VSB TECHNICAL UNIVERSITY OF OSTRAVA | FACULTY OF ECONOMICS | DEPARTMENT OF INTERNATIONAL ECONOMIC RELATIONS

International Conference on European Integration 2024

ICEI 2024

Proceedings
of the 7th International Conference on European Integration 2024

May 29 – 31, 2024
Ostrava, Czech Republic

VSB – Technical University of Ostrava

Faculty of Economics

Department of International Economic Relations

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DOI 10.31490/9788024847344

Publisher:

VSB – Technical University of Ostrava
Sokolská třída 33, 702 00 Ostrava 1, Czech Republic

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Cover:

Jan Pražák

ISBN 978-80-248-4733-7 (print)
ISBN 978-80-248-4734-4 (on-line)
ISSN 2571-029X (print)
ISSN 2788-0958 (on-line)

Publication has been supported by the European Commission – Representation in the Czech Republic and the Karel English Endowment Fund.

Publication is not a subject of language check.

Papers are sorted by author's names in alphabetical order.

All papers passed a double-blind review process.

Authors are fully responsible for the content and originality of the papers.

Suggested citation:

Author, A. Title of the paper. In STANÍČKOVÁ, Michaela and MELECKÝ, Lukáš (eds.). *Proceedings of the 7th International Conference on European Integration 2024*. Ostrava: VSB – Technical University of Ostrava, 2024, pp. xxx-xxx. ISBN 978-80-248-4733-7 (print). ISBN 978-80-248-4734-4 (on-line). ISSN 2571-029X (print). ISSN 2788-0958 (on-line). DOI 10.31490/9788024847344.

The conference is organized by

VSB TECHNICAL UNIVERSITY OF OSTRAVA | FACULTY OF ECONOMICS | DEPARTMENT OF INTERNATIONAL ECONOMIC RELATIONS

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Office of the Government of the Czech Republic

TVOŘÍME EVROPU již 20 let

Diplomatic Academy of the Ministry of Foreign Affairs

Co-funded by the European Union

MINISTRY OF REGIONAL DEVELOPMENT CZ

Ministry of the Environment of the Czech Republic

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Foreword

Ladies and gentlemen, dear readers, esteemed attendees and ICEI friends,

Welcome back to Ostrava for the 7th International Conference on European Integration (ICEI 2024). As we celebrate the 20th anniversary of the Czech Republic's accession to the European Union, we are reminded of the pivotal moments that have shaped our shared European narrative. The ICEI 2024 is thus linked to this anniversary as an essential symbol but also reminds the 20th anniversary of the foundation of our department, which had successfully transformed from the Department of European Integration to the Department of International Economic Relations several years ago, which emphasises the adaptability and uniqueness of the department, thanks to its focus and range of external relations and internationalisation.

This year's conference, themed 'Celebrating Yesterday, Shaping Today, Unveiling Tomorrow', is not just a mere title but a call to action. It commemorates past milestones and addresses urgent issues at the time, inspiring us to reflect, learn, and act. The juxtaposition of celebration and reflection is especially appropriate as we tackle the ongoing challenges within the EU, including the implications of the war in Ukraine, the evolving security landscape, and the upcoming European Parliament elections.

Two decades will have passed on 1 May 2024 since the Czech Republic joined the EU, symbolising hope and unity during a significant enlargement phase. Today, we stand at another critical juncture as the EU navigates the complexities of geopolitical tensions, economic uncertainties, and societal transformations. The conference aligns with these themes, emphasising the importance of resilience, cooperation, and foresight in building a future-ready Europe.

In recent years, the EU has faced numerous internal challenges that have tested its cohesion and resilience. These challenges require thoughtful discussion and innovative solutions, from economic disparities among EU Member States to social issues like migration and demographic trends. This conference presents an opportunity to address these vital issues constructively.

Externally, the EU's geopolitical relationships continue to evolve in a rapidly changing world. Our proximity and response to conflicts in neighbouring regions, trade negotiations, and partnerships with global powers are shaping the future of Europe in the international arena. These topics demand our attention and will be explored during our sessions.

Our discussions will explore how the EU's response to current crises, including security concerns and the Ukrainian conflict, reinforces our commitment to foundational European values of peace, democracy, and solidarity. These discussions are timely and essential as they influence our strategic priorities and the EU's role on the global stage.

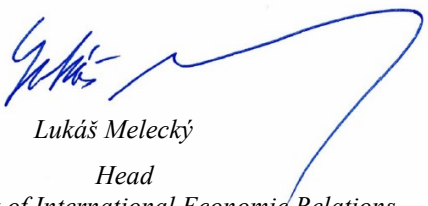
In addition, the conference will explore the impact of these events on regional development, competitiveness, and spatial analysis, areas critical to understanding and enhancing the EU's internal dynamics and interactions on a global scale. As we engage in these discussions, we are guided by the EU's motto, "United in Diversity," which resonates more deeply today amidst our challenges.

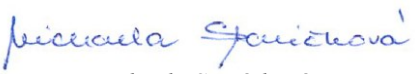
ICEI 2024 serves as a platform for thought leaders, policymakers, and academics to forge paths for cooperation and innovation. It is a call to action for all stakeholders to contribute to a dialogue that is not only reflective of our past and present but also anticipative of the needs of future generations.

We appreciate your participation and contribution to this critical conversation. Your presence in the Proceedings of the 7th International Conference on European Integration 2024 is a testament to your significant contributions to European integration and international economic relations. Together, we aim to enhance our understanding of European integration and its implications for regional and global contexts.

