around a value of 3, but with a slight asymmetry, inclined to higher values. The distribution of

resource quality culminates at a value of 2 (Table 6) and the course of distribution is relatively flat without significant dominance. The distribution of the degree of development of resources (Table 7) is asymmetric with a tendency towards a higher degree of development, but the distribution is scattered almost over the entire evaluation scale.

Table 3
Resource value distribution (%)

V	finance	techno-logies	intel. cap.	know-ledge	expe-riences	ext know-how	diligence	perseve-rance	venues
1	.9	1.8	2.7	-	-	12.5	1.8	1.8	22.3
2	5.4	6.3	5.4	.9	9.8	16.1	.9	1.8	16.1
3	20.5	10.7	14.3	24.1	25.0	**31.3**	12.5	13.4	**27.7**
4	25.9	20.5	30.4	33.9	**34.8**	22.3	32.1	29.5	15.2
5	**47.3**	**60.7**	**47.3**	**41.1**	30.4	17.0	**52.7**	**53.6**	18.8
Total	100.0	100.0	100.0	100.0	100.0	99.1	100.0	100.0	100.0

Table 4
Resource rareness distribution (%)

R	finance	techno-logies	intel. cap.	know-ledge	expe-riences	ext know-how	diligence	perseve-rance	venues
1	4.5	17.0	12.5	8.9	8.0	7.1	11.6	11.6	28.6
2	20.5	**29.5**	22.3	23.2	18.8	27.7	21.4	17.0	23.2
3	**44.6**	26.8	**25.9**	**26.8**	**32.1**	**35.7**	**30.4**	**30.4**	**33.0**
4	20.5	17.0	16.1	21.4	25.0	19.6	17.0	20.5	7.1
5	9.8	9.8	23.2	19.6	16.1	9.8	19.6	20.5	8.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 5
Resource imitability distribution (%)

I	finance	techno-logies	intel.cap.	know-ledge	expe-riences	ext know-how	diligence	perseve-rance	venues
1	19.6	10.7	3.6	2.7	5.4	13.4	11.6	9.8	**39.3**
2	18.8	14.3	11.6	9.8	5.4	19.6	13.4	16.1	25.0
3	**24.1**	**37.5**	**39.3**	**43.8**	**42.0**	**35.7**	**33.0**	28.6	18.8
4	16.1	17.9	23.2	24.1	28.6	26.8	25.9	**30.4**	8.9
5	21.4	19.6	22.3	19.6	18.8	4.5	16.1	15.2	8.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 6

Resource quality (exceptionality, novelty) distribution (%)

Q	finance	techno-logies	intel. cap.	know-ledge	expe-riences	ext know-how	diligence	perseve-rance	venues
1	21.4	10.7	28.6	15.2	18.8	17.9	25.9	26.8	**58.0**
2	**46.4**	23.2	**29.5**	**29.5**	**30.4**	**31.3**	**29.5**	**29.5**	19.6
3	11.6	9.8	15.2	17.0	17.0	16.1	16.1	12.5	7.1
4	8.9	18.8	17.0	21.4	14.3	17.0	17.0	17.9	9.8
5	11.6	**37.5**	9.8	17.0	19.6	17.9	11.6	13.4	5.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 7

Distribution of the degree of development of resources (completion rate, sufficiency, etc.) (%)

SRZ (%)	financ e	techn o-logies	intel. cap.	know-ledge	expe-riences	ext know-how	diligenc e	perseve-rance	venue s
0	1.8	1.8	.9	0	.9	3.6	3.6	3.6	2.7
1-10	5.4	1.8	.9	0	0	3.6	0	0	3.6
11-20	4.5	2.7	.9	0		4.5			9.8
21-30	6.3	3.6	4.5		4.5	10.7	1.8	.9	6.3
31-40	7.1	3.6	.9	4.5	8.9	5.4	.9	.9	5.4
41-50	**18.8**	7.1	4.5	4.5	9.8	9.8	5.4	6.3	15.2
51-60	10.7	8.0	14.3	6.3	9.8	10.7	9.8	8.9	2.7
61-70	14.3	12.5	14.3	18.8	15.2	10.7	8.0	10.7	9.8
71-80	**18.8**	**22.3**	**25.0**	**32.2**	**21.4**	**17.0**	**25.0**	21.4	13.4
81-90	3.6	17.9	15.2	19.7	18.8	12.5	22.3	**25.0**	13.4
91-100	8.0	17.9	17.9	9.8	9.0	8.9	21.4	20.5	**16.1**
Total	99.1	99.1	99.1	99.1	99.1	97.3	99.1	99.1	98.2
	100.0	100.0	100.0	100.0		100.0	100.0	100.0	

Table 8

Novelty and development of a business idea

Novelty	1 - local	2 - national	3 - central European	4 - European	5 - worldwide	Total
share (%)	6.3	**32.1**	14.3	11.6	**35.7**	100.0
Degree of development	1 - idea/ concept/research	2 - development of product	3 - a prototype of product/testing	4 - the first income	5 - growing income	-
share (%)	4.5	6.3	12.6	**28.8**	**47.7**	100.0

The distribution of the attributes of the business idea is recorded in table 8. The average novelty of a business idea is 3.4, it is approximately in the middle between the Central European and

European levels. However, the average value does not provide a completely accurate notion about the novelty of the idea, because the distribution of values has two significant peaks, which are the occurrence of national and global novelty. Each of these levels of novelty accounts for about one-third of the research sample. Arguments to justify novelty are subjective and based on personal experience. The average stage of developing a business idea is 4.1. The idea is already in the form of a finished product that has been tested and is starting to bring the first revenue. A more detailed representation of start-ups in the development phases is in table 8. The average stage of the development of a business idea also does not provide a completely accurate picture of the reality, as the representation of start-ups in the rising income phase and then in the first income phase is significant, together with about three-quarters of the research sample.

The level of attributes and the degree of development of resources should not be autotelic. Their meaning and functionality should be confirmed by the impact on the novelty of the business idea and the business performance of the start-up. The effect was measured using correlation and regression analysis. Regression analysis did not yield statistically significant results and is therefore not described. Correlation analysis identified several statistically significant relationships:

* The quality of all resources has a positive connection with the originality of the business idea.
* The degree of development of external know-how and venues has a positive connection with the novelty of the business idea.
* The quality of finances, intellectual capacity, and external know-how have a positive link with sales.
* The degree of development of knowledge, experience, and external know-how has a positive connection with the number of users.
* The degree of development of diligence and perseverance of human resources has a positive relationship with the number of customers (paying users).
* The degree of development of external know-how and premises has a positive connection with sales.

Summary of analysis results:

* Evaluation of resource exceptionality according to individual characteristics:
- technologies have excelled in value and quality, but are also the least rare, but their quality is clearly higher than that of other resources,
- knowledge excelled in rarity and imitability,
- experience has excelled in rarity and imitability,

- the perseverance of human resources has excelled in value and rarity,
- external know-how has the least value and is the easiest to imitate,
- - the finances are of the lowest quality and least developed,
- the quality of all resources is low compared to other features (VRI).

* Evaluation of resources in the summary of attributes and degree of development:
- the weakest resources are finance and external know-how
- weaker resources include experience
- other resources barely reach 50% of the ideal (maximum) level

* Summary evaluation of resource attributes:
- order: value, imitability, rareness, quality

* Attributes distribution evaluation:
- the lower the average value of the attribute, the flatter the distribution of the attribute, i.e. the more scattered around the mean value,
- the higher the average value of the attribute, the more asymmetric the distribution of the attribute with the inclination to higher values.

* Novelty and level of development of the business idea:
- has two dominants, namely national and worldwide quality, almost half of the ideas are finished products with growing incomes, but only one-third of them are world-class.

* Resources and novelty of the business idea:
- the quality of resources and in some cases the degree of their development affects the novelty of the business idea.

* Resources and business performance:
- the main influencing factors are finance, external know-how, and human resources, their intellectual capacity, knowledge, experience, diligence, and perseverance.

5 Discussion

Are start-up resources exceptional?

Resources are exceptional in one or two attributes, but they are not exceptional in all attributes. A resource full of paradoxes is a technology that is exceptional in value and quality, while its quality is significantly higher than the quality of other resources, but its rareness lags behind other resources. People are an exceptional resource, more precisely their knowledge, experience, and perseverance, which are rare and probably therefore resistant to imitation. However, the exceptional and average attributes of resources (VRI) are weakened by their low quality, the evaluation of which is based on external, international comparisons. Start-ups are

also weakened by insufficient external know-how and lack of finances combined with low quality, hence without advice from strategic investors.

An overall assessment of resources will eliminate more significant differences between them, although weak resources will remain weak.

The aggregation of resource attributes and their multiplication by the degree of development have erased significant differences between them, but they are approaching the maximum, ideal level of barely 50%. The comprehensively assessed sources are not exceptional, they have unmissable shortcomings. Even after a comprehensive assessment, experience is one of the weaker resources and the real weaknesses are finance and external know-how. Access to finance depends on the originality of the business idea and the willingness of the founders to share control of the company. Access to external know-how depends on a willingness to acknowledge one's own shortcomings and establish professional and business alliances.

The VRIQ assessment will show the strengths and weaknesses of the resources.

Resources are usually selected and used correctly for the needs of a start-up, so they are valued/useful. Their selection is proof of the technical expertise of the founders, but resistance to imitation and rareness is significantly weaker, which is probably evidence of the limited possibilities and abilities of the founders or their incomplete business expertise. The quality of resources, which is assessed internationally, exacerbates these weaknesses.

Why are finances and external know-how weak resources?

Finance and external know-how are attracted by the originality and business attractiveness of a business idea that is verified by market demand and generates first or growing revenue. It can be assumed that the insufficient supply of finance and external know-how is primarily caused by the insufficient supply of attractive and promising business ideas or their cumbersome implementation.

Is a business idea a valuable start-up resource?

The average novelty of a business idea is weakened by a relatively large proportion of ideas that have a national level. It can be assumed that only ideas whose level is at least European have a business sense because a slight degradation rather than escalation can be expected during the development of the idea. The novelty of a business idea is influenced by all resources, but their lower quality and lower level of development are probably not a guarantee of improving the idea. The novelty of the idea and the value derived from it do not stand out above other

sources of start-ups.

The business performance of a start-up is influenced by exceptional people and unexceptional resources.

The business performance of a start-up depends on the exceptional quality of human resources, which are the strength of the start-up, and the availability of finance and know-how that come from the external environment while being considered the weaknesses of the start-up. The combination of strengths and weaknesses that affects performance is an unusual paradox. It can be explained by the inevitable complementarity of resources, which, despite their shortcomings, are a driving force and apparently cannot be substituted by other resources. This has significant implications for performance and viability. Natural internal resource limits of a micro-enterprise, e.g. intellectual capacity, can be overcome despite all possible efforts by acquiring external know-how only. Sustaining and accelerating growth is possible with the help of external investment only.

6 Conclusion

People have the highest level of aggregate evaluation among the studied sources, but their weaker value of the business experience weakens them. The source with the highest level of quality is technology, but it is weakened by a small rareness. The problem of all sources is low quality, which is evaluated from an international point of view, and therefore, given the possibilities of research, it is the most objective measure. Start-ups are weakened by a lack of quality/smart finance and external know-how. However, finance and external know-how are also relevant factors in a start-up's business performance. Start-up resources measured by several criteria show an uneven level, in some cases with an unexpected impact on performance. The novelty/quality of a business idea also reaches a fluctuating level.

The ascertained facts can be interpreted as natural attributes of a very small and nascent company, which must be respected as an objective reality that determines the expectations and demands associated with an elementary business making, e.g. investors' attitudes, public support, naive illusions about entrepreneurship, readiness for entrepreneurship, availability of rare technology and others. The findings can also be interpreted as a critique and a call to eliminate the shortcomings and to improve resources, which, however, again encounters the availability of smart finance, rare technology, the length and diversity of the founders' previous practice, and other obstacles. Deciding between respect for reality and the intention to change the world is a matter of courage, expertise, and ingenuity of the founders of start-ups.

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Ethnocentrism of Slovak consumers in Relation to Sustainable Products

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Abstract

Slovak consumers have changed in the last decade. Their consumer behaviour has been heavily influenced by EU marketing campaigns aimed at consumer environmental literacy, as well as by government authorities aimed at increasing the share of domestic production on store shelves. The aim of this study is to analyse results of representative marketing research that relate to the consumer behaviour of Slovak consumers when shopping in general and also shopping for Slovak products. One of the goals of the research was also to verify the functioning and effectiveness of those business strategies that emphasize environmental values and the sustainability of production. The results have shown the environmental values that companies have adopted and the goals that they have incorporated into their strategies are bearing fruit. It turns out that Slovak consumers, and this applies to all generations of consumers, have realized in the last 10 years the need to take environmental criteria into account when buying products and are of the opinion that Slovak products are less harmful to the environment than foreign ones.

Keywords*: Slovak consumers, ethnocentrism, sustainable products*

1 Introduction

Businesses have identified the need to incorporate sustainability principles into their marketing strategies and have identified with environmental values several years ago, when it became clear that not only the political environment was putting pressure on environmental strategies, but this pressure was also evident from consumers. In companies, including the Slovak ones, concepts of eliminating environmental burdens, strategies for the circular economy and reducing the carbon footprint began to emerge. However, visions of waste-free technologies were also born. In order for companies to verify the correctness of environmental goals, they needed insights into consumer behavior preferences. Over the last 10 years, Slovak consumers have started to buy and actively look for Slovak products that meet strict environmental criteria. The aim of the study is to analyze results of representative marketing research that relate to the consumer behavior of Slovak consumers when shopping in general and also shopping for

Slovak products. One of the goals of the research was also to verify the functioning and effectiveness of those business strategies that emphasize environmental values and the sustainability of production. The range of products on the market today is very diverse. It is therefore necessary to know whether consumers buy products that match their preferences, whether consumers with environmental values identify what they consume and to what extent the environmental preferences of consumers play a role. In the interpretation, we also identify differences in the generations of Slovak consumers in the preference of products that meet environmental criteria.

2 Consumer behavior in the context of environmental values

The consumer decision-making process is one of the most dynamic processes because a large number of factors are involved in decision-making. Consumer preferences influence this process to the most extent (Shareef, Mahmud , Dwivedi, Kumar, 2016). Consumer behavior is very difficult to measure, it is a "summary of consumer decisions on the acquisition, consumption and disposal of products, services, activities, experiences, people and ideas of decision-makers (consumers)" (Hoyer,et al, 20201). Consumer preferences relate to certain characteristics that the consumer seeks in the goods or services purchased. At the same time, they are the main factors influencing consumer demand to make it clear which products and services have the highest demand and what the future consequences may be (The Economic Times). Consumer preferences are the main reason why consumers prefer one product over another, they are a comprehensible reason that allows for correct targeting of a selected customer segment and addressing the consumer. Of the questions that allow us to better understand the consumer in this context, we will be particularly interested in what factors determine consumer reactions (East, 2017)? Consumers make decisions based on the values with which they identify and which they profess, which in turn influence their preferences and requirements. Previous experiences, recommendations from acquaintances, friends, celebrities or influencers and other suggestions also enter the decision-making process. Consumers also make decisions based on the incentives chosen by the manufacturer or seller through marketing communication, and very often also on the country of origin of the product. The authors of the *Mobile Marketing Channel tried to identify the influence of individual factors on future consumer decision-making (*Shareef, Mahmoud, Dwivedi, Kumar, 2016), *who* divided the factors influencing consumer behavior into four main points.

1. Internal consumer beliefs and attitudes arising from the psychological, sociological and socio-

anthropological point of view.

2. External factors influencing consumer shopping behavior. These are marketing and economic impacts.
3. External environmental market settings and related parameters such as ethical issues, sustainable environmental issues or globalization issues.
4. Consumer behavioral changes due to changes in consumer perceptions, attention, beliefs, attitudes and behaviors. These changes are due to information and communication technologies. (Shareef, Mahmud, Dwivedi, Kumar, 2016).