ICEI 2024 is, therefore, an ideal platform for fruitful discussions and new insights to steer European integration towards a more secure, prosperous future.

We wish you an enlightening and inspiring conference.





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State Aid in Less Prosperous European Union Countries During the COVID-19 Pandemic. The Case of the Visegrád Group Countries

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Abstract
The COVID-19 pandemic was an external shock to economies around the world, including the Visegrád countries (V4) within the European Union. The aim of this study is to identify the position of the Visegrád countries, as representatives of less prosperous countries in the European Union. The study covers not only the aid provided on the basis of the aforementioned guidelines stricto sensu, but also all other financial public measures undertaken for entrepreneurs during this period. In the wake of the COVID-19 pandemic, the V4 countries, like other EU Member States, increased their financial presence in the EU Internal Market, however this was still below that of the other EU Member States. They decided to reallocate available public resources to mitigate the negative consequences of the COVID-19 pandemic. This resulted in changes to the structure of regular State aid in the V4 countries. The COVID-19 pandemic forced the V4 countries to significantly refocus their interventions by drastically reducing regional investment aid, to support the climate transition.

Keywords: *COVID-19 state aid, European Union, state aid, subsidies, Visegrád group*

JEL Classification: *H25, H71, F02*

1. Introduction

The COVID-19 pandemic was an external shock to economies around the world, including the Visegrád countries (V4) within the European Union (EU). Uncertainty about the extent and impact of the spread of the disease led to hasty decisions by governments to curtail not only social but also economic life, including the freezing of many economic activities. This meant tangible losses on the part of businesses as a result of administrative decisions made by governments that could not have been anticipated and prepared for in advance. Consequently, governments took many measures worldwide, including within the EU, to compensate for negative consequences of the COVID-19 pandemic.

The possibility of State aid in the EU is much more complicated than in any country in the world. In addition to dealing with market failures or crises, it is necessary to ensure the maintenance of a workable competition and level playing field between entrepreneurs from different Member States within the European Single Market. The European Commission, as guardian of EU competition policy, has prepared a special Temporary Framework for State aid measures to support the economy in the current COVID-19 outbreak (European Commission, 2020). These measures were the possibility of supporting entrepreneurs negatively affected by the COVID-19 pandemic, in the form of grants and write-offs, and preferential loans and

guarantees. These were used in various ways by Member States between 2020 and 2022 (Ambroziak, 2023). Even when the pandemic was coming to an end, there were claims that some countries provided significantly more aid of this kind compared to others. The line of demarcation was the affluence of the national budgets of the individual Member States, which were also significantly burdened by additional expenditure, such as for additional medical care.

To date, research on COVID-19 State aid has been quite sparse due to both the relatively short duration of the pandemic and the time that has passed since it ended. The first studies were largely concerned with the presentation of new EU legislation (Agnolucci, 2021; Ambroziak, 2021; Puksas et. al., 2022). Regarding the impact of COVID-19 and State aid on the economy, several research areas can be identified. Firstly, the largest (in relative terms) pool of research has been carried out from a micro point of view, taking into account the functioning of entrepreneurs (Dowling, 2021, Utit et.al, 2021; Ambroziak, 2022a; Groenewegen, et.al, 2022; Janzen and Radulescu, 2022; Pseiridis and Kostopoulos, 2023), especially SMEs (Belghitar et. al, 2021; Dörr et. al, 2022; Gregurec et.al, 2021) and self-employment practice (Bertschek et.al, 2024). Another group of available studies concerns analyses of the impact of COVID-19 on specific economic sectors (Lakså, 2023): agriculture (Štreimikienė et.al, 2021), transport, including air transport (Aksamovic and Simunovic, 2022), maritime (van Tatenhove, 2021), the pharmaceutical industry (Plank, 2022), the healthcare and media sector (Glosa, 2023), tourism (Williams, 2021), construction services (Nový and Nováková, 2022) and gym and fitness clubs (Piotrowski and Piotrowska, 2021), as well as football clubs (Kiełbasiński and Brzeziński, 2021). A separate group of studies is devoted to the impact of COVID-19 on key macroeconomic indicators, including inflation (Hančlová and Chytilová, 2022), unemployment (Svabova et. al, 2022), and enterprise structure (Musa, et al., 2023). It is also worth noting studies on the impact of COVID-19 on international trade, including the position of the EU (Fojtíková, 2022), but also on the EU's internal cohesion policy by analysing regional development (Melecký, 2022), including job protection (Bennedsen, et. al, 2020), but also through workers' own adjustments (Köllő and Reizer, 2021). However, there is no comprehensive analysis of the COVID-19 assistance provided in comparison with the aid instruments available to date in the EU, taking into account, in particular, the nature of the Member States: those with larger (the Western European Countries) and smaller budgets (the Central and Eastern European Countries) necessary to provide crisis support to entrepreneurs.

Therefore, the aim of this study is to identify the position of the Visegrád countries, as representatives of less prosperous countries in the EU, in terms of State aid during the COVID-19 pandemic. The study covers not only the aid provided on the basis of the aforementioned guidelines *stricto sensu*, but also all other financial public measures undertaken for entrepreneurs during this period. This is because the objective was to capture the relevance of COVID-19 aid to the economies of these countries, but also possible changes in the structure of the remaining regular State aid. In the latter case, the additional aim is to confirm how the directions of State aid should be aligned with EU priorities.

As an introduction, the methods used will be presented together with the data analysed. This will be followed by a presentation of the position of the Visegrád countries in comparison to the EU in terms of the provided State aid during the COVID-19 pandemic in 2020-2021. In the last part, after a discussion of the results, recommendations and potential directions for further research will be presented.

2. Methodology

In order to capture the position of the Visegrád countries in the EU in terms of State aid, a comparative analysis of the absolute and relative values of the financial support transferred to entrepreneurs was performed. These subsidies were divided into two groups:

- regular State aid - granted under existing State aid rules,
- COVID-19 State aid - granted in connection with the COVID-19 pandemic.

A comparative analysis of the two sources of financial support will indicate possible substitution of funds, as well as the degree of involvement of the V4 countries in their economies during the pandemic.

In order to capture changes in the intensity and structure of State aid in these countries, the 2020-2021 pandemic period will be compared with the pre-pandemic period of 2018-2019, while covering the same multiannual financial perspective. The data for the pandemic period was treated cumulatively for 2020-2021 and for the pre-pandemic period for 2018-2019. The analysis of regular State aid considered the most important support objectives: regional development, environmental protection including energy savings, research and development including innovation, training, and sectoral development, and SMEs, including risk capital, culture, and employment.

A particularly important issue was the assessment of intensity of both regular and COVID-19 State aid. The European Commission presents it as a percentage of GDP. However, Ambroziak (2022) identified a series of shortcomings, starting with the fact that it disregards the EU average. Therefore, we decided to apply a Relative State Aid Intensity (RSAI) index (Ambroziak, 2021), based on Balassa's (1989) well-known Revealed Comparative Advantage (RCA) index. RSAI is calculated as the relationship between the value of State aid in either a given EU Member State or the EU, and GDP of that EU Member State or the EU. Thus RSAI reveals the relative intensity of State aid in a given country compared to the average intensity of State aid in the EU. Moreover, in order to ensure symmetric values, we applied Laursen's (1998) concept, which allowed us to construct the final formula:

$$RSAI_i = \left(\left({}^{x_i}/_{v_i} \right) / \left({}^{X_{EU}}/_{V_{EU}} \right) - 1 \right) / \left(\left({}^{x_i}/_{v_i} \right) / \left({}^{X_{EU}}/_{V_{EU}} \right) + 1 \right) \quad (1)$$

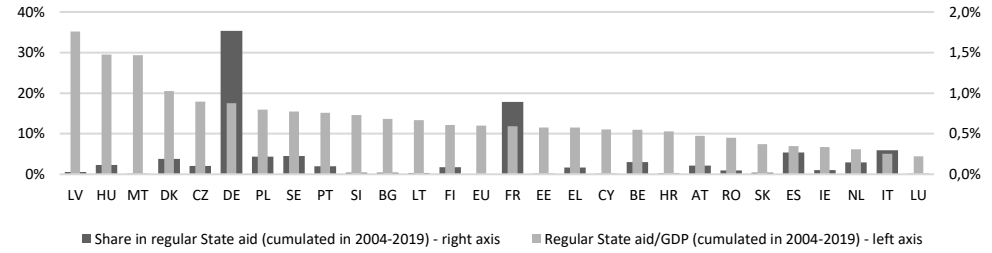
where: x_i – value of State aid in country *i*; v_i – value added of country *i;* X_{EU} – value of State aid in the EU; V_{EU} – value added of the EU. When the final value of RSAI is above 0, State aid intensity in a given country is relatively high (higher than for the EU average), while, when it is below 0, the intensity is relatively low (lower than at the EU level).

Consequently, to present the position of the V4 countries, we have calculated the RSAI to assess aid intensity. All data used in this study come from the Eurostat Database, and were downloaded on 31 December 2023.

3. State Aid in the V4 Countries During the COVID-19 Pandemic

While the V4 countries embarked on their integration path at the same time twenty years ago and began from a similar starting point, their distance from the EU average differed substantially in terms of both relative value and the structure of regular State aid. The share of the Visegrád countries reached 9.1% of the total value of State aid in the EU for the period 2004-2019, which was considerably lower than in Germany (35.4%) and France (17.8%). However, taking into account the relative share of State aid in their economies, calculated as a percentage of their GDP, the V4 countries recorded significantly higher positions (Hungary 1.5%, the Czech Republic 0.9%), Poland 0.8% and Slovakia 0.4%) compared to Germany (0.9%) and France (0.6%). This means that these countries did not shy away from financial interference in the economy and, with the exception of Slovakia, were among the seven countries with the highest share of State aid in GDP (Figure 1).

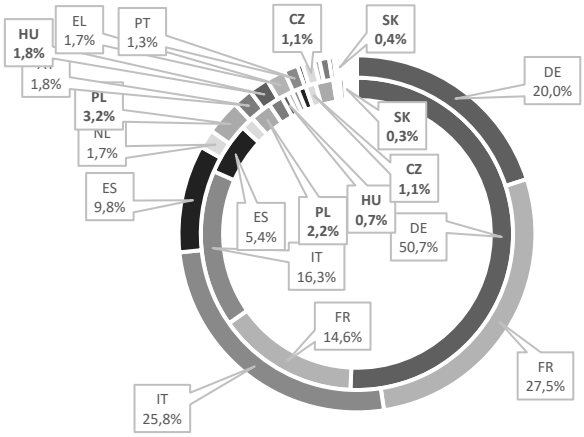
Figure 1: Position of the V4 countries in Cumulative State aid in 2004-2019



Source: Own work based on the EC (2023) and Eurostat Database.