As can be seen from the above, all of the above points are directly or indirectly related to the environmental factors to which we pay attention in this article. Undoubtedly, there is a difference between what the consumer prefers and what he actually buys. Who among us would not want to buy only healthy foods and products whose production does not affect the negative environment?

Our attention is focused on consumer behavior, so we must also reflect the stages of the consumer's shopping cycle. All are directly dependent on marketing communication. The first contact with the company is, usually conditioned by the product offer, pricing, method of communication and product availability. Subsequently, however, not only the characteristics of the product themselves enter the process – the brand and image of the company that offers the product, but also the country of origin of the product. The availability of products, the experience of other consumers, ie references to the product, said in the language of marketers, customer satisfaction with the product and its use play an important role. At present, it is not enough just to attract a potential person interested in a product, it is necessary to "turn" it into a consumer and an optimally loyal consumer who will buy a product or products under the same brand repeatedly. However, this is not possible if the product has not met consumer expectations.

2.1 Ethnocentrism of Slovak consumers

If we have so far dealt with the company's brand and environmental values in relation to the brand, it is also necessary to point out that it is not only who produced, cultivated or provided the service that enters the purchasing decision-making process. The country of origin of the product also plays an important role. The customer is offered products from various companies from different countries of the world. Wanting the consumer to perceive the country of origin is always linked to the need to point out that the country of origin can be perceived as one and even a key element of the brand. This helps the consumer to associate the brand with a specific

country. Sometimes the origin of a product can create a barrier to trade in goods and services within or between countries. Consumer preferences for foreign and domestic products may be affected by:

1. confidence in foreign products, especially from the portfolio of established brands,
2. distrust of foreign goods and services, ie consumer ethnocentrism, preference for products originating in the consumer's country of origin.

From a marketing point of view, not only the product itself but also the image of the country of origin of the product play an important role in the process of consumer behavior. The country's image can be seen as a tool relevant to shopping behavior, which can be used as a driving force for the sale of its products. Consumers use the image of the country of origin of products as a means to evaluate them, assess product characteristics but also the capabilities of businesses and brands. Associations associated with the name (brand) of the country can help the consumer to orient and apply information about the country of the product, its quality, benefits, promises and values, including environmental ones. This picture determines the perceived quality of a country's exports as well as the type of goods that a particular country focuses on. Consumers can also generalize their views and opinions on a country's products based on their knowledge, general characteristics and past experience. As an example we can mention e.g. Japanese technology, German precision and the like. It is important for traders to examine such associations linked to the country of origin in order to determine basic consumer attitudes, create or modify product value or even ensure that goods produced in one country are assembled in another, which will have the final products label. For example, products labeled Made in Germany or the US are generally accepted more positively than those labeled Made in Bangladesh or China.

If we were to think about what unites the brand of the country of origin Slovakia in the minds of consumers, we will probably be embarrassed. This brand can still be described as not fully profiled. It can be stated that it has been intensively built (more precisely, it would be sought) for almost 30 years. Nevertheless, it is not possible to say that it meets the characteristics of the newly created brand, as it still uses the connection to the Czechoslovakia brand and can draw from it. Slovakia is perceived by a large part of consumers as a member of the European Union, which can be considered a competitive advantage. The EU has paid close attention to giving individual Member States the space to build their own brand - a rotating EU presidency and the possibility of accompanying marketing activities. It has made considerable efforts to ensure that products with national characteristics have the right to a country

trademark. The reason was to protect products originating in the EU, but the result was to strengthen the brands of the Member States of the Union and to build the basic characteristics of the countries of origin of the brands. If it succeeded in some segments, it was mainly agricultural products, food and beverages. The country brand therefore plays an important role in the purchasing behavior process. There are many reasons for favoring domestic production and it may be conditioned by several factors. Given the subject matter of the article, we will also consider that these include the environmental preferences of consumers. We are not naive and we know that ethnocentric behavior is often conditioned by ignorance, distrust, even rejection or prejudice towards a particular country (Torres & Gutiérrez, 2007). This also applies to all brands of goods in relation to the brand of the country of origin. Consumer ethnocentrism can therefore be understood as the belief of consumers about the unsuitability of buying imported products, the purchase of which can cause problems for the domestic economy - the loss of sales of domestic products or jobs. The level of ethnocentrism is often higher the more noticeable the influence of foreign competition. Buying a product made outside the consumer's home market can raise concerns about the deteriorating economy and consequently the living standards of the population. The people of the country are often encouraged by politicians to buy products of domestic origin and at the same time to favor ethnocentrism as the idea according to which they will behave in their shopping behavior. We have tried to suggest that one of the key reasons for ethnocentric consumer behavior is the environmental preferences of customers. There are several factors that a consumer with such preferences takes into account when buying products, namely

1. carbon footprint of the product and the company. The carbon footprint is always smaller for products that are distributed over short distances

2. recyclability of the product and often also its packaging - purchase with regard to the degree of future environmental burden - waste-free technologies are optimal.

3. corporate strategy of the circular economy.

Of course, we are aware that not all ethnocentric consumers also take environmental factors into account. Many see ethnocentrism only as a reflection of nationalist ideas in shopping behavior and do not have environmental preferences. However, those who have them are looking for information about such product features and leaving a digital footprint that identifies how the number of people looking for information about these factors is rising. At the same time, analyzes of pro-environmental behavior show that the number of consumers with such preferences is growing.

3 Methods

The aim of the study is to analyze those results of representative marketing research that relate to the consumer behavior of different generations of Slovak consumers when buying products of companies in general and Slovak products in particular. One of the aims of the research was also to verify the functioning and effectiveness of those business strategies that emphasize environmental values and the sustainability of production.

The marketing survey, the partial results of which we will focus on in the next section, was conducted in the Slovak Republic and was conducted in the period from 2 to 7 December 2020 with 1000 respondents. It was a survey in which only respondents over 18 years of age participated. There were 30 statements in the questionnaire, with which the respondents had to express the degree of agreement, resp. disagreement. The questionnaire also included questions focused on the socio -demographic characteristics of the respondents.

From the 30 statements, we selected 4 for the needs of this study, which are directly or indirectly related to the researched issue and we put them in relation to the age of consumers. This is not to say that the other issues do not concern the issue. The questions mentioned were:

1. I am willing to pay more for sustainable products
2. The purchase of Slovak products has a smaller impact on the environment
3. I trust more brands that emphasize sustainable development
4. I notice the country of origin of the products I buy / age

4 Research results

The knowledge that products produced or grown with respect to the environment are more expensive resonates in the population. Accordingly, the question has been formulated whether a particular consumer will reach for a product that meets strict environmental criteria. As can be seen from the table 1, members of the older generations over the age of 50 and 60 were positively surprised, and as expected, other generations tend to agree that such products need to be paid extra, which really means that they have a higher price on the market. It is also possible to evaluate positively the very small percentage of respondents who could not take any position on the issue. Less than a third of respondents in all categories tend to disagree with the need to pay extra for such products. They are very likely to be based on the assumption that such products should be price comparable or on the assumption that all products on the market should meet environmental criteria.

Table 1

I am willing to pay more for sustainable products/age

	I definitely agree	Rather, I agree	I rather disagree	I definitely disagree	I do not know
18 - 29 years	13.9	40.6	23.3	11.7	10.6
30 - 39 years	18.6	35.7	28.1	8.0	9.5
40 - 49 years	14.1	37.0	28.6	12.5	7.8
50 - 59 years	12.0	42.4	28.5	8.2	8.9
60 and older	9.2	46.9	27.7	11.8	4.4

The next question was asked with the knowledge that the consumer knows that some consumer products, e.g. electronics, textile products, mobile phones and many other products are not produced in Slovakia. Therefore, it is necessary to perceive the answers with regard to the profile of Slovak production and the shopping cart of the Slovak consumer, who in the given context perceives food production more. Research results can be seen in Table 2 below. However, as we have already indicated, the majority of the population perceives the length of the distribution channel also in terms of carbon footprint and it is possible that the other aspects we mentioned, waste technologies, recyclability of the product itself and packaging are taken into account by consumers when buying products. This is also evidenced by the greater degree of agreement with the statement, although this is mostly related to the "rather agree" answer. However, almost 20% of the population do not know how to comment, which also means that they do not seek this information or their country of origin is simply not interested in the product.

Table 2

The purchase of Slovak products has a smaller impact on the environment/age

	I definitely agree	Rather, I agree	I rather disagree	I definitely disagree	I do not know
18 - 29 years	18.3	33.3	25.0	6.1	17.2
30 - 39 years	21.6	35.2	23.1	3.0	17.1
40 - 49 years	17.2	38.5	20.3	5.2	18.8
50 - 59 years	18.4	43.0	20.3	6.3	12.0
60 and older	21.0	42.8	15.5	4.8	15.9

The answers we obtained from the research clearly confirm that brands that present environmental values and implement environmental strategies appeal to the entire population

(see table 3). Responses that agree agree to reach 70% of the population, which is in line with the assumptions we have made in the theory that the growth of consumers with environmental preferences is growing and this group of consumers will also consider the environmental aspect when buying products. On average, 20% of respondents did not present a dissenting opinion, which is not even a quarter of the population.

Table 3

I trust more brands that emphasize sustainable development/age

	I definitely agree	Rather, I agree	I rather disagree	I definitely disagree	I do not know
18 - 29 years	20.0	52.8	13.9	4.4	8.9
30 - 39 years	24.1	46.2	16.1	3.0	10.6
40 - 49 years	15.1	50.0	16.7	3.6	14.6
50 - 59 years	18.4	51.3	13.9	2.5	13.9
60 and older	11.4	52.0	19.6	3.0	14.0

5 Discussion

The issue of environmental preferences of Slovak consumers is one of those we have encountered intensively in recent years. In the past, Slovak consumers were confronted with the demise of many established brands and a small percentage of Slovak products on store shelves. They didn't even have a real chance to become what is called consumer patriotism. Consumer ethnocentrism also depends on the share of domestic production in comparison with foreign products, and as we have stated, there are sectors where the share of Slovak production is very small or even non-existent, which is why many goods that Slovak consumers have to buy from abroad. However, the Slovak consumer has changed in the last decade. It follows different criteria than years ago. It has been heavily influenced by EU marketing campaigns aimed at consumer environmental literacy, as well as by government authorities aimed at increasing the share of domestic production on store shelves. It can be simply said that in recent years the need for ethnocentrism and environmental literacy of the Slovak consumer has been intensively communicated. Businesses began to present their own environmental strategies as they identified the need to promote sustainability principles. They had to present themselves with environmental values not only because they needed to adapt to current legislation but also because it became clear that not only was the political environment putting pressure on the implementation of environmental strategies, but that this pressure was also evident on the part

of consumers. According to current consumer behavior research, the results of which we have processed, approximately 70% of consumers of all generations are brand-oriented when buying products, both the brand of the company and the brand of the country of origin of the product. And it is with brands that they pay attention to sustainability criteria. Of course, we are aware that not only internal, corporate factors, but also external ones - manifestations of climate change and environmental devastation - affect the need for environmental goals at the level of companies as well as states or supranational institutions.

The environmental values that companies have adopted and the goals that they have incorporated into their strategies are bearing fruit. It turns out that Slovak consumers, and this applies to all generations of consumers, have realized in the last 10 years the need to take environmental criteria into account when buying products and are of the opinion that Slovak products are less harmful to the environment than foreign ones. The promotion of ethnocentrism has borne fruit.

The aim of the study was to analyze those results of representative marketing research that concerned the consumer behavior of different generations of Slovak consumers. However, it turned out that all generations of Slovak consumers also consider environmental criteria when buying products, although, of course, not to the same extent. However, the intergenerational differences are relatively small, so it can be stated, based on the respondents' answers, that without the consumer, it requires environmental strategies and subordinates its purchasing behavior to the principles of sustainability.

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Furniture Marketing and Product Development

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Abstract

The furniture manufacturing industry is facing several challenges that it needs to respond to and deal with. There are sustainability issues that translate into all stages of product research, development, production, and supply chain. Companies need to focus on their CSR activities. Consumers are changing their preferences in favour of green products. Also, their anthropometric characteristics are evolving, which requires a new approach to furniture design, fuelling product innovations and supporting inclusive design. In this paper, we identify the current issues related to furniture marketing and product development and the steps and methods of gaining more insights into these issues in the V4 countries applicable in the future research.

***Keywords*:** *Furniture sector, furniture manufacturing, furniture marketing, product development*

1 Introduction

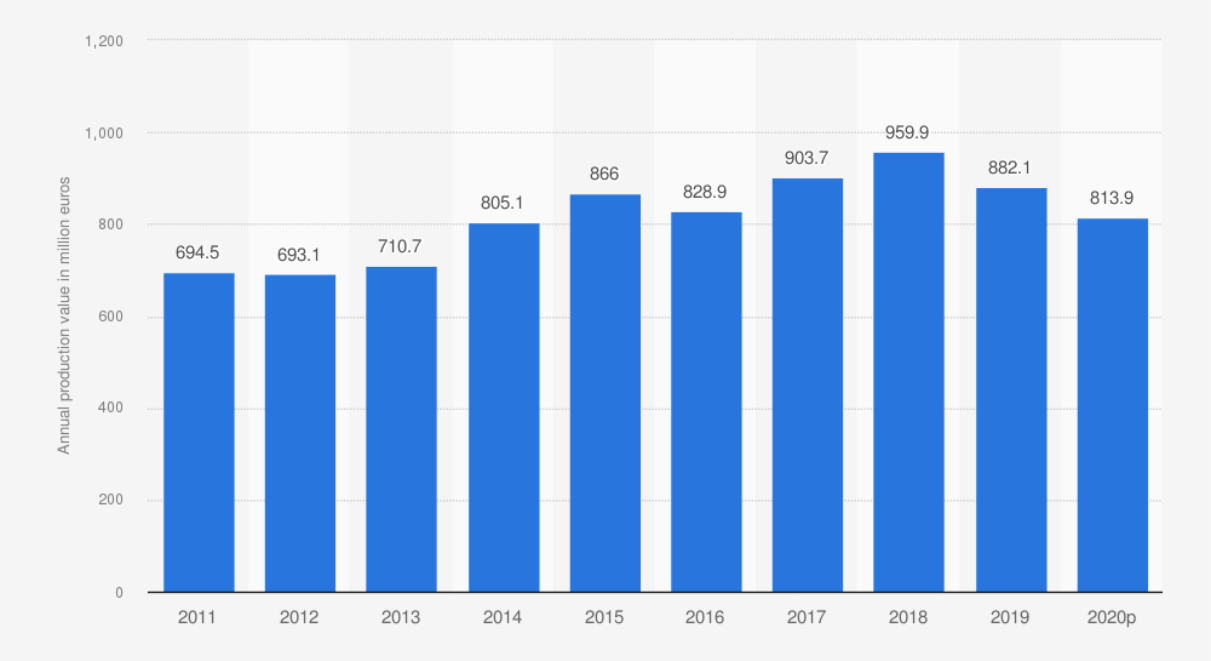
The furniture sector has traditionally been a resource and labour-intensive industry characterised by the co-existence of both local craft-based firms and large volume producers (Chobanova & Popova, 2015). In this respect, the adoption of new technologies can represent a challenge to the manufacturing companies. Digital transformation of all processes within the business represents a significant challenge due to the complexity of its processes. Also, in terms of their ability to sustain the employment levels as more and more activities will be automated and robotised, deploying state-of-the-art computational and manufacturing technologies (Ma et al., 2021). The EU furniture sector is predominantly made of SMEs, with around 85% being micro enterprises (fewer than 10 employees) and another 12% of companies being small (10 to 49). Medium-sized companies account for 2% (Chobanova & Popova, 2015).