Under Article 108 TFEU, any state aid, including COVID-19 aid, must be notified to the European Commission before it is granted. The value of State aid projects notified by the Visegrád countries reached EUR 133 billion, which in total represented only 4.3% of the total value of notified aid. Poland had the largest share (2.2%), followed by the Czech Republic (1.1%), Hungary (0.7%), and Slovakia (0.3%), while the clear leaders among EU Member States were Germany (50.7%), Italy (16.3%) and France (14.6%). The shares of these countries in the actual COVID-19 aid granted was slightly different: Poland 3.2%, Hungary 1.8%, Czech Republic 1.1% and Slovakia 0.4%. This was due to a radically lower level of use of the aid budget by Germany (20%) and a higher level of use by the other EU Member States (Figure 2.).

Figure 2: Share of the V4 Countries in Approved and Granted COVID-19 State Aid



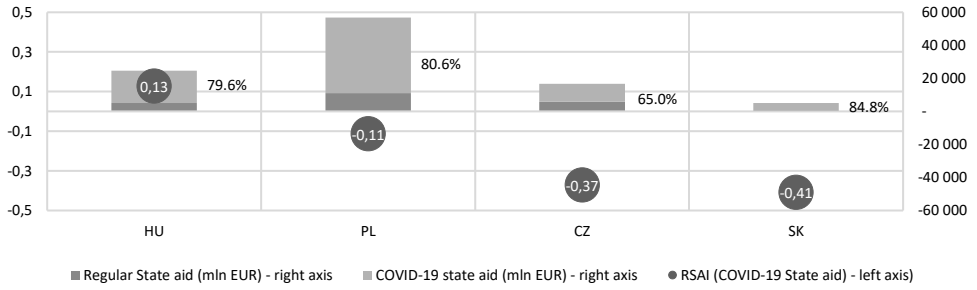
Inner doughnut: COVID-19 state aid approved by the European Commission in 2020-21
Outer doughnut: COVID-19 state aid granted by EU Member States in 2020-21
Source: Own work based on the EC (2023) and Eurostat Database.

3.1 State Aid Intensity

The intensity of State aid in a relation to the EU average was calculated using the RSAI index. This index oscillated in the EU between 0.27 (Italy) and -0.88 (Ireland). In the case of the Visegrád countries, a positive and the highest RSAI index was recorded by Hungary (0.13), which means that this country provided a significant amount of COVID-19 State aid relative to the EU average. The V4 countries registered negative values: Poland -0.11, the Czech Republic -0.37 and Slovakia -0.41. This means that the latter two countries in particular

engaged a much lower amount of public funds for entrepreneurs, compared to other EU Member States, in offsetting the negative consequences of COVID-19 (Figure 3.).

Figure 3: COVID-19 State Aid in the V4 Countries in 2020-2021

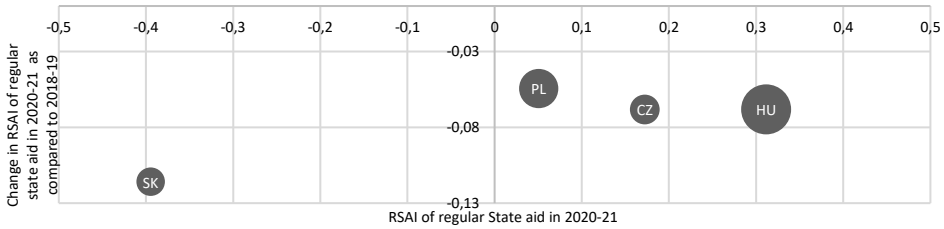


Source: Own work based on the EC (2023).

In addition to COVID-19 State aid, regular State aid was also available in all Member States under the existing rules. Despite the direct lack of reference to the pandemic and its negative effects, it also allowed for the mitigation of problems related for example to liquidity in companies. While on average in the EU the share of COVID-19 aid in total State aid (comprising COVID-19 State aid and regular State aid) was 85.2%, the highest percentage among the Visegrád countries was recorded by Slovakia (84.8%). In Poland it was 80.6%, in Hungary 79.6%, and in the Czech Republic 65% (Figure 3.). This meant that some of the public financial resources originally recognised as regular State aid were redirected towards COVID-related measures.

This is confirmed by an analysis of the change in the RSAI of regular State aid in 2020-2021 compared to the corresponding period of the two previous years 2018-19. The Visegrád countries, like the vast majority of EU Member States, recorded a significant decrease in the intensity of regular State aid (Slovakia -0.12; Hungary -0.07; Czech Republic -0.12; Poland -0.05) (Figure 4.). France registered a smaller decrease (-0.04) , and Germany an increase in regular State aid intensity (0.01).

Figure 4: Changes in RSAI of Regular State Aid in 2020-21 in Comparison to 2018-19



Note: the size of the bubble represents the value of COVID-19 State aid in relation to GDP.
Source: Own work based on the EC (2023) and Eurostat database.

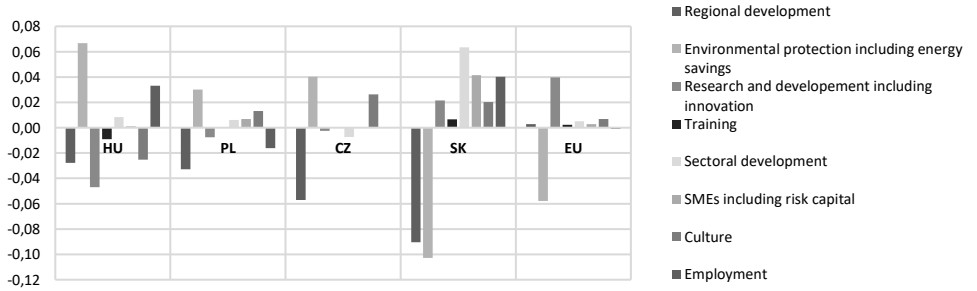
3.2 Structure of State Aid

The structure of regular State aid evolves relatively slowly, with the main turning points for the Visegrád countries being the successive multiannual financial perspectives. As their objectives are driven by the EU's overall economic policy (in recent years geared towards the climate and digital transformation), the objectives of EU funds are adjusted accordingly (Ambroziak, 2022b).

The COVID-19 pandemic and the redirection of available public funds at the disposal of Member State governments to activities related to the COVID-19 pandemic resulted in a sharp decline in the share of aid for environmental protection and energy efficiency in favour of all examined categories of State aid at EU level, including most notably research, development and innovation. This is an understandable trend, as available national financial resources related to the achievement of climate targets were redirected to all initiatives related to the fight against COVID-19 (and the urgent search for a vaccine). A trend similar to that observed at EU level can be seen in Slovakia, which significantly reduced aid for environmental protection and simple regional investment aid in favour of RDI.

However, for the other Visegrád countries, changes took place in radically different areas of State aid, compared to data for the EU as a whole. These countries significantly reduced regional investment aid, which should be recognised as an apt shift away from supporting simple investment in the least developed regions, as well as support for RDI in Hungary and, to a lesser extent, in Poland (Figure 5). Thus, the change in the intensity of regular State aid meant not only that more funds were transferred to activities covered by the COVID rules, but also that the State aid structure was significantly interfered with. Taking into account the categories of State aid, especially aid for environmental protection and energy efficiency, this move helped optimise the disposal of public funds limiting regional aid in favour of business support for climate transformation.

Figure 5: Changes in the Structure of Regular State Aid in the V4 Countries in 2020-2021 in Comparison to 2018-2019



Source: Own work based on the EC (2023).

4. Conclusion

In the wake of the COVID-19 pandemic, the Visegrád countries, like other EU Member States, increased their financial presence in the EU Internal Market. The states in the EU providing the most State aid were Germany, France and Italy. This therefore indicates that the Visegrád countries were right to join in in expressing concern about distortion of competition in the EU Internal Market, even though they were among the leaders in providing support in the pre-pandemic period. However, research to date suggests that this was primarily prompted by the availability of EU funds targeted in such a way as not to distort the level playing field within the European Single Market.

Within the V4 group, the countries that opted to intervene the most during the COVID-19 pandemic were Hungary and Poland, as opposed to Czechia and Slovakia. However, taking into account previous research (Ambroziak, 2022b), this does not imply a need for an increased State presence in the market, but only a continuation of the previous trend of strengthening the position of public authorities in the free market economy.

All of the V4 countries decided to partially reallocate available EU funds, as well as national resources, from the multiannual financial perspectives, in favour of measures to mitigate the negative consequences of the COVID-19 pandemic. This resulted in changes to the structure of regular State aid of the V4 countries. The previous research made it possible to identify two groups of countries: Czechia and Slovakia, where intervention was directed towards climate and digital transformation objectives in the EU, and Poland and Hungary, where there was a clear departure from the innovative paths of public interventions in the EU, to focus on making the least developed regions more attractive for investment and combating unemployment (Ambroziak, 2022b). However, the COVID-19 pandemic forced the V4 countries to significantly refocus their interventions by drastically reducing regional investment aid, in favour of supporting the climate transition.

Depending on the availability of data, it would be worthwhile in future studies to re-analyse the sectors of aid beneficiaries during COVID-19 in order, as in the case of Poland (Ambroziak, 2023), to be able to determine whether it was correctly targeted and, in the future, whether it was effective.

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Assessment of Digital Competences of EU Population as a Key Factor to Support the Implementation of Digital and Technological Innovations in the Public Sector of European Countries

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Abstract
Digital knowledge of the European population is an important factor for the digital transformation of the European Union's economies and the implementation of digital public services. The successful development and use of new information technologies, digital platforms and services and technological innovations in the public and private sectors depend on the digital skills and knowledge of their users. The European Union therefore promotes the development of digital competences in its policies and recognises its importance for Europe's future competitiveness. Every citizen of the European Union should have at least basic digital skills to be able to integrate in the new digital era. The paper is focused on the assessment of digital competences of citizens in the European Union countries, because they are necessary for the further implementation of digital and technological innovations in the public sector. The evaluation is based on the application of the weighted-sum method and uses actual Digital Economy and Society Indicators. The result of the research is an assessment of the level of digital competences of the population in the European Union countries with respect to the individual groups of EU-27, EU-13 and EU-14 countries. The research also focuses on assessing the basic digital competencies of women compared to the general population.

Keywords: *Digital Competences, Digital Transformation, European Union, Public Sector Innovations, WSA*

JEL Classification: *O34, O52, J24, H87, C44*

1. Introduction

The topic of digital transformation is currently in the forefront of interest of many authors and international organisations, see (Małkowska, Urbaniec and Kosała, 2021), (Kraus et al., 2021), (OECD, 2019a), (OECD, 2019b) or (OECD, 2014). Digitalization is an integral part of today's society, which significantly affects the functioning of the state, municipalities and public institutions and changes the requirements for the knowledge and skills of citizens (Veber et al., 2018) or (European Parliament, 2021). Digitisation is a tool to make the public sector more efficient and transparent, and the results of digitisation are measured and evaluated at different levels of government (Krejnus, 2023), (Ardielli, 2021) and various eGovernment indices are monitored, see UN (2024), European Commission (2022), European Commission (2023a). Digital technologies are also implemented as a part of business processes, together with labour, capital and knowledge capital assets, in order to drive performance (OECD, 2019a). The internet, social networks and mobile applications are becoming an indispensable part of every member of the digital society (European Commission, 2016)

Digitisation is a key issue in the European Union (EU). In 2010, the document *Digital Agenda for Europe* (European Commission, 2010a) was presented, which for the first time set out the key role of information and communication technologies in achieving the European Union's objectives. The Digital Agenda for Europe is one of the seven main initiatives of the *Europe 2020* strategy (European Commission, 2010b). Europe 2020 strategy from 2010 sets out a vision for achieving high levels of employment, productivity and social cohesion and a low-carbon economy. In 2020, the second five-year digital strategy, *Shaping Europe's Digital Future* (European Commission, 2020), was presented, focusing on three key digital objectives:

- technologies that work for people,
- a fair and competitive economy
- and an open, democratic and sustainable societies.