2 Furniture manufacturing industry in Slovakia

In Slovakia, the furniture manufacturing industry has been growing steadily since 2011. The turnover of the industry has however peaked in 2018, reaching 959.9 mil. euros and since, has started declining to 882.1 mil. euros in 2019 and 813.9 mil. euros in 2022 (Statista, 2022b). The production value of the furniture manufacturing industry in Slovakia has also been growing since 2011 (694.5 mil. euros) and reached its peak in 2018, with the production value of 959.9 mil. euros. In the two following years it has declined (see Figure 1). The value of production is defined by Eurostat as the amount actually produced by the unit, based on sales, including changes in stocks and the resale of goods and services (Statista, 2022a).

Figure 4

Production value of the furniture manufacturing industry in Slovakia from 2011 to 2020



Source: Statista, 2022a

2.1 Current issues of furniture marketing and product development

In the EU, companies from the furniture sector are facing a number of challenges. In 2008, the Commission Communication on innovative and sustainable forest-based industries identified these as i) growing global competition, ii) the availability of energy and wood supplies, and iii) the role of the sector in limiting climate change (Chobanova & Popova, 2015).

In terms of the current issues in furniture marketing and product development, six main groups have been identified that resonate in the literature: i) Sustainability issues, ii) Corporate social responsibility, iii) Green consumption behaviour, iv) Evolving anthropometric data, v) Product

innovations, vi) Inclusive design. The first three issues all relate to the third challenge named by the EU Commission, mentioned above. In terms of sustainability, the literature focuses on access to sustainable raw materials (Chobanova & Popova, 2015), preparing sustainable development plans (Chobanova & Popova, 2015), waste management practices (Daian & Ozarska, 2009) and evaluating and assessing the sustainability performance of the manufacturing process (Feil et al., 2022; Hartini et al., 2020). Corporate social responsibility is closely tied to the emerging concept of industrial ecology (Yanglei, 2011) that is connected to sustainability. The focus on sustainability issues is driven by increasing consumer interest in green products and sustainability values (Suandi et al., 2022). The average height and weight of both women and men are increasing over time (Sedmak & Hitka, 2004). This represents a challenge for product design and development, fuelling innovations that would cater for oversize and overweight consumers, making the design more inclusive. These changes also need to reflect in furniture marketing (Reh et al., 2019).

2. 2 Digital transformation challenges

Digital transformation refers to improvements in business models, processes, activities, customer experience, and competencies, by taking advantage of the opportunities offered by digital technologies. It is imperative for businesses to create the vision, strategy, process, divisions and culture that can encourage their employees to innovate and experiment with new technologies and business models (Mhlungu et al., 2019). Mancha and Gordon (2020) suggest that all organisations should consider using a digital multi-sided platform business model to remain competitive in the sharing economy. Digital transformation creates numerous challenges but also opportunities for both furniture marketing and product development. Some of them will be identified in the Results part of this paper and represent future research agenda in this field.

3 Method

The main aim of the wider research project is to define dimensional characteristics of selected types of wood-based furniture and wood-based furniture constructions for overweight or tall users in relation to the dimensions of current Slovak population based on anthropocentric measurements and strength analysis of selected models and types of furniture structure and the effect on the selected business processes.

The primary goal for this particular stage of the research was to identify current issues related to furniture marketing and product development and the steps and methods of gaining more insights into these issues in the V4 countries applicable in the future research.

To achieve this objective, the method of systematic literature review has been used to identify relevant literature dealing with the topic of interest. Methods of analysis, synthesis and deduction were applied to determine the key issues related to marketing processes of companies producing and selling wood-based furniture.

Five research methods were identified as appropriate for future research and the following part of this paper describes the parts of the research project where they will be subsequently applied.

4 Results

The following key areas that require further attention were identified and defined as next steps in the research project to gain more insights into these issues and identify new ones: i) Discussing the potential issues with selected furniture manufacturers and resellers; ii) Analysis of consumer online information search, iii) Social Media Marketing: Selected KPIs and content strategy, iv) Content analysis of websites of selected resellers, v) Analysis of in-store customer shopping behaviour.

4.1 Furniture marketing: Key issues

The aim of this part of the future research will be to get insights from relevant executives and marketing managers in relation various aspects of furniture marketing strategy and key issues in relation to successful furniture marketing. Qualitative research will be used with the method of structured in-depth interviews. This part will serve to gain more knowledge about the already identified six key issues that were defined in the Introduction, specifically its part Current issues of furniture marketing and product development. The research team will also try to learn about other important considerations.

4.2 Consumer online information search

Consumer preferences are shifting not only in terms of their preference of green products. Due to the widespread availability of mobile devices and internet, they also have changed the way they search for information in relation to their future purchases. The research team will aim to identify key search terms in relation to identified key issues of furniture marketing, and determine which issues are relevant to consumers. The following methods will be used in this part of the research project: Keyword search, clustering, trends identification. Selected tools will assist the team in reaching their objectives, such as Google Trends, Google Ads Keyword Tool, Ahrefs, SE Ranking keyword tool.

4.3 Social Media Marketing: Selected KPIs and content strategy

This leg of the research project will deal with defining and measuring selected Key Performance Indicators on social media profiles of selected furniture manufacturers and resellers. Content analysis of selected profiles in relation to their content strategy and incorporation of key relevant issues (keywords) in their content will be performed. Content analysis is often referred to as a method on the verge of quantitative and qualitative research.

4.4 Content analysis of websites of selected resellers

Researchers will perform Content analysis of selected websites of furniture manufacturers and resellers. Determining keyword frequencies, keyword clustering and confirmation of relevant topics resonating in their online communication strategy is the next step in the research project. The team will then compare the findings against the identified consumer preferences and search trends. Determining search rankings for relevant keywords and assessing the overall search marketing strategy and performance will be done as part of dealing with this research topic.

4.5 In-store customer shopping behaviour

The following tasks are expected to be dealt with in this part of research: i) Assessing defined parameters of the point of sale and sale personnel in selected retail venues; ii) Observation of the behaviour both of the personnel and customers, iii) Mystery shopping as the method of qualitative/quantitative research, and iv) Detailed analysis of logs and reports to produce meaningful insights and provide recommendations.

5 Discussion

The identified opportunities for further research do not only serve the research team but can be useful for the wider academic community. Thanks to the provided details on partial aims and methods for each of the give areas, researchers from other organisations and other countries can work on these issues, enriching the state of the art with new relevant findings. Thanks to this, new knowledge in the field of furniture marketing and product development can be generated, the research can progress quicker, and collaboration between various organisations can be initiated using the provided research framework.

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Cross-Cultural Segmentation: Hierarchical Clustering Analysis Using Hofstede's Cultural Model

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Abstract

The aim of this paper is to identify specific cultural segments i.e., clusters within the global market, which could be defined from marketers' perspective as a zone of cultural homogeneity. It allows marketers to create and apply uniformed marketing program for each segment separately, using the strengths of localization, while maintaining a reasonable level of global approach i.e., optimized glocalization. The segmentation presented in this paper was conducted using the Hierarchical clustering analysis. As a segmentation variable (bases), the Hofstede's cultural dimensions were applied i.e., power distance, individualism, uncertainty avoidance, masculinity, long-term orientation, and indulgence. Using statistical measures of the loss of information, six segments were created and described. For the description purposes, the bases were applied as the descriptors were left out of this research, creating the universal bases for future research, and allowing future precisions of these findings.

Keywords*: segmentation, hierarchical clustering analysis, culture, Hofstede's cultural model*

1 Introduction

Intercultural marketing is about both localization and globalization: it aims to customize products and marketing strategies to the needs of customers, within the framework of a global strategy. Intercultural marketing seeks to balance intercultural differences between nations, requiring local adaptation of the marketing program, and intercultural equivalences, contributing to the creation of a scope and learning effect. To carry out such a marketing optimization, it is necessary to identify segments of the global market, consisting of countries, in which it is possible to apply a single marketing program. Yet, intercultural marketing does not only focus on geographical and national segmentation criteria, but also considers consumer values, attitudes, preferences, and lifestyles, which it also associates with age, social class, ethnicity, employment, etc. (Usinier, 2009)

There are currently several studies that have used these segmentation criteria to identify segments of the global market, including demographic (Anderson et al., 1999), psychological and value-oriented studies (Boote, 1983), quality of life studies (Peterson et al., 2000), attitudes (Verhage et al., 1989), behavior (Askegaard et al., 1998), customer loyalty (Yavas et al., 1992)

and purchasing situation (Gehrt et al., 2003).

Geographical zones of cultural homogeneity correspond to a large extent with national cultures (Usinier, 2009). One of the studies confirming this statement is that of De Mooij and Keegan (1991), who conducted a comparative analysis of lifestyles in Europe and Asia, which resulted in the definition of multinational target groups. Each of these target groups represents a separate segment, consisting of consumers in several countries.

As part of monitoring and comparing the lifestyle of consumers, there are currently several centers conducting research on these aspects of consumer behavior across cultures. Examples include the Survey Research Group (2022), which monitors cross-border lifestyle changes in Hong Kong, Malaysia, the Philippines, Singapore, Thailand, and Taiwan. In parallel, similar consumer lifestyle research in Europe is being carried out, in the form of an extensive survey, under the auspices of ACE (Anticipating Change in Europe) and the CCA (Center de Communication Avancée, 2022).

Conclusions on global lifestyle convergence have also been supported by gender-based global market segmentation (Tai et al., 1997), which identified changes in consumer lifestyles in Hong Kong, Taiwan, and China e.g., based on women's perceptions and roles, family life, health, and the environment. The research led to the finding that women in China tend to be influenced by Western values and are radically approaching Hong Kong and Taiwanese consumers. Another study demonstrated the usefulness of global gender-based segmentation for Turkish travel agencies (Koc, 2002).

There is no uniformity in intercultural marketing in the methodology of global market segmentation based on socio-cultural factors. Research methods and procedures are often derived from intercultural psychology (Matsumoto et al., 2011). Certain alternative approaches have been provided by other authors (Kale, 1987; Kreutzer, 1988; Souiden, 2002; Hofstede, 1999; Usinier, 2009), which deal directly with the field of intercultural or global marketing. Usinier (2009) also presented a specific methodology in the form of operative mapping of zones of cultural homogeneity, based on cultural as well as marketing criteria associated with the product category. The result of such a matrix should be the identification of the countries within which the product will be marketed, and which fall into one segment as the equivalent of a zone of cultural homogeneity.

This paper presents a hierarchical clustering analysis (segmentation) based on Hofstede's cultural model (Hofstede, 2001), who has carried out extensive research on this issue over several decades. A key concept of his research is national culture, which he understands as the collective programming of the mind that an individual acquires when growing up in a particular

country (Hofstede, 1997).

He was inspired by Inkeles and Levinson (1997) - a study of national culture, in which they distinguished three dimensions of values that have incremental implications for the functioning of society and individuals within societies. These are: the relationship to authority; the self-perception of the individual in terms of the relationship between the individual and society, as well as in terms of the individual understanding of masculinity and femininity; and finally, ways of managing conflicts, including managing aggression and expressing emotions.

Hofstede (2001) conducted his pilot research in IBM, on the sample of 116,000 employees of 66 nationalities in 50 countries, who answered 63 questions reflecting their system of values. Based on their answers, Hofstede derived four dimensions of national culture, for which he subsequently quantified the respective values for each country. These dimensions are: (1) Power Distance (PDI), which deals with the fact that all individuals in societies are not equal – it expresses the attitude of the culture towards these inequalities amongst us. Power Distance is defined as the extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed unequally. (2) Uncertainty Avoidance (UAI) has to do with the way that a society deals with the fact that the future can never be known: should we try to control the future or just let it happen? This ambiguity brings with it anxiety and different cultures have learnt to deal with this anxiety in different ways. The extent to which the members of a culture feel threatened by ambiguous or unknown situations and have created beliefs and institutions that try to avoid these is reflected in the score on Uncertainty Avoidance. (3) Individualism (IDV) - the fundamental issue addressed by this dimension is the degree of interdependence a society maintains among its members. It has to do with whether people´s self-image is defined in terms of "I" or "We". In Individualist societies people are supposed to look after themselves and their direct family only. In Collectivist societies people belong to 'in groups' that take care of them in exchange for loyalty. (4) Masculinity (MAS) - a high score (Masculine) on this dimension indicates that the society will be driven by competition, achievement and success, with success being defined by the winner / best in field – a value system that starts in school and continues throughout organisational life. A low score (Feminine) on the dimension means that the dominant values in society are caring for others and quality of life. A Feminine society is one where quality of life is the sign of success and standing out from the crowd is not admirable. The fundamental issue here is what motivates people, wanting to be the best (Masculine) or liking what you do (Feminine). (5) Long Term Orientation (LTO) - this dimension describes how every society must maintain some links with its own past while dealing with the challenges of the present and

future, and societies prioritize these two existential goals differently. Normative societies. which score low on this dimension, for example, prefer to maintain time-honoured traditions and norms while viewing societal change with suspicion. Those with a culture which scores high, on the other hand, take a more pragmatic approach: they encourage thrift and efforts in modern education to prepare for the future. (6) Indulgence (IND) - one challenge that confronts humanity, now and in the past, is the degree to which small children are socialized. Without socialization we do not become "human". This dimension is defined as the extent to which people try to control their desires and impulses, based on the way they were raised. Relatively weak control is called Indulgence" and relatively strong control is called "Restraint". Cultures can, therefore, be described as Indulgent or Restrained.

An extensive replica of Hofstede's research, entitled Culture in the Cockpit, was conducted by Merrit (2000), who set the following question: Does Hofstede's theory, which is based on research conducted in only one enterprise in the 1970s, currently have a universal validity? Merrit conducted similar research as Hofstede on the sample of 9,417 pilots from 26 airlines in 19 countries. He used the FMAQ questionnaire, which measures 82 items using a five-point Likert scale of pilots' attitudes and values, related to their work and environment. The result of this research was the validation of Hofstede's findings.

In research following Hofstede's theory, an internal differentiation of the individualism-collectivism dimension was achieved. It turned out that individualism is not the same in all the countries, esp. in terms of performance-related values. E.g., a study of three individualistic countries with the same language (USA, Canada, Australia) found that US residents place much higher pressure on performance compared to the other two countries (Feather, 1994). However, the differences between individualistic countries are even more pronounced when looking at the Scandinavian countries, which, as individualistic countries, share certain features with the US, but collectivistic elements are also included here. Because of this finding, researchers started to distinguish between the vertical and horizontal dimensions of individualism - collectivism, based on the individual's view of their own position in relation to others. While in horizontally oriented societies individuals tend to perceive the position of people equally, individuals are perceived as different from other members of society based on the social hierarchy, thus accepting social inequalities (Triandis, 1995).

Hofstede's approach to identifying and comparing cultural values has been widely criticized (McSweeney, 2002; Gerhart et al., 2005; Nakata, 2009), but it can still be considered relevant and evidenced by its relevance in subsequent research and studies (Steenkamp et al., 2002;

Hofstede, 1999; Wedel et al., 2000).

2 Method

Broadly stated, there are two approaches to segmentation (Wedel & Kamakura, 2000), namely, a priori methods and post-hoc methods. In a priori methods, an analyst uses domain knowledge to segment the population into different groups. We will not be focusing on these types of approaches. In post-hoc methods, the analyst relies on data analysis to identify groupings. There are two broad categories of post-hoc methods: (1) Traditional methods, which are based on using a distance or a similarity metric to determine how far or near a customer is from other customers in the market, and (2) Newer probability-based, such as latent cluster analysis, which can help identify groupings in the population from which a sample of respondents has been selected for the segmentation analysis.

Traditional cluster analysis refers to a range of techniques that are available to identify structure (groupings) within complex and multidimensional data, as are typically available in segmentation studies. There are two basic classes of methods: (1) Hierarchical methods, in which we build up or break down the data row by row, and (2) Partitioning methods, in which we break the data into a prespecified number of groups and then reallocate or swap data to improve some measure of effectiveness. The software that was used to conduct the analysis (enginius) includes one method of each type i.e., Ward's (1963) (hierarchical) and K-means (partitioning), which are among the most popular segmentation methods used in practice.

Hierarchical methods produce "trees," formally called dendograms. In Ward's method, we form clusters based on the change in the error sum of squares associated with joining any pair of clusters. Using Ward's (1963) procedure, we form clusters based on minimizing the loss of information associated with grouping individuals into clusters. We measure loss of information by summing the squared deviations of every observation from the mean of the cluster to which it is assigned. Using Ward's method, we assign clusters in an order that minimizes the error sum of squares (ESS) from among all possible assignments, where ESS is defined as

$$ESS = \sum_{j=1}^{k} \left(\sum_{i=1}^{n_j} X_{ij}^2 - \frac{1}{n_j} \left(\sum_{i=1}^{n_j} X_{ij} \right)^2 \right),$$

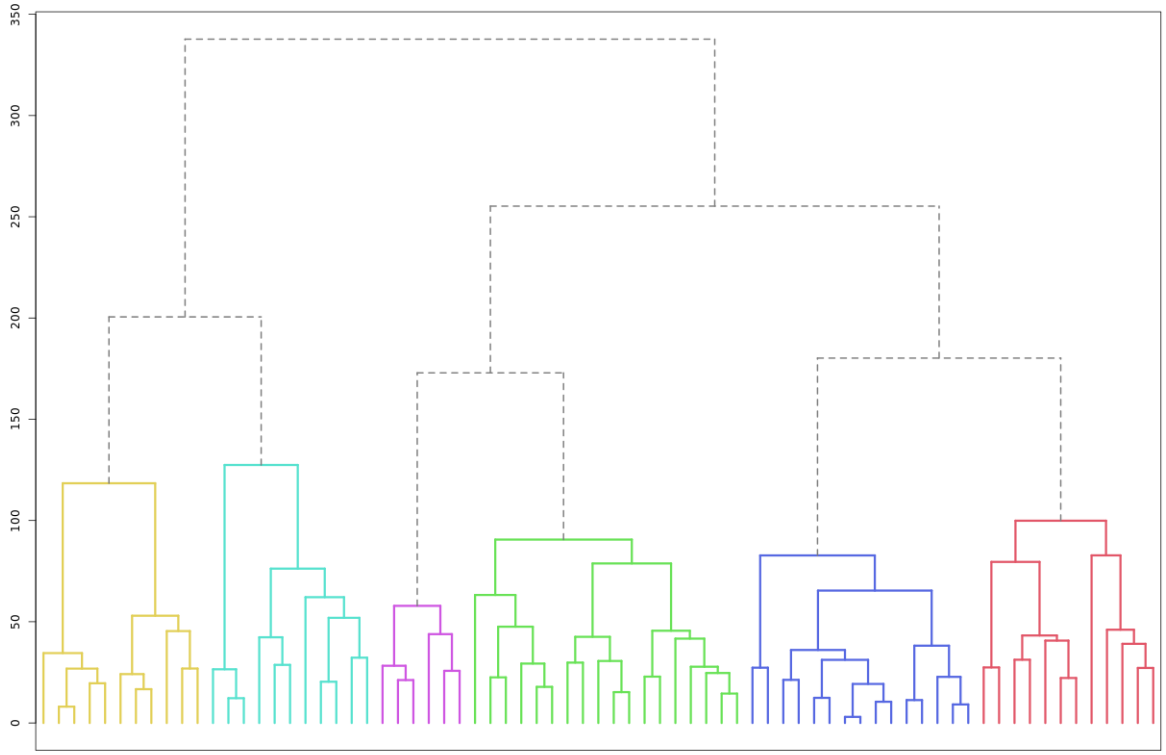
where X_{ij} is the intent to purchase score for the *i*th individual in the *j*th cluster; k is the number of clusters at each stage; and n_j is the number of individuals in the *j*th cluster.

The number of clusters (K) to use is usually based on managerial judgment, but certain indices can also help us to determine an appropriate number of clusters. In hierarchical clustering, we use the distances at which clusters are combined as a criterion and select the solution (number of clusters) for which distances between clusters are reasonably large. As we increase the number of clusters, we should be looking for a big improvement in our criterion followed by a smaller improvement, as an indication that there is little benefit to producing finer clusters.
Once we've identified the appropriate number of segments and countries which belong to each segment, we begin the process of profiling the members of those segments. In cluster profiling, we attempt to create a picture of the members of the clusters using all the variables of interest. In this paper, we are not presenting the outcomes of discriminant analysis using descriptors i.e., for the profiling purposes, we are using the clustering variables (the bases).

3 Results

The ideal number of segments is a function of statistical fit (what the data say), managerial relevance (what makes the most sense from a managerial point of view), and targetability (can the segments be easily targeted). When the three criteria do not perfectly converge, selecting the right number of segments becomes a judgment call. Using statistical criteria exclusively (see scree plot analysis below), we have retained 6 segments. The segmentation method relies on the hierarchical clustering approach. This approach generates a dendrogram that we display next.
The dendrogram represents the grouping process of observations into clusters. It is a tree diagram to illustrate the arrangement of clusters produced by hierarchical clustering, and how the observations are incrementally clustered together. The chart reads from bottom (all initial observations are separated) to top (all observations are clustered into one unique segment). The height represents the distance between the two groups of observations being merged at each step. If two very distant groups are being merged, this will create a 'jump' in the dendrogram, indicating that it might be wise to stop the clustering process before.

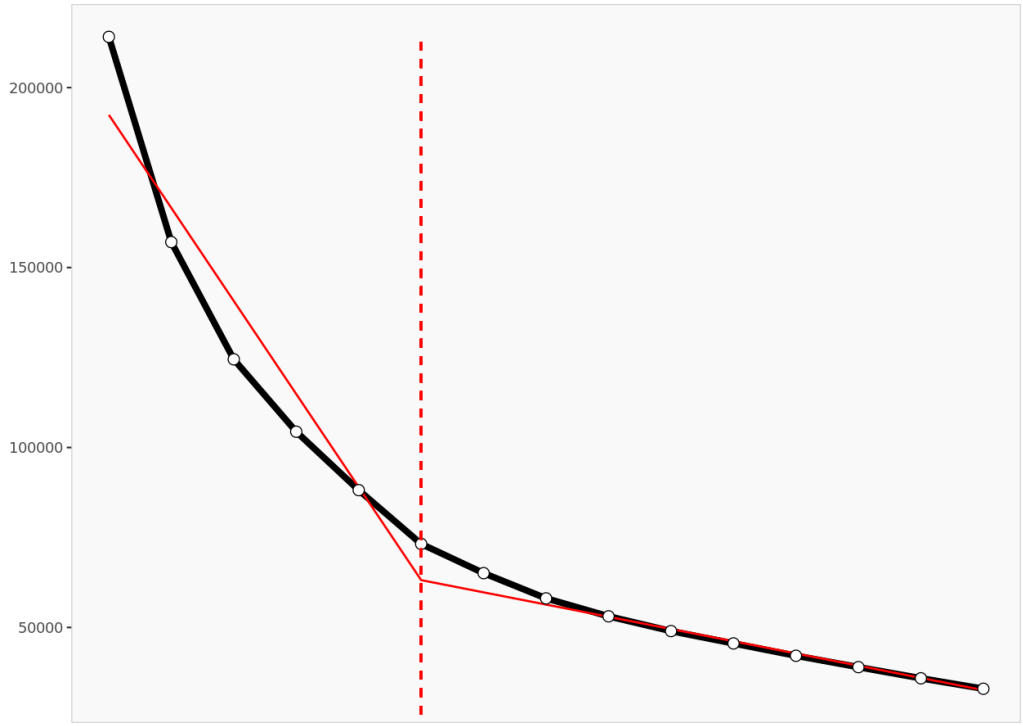
Figure 1
Dendogram



The scree plot compares the sum of squared error (SSE) for each cluster solution. A good cluster solution might be when the SSE slows dramatically, creating an 'elbow'. Such elbow does not always exist. From a statistical point of view, the SSE reported in the screeplot is computed as the sum of squared error between each observation and its cluster centroid (or center), summed over all the observations.

The screeplot displays, for each cluster solution, a measure of within-cluster heterogeneity. If clusters group observations that are widely different (which will happen if the number of clusters is too small to capture the variability in the data), the value will be high. A good cluster solution might be where the screeplot displays an 'elbow', that is, where increasing the number of clusters beyond a certain point does not dramatically decreases within-cluster heterogeneity. The measure displayed in the screeplot is related, but not equivalent, to the distance reported in the dendrogram.

Figure 2
Screeplot



The following table presents the size of the population (the number of countries being included in the analysis) and its structure i.e., the size of each segment being created using hierarchical clustering approach.

Table 1
Segment size

Segment size	Population	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6
Size	73	12	18	15	11	11	6
Relative size	100%	16%	25%	21%	15%	15%	8%

The following table presents the description of the population as an average value per the whole group of countries being included in the analysis, and the description of each segment being created using the hierarchical clustering approach. These average values are calculated as averages of each segmentation variable, overall for each segment (centroid). Segmentation variables that are statistically different from the rest of the population are highlighted in red (lower) or green (higher).

Table 2

Segment description

Segment description	Population	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6
Power Distance	64,6	80,8	66,3	82,9	32,3	43,7	79,5
Individualism	41,1	25,0	34,6	24,9	76,9	64,6	24,5
Masculinity	48,4	59,3	44,8	41,5	34,4	56,9	64,7
Uncertainty Avoidance	68,4	44,3	81,5	87,6	44,8	71,8	66,3
Long Term Orientation	49,5	57,0	30,4	72,4	38,5	71,8	13,5
Indulgence	42,9	26,8	41,8	26,1	67,8	35,8	88,0

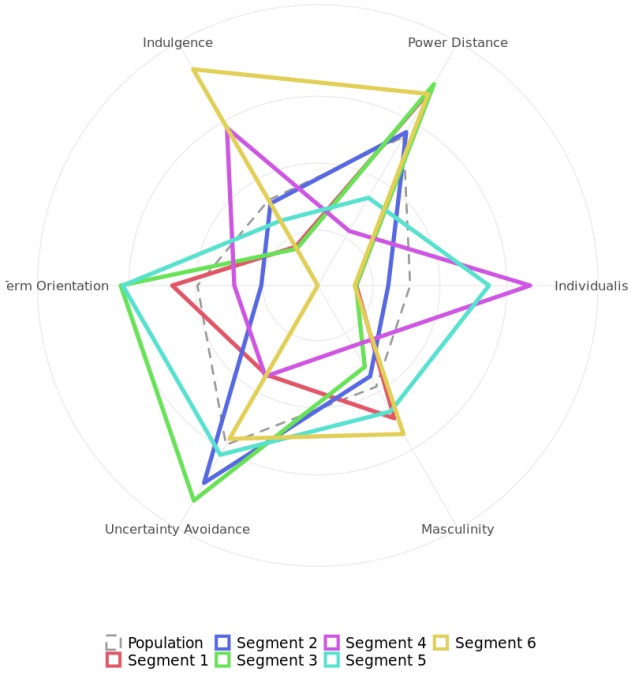
Segment differences per segment were further assessed. Cell colours indicate to what extent a segment is statistically different from the rest of the population on each segmentation variable.

Figure 3

Statistical differences in segment profiles

The following chart is comparing the averages of the segmentation variables across all segments.

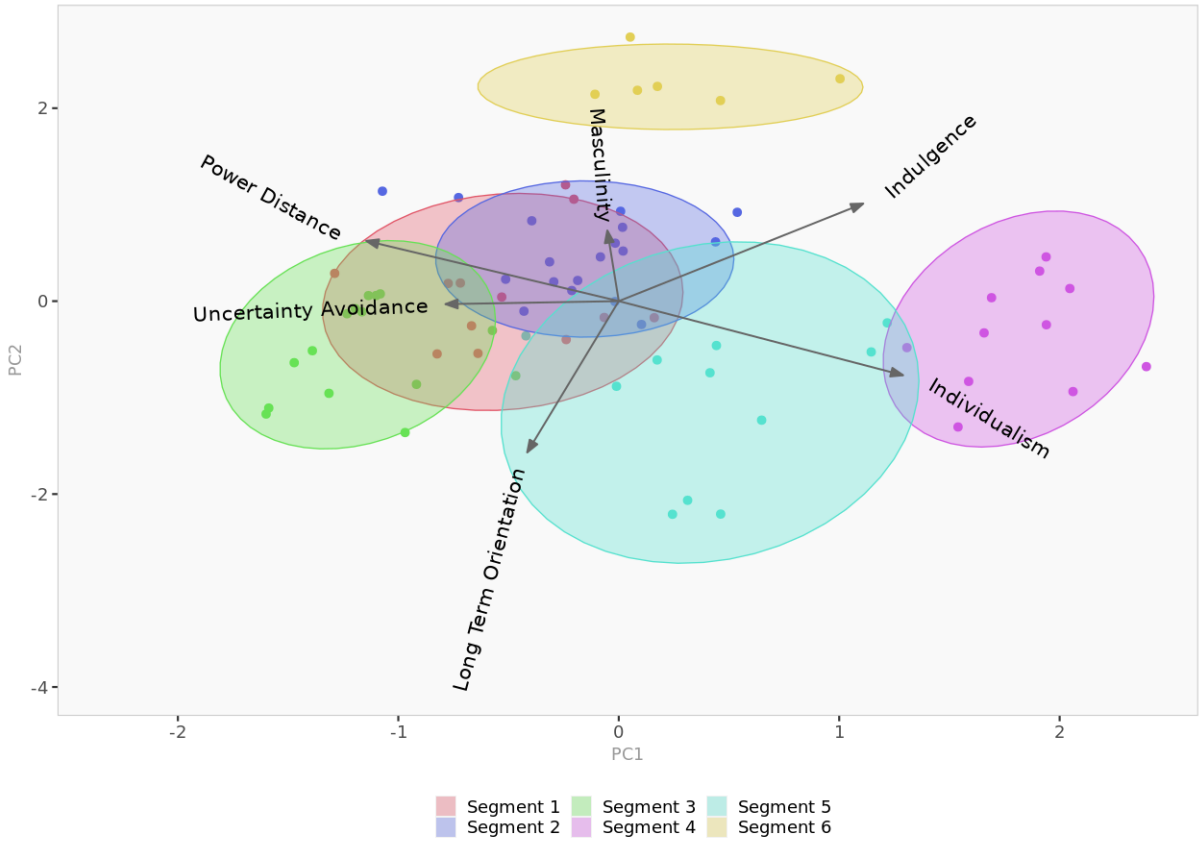
Figure 4
Spider chart



The chart below is a graphical representation of the various segments, segment members, and segmentation variables. It is obtained by plotting the first two dimensions of a principal component analysis performed on the (standardized) segmentation data, on top of which segment information has been overlaid. Because only the first two dimensions of the PCA are displayed, and these two dimensions capture only 59.6% of the variance in the data, some differences between segments might not appear here. Note that segmentation variables with no variance, if any, have been excluded. Two clusters who appear to overlap in the first two dimensions might be distinct on other dimensions. Consequently, this chart is a useful guide, especially to see which segmentation variables are correlated, but may be misleading if used to select the optimal number of segments.

Figure 4

Spatial representation of segments and segmentation variables using principal component analysis



The following table presents the segment to which each country (member of the population) belongs to.