This strategy was complemented by the strategic communication *A Digital Decade for Europe* and the adoption of a ten-year plan, the *Digital Compass: Europe's vision for the Digital Decade* in 2021, which pursues the European Union's digitalisation goals to 2030 (Europa, 2024), (European Commission, 2021). Public sector such as state administration, local government, transport, health, education or culture are also significantly affected by digital transformation. The digitisation of public administration is therefore included among the key objectives of the Digital Compass. In the field of public services, all key public services should be available online till 2030, all citizens should have access to their electronic health records and 80 % of citizens should use e-identity solutions (European Commission, 2021).

Digital transformation in public administration will require certain demands on users of digital public administration services in the form of digital literacy of citizens. A key competence for the use of public and private digital services is the acquisition of basic digital skills. Digital skills also include the ability to communicate digitally with the state administration and use eGovernment services (MPSV, 2023). The European Commission has been addressing this for a long time. *European Skills Agenda* (European Commission, 2016) aims to achieve that 70% of 16-74 year olds have at least basic digital skills by 2025 and at least 80% of the population have basic digital skills by 2030.

Due to the relevance of the topic of achieving digital competences by EU citizens across all EU policies aimed at the digital transformation of the EU economies, this *paper focuses on the evaluation of digital competences of population in the European Union countries.* The paper emphasises the necessity of citizens' digital competences for the implementation of digital and technological innovations in the public and private sector.

2. Theoretical Background of Public Sector Digitalization

Digital technologies have a profound impact on the economy. Digitalization is a contemporary process of transformation of the economy and society, in which digital technologies are being introduced and used in various spheres of life, including the public, business and non-profit sectors (Veber et al., 2018), (Pilný, 2016) and (MPSV, 2023). This is a feature of the development of the global community that is characterized by quantitative growth, associated with the expansion of Internet users and software applications, and qualitative growth, associated with the development of qualitatively higher networks (G5) and new applications (Veber et al., 2018). The goal of implementing digitalization in the economic sphere is to strengthen the competitiveness of the respective economy at the micro level (competitiveness of the firm that implements the elements of digitalization) and at the macro level (strengthening international competitiveness). Electronization and digitalization are among the essential

elements that contribute to the modernization of the public sector in all developed countries (Ardielli, 2016).

2.1. Digital Transformation in the European Union

Digital transformation represents the integration of digital technologies by companies and enterprises and includes the impact of these technologies on society. Above all, digital platforms, the Internet of Things, so-called cloud computing and artificial intelligence are among the technologies transforming people's lives and affecting a whole range of industries. The process of implementing digitization to date has not been a leap, but rather a gradual and also largely asymmetric one. However, the digital transformation process is such an important aspect that it cannot be grasped by initiatives from below in the form of isolated business entities, but needs to be conceptualized, coordinated and supported from the level of national executives and transnational policies (Malodia et. al, 2021), (Veber, 2018). EU countries are tasked with promoting digital transformation initiatives in their national environments to be able to harness the potential of the gradual digitalisation of society and face the challenges it brings. The main objective is therefore to develop policies and implement innovative solutions for public and private sector that give the economic subjects the confidence, competences and means to digitise and grow (European Parliament, 2023). As part of the development of the digitisation of the public sector, the EU aims to fully digitise the provision of essential services to citizens by 2030 (life events listed in the Commission decision C2023(4288)), see European Commission (2023b). On average across EU countries, 77% of basic life events in relation to public administration could be completed online in 2022. The assumption for 2030 is that 100% of services will be available online, see European Commission (2023a). The transformation of the public sector requires that users of digital public services have sufficient digital knowledge. In 2021, 53.84 % of individuals in EU countries had at least basic digital skills. Europe's digital transformation aims to reach 80% by 2030 (European Commission, 2023a).

The increasing involvement of digital technologies in the public sector will have an impact on the need for experts and ICT specialists who will be able to implement and manage these technologies. As ICT specialists are considered workers who have the ability to develop, operate and maintain ICT systems, and for whom ICT constitutes the main part of their job. A number of EU countries are already struggling with a shortage of ICT professionals, and this problem is even more acute in the public sector. Women should be more involved in ICT and encouraged to pursue education and careers in ICT. The Digital Compass (European Commission, 2021) sets a target of 20 million ICT professionals in the EU by 2030, with more women entering the workforce. In 2022, a total of about 9.4 million ICT professionals were available in the EU (European Commission, 2023a).