Table 3
Segment membership

Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6
Albania	Argentina	Armenia	Australia	Austria	Colombia
Bangladesh	Bolivia	Azerbaijan	Canada	Czech Republic	Libya
China	Brazil	Belarus	Denmark	Estonia	Mexico
Egypt	Chile	Bosnia and Herzegovina	Finland	France	Nigeria
Hong Kong	Georgia	Bulgaria	Iceland	Germany	Puerto Rico
Indonesia	Greece	Croatia	Netherlands	Hungary	Venezuela
Malaysia	Iran	Kazakhstan	New Zealand	Italy	
Pakistan	Iraq	Montenegro	Norway	Japan	
Philippines	Jordan	North Macedonia	Sweden	Latvia	
Singapore	Lebanon	Romania	United Kingdom	Lithuania	
Slovakia	Morocco	Russian Federation	United States	Switzerland	
Vietnam	Peru	Serbia			
	Poland	South Korea			
	Portugal	Taiwan			
	Slovenia	Ukraine			
	Spain				
	Thailand				
	Turkey				

4 Discussion

Intercultural marketing and socio-cultural segmentation of the global market is a long-term subject of research by the authors of this paper (Štetka, 2013). Several relevant reasons have so far been identified to justify the implementation of Hofstede's research findings in global markets (Štetka, 2012). The authors also dealt with the definition of value-based factors influencing consumers' decision making, considering Hofstede's cultural dimensions as the base (Kintler & Štetka, 2013). Subsequent research on profiling the individual segments was conducted, e.g., individualistic versus collectivist segment (Štetka, 2014a), or a segment characterized by a high and low power distance index (Štetka, 2014b). A special field of the authors' previous research was the impact of Hofste's cultural dimensions on the diffusion of product innovations (Štetka, 2015; Štetka et al., 2016), which resulted in the identification of European innovation-diffusion segments (Štetka et al., 2015). These research results followed the identification of diffusion factors of product innovations (Štetka et al., 2019), identified consumer reference framework across cultures (Štetka & Majtán, 2014), and the subsequent definition of the information mechanism (Štetka, et al., 2015a; Štetka & Rybárová, 2014; Štetka & Braunová, 2014) and a normative mechanism (Štetka et al., 2015b) and its impact on the diffusion of innovations.

However, in these cases authors worked with separate dimensions of Hofstede's cultural model, which were specially profiled. In selected cases, these dimensions were combined on a logical basis, but without further statistical analysis. The research results presented in this paper therefore represent a significant shift for the future profiling of the segments identified here, using descriptors as discriminatory variables. The partial research results presented in this paper therefore represent the basis for future research in the field of socio-cultural segmentation of the global market.

5 Conclusion

The aim of this paper was to identify specific cultural segments i.e., clusters within the global market, which could be defined from marketers' perspective as a zone of cultural homogeneity. It allows marketers to create and apply uniformed marketing program for each segment - cluster of countries but not for each country separately, using the strengths of localization, while maintaining a reasonable level of global approach i.e., optimized glocalization. The segmentation presented in this paper was conducted using the Hierarchical clustering analysis and further attributed methods precising obtained results. As a segmentation variable (bases), the Hofstede's cultural dimensions were applied i.e., power distance, individualism, uncertainty avoidance, masculinity, long-term orientation, and indulgence. Using statistical measures of the loss of information, six segments were created and described. For the description purposes, the bases were applied as the descriptors were left out of this research, creating the universal bases for future research, and allowing future precisions of these findings.

Intercultural marketing and socio-cultural segmentation of the global market is a long-term subject of research by the authors of this paper. However, in their previous research, authors worked with separate dimensions of Hofstede's cultural model, which were specially profiled. In selected cases, these dimensions were combined on a logical basis, but without further statistical analysis. The research results presented in this paper therefore represent a significant shift for the future profiling of the segments identified here, using descriptors as discriminatory variables. The partial research results presented in this paper represent the basis for future research in the field of socio-cultural segmentation of the global market and further applications.

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Sustainability of family businesses during a pandemic COVID-19

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Abstract

Family business is the most ubiquitous form of business organization in any world economy. Behavior of family businesses is to some extent different than other types of business. The key problem and factor of family businesses is sustainability. Family businesses have many specific features -family firms tend to be more stable, accountable, and trustable on the one hand, but on the other hand, they must combine private and business life and deal with succession issues. Research on the sustainability of family businesses is relatively new, and there are three aspects - sustainability in this type of business has been defined as those concerns related to continuity, perseverance, the second aspect includes actions related to the transparency and values of the company, internal audits, respect for the environment, relationships with both suppliers and customers or consumers, and interaction with the community, all focused on strengthening the viability of the company and the third view focuses on financial stability and sustainable financial performance. We focused on three models – Altman Z-score, IN05 and Binkert´s model a analysed period before and after outbreak COVID-19 pandemic. We monitored how COVID-19 pandemic influenced financial stability of family businesses in selected sector – construction.

Keywords*: sustainability, family business, financial health, COVID-19.*

1 Introduction

In general, family businesses are important part in any world economy, with extensive experience on the market, more stability, business heritage from generation to generation, and real economic contributions. In Europe, this unique category plays a vital role for the economy: Family businesses account for a 40 -50 % of all jobs of European private employment. (European Family Businesses, 2022).

Family-owned enterprises are becoming more and more successful on the market due to their exceptional flexibility, high level of commitment of family members participating in the business, and the ability to meet the diversified needs of customers. These types of businesses have a significant economic impact, but not enough attention has been addressed to them (Mura et al, 2021). Despite the absence of a legal definition of the term “family business” in Slovak

republic, the most cited is definition of European Commission: A firm, of any size, is a family business, if:

- The majority of decision-making rights are in the possession of the natural person(s) who established the firm, or in the possession of the natural person(s) who has/have acquired the share capital of the firm, or in the possession of their spouses, parents, child or children's direct heirs.
- The majority of decision-making rights are indirect or direct.
- At least one representative of the family or kin is formally involved in the governance of the firm.
- Listed companies meet the definition of family enterprise if the person who established or acquired the firm (share capital) or their families or descendants possess 25% of the decision-making rights mandated by their share capital.

One of the key factor and specific aspect of family businesses is sustainability. The first view of concept of sustainability in family businesses has often been associated with the longevity of family businesses, although there are only a few specific studies that combine the two (Antheaume et al., 2013). Firms' longevity has been analysed under different perspectives, mainly to conceptually identify the key factors and common organizational features of long-standing firms. Studies show that only 30% of family businesses survive when passed to the second generation and this rate drops to 10-15% when the business passes to the third generation (SBA, 2018). Many researchers strive to identify new aspects, which are crucial for sustainability, such as innovativeness or a risk-taking attitude. The study by Marques et al. (2020) structured and analysed determinants of family business growth using a fuzzy cognitive mapping technique and system dynamic approach. The authors observed a positive impact on the creation of new business areas and ventures based on new technologies. Urbaníková et al. (2020) found out, that the most common types of innovation are product and process innovations, and medium-sized family businesses introduce more types of innovations than small family businesses. One of the aspects is generational change in the management structures of family businesses.

Although this topic has a very long history, there is still an ongoing discussion about what is beneficial for the sustainability of family businesses. Many recently published papers strive to

identify new aspects, which are crucial for sustainability, such as innovativeness or a risk-taking attitude. Some of them result in the claim that family businesses are very different among themselves so it cannot be easily measured as to whether it is crucially beneficial or not (Chua et al., 2012; Vollero et al., 2019). The goal is to propose a way to create a sustainable value that lasts for generations.

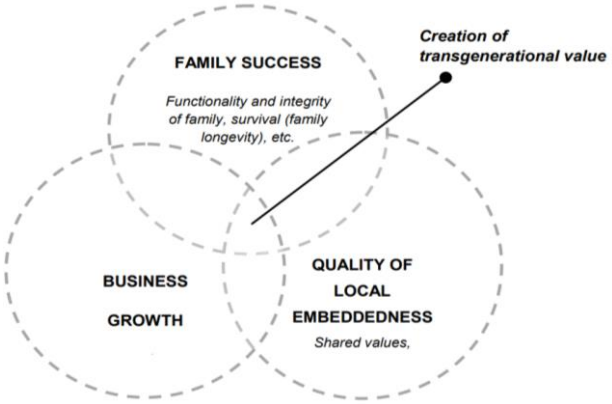
The literature indicates that sustainability practices may be particularly important to family-owned and -managed businesses due to various factors, most prominently the inclination to pass the business to the next generation and the company's long-term business orientation (Le Breton & Miller, 2006). The sustainability of family firms is nurtured by the desire of entrepreneurs to pass on a healthy firm to future generations. This leads to decisions aimed at ensuring the permanence of the company and, for the most part, translates into firm success (Herrera & de las Heras-Rosas, 2020). Engaging in pro-sustainability actions can help family businesses achieve and maintain a positive reputation (Gómez-Mejía et al., 2007) and, more broadly, protect their socio-emotional wealth (SEW), which is connected to non-financial goals and emotional aspects, including intergenerational firm survival, social embeddedness and family control (Cruz et al., 2014).

Some researchers result in the claim that family businesses are very different among themselves so it cannot be easily measured as to whether it is crucially beneficial or not (Vollero et al., 2019). The meaning of the concept of sustainability for family businesses is about solving the problems faced at the business scale and the successful realization of the management transfer to the next generation. The goal is to propose a way to create a sustainable value that lasts for generations. Vollero et al. (2019) created model of transgenerational value, i.e. the sustainability of the family business, is therefore likely to be a combination of three systems' outcomes:

- Business growth, in terms of business longevity, the firm's performance, its ability to innovate, etc.;
- Family success, i.e. the family's cohesion and functionality, its survival as an enterprising family (family business' longevity), family wealth, etc.;
- Quality of local embeddedness (shared community values, social ties, etc.)

Figure 5

Crration of transgenerational value in family businesses



Source: (Vollero, A., Siano, A., & Della Volpe, M.., 2019)

Transgenerational value therefore becomes the result of both the entrepreneurial ability of the family to transfer value to future generations of the family and the ability to ensure the balancing of three systems' objectives, i.e. family functionality, the growth of the business and positive impact on local communities, e.g. the ability of the organization to preserve the wealth of the territory in which the family firm was founded and grew (Vollero & De Falco, 2015).

The second point of view is the growing discussion regarding the potential of family firms to embrace practices of corporate sustainability – the tendency to behave in economically, socially, and environmentally responsible ways in a manner that benefits all stakeholders and the community at large (Le Breton–Miller & Miller, 2006). Sustainability practices as those that work towards the longer term benefit of all of an organization's stakeholders – the broader community included. Within the extant research, several internal factors of family business sustainability have been studied, including long-term orientation, corporate governance, family involvement in ownership and management, values and educational background, relationship with stakeholders, community commitment, reputation and firm size (Broccardo et al, 2019).

Table 1

Positive and negative relationships between sustainability and family business and moderating factors

Positive relationships between sustainability and family business	*The dark side of family firm sustainability*	*Moderating factors*
Stewardship and long-term orientation	Conflict	family background as related to values, parenting and education
Family values and reputation	Socioemotional restrictions	firm governance as revealed by ownership structure and control, executive management, and board composition
Agency costs	Owner–owner agency costs	the environment of the firm as reflected by demographics, institutional context, and techno-economic conditions
		the nature of the organization – its strategy, structure and external ties.

Soruce: (Le-Breton Miller & Miller, 2006).

Domańská et al. (2022) examined Polish family businesses and they found out that family businesses represent divergent levels of implementation of sustainable development solutions and actions. By considering 30 detailed aspects of social, environmental and economic pillars of sustainable development, participating family businesses were divided into three separate groups sustainable development laggards“, “non-formal sustainable development followers” and „sustainable development trailblazers”. Zhu & Lu (2020) focused on corporate environmental responsibility (CER) of family businesses and results show that family ownership is negatively related to CER investments, which suggests that private family firms with tight ownership control are less likely to spend on CER when compared to firms with less concentrated ownership structure. Results of research also show that when venture capital investments come in from developed markets, the aforementioned negative relationship is reversed.

The third point of view is connected with financial health of businesses and financial strength for family businesses. An effective warning system is crucial for the prediction of the financial situation in corporate governance (Pavlicko et al., 2020). Family businesses have to face the same problems as the non-family businesses. But there are some specific characteristics in context of financial performance and risk of financial distress. Many authors (Anderson and Reeb, 2003) have revealed that family businesses perform better than others. The reason is the involvement family members in management of the business and risk aversion of family members. The earliest researchers were Beaver and Altman and their models are one of the most cited in literature. Their models are based on calculation of financial ratios from financial

statements. These ratios can be used to predict financial distress of company or bankruptcy. Altman considered simultaneous impact of several indicators on the financial condition of the company by combining them into a single measure (Z-score). He used the technique of the multivariate linear discriminant analysis to achieve this purpose (Prusak, 2018). Later, some researchers created models based on logit and probit analysis – Ohlson O-Score was derived from a study of more than 2000 companies (Rahman et al., 2021) (used set of nine accounting ratios) or Zmijewski (three-variable distress prediction model) (Ashraf et al., 2019).

2 Methods

The data was obtained from Finstat database. This database contains financial data about all subjects with a registered ID in the Slovak Republic. We analysed financial situation of family businesses operating in the construction sector. We analysed a sample of 50 family businesses in Slovakia. The analysis carried out was based on models predicting financial distress. When selecting the bankruptcy risk models, the aim was to select those which can be applied to family businesses and do not make restrictions concerning publicly quoted shares or the availability of market capitalization. Two very popular models were selected: Altman Z-score and the IN05 Test. For analysis we used also Binkert model. The Altman Z-score (multiple discriminant function) is a linear combination of the following five financial ratios:

Table 2

Altman Z-score indicators

Prediction model and formula	Variables	The classification of the resulting values
Altman Z-score Z = 0,717X1 + 0,847X2 + 3,107X3 + 0,420X4 + 0,998X5	X1 = working capital/total assets X2 = retained earnings/total assets X3 = earnings before interest and taxes/ total assets X4 = equity/liabilities X5 = sales/total assets	Z' > 2.9 “Safe” Zone 1.23 < Z' < 2. 9 “Grey” Zone Z' < 1.23 “Distress” Zone

Source: own processing according to Altman (1968)

The IN05 model, on the other hand, can be written in the following form (Neumaier & Neumaierová, 2005):

Table 3

Index IN05 indicators

Prediction model and formula	Variables	The classification of the resulting values
IN05 IN05 = 0,13Y1 + 0,04Y2 + 3,97Y3 + 0,21Y4 + 0,09Y5	Y1 = ratio of total assets to total liabilities Y2 = ratio of earnings before interest and taxes to interest Y3 = the ratio of earnings before interest and taxes to total assets Y4 = ratio of operating revenue to total assets Y5 = ratio of current assets to current liabilities	IN05 < 0.9 company does not create value for its owners or may even destroy value IN05 > 1.6 the company creates new value for its owners 1.6 > IN05 > 0.9 the results are inconclusive (a grey area)

Source: Neumaier & Neumaierová, 2005

Binkert and Zallay constructed model for business companies:

Table 4

Binkert model indicators

Prediction model and formula	Variables	The classification of the resulting values
Binkert B = 0,18Z1 + 0,147Z2 + 0,237Z3 + 0,377Z4 + 0,514Z5 + 0,505Z6 + 0,271Z7 + 0,207Z8	Z1 = ratio of current assets to current liabilities Z2 = ratio of equity to non-current assets Z3 = ratio of net profit for the accounting period after tax to revenues Z4 = ratio of revenues to added value Z5 = ratio of total assets 1 to total assets 0 Z6 = ratio of equity 1 to equity 0 Z7 = ratio of liabilities 1 to liabilities 0 Z8 = ratio of net profit for the accounting period after tax to (equity + non-current liabilities + funds)	B > 4,35 Safe zone -4,35 >B > 4,35 Grey zone -4,35 > B Distress zone

Source: Neumaier & Neumaierová, 2005

Following the working definition of family businesses referred to earlier in this paper, the criteria defined in Act no. 431/2002 Coll. on Accounting were examined for each business. The categories of companies by size were:

1. Micro accounting unit (total assets did not exceed €4 000,000 net turnover did not exceed €700,000, average number of employees did not exceed 10)
2. Small accounting unit (total sum of assets exceeded €350,000 but did not exceed

€4,000,000, net turnover exceeded €700,000 but did not exceed €8,000,000, the average calculated number of employees exceeded 10 but did not exceed 50)

3. Large accounting unit (total assets exceeded €4 000,000 net turnover exceeded €8 000,000, average number of employees exceed 50)

Over the 2010-2018 period, the turnover of the Slovak broad construction sector grew by 40.0%, reaching EUR 20.5 billion. In 2020, it declined to EUR 18.4 billion, a decrease of 11.6% over the previous year (while this represented an increase of 25.7% over the 2010 level). This decline reflects the impact of the COVID-19 pandemic on the sector. We tried to evaluated financial health of family businesses in this sector before year 2020 (before COVID-19) and after to find out how COVID-19 pandemic affected this type of businesses and their health.

3 Results

Three models that are tested will be listed here consecutively. For each model, the total data sample is presented first, followed by the companies grouped according to size. Tables 5 shows the bankruptcy test results for Altman Z-scores. In case of the IN05 model, three out of the five elements of the index refer directly to earnings generating capability of the companies. The overall results are displayed in Table 6. The last Table 7 shows results of Binkert´s model. According to the Altman Z score and IN05 tests, the distribution of the overall family businesses in construction sector by size is quite similar. In case of Binkert´s model results of family businesses are in the „grey zone."

Table 5

Altman Z-scores of family businesses in construction grouped by size

Category of companies	Altman Z-score							
	Z' > 2.9		**1.23 < Z' < 2. 9**		**Z' < 1.23**		**All**	
Reference year :2019								
micro	13,0	61,90%	8,0	40,00%	9,0	100,00%	30,0	60,00%
small	8,0	38,10%	11,0	55,00%	0,0	0,00%	19,0	38,00%
large	0,0	0,00%	1,0	5,00%	0,0	0,00%	1,0	2,00%
Total	**21,0**	**100,00%**	**20,0**	**100,00%**	**9,0**	**100,00%**	**50,0**	**100,00%**
Reference year :2020								
micro	12,0	60,00%	9,0	45,00%	9,0	90,00%	30,0	60,00%
small	8,0	40,00%	10,0	50,00%	1,0	10,00%	19,0	38,00%
large	0,0	0,00%	1,0	5,00%	0,0	0,00%	1,0	2,00%
Total	**20,0**	**100,00%**	**20,0**	**100,00%**	**10,0**	**100,00%**	**50,0**	**100,00%**
Reference year :2021								
micro	12,0	63,16%	8,0	42,11%	10,0	83,33%	30,0	60,00%

small	7,0	36,84%	10,0	52,63%	2,0	16,67%	19,0	38,00%
large	0,0	0,00%	1,0	5,26%	0,0	0,00%	1,0	2,00%
Total	**19,0**	**100,00%**	**19,0**	**100,00%**	**12,0**	**100,00%**	**50,0**	**100,00%**

Table 6

IN05 of family businesses in construction grouped by size

Category of companies	IN 05							
	IN05 > 1.6		**1.6 > IN05 > 0.9**		**IN05 < 0.9**		**All**	
Reference year :2019								
micro	10,0	52,63%	4,0	44,44%	16,0	72,73%	30,0	60,00%
small	8,0	42,11%	5,0	55,56%	6,0	27,27%	19,0	38,00%
large	1,0	5,26%	0,0	0,00%	0,0	0,00%	1,0	2,00%
Total	**19,0**	**100,00%**	**9,0**	**100,00%**	**22,0**	**100,00%**	**50,0**	**100,00%**
Reference year :2020								
micro	14,0	63,64%	7,0	70,00%	9,0	50,00%	30,0	60,00%
small	7,0	31,82%	3,0	30,00%	9,0	50,00%	19,0	38,00%
large	1,0	4,55%	0,0	0,00%	0,0	0,00%	1,0	2,00%
Total	**22,0**	**100,00%**	**10,0**	**100,00%**	**18,0**	**100,00%**	**50,0**	**100,00%**
Reference year :2021								
micro	8,0	53,33%	7,0	53,85%	15,0	68,18%	30,0	60,00%
small	6,0	40,00%	6,0	46,15%	7,0	31,82%	19,0	38,00%
large	1,0	6,67%	0,0	0,00%	0,0	0,00%	1,0	2,00%
Total	**15,0**	**100,00%**	**13,0**	**100,00%**	**22,0**	**100,00%**	**50,0**	**100,00%**

Table 7

Binkert´s model of family businesses in construction grouped by size

Category of companies	Binkert´s model							
	B > 4,35		**-4,35 >B > 4,35**		**B < -4,35**		**All**	
Reference year :2019								
micro	4,0	44,44%	24,0	61,54%	1,0	100,00%	29,0	59,18%
small	4,0	44,44%	15,0	38,46%	0,0	0,00%	19,0	38,78%
large	1,0	11,11%	0,0	0,00%	0,0	0,00%	1,0	2,04%
Total	**9,0**	**100,00%**	**39,0**	**100,00%**	**1,0**	**100,00%**	**49,0**	**100,00%**
Reference year :2020								
micro	8,0	66,67%	20,0	55,56%	2,0	100,00%	30,0	60,00%
small	3,0	25,00%	16,0	44,44%	0,0	0,00%	19,0	38,00%
large	1,0	8,33%	0,0	0,00%	0,0	0,00%	1,0	2,00%
Total	**12,0**	**100,00%**	**36,0**	**100,00%**	**2,0**	**100,00%**	**50,0**	**100,00%**
Reference year :2021								
micro	4,0	40,00%	25,0	64,10%	1,0	0,00%	30,0	60,00%
small	5,0	50,00%	14,0	35,90%	0,0	0,00%	19,0	38,00%

large	1,0	10,00%	0,0	0,00%	0,0	0,00%	1,0	2,00%
Total	**10,0**	**100,00%**	**39,0**	**100,00%**	**1,0**	**0,00%**	**50,0**	**100,00%**

*only 49 family businesses in 2019 were evaluated

We could conclude that, although the first wave of the COVID-19 pandemic caused some forms of restrictions or increased costs to all business entities throughout Slovakia, not all industries touched as well. Some sectors were only indirectly affected and were not directly affected none of the restrictions (eg industry, construction, agriculture).

4 Discussion

The revised Altman Z-score indicates low bankruptcy probabilities: about 20 per cent of companies are on the verge of bankruptcy, and more than 40 per cent of them are projected to survive with stable financials. Tests are similiar for every reference year. As expected, micro companies perform worse than than small companies. According to Altman Z-score, family businesses perform good with predictability of survival. Accordingly, their ability to adapt to crisis financial constraints (the retreat of bank credits giving ground for the accounts suppliers' funds) is more promising. In today's business environment, the cash-flow based indices have proved to be more reliable for measuring financial stability and added values. In this respect, IN05 predicted better chances for medium-sized family businesses in generating cash flows.

The results of these two model are very similar. We can state that large differences did not occur even before and after the outbreak of the COVID-19 pandemic, as we expected. Results of the third model (Binkert´s model) are different – more family businesses were classified like companies with uncertain future and financial performance.

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Priorities of Ukrainian Green economy integration into European environmental policy in the context of Association Agreement

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Abstract

The present paper investigates opportunities and threats of Ukrainian Green economy integration into European Green Deal policy initiatives in the context of Association Agreement between Ukraine and EU. As environmental aspects are the key part of socio-economic convergence between Ukraine and EU, European Green Deal will be a determinant of Ukrainian Green economy integration into European one. The paper presents research of environmental aspects in Association Agreement as well as Ukrainian Ukraine's involvement in the process of achieving climate-neutral Europe. The set of mechanisms is proposed to improve the implementation of the Association Agreement under the current conditions. Paper also highlights priorities of Ukrainian Green economy integration into European environmental policy.

Keywords: *Association Agreement, Green Economy, European Green Deal, environmental convergence*

1 Introduction

Ukraine has chosen the path of European integration by signing the Association Agreement between Ukraine and the EU in 2014 (European Union, 2014) that resulted in adoption of ambitious and complex reforms aimed to achieve economic growth and improving the quality of life. From the other hand economic growth, as a ground of convergence process, accompanied by a negative impact on the environment. The Association Agreement (one part of which deals with environmental aspects) is a key fundamental tool not only for socio-economic convergence between Ukraine and EU but also a powerful stimulus to adopt Ukrainian environmental and economic policy to European one and to ensure its integrated nature. In this context, it is worth emphasizing that Ukrainian integration into EU should benefit in environmental protection through the formation of new legislation, policies and practices in line of European model. Ukraine should promote an effective implementation it's environmental commitments in the framework of Association Agreement and multilateral European integration cooperation (European Neighborhood Policy and Eastern Partnership

initiatives) (RAC, 2020a). Thus, detailed analyses of Ukrainian green economy integration into European environmental policy is relevant.

2 European Green Deal as a basis of Ukrainian Green economy integration into European environmental policy

The concept of the green economy has received considerable international attention and was seen as the basis for overcoming the financial crisis of 2008, as well as one of the main themes of the UN Conference on Sustainable Development 2012 (Rio +20) (United Nations, 2012). This has led to a sharp increase in the number of scientific publications that have studied the problems of the green economy. Green economy is characterized by a significant increase in investment in sectors of the economy that create and strengthen the Earth's natural capital or help reduce environmental deficits and environmental threats. These sectors include, in particular, renewable energy sources, low-emission transport, energy-efficient construction, clean technologies, improved waste management, sustainable agriculture, forest and fisheries.

The tenets of Green economy have formed the basis of an ambitious policy initiative of the European Green Deal adopted 2019 (European Commission, 2021) as an ambitious plan to move to a climate-neutral Europe by 2050. The document covers all sectors of economy and sets out EU policies on climate change, industrial and agricultural policy, biodiversity, energy, trade, etc.; it's a roadmap aiming to transform EU into efficient, sustainable and competitive economy, identifying the means of transforming Europe into the world's first climate-neutral continent by 2050, boosting economic development, improving human health and quality of life, and converting climate and environmental challenges to opportunities in all areas and policies of the EU ensuring a fair and inclusive nature of the green transition (MFA, 2021).

With regard to European Green Deal, it should be emphasized that this policy is currently the main basis for reforming Ukrainian ecological and economic system in the context of European integration as in August 2020 Ukraine passed to the European Commission a position paper on Ukraine's vision of implementing European Green Deal. In the document, Government of Ukraine proposed to establish a structured and regular dialogue with the EU on modalities of early involvement of Ukraine into development and implementation of policies under the European Green Deal and develop a joint Roadmap for Ukraine's participation in it (MFA, 2021).

Shifting the focus to the European integration vector of Ukraine we emphasize that convergence process is the basis for new member states (including neighboring countries). On the other hand, this process covers a large number of environmental policies and initiatives of environmental convergence. Pilot studies of environmental convergence were carried out in 90's by the Bank

(1992), Shafiq & Bandyopadhyay (1992), Grossman and Krueger (1995), as well as Panayotou (1993). Thus, in a well-known publication Baumol (1982) demonstrated a significant effect of environmental convergence during catch-up process. In order to solve the problem of sustainable economic growth in less developed countries, as well as to catch up with more developed countries with less pollution, the paradigm of convergence analysis was included in the factors of Green economy (Brown et al., 2009; Pretty, 2013; Li, 2015). Thus, environmental convergence would be the basis for construction of the relevant environmental and economic policy of Ukraine in the context of its integration with EU.

3 Research design

The main goal of the paper is to determine priority areas of national ecological system of Ukraine in the context of Association Agreement signed; as long as it includes environmental aspects our analysis will allow uncover opportunities and threats of Ukrainian green economy integration into European environmental policy. For this study we processed with research methods of qualitative, thematic and content analysis, synthesis, induction and deduction/

4 Results and discussion

According to official EU materials (European Parliament, 2021) European environment policy rests on the principles of precaution, prevention and rectifying pollution at source, and on the ‘polluter pays’ principle. It’s well known that economic growth as well as the associated increase in consumption has a negative impact on the environment, thus as can be seen from the analysis of European environment policy (European Parliament, 2021), EU pays considerable attention to solving environmental and economic problems which result in the implementation of ambitious "green policies and initiatives", the last of which was European Green Deal. For the Ukrainian economy the characters of environmental problems are broader in nature as its solution is complexed by the long-term systemic crisis in the financial and economic spheres and insufficient attention to environmental issues. In such conditions the goals of “greening” Ukrainian integration policy and its scientific analysis become especially relevant; in particular the study of the main aspects, obligations, forms of manifestation and main consequences for environmental and economic system of Ukraine in the context Association Agreement and European Green Deal. The implementation of commitments within these initiatives should be the basis for the development of effective means of ensuring sustainable development through the implementation of appropriate state environmental and economic policies

Implementation of the Association Agreement in the part of "Environment and civil protection" contributes to the Sustainable Development Goals 6 "Clean water and Sanitation", 7

"Affordable and clean energy", 11 "Sustainable cities and communities ", 12 "Responsible consumption" and production", 13 "Climate action", 14 "Life below water" and 15 "Life on land". The Association Agreement provides promotion and encouragement of trade and foreign direct investment in environmentally friendly goods, services and technologies, the use of balanced sources of renewable energy, energy-saving products and services, environmental labeling of goods, including eliminating related non-tariff barriers. Chapter 6 "Environment" covers development and strengthening of cooperation on environmental protection and promotion of long-term Goals of sustainable development and green economy. According to Annex XXX of the Agreement, Ukraine has to adapt its legislation to 26 EU directives and 3 regulations in such sectors as (KMU, 2019a): environmental management and integration of environmental policy into other sectoral policies, air quality, waste and resource management, water quality and water management, including the marine environment, conservation, industrial pollution and man-made threats, climate change and protection of ozone layer, genetically modified organisms.

In total, Ukraine has about 180 obligations in this area. At the same time, by 2021 Ukraine completed only 53% of the tasks (KMU, 2019b). The general trend of performance demonstrates the ineffective implementation of the Agreement. Accordingly, several mechanisms can be proposed to improve the implementation of the Association Agreement under the current conditions (RAC, 2020b):

- adoption of a special normative act that will determine the general approach for the implementation of environmental and climate legislation; such a document may cover various areas of cooperation between Ukraine and EU, except those where the Agreement itself provides special regimes (trade, energy);
- activation of EU role in the implementation of the Association Agreement; in addition to Ukraine's "homework", there are areas where constant dialogue and cooperation between Ukraine and EU is needed;
- implementation of directives and regulations should not be completed or limited to the stage of transposition of relevant European norms into Ukrainian legislation; practical implementation must be accompanied by a detailed economic and social forecast, as well as supported by the implementation of specific financial instruments;
- environmental and climate change reforms cannot be successful without strengthening other horizontal reforms, such as decentralization, judicial reform,

digitalization, anticorruption activities;

- to ensure the translation of current European legislation, harmonization of terminology, tracking the latest trends in European policy and legislation, it would be appropriate to create and ensure operation of the Center for European Legislation and Policy;

To highlight priorities of Ukrainian Green economy integration into European environmental policy we emphasize that in the coming years the European Green Deal (European Commission, 20221) will affect climate, industrial, energy, environmental, transport, agricultural policies of Ukraine and neighboring countries; as the key goal of the EGD is a climate-neutral Europe by 2050, so Ukraine's involvement in this process is a necessary condition.