The importance of the policy is also demonstrated by the fact that the digital transformation is supported at EU level by a number of funding programmes such as the *Digital Europe Programme* (European Parliament, 2021) with a total budget of €7.588 billion for the period 2021-2027, as well as investment programmes such as *Horizon Europe*, the *Connecting Europe Facility* (CEF Difital) and the *Recovery and Resilience Facility* (RRF). These programmes aim to promote a more sustainable and resilient economy and society, ready for a green and digital transformation in line with EU priorities (European Commission, 2024). The approach of individual EU countries to digitization also differs in the amount of financial resources spent. To set the same conditions for all EU countries, the European Commission for example defined the requirement of at least 20% of Recovery and Resilience Plan funding for the digital transformation in national economies. The countries that plan to invest the most

in the area of human resources and eGovernment are for example Czechia, Slovakia, Hungary (digital re-skilling and up-skilling strategies) and Germany (eGovernment development). The least proportion of their RRP to the area of human resources is planning to invest Croatia, Lithuania and Estonia, in case of eGovernment measures are there countries as Hungary and Romania that are not planning to invest any important part of their RRP even though these countries have not yet achieved a necessary level in this area (Lacová and Šuplata, 2022).

2.2 Digital Competences and Digital Education

Digital competences are understood as cross-cutting key competences, without which it is not possible to fully develop other key competences that are necessary for active employment in society and on the labour market (NPI, 2024). Digital literacy is a set of individual (digital) competences that an individual needs to use digital technologies safely, confidently, critically and creatively at work, in learning, in leisure and in their social life. However, the specific competences that make up digital literacy are not permanent, lasting competences. They change as the way and breadth of the use of digital technologies in society and in people's lives changes. Digital skills are at the forefront of the EU's concerns as they have a significant impact on shaping Europe's digital future. The covid-19 pandemic has shown how important digital skills are for work, but on the other hand, it has also highlighted gaps in digital education and skills (European Parliament, 2023). Eurostat statistics show that 42% of EU citizens lack basic digital skills (Eurostat, 2024). The EU is aware of the lack of digital skills among EU citizens and seeks to support projects and strategies to improve the level of digital skills in Europe. Digital skills are a key driver of EU competitiveness and innovation capacity. They are also a key factor for social cohesion and personal well-being. The *Digital Competences Framework for Citizens* (Vuorikari, Kluzer and Punie, 2022) defines so-called digital competences. Digital competences include "the confident, critical and responsible use of digital technologies and their use for learning, work and participation in society". They are defined as a combination of knowledge, skills and attitudes (European Commission, 2016). Core digital skills include (Vuorikari, Kluzer and Punie, 2022):

- Information and data literacy - this area includes searching, accessing and navigating different types of digital content (files, websites, etc.).
- Communication and collaboration - this area involves using digital technologies to interact, communicate and collaborate with other people. This includes the use of public and private digital services and the ability to manage digital identity.
- Digital content creation - the skills needed to create and edit different types of digital content, including text and multimedia files.
- Security - the skills needed to protect equipment, content, personal data and privacy.
- Problem solving - the skills needed to identify needs and technical problems in the digital domain and then to choose appropriate technological solutions.

Ongoing digital and green transformations are bringing rapid economic restructuring that requires people to engage in lifelong learning. Moreover, these transformations require EU countries to unlock their full potential in skills and innovation. This includes reforms aimed at improving the quality of education and training systems (European Parliament, 2023). The EU is investing in training programmes for EU citizens because digital skills are a springboard for employability and prosperity, see European Commission (2016).

3. Problem Formulation and Methodology

Digital transformation is one of the priorities of the European Union, which is reflected in its policies. Digital technologies are perceived as an important aspect, representing a huge growth potential for EU countries. The digital transformation is therefore primarily aimed at strengthening the capacity of EU countries in new digital technologies (Europa, 2024). This should lead to increased competitiveness as a whole, open up new opportunities for businesses and consumers, support the EU's green transformation and help it achieve climate neutrality by 2050 (covered by the *Green Deal for Europe*) (European Commission, 2020). Increasing the digital literacy of EU citizens, enhancing the digital skills of employees and promoting the digitisation of public services are also important areas of digital transformation in the EU (European Parliament, 2023), (Europa, 2024).

The aim of the paper is to assess the digital competences of population in the European Union countries.

Two research questions RQ1 and RQ2 were also established:

- RQ1: *Is there a difference in level of digital competences achieved between EU-13 and EU-14 countries?*
- RQ2: *Is the share of women reaching at least the basic level of digital competence on average lower than in the general population?*

Due to the inclusion of multiple indicators with different scales, multi-criteria decision-making methods were applied in the processing. The weighted sum method (WSA) is commonly used in various economic and social contexts where it is necessary to find an efficient solution or to rank the options (Šubrt et al., 2019).

3.1 Methods

The Weighted Sum Approach is a multi-criteria method for evaluating variants. These models are used to effectively deal with situations where multiple criteria influence the decision. Multi-criteria methods aim to identify the best option within all the aspects considered, eliminate ineffective options and propose an arrangement of options. Thus, these methods allow a systematic and structured approach to decision making in complex and multifaceted situations (Šubrt et al., 2019). The weighted sum method is based on the creation of a linear utility function on a scale from 0 to 1. This function reflects the ranking of options according to a given criterion, with the worst option having a utility of 0, the best option having a utility of 1, and the other options occupying values between these extremes. This method requires precise and measurable information (cardinal), a criterion matrix and a vector of criterion weights. It constructs an overall ranking for each variant and allows not only finding the single most favourable variant, but also ranking all variants from best to worst. The weighted sum method is based on the principle of utility maximization, where it tries to find the variant that maximizes the total utility when considering the weights in the evaluation of each criterion (Šubrt et al., 2019).