As for today Ukraine is the only country that is officially launching a dialogue with EU on joining EGD and this dialogue already has some results. In particular, Ukraine participated in consultations on the Border Carbon Adjustment Mechanism - European Commission's initiative on taxation of non-environmental products supplied to EU markets. EGD is a part of AA and is a part of joint commitment in the framework of a free trade area with EU. Accordingly, we summarize the opportunities and threats of the EGD for Ukraine (see Table 1)

Table 2

European Green Deal and Ukraine

№	Conclusion	Description
1	Climate change is the main priority of EU	For Ukraine, this means the need to clearly articulate climate policy, namely ambitious climate goals in the framework of commitments under the Paris Agreement an appropriate energy strategy, taking into account climate change in all sectoral policies. Opportunities in the context of EGD are hidden in the low current energy efficiency and high carbon intensity of Ukrainian economy, which are caused by both high depreciation of fixed assets and a significant share of fossil fuels in the energy balance. In the case of establishment of effective international and/or bilateral mechanism, in particular within the EGD, this will attract significant amounts of "green" funding. It is obvious that new non-tariff barriers in trade would be "climatic", and in climate-friendly areas such barriers will be reduced.
2	The implementation of EGD creates a number of strategic opportunities for development of	Adoption of industrial visa-free regime will facilitate the integration of Ukrainian industries into the EU's new industrial processes. Expected restrictions on the "environmental friendliness" of goods and services placed on EU market may create new niches for Ukrainian producers by displacing imports to EU from other countries. In the field of agriculture, it would strengths the development of organic production, in the field of energy cooperation on hydrogen energy, in the field of finance – accessing

	Ukraine	to European public procurement market, financial and technical support instruments. In the field of environmental protection - integration of protected areas into the NATURA 2000 network through the creation of special financial instruments.
3	A separate group of new opportunities for Ukraine is geopolitical	As the key goal of EGD is a climate-neutral Europe, Ukraine's involvement in the process of achieving is a necessary condition. Climate-neutral Europe creates a conceptual and valuable basis for foreign policy cooperation, in particular in the framework of Eastern Partnership and deepening the association process with EU, the Paris Agreement, environmental conventions, Energy Community and Memorandum on Strategic Energy Partnership Ukraine-EU.
4	EGD poses a number of threats for Ukraine	Strengthening requirements to the quality of certain products and technologies is likely to create additional challenges for "industrial visa-free" process, as EU plans create a difficult "moving target" for Ukraine in this area. The strengthening of the secondary raw materials market in EU is likely to reduce the export of secondary raw materials to Ukraine affecting processing plants, which are currently dependent on imports of such raw materials. The EU's desire to reduce freight transport by road in order to reduce emissions may have an impact on the issuance of permits to Ukrainian trucking companies. High priority of environmental protection in EU may affect implementation of investment projects in the energy sector.
5	The key threat is restricting the access of Ukrainian goods to European markets and new non-tariff barriers of trade	This primarily applies to energy and resource-intensive goods, which cover a significant share in the structure of Ukrainian exports - metallurgy, agriculture, food industry, energy, heavy chemicals, engineering, steel, building materials etc. Transport infrastructure, such as gas pipelines, may also come under pressure from such mechanisms. The intention of EU to implement the carbon import adjustment mechanism to prevent neighboring countries from turning into carbon offshore can significantly complicate Ukraine's electricity exports to EU, as Ukraine has a significant share of thermal power stations in overall electricity generation. High requirements for food products and compliance with environmental standards in their production may be an obstacle to further exports of Ukrainian agricultural products to EU markets
6	New opportunities through increased digitalization	The development of digital sphere in EU opens up many opportunities: from simplifying calculations and customs procedures to strengthening the fight against smuggling, further development of IT sector, access to public procurement in EU

Note. According to RAC (2020b)

Summarizing the above, we propose the following priorities of Ukrainian Green economy integration into European environmental policy:

1) Replacement of fossil fuel energy consumption with alternative sources, which will create opportunities of green production; waste recycling, renewable fuels and intelligent technologies will largely ensure the achievement of the sustainable development goals and

principles of EGD.

2) Implementation of environmentally efficient production practices that involve waste minimization through sustainable recycling of non-ferrous and solid plastic waste. Effective waste management reduces the potential risk of water, soil and air pollution. However, to achieve this goal it is necessary to change the structure of consumption, the transition from non-renewable fuels to green fuels and address the issues of urban waste disposal. At the same time there is a growing need of government initiatives for mandatory waste recycling and composting, which contributes to sustainable development program. Therefore, it is extremely important to use inexpensive clean advanced technologies for the processing and management of toxic industrial waste to protect the environment.

3) Reducing carbon and greenhouse gas emissions through the clean production technologies, the use of available green energy resources and technological modernization. In addition, strategic action plans including joint public-private partnership programs, should promote the development of renewable energy projects that will help to achieve industrial energy efficiency in the country.

4) Sustainable production and consumption. Restrictive economic policies will help to achieve environmentally friendly production by promoting technological innovation and providing environmental subsidies to mitigate environmental adverse factors in production and consumption sectors.

5) Economic activity should be environmentally friendly and based on cleaner production technologies, ISO certification, taxations for polluting activities, subsidies for environmental quality assessment organizations. In addition, human development programs should be initiated to invest in human capital, which is the basis of economic growth and environmental protection.

6) Trade liberalization policy must be environmentally regulated to support the country's natural resource capital. At the same time, there is a need to investigate the greening of certain types of economic activity. The renewable energy market can be introduced through green financing, creation of green economic zones and green innovations in research and development.

7) Promoting the spread of electric transport, developing strategies for the conversion of dirty fuel to clean one. Nowadays most of fuel tests show excess of sulfur. At the same time, supplies from own refineries should be increased. In addition, an efficient public transport system running on clean fuel is needed, which will also reduce air pollution.

8) A partnership between state and private sector in resource supply market, which is

needed to support long-term environmental and economic growth.

5 Conclusion

The doctrine of Green economy of Ukraine in the context of EU integration will be based on Association Agreement obligations. It should be updated in line of European environmental and economic policy, in particular on initiatives of European Green Deal. It is proved that by reorienting economic systems to ensure mutual synergy of economic growth and environmental protection these initiatives aim to support traditional ways of economic development in better adaptation to the goals of sustainable development. Implementation of Ukrainian commitments under these initiatives should become the basis for achievement sustainable development goals through the implementation of appropriate environmental and economic policies. In the coming years the European Green Deal will affect climate, industrial, energy, environmental, transport, agricultural policies of Ukraine and neighboring countries; as the key goal of the EGD is a climate-neutral Europe by 2050, so Ukraine's involvement in this process is a necessary condition.

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Smart Applications as driver for Green Competitiveness in the Construction Industry

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Abstract

Although the construction industry is one of the largest emitters of greenhouse gases due to material production, transport and installation, the goal of minimising the impact is not commonly on the daily agenda. Especially, there is little specific solution-oriented potential for optimisation during decades of operation. The paper deals with the approach of smart applications and their applicability in buildings in the operational phase to gain a green competitiveness in construction. Hereby, are smart applications data-supported tools to provide the user with specific information in the operational phase of the building. Data for these applications derive from digitally created planning models and is supplemented with dynamic data from operations. In the introductory part, the basic characteristics of information management in construction are described based on a literature review, followed by a description of the potential of green competitiveness in construction. The paper defines basic assumptions to optimise the use of smart applications, which envisage a "Building-as-a-Service" approach to achieve green competitiveness in the real estate sector.

Keyword: *Construction industry, Green Competitiveness, Smart applications*

1 Introduction

The built environment is defined by International Organization for Standardization [ISO], 2021 as *"external and internal environments and any element, component or fitting that is commissioned, designed, constructed and managed for use by people*". It covers construction activities for assets of all types, sizes and conditions in all associated industries. These industries (herein simplified "industry") are one of the largest emitters of greenhouse gases due to resource-intensive work, use of resources, potentially lengthy haulage distances and high energy use during design and construction and, above all, the operation of buildings (Cubukcuoglu, 2022). The operational phase of buildings exceeds the construction phase of buildings by several times (Helmus et al., 2020). It is therefore important that assets can be operated in an energy-efficient manner. Industry, however, is facing pressure to make processes more sustainable in terms of economic, social and environmental sustainability (Almeida Barbosa Franco et al., 2022) but is still not on track to reach decarbonisation of the building

stock by 2050 (UNEP, 2021).

In this context, the intelligent use of Information and Communication Technologies (ICT) can help the industry to succeed in their approach to gain a green competitiveness by enabling knowledge management in the operation of assets (Casini, 2022). Besides the appropriate technology and legislation (Fraunhofer IAO, 2022), it also requires the appropriate structuring of information to form a basis for reliable decisions for measurable and sustainable business practices, a task called data-driven sustainability (Tripathy, 2021).

Characteristics of information management in construction

The industry is one of the worldwide largest industries and not known for a sustainable approach due to the predominantly singular use of materials (Rau & Oberhuber, 2018). This is added with the low spread of digital working methods (Gehring et al., 2017) combined with an increasing complexity on- and offsite leading to a non-continuous data flow and not appropriate data structuring (Wildenauer & Basl, 2021, pp. 62–63). The resulting, necessary structuring and use of information management in the industry is matter to scientific and practical research. An encouraging concept is the increased use of Building Information Modelling (BIM), which, as a digital planning and realisation method, helps to provide data for later operation (Solla et al., 2022). BIM is defined as "use of a shared digital representation of an asset to facilitate design, construction and operation processes to form a reliable basis for decisions" according to ISO, 2018. It is a first approach to change the industry from a phase-, process- and project driven industry towards an information driven industry (Rudden et al., 2019). The practice of information management by the use of BIM was already considered a decade ago as having *"considerable potential for enhancing the efficiency, sustainability, and effectiveness […] in all stages of the construction process"* (Kivits & Furneaux, 2013). The authors saw BIM as a knowledge management database which facilitates sustainability and asset management. However, it has still not received the necessary dissemination for widespread application, so that data is not or only conditionally available for effective and efficient project management over the life cycle (IDC, 2020). The authors around Olawumi & Chan, 2018 have identified a total of 36 benefits in in-depth evaluations of how the industry can create, expand and strengthen its sustainable profile by means of concrete information management such as BIM. The associated technological necessities were elicited and described by Al Hattab, 2021. This explicit implementation would lead to a considerable boost in productivity and, due to the availability of data, to a strong intensification of green competitiveness in construction (Michalski et al., 2022).

Green competitiveness in construction

Porter & van der Linde, 1995 have already described that green, sustainable action and economic competitiveness are not contradictory but complementary. This is supported by numerous researchers' studies (Junquera et al., 2012, p. 288). To achieve this intertwining, technological development is necessary in order to link the requirements from business with the basics of information and communication technology (Brunner et al., 2021). These technological advancements form the basis for implementing the Global Sustainable Development Goals 2030 and highlights the necessity to accelerate the dynamic processes of changing traditional approaches to doing business, favouring environmentally friendly and responsible ones (Chygryn et al., 2021), especially in this inertia industry (Bertschek et al., 2019).

The political initiative "European Green Deal" strived to be the first climate-neutral continent with a roadmap with specific actions to be implemented (European Commission [EC], 2020). Although this "Green New Deal" (Adler et al., 2019) recognised the need to make Europe's industries more sustainable and ecological, there are few substantial approaches in previous attempts (Harvey & Rankin, 2020). The approach of decarbonising the industry leads to a holistic framework of private wealth accumulation, integrated housing, utilities and mobility strategies to massively reduce the energy demand and therefore the carbonisation (Adler et al., 2019, p. 9). Millions of "green jobs" are to be created, regardless of educational status (Masterson, 2022). According to the author and Zahidi et al., 2020, the industry is one of the main beneficiaries of this development, with rapidly growing numbers of specialists such as construction managers, solar and wind power technicians and facility managers for the efficient operation of buildings. Still, 38% of world's carbon emissions are caused by construction activities (Ghaffar et al., 2022, p. 94). A typical house emits about 50 tonnes of $CO_{2equivalent}$ for construction and about 5 to 8 tonnes per year for operation (Committee on Climate Change [CCC], 2016). These figures indicate that the goal must be a carbon efficient operation, as the operating costs exceed the construction phase after a few years. Therefore, not only the planning and construction phase must be realised efficiently, but also and most importantly, the operation of an asset in the built environment (Atta et al., 2021).

Acanfora et al., 2022, p. 3 propose a tripartite division of the topics here: First, investments in decarbonising technologies, second, investments in digital and third, investments in city ecosystems. They also note that 80% of the buildings that will exist in 2050 already exist now (p.5). In order to achieve the ambitious climate goals, there is a strong need to present a short-

to medium-term solution as smart applications can be.

Approach of smart applications

The application of digital techniques and methods will only be successful if there is a media [and data] continuity across all phases, projects, and companies (Rock et al., 2019). This requires an associated knowledge management, which can only be successfully implemented by means of an associated data and information management. In this way, causal relationships can be developed that benefit all participants and lead to innovations (Weissinger et al., 2021). Construction has always struggled to understand and benefit from innovation (Ghaffar et al., 2022, p. 77, 80). (Lees, 2013) emphasises that the introduction of gradual innovations is likely to find higher acceptance due to existing skills and competences and processes. Moreover, a fully digitised "Digital Twin Ecosystem", where all assets in the built environment are exchanging information may not be achievable in the near future due to the necessary high investments (Wildenauer & Basl, 2022). This is where smart applications arise as an incremental development for the operational phase.

These smart applications are defined by Wildenauer, 2022 as *"data-supported tools that provide added value for the user based on stored, static data in a BIM-supported database. They support the user in making regular decisions. For this purpose, the generic data stored in the three-dimensional models is linked to current, dynamic data on the use of an asset and made available to the user graphically, alphanumerically or a combination of both".* This will make it possible to acquire and link static data from digital building models with dynamic data, such as the occupancy of rooms or movements within the building by sensors. Existing sensors can be used to provide data. Based on this valid data basis, effective and reliable decisions can be made during the use of the buildings. It must be noted that data is not returned bidirectionally. In order to display short-term conditions, such as the free availability, cleanliness etc. of meeting rooms and the route to them, these different data sets must be combined from different, existing sources. This requires, naturally, that data available in digital building models are correct, consistent and comprehensible to all participants.

Potential of smart applications and Building-as-a-Service

Buildings are characterised by a high degree of immobility, durability and complexity due to the fixed supporting structures and the components, apparatus and technical installations connected to them (Fernández-Solís, 2008). A distinction must be made between data from the construction ("static data") and the use of the building ("dynamic data"). Hereby, the "static" data of the asset changes with a non-existent to low rate of alteration in the daily use of an asset, such as location, locus and layout of rooms or building services.

With accurate recording of the existing static data, a corresponding data basis can now be provided and linked to dynamic data. Dynamic data such as occupancy figures, number of accesses, cleaning and disinfection cycles, etc., can now be provided from the various databases, sensors, actuators, members of staff etc. and made available in a smart application (Wildenauer, 2022). The flexible deployment capability makes it possible to respond to modifications in the initial situation, such as the change in use, at short notice. These can be the different occupancies of office workplaces, the rate of use of meeting rooms or the frequency of use of sanitary facilities. Resources can be saved in that logistical routes in the building can be saved or shortened on the basis of the evaluated data, spaces are not cleaned when they have not been used and building services applications are switched off when the space is not in use.
Considering this use of smart applications further, a new generation of buildings becomes apparent: "Building-as-a-Service", which can be a crucial point in reducing CO_2 during the operation of a building. This novel approach of viewing buildings as service providers is subject to scientific investigation. It was first discussed in this form by Wildenauer & Basl, 2022. They state that users become recipients of services **of** the building and not only of services **in** the building. Assets are no longer seen as an amalgamation of materials and labour, but as a set of associated services with offered services being independent of the duration of services and the number of users. This makes buildings more flexible to use, as different services are offered depending on the type of building. If buildings become more adaptable, this also means a shift in roles: construction companies become platform providers for the provision of building services. The industry would have to change from a goods-dominant logic to a service-dominant logic concept. If the industry succeeds in implementing this service-oriented idea, it will achieve an increase in its green competitiveness. It is not the lack of ideas, but the time to scale up and step up in the implementation to deliver innovation (McQuaid et al., 2022)

3 Results and Discussion

The industry’s digital transformation is to be welcomed yet overdue. It is already part of political action plans that now need to be translated into actionable processes, guidance, tools and specific applications. Construction must be careful not to follow the same rule that other industries have unsuccessfully followed: Innovation for innovation's sake without making it tangible and implementable. Buildings should no longer be regarded solely as individually usable spaces, but as universally usable spaces due to the proposed smart applications.
The linking of information management, the creation of needs-based, sustainably constructed buildings and the associated, demand-driven operation by means of smart applications will lead to a green competitive advantage. Green competitiveness is aiming to be a decisive competitive

factor for the industry: whether as an individual company or as an industry sector that wants to be suitably attractive for its future employees, users and society.

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The impact of marketing in the processing of agricultural waste

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ABSTRACT

Waste from agricultural waste accounts for a large share of waste in general, in general about 64% of waste per year is waste from rural industry. The quality and speed of processing of agricultural waste is influenced by the behavior of the population. Changing the behavior of the population to good habits has the best effect on the speed of integration of agricultural waste processing. In general, the main marketing parties that influence the processing of agricultural waste include: customers, suppliers, employees, finance, regulators, media, the public. Types of waste can be divided into: avoidable, partially avoidable and unavoidable. Garbage recycling marketing affects all stages of product consumption, namely: manufacturing, manufacturing, retail and household.

Keywords: *Recycling marketing, waste, waste recycling, marketing strategy, recycling integration.*

1 Introduction

The problem of waste generation in the world is growing every day, and globalization systems do not provide complete processing of these resources. Foremost, this has become a problem due to the low development of logistics and technological infrastructure in this area. Not so long ago, the world began to realize that waste is an additional resource for production. Thus, recycling solves two strategic problems: reducing the amount of resources and increasing pollution of the planet with garbage. Recycling of waste, in general and from agricultural production, for the full functioning should involve such entities as the state, citizens, business and the scientific community. One of the key roles in the proper recycling of garbage is played by sorting, which in the recycling of agricultural waste is played by the community and each individual.

Complete and correct recycling is not possible without recycling marketing, as the efficiency of waste sorting directly depends on human habits and behavior. Therefore, efficient integration of recycling requires efficient sorting, and this requires changing the culture and habits of citizens in general.

This is primarily done by marketing, and marketing tools that can psychologically affect the habits of citizens. Therefore, in order to quickly and efficiently implement waste recycling into a sustainable concept of global development, marketing tools must be strongly involved.

2 Methodology

To answer the question of what marketing factors will be able to influence the change of behavior of the population, it is necessary to determine the types of influence and criteria for assessing the effectiveness of the marketing model and strategy. In this case, marketing components are divided into strategic and tactical, as well as those that may be involved in government, business or NGOs. Stakeholder allocation criteria are divided into customers, suppliers, employees, finance, regulators, media and the public. The concept of the Four Functions can best show where exactly each of the stakeholders is located.

On the other hand, the concept of agricultural waste recycling is part of the common values and goals of sustainable development and provides a solution to its problems. The concept of sustainable development can well describe the life cycle of goods processing and its cyclical basis.

3 Marketing of agricultural waste recycling

Waste recycling marketing in its field is not entirely research in the field of science as it is based mostly on free tools, although in general the effectiveness of marketing strategy depends entirely on the budgeting of a particular marketing niche. In general, it can be said that without investment in the field of informing the population and business, it is not possible to radically implement and change consumer habits and further sorting (behavior of garbage treatment) habits of the population and enterprises.

In essence, marketing is work in the market on sales channels to increase the distribution of certain goods and services. An integral part of marketing is innovation and technological improvements of the product, to better meet the desires and needs of customers. The main word in marketing is always the need, which is why the main goal in recycling marketing is to find and communicate the goals and needs of the user (citizen).

3.1. Recycling marketing and its impact on stakeholders

Waste recycling marketing research indicates and describes primarily changes in population behavior. This is the relationship of recycling marketing with the psychological aspects of influence. In general, recycling marketing should serve to increase the sustainable consumption of products and their sustainable use.

Recycling marketing is a very new and unexplored concept, many scientists consider it quite complex, because its main task is to change the behavior of the population, which includes sciences such as psychology, economics and ecology. Garbage recycling marketing is, so to speak, a combination of these three sciences and may involve numerous facets and branches and contains considerable scientific interest for research.

The author defined the following definition:

"Waste recycling marketing is about informing all parties to recycling, to achieve the goals of a sustainable economy, to preserve nature and the planet for future generations, to attract more recycling entities to ensure sustainable consumption and preserve the environment. The effectiveness of processing marketing can be assessed in terms of market share (in this case, the population and enterprises), which are involved in sorting, processing and reducing waste from agricultural products. "

Christina Calvo-Porral (S. Calvo-Porral, 2019) defines that any work of the company is inextricably linked with the quality of the environment, and the company itself is interested in preserving the environment. On the other hand, marketing is interested in increasing product consumption, which separates marketing from sustainable development. Christina Calvo-Porral calls this the paradox of sustainable marketing, because it is this factor in marketing that contradicts itself.

But on the other hand, if we take the theory that marketing should not increase consumption, but meet needs, then sustainable development marketing has the essence and main goals, which are accompanied by the preservation of nature and the environment. That is why marketing can impose a reduction in energy consumption, smart food consumption and promote the main goals of sustainable development, which can give impetus to changes in the cultural behavior of product consumption.

Sustainable marketing has the following main components:

1. Society - which is associated with the influence of companies on people on the one hand, and the influence of society's behavior on the overall result of the enterprise on the other;
2. Ecological environment - the main purpose of this component is to verify the impact of the enterprise on the natural environment and the company's contribution to the development and implementation of key aspects of environmental sustainability;
3. Economic - which is responsible for the economic performance of the company, although it must be consistent with the environmental performance, it can not fall sharply.

With these approaches, you can work out the main points of the marketing strategy of recycling. From all these parameters follow the following main stages of the marketing strategy of processing:

1. Ideology - the creation of the main key ideas of recycling marketing and the philosophy of recycling marketing. Setting the mission and goals of processing and conservation of nature. The approach to sustainable marketing should help with this point;
2. Statement of the main problems - analysis and identification of the main problems that need to be solved in order to implement a holistic system of agricultural waste recycling. Critical

marketing is best at this stage;

3. Attracting the necessary tools - creating and attracting all the necessary materials and resources to ensure the purpose of processing. It is the proper provision of materials and resources that mainly affects the speed and quality of system implementation. At this stage of implementation helps environmental marketing, which provides environmental packages, garbage sorting systems and more;

4. Changing the behavior of selected audiences - promoting new types of behavior of the subject from a particular audience to the desired behavior and habits for the purposes of marketing recycling. This stage is the most labor-intensive and long-term, for certain cultures this stage may take several generations. At this stage, it is best to use social marketing.

In general, the problem of waste recycling is also quite difficult in terms of integration and promotion of this culture and system of behavior at the national level. In general, the recycling system is divided into two parts: recycling of agricultural waste on the side of the enterprise and on the side of the end customer. Over the years, certain cultural and economic principles of waste management have been established, so the new system needs to be integrated in two ways.

Thus, it is possible to separate stakeholders effect and business drivers of interest, more details in Table 1.

Table 1

Types and influence of stakeholders on the system of agricultural waste processing

Stakeholder	Effect	Business driver of interest
Customers	- high level of interest - high social responsibility - high level of sales	Wages and expenses
Suppliers	- low prices - low level of interest - high level of supply - high loyalty to partners	Price / production price / income
Employees	- - high social responsibility - low cost of finding employees - low cost of staff training - high level of loyalty of citizens to the main goals of work	Price / salary
	- long cycle of return on investment	Weighted average

Finances	- high level of capital for business in this area	cost of capital
Regulators	- high impact on the creation of the financial base of the waste recycling structure - high level of development of waste recycling	Long-term development and sustainable development of the state / community
Media	- direct impact on the promotion of processing among citizens - indirect influence on the decisions of managers or regulators	
Public	- influences the decisions of direct stakeholders	

The main stakeholders influencing the integration and success of the global recycling strategy are customers and suppliers influenced by employees, finance, regulators, the media and the public. Also, depending on the type of audience and the function and the state in which it is now, stakeholders may change. That is, the same person can be both in one stakeholder and in another, depending on where he is.

3.2. Garbage recycling life cycle of agricultural industry

In general, all sustainable consumption systems are reduced to the fact that sustainable consumption is aimed at preserving and improving the lives of future generations, reducing waste. And also, to reduce the overall consumption of the product. This method of behavior change is difficult to implement, because the main factors used in it depend on the desires of people and their lifestyles. Of course, you can use marketing tools such as training, promotion, branded items, but the conversion from these activities will not be high immediately and will give a weak stable result. Also, much depends on the good infrastructure created. It should be noted that a large proportion of stable consumption depends on people's awareness of the needs of their body and the needs of the environment, which in turn joins such sciences as biology and chemistry. The next aspect is that behavioral and consumer habits take root in childhood, so the child takes over the habits of consumption from his parents, which connects himself to the system of stable consumption and psychological sciences as well. Thus, it can be concluded that the marketing of stable consumption is a rather complex component product and is not appropriate for use in the early stages of integration of agricultural waste recycling.

Many sources equate sustainable consumption and responsible consumption approaches, which in turn are incorrect. Because sustainable consumption aims at the sustainability of the whole system, which includes such key players as producers, consumers and the state. In turn, the

marketing of responsible consumption is aimed only at society, on the user, and does not take into account the company and the state.

In his paper, Harris K. E. (Mohr, J. A., Webb, D. J., & Harris, K. E., 2001) identified that responsible consumption is the customer's decision at the time of purchase, which aims to preserve nature and long-term impact with beneficial effects on nature.

Thus, in responsible use, the main active participant is the user and only the indirect environment, which can have both negative and positive effects. Anti-consumption is an incentive for the customer to reduce excessive, unnecessary consumption. That is, this approach is aimed at the user, whose main goal is to change user behavior. The main difference between anti-consumption and sustainable consumption or renewable consumption is that anti-consumption not only reduces consumption, it supports longer use of things that are in use. That is, the main tool of anti-consumption is to motivate people to use current things for a long time and repair them.

The main purpose of careful consumption is a conscious choice in the consumption of products. Thus, the consumer understands the factors that influence the choice and the whole result of their actions. Authors argue that the main strategy for proper consumption of products is the tactic of moderate consumption of products by users, for better health. Also, attention to consumption is stable and not stable, this may be due to psychological factors and habits of both the population and the individual, Table 2.

Table 2

Types of waste generation in the process of food consumption with a description of possible changes in consumer behavior

Reason	Description	Expenses
1. Losses that can be avoided		
1. 1. Excessive purchases	Customers buy too much, which spoils the product.	Proper procurement planning, avoid special offers in stores and large volumes.
1.2. The rest after cooking	Cooking is more than you can consume, after which the food spoils.	Reduce cooking.
1.3. Leftovers after meals	Plate waste after meals, except for inedible parts.	Reduce the portion of the plate to the amount that the person is sure he wants to eat.
1.4. Long storage	Spoiled food due to expired consumption and improper storage in the retail sector.	The customer must be informed about seasonal discounts and products.
1.5. Overproduction	Production is more than the ability to buy and consume customers.	Correct calculation of production and production of the product that the user needs.
1. 6. Unnecessary animals	Killing animals as a child, because they do not bring strong financial benefits.	Financing the maintenance and feeding of these animals to break-even, and financing new species that do not require the killing of animals.
1.7. Change of	Excessive waste, defects or unclean	To process all raw materials, and to turn

production line	products can be generated during the change of the food rhinoceros.	impure products which were formed at it into the promotional goods.
1.8. Processing method	Losses due to outdated, incorrect or ill-considered process of processing goods and agricultural raw materials.	Introduction of new technologies and approaches in processing, preparation and processing of goods.
2. Waste that can be avoided		
2.1. Taste benefits	Loss of parts of the product due to their taste difference or improper / incompetent cooking.	Use other cooking methods, tell other parts of the product to other people.
2.2. Low demand due to product	Too long storage due to low quality (mostly aesthetic).	Consumers should be less demanding, and sellers should reduce the prices of such goods.
2.3. Quality sorting	Sorting products through aesthetic indicators.	Find channels to sell unsightly products, recycle them or sell them at a lower price.
3. Inevitable losses		
3.1. Basic sorting	Sorting inedible products that spoiled after harvest or were immature.	
3.2. Machine / convenient harvesting	Yield losses due to changes in the specifics of harvesting.	
3.3. Pollution	Disposal of contaminated products.	
3.4. Diseases	Disposal due to crop diseases.	
3.5. Storage problems	Deterioration due to storage problems.	
	Deterioration due to damage during transportation.	
3.6. Logistics and delivery	Inedible parts of the plant to be recycled.	
3.7. Inedible parts	Losses due to the specifics of processing.	
3.8. Processing method	Damage to agricultural products due to weather conditions.	

According to Table 2, agricultural products can be divided into 3 types, and those segments of products can be distinguished that can be saved by not losing them during transportation, processing or consumption. For the most part, the loss of agricultural and food products can be reduced in the first two blocks by changing the behavioral habits of the population.

4 Results and Discussion

Based on the results of the work, the main parties involved in waste recycling were identified, including customers, suppliers, employees, finance, regulators, media and the public. The definition of sustainable marketing was formed, which is a prerequisite for the stability of the integration of processing. Thus, recycling marketing is fundamentally different from traditional marketing, as it forces to proper consumption, rather than excessive and irrational consumption.

According to the results of the work, it was determined that there are stages of consumption that can reduce the amount of waste generated. Proper marketing and involving different parties in solving the problem of waste generation should radically reduce their amount.

5 Conclusion

Recycling marketing, a fairly new concept that has not formed a precise definition. Based on

various sources, the authors formed their vision, which consists in the fact that “recycling marketing is informing all parties to recycling, to achieve sustainable economic goals, preserve nature and the planet for future generations, attract more recycling entities to ensure sustainability consumption and preservation of the natural environment ”.

Marketing of agricultural waste processing involves the stages of consumption itself, namely the reduction of irrational purchases. Thus, sustainable marketing (recycling marketing) is not of interest to the business in full, as it reduces its direct income. However, marketing processing in the business can have a greater strength of the brand image, which indirectly affects the increase in revenue. Also, there are a number of developed countries where strong social marketing has a significant impact, and the more a company uses marketing to process its product, the more it is respected. One of the greatest examples of sustainable marketing is Tesla. That is why the marketing of recycling involves a lot of stakeholders who have different influences, as shown in Table 1.

The next stage of the product life cycle and waste generation in general is household consumption. So from Table 2 we see that by changing the behavior of the population can reduce waste such as: unnecessary purchases, excessive leftovers after eating, improper processing of the product during cooking, improper storage, changes in production line and long storage. All these factors appear primarily due to lack of information of the population. That is, citizens are not taught to handle and use food properly. Thus, the main goal of sustainable marketing is to teach citizens how to handle products properly. The authors believe that the proper handling of food should dramatically reduce the amount of agricultural waste.

6 Future Trends

The issues to be raised in the following papers should describe the proper integration of recycling marketing into public life, the development of tools to bring recycling marketing into the lives of the population and the calculation of the speed of implementation of recycling marketing in practice.

Also, there is the question of ethical separation of decision-making in business in favor of sustainable (green) marketing. Business must move away from revenue goals to nature conservation, which is not fundamentally the main goal of business. That is why it is necessary to describe the possibilities of the right transition of business to sustainable marketing. The issue of sustainable marketing is also quite difficult for marketers, who must decide to take the side of green marketing and their customers or the side of business and increase income. That is why

research in the combination of nature conservation and income from recycling is very relevant.

The next issue that needs to be described is the issue of solving logistical problems of delivery of agricultural products. After all, it is during improper delivery that a significant mass of goods spoils and does not reach the final consumer.

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