When using the weighted sum method, it is necessary to replace the elements y_{ij} of the input criterion matrix with new values y_{ij}' that represent the utility of the variant X_i relative to the criterion score Y_j. For the maximisation criteria, the values of y_{ij}' can be obtained using the following relation (1):

$$y'_{ij} = \frac{y_{ij} - D_j}{H_j - D_j} \tag{1}$$

where D_j represents the lowest value of Y_j (worst in the case of maximization) and H_j represents the highest value of Y_j (best in the case of maximization). From this relationship, it can be seen that the utility y_{ij}' for the worst criterion value $y_{ij} = D_j$ will be equal to 0, and for the best criterion value $y_{ij} = H_j$ will be equal to 1. For minimization criteria, the above relationship needs to be modified according to the following formula (2):

$$y'_{ij} = \frac{H_j - y_{ij}}{H_j - D_j} \quad (2)$$

The total utility of option Xi can then be calculated as the weighted sum of the partial benefits of each criterion (Jablonský and Dlouhý, 2015), see relation (3):

$$u(X_i) = \sum_{j=1}^{k} v_j . y'_{ij} \quad (3)$$

For each variant, is calculated the total utility function. The variants are then arranged in descending order according to the value of $u(X_i)$ and those variants that achieve the highest utility values in the required number are considered the optimal solution to the problem (Šubrt et al., 2019).

3.1.1 Model and Data

The evaluation is based on the application of the weighted-sum method and uses actual Digital Economy and Society Indicators from 2022 (European Commission, 2023a), which are used by the European Commission to assess its digitalisation targets. The European Commission has been monitoring the digital progress of EU countries through the *Digital Economy and Society Index (DESI) reports* since 2014. From 2023 and in line with the Digital Decade 2030 policy agenda, the DESI is now included in the *Digital Decade Status Report* and used to track progress towards digital goals, see European Commission (2021). The MCDM model includes 27 variants (EU-27 countries) and 7 criteria I_1-I_7:

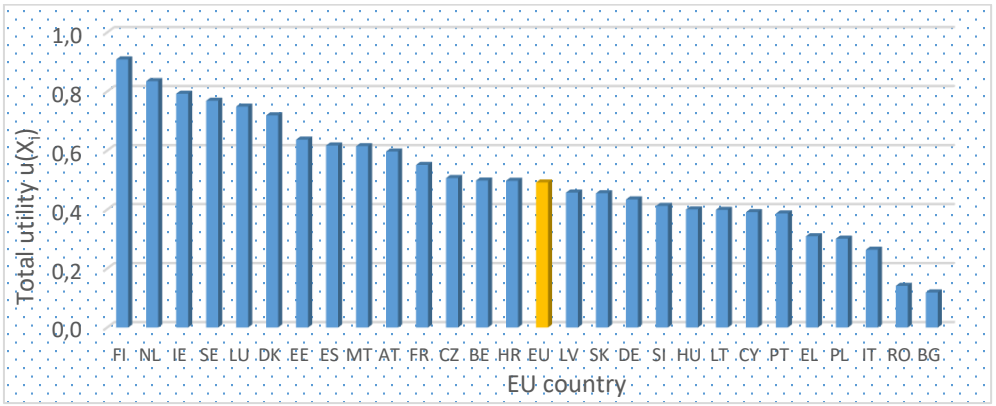
- Internet use (I_1) describes individuals who use the internet at least once a week
- At least basic digital skills (I_2) describes individuals with basic or above basic digital skills in each of the five dimensions (information and data literacy, communication and collaboration, problem solving, digital content creation).
- Above basic digital skills (I_3) describes individuals with above basic digital skills in each of the five dimensions of digital competences.
- At least basic digital content creation skills (I_4) describes individuals with at a basic level of skills in using software for digital content creation.
- Females having at least basic digital skills (I_5) describes females with basic or above basic digital skills in each of the five dimensions of digital competences.
- ICT specialists (I_6) describes employed ICT specialists (ICT service managers, ICT professionals, ICT technicians, ICT installers and servicers)
- ICT graduates (I_7) describes persons with a degree in ICT

By application of WSA, the method of equal weights was used for all criteria.

4. Problem Solution

The assessment of the digital competences of population in the European Union countries was made by applying the multi-criteria decision-making method WSA. The evaluation is based on selected DESI indicators I_1-I_7 (European Commission, 2023a). The result of the research is the ranking of the EU countries according to the achieved value of total utility $u(X_i)$, see Figure 1.

Figure 1: Assessment of Digital Competences of Population in the EU-27 (2022)



Source: European Commission (2023a), own processing

The best digital competences of the population were found in Finland (0.9085), the Netherlands (0.8351), Ireland (0.7924), Sweden (0.7687), Luxembourg (0.7485) and Denmark (0.7190). All these leading countries belong to the EU-14 countries. The best placed country out of the EU-13 countries is Estonia, ranked 7th with a score of 0.6370. Among the worst placed countries are Greece (0.3092), Poland (0.3010), Italy (0.2636), Romania (0.1412) and Bulgaria (0.1187). On average, the EU-27 countries achieve a total utility value of 0.5096. EU-14 countries that joined the EU before 2004 (so-called old EU countries) on average achieved a significantly higher score of 0.6020 than EU-13 countries that joined after 2024 (so-called new EU countries or Eastern countries) with a value of 0.4101, see Table 1.

Table 1: Descriptive Statistics of the Variants (2022).

Country groups	Mean	SD	Median	Variance	Min	Max
EU-27	0.5096	0.2027	0.4973	0.0411	0.1187	0.9085
EU-14	0.6020	0.2031	0.6067	0.0412	0.2636	0.9085
EU-13	0.4101	0.1539	0.4122	0.0237	0.1187	0.6370

Source: European Commission (2023a), own processing

Research question RQ1 was verified and confirmed. *There is a difference in level of digital competences achieved between EU-13 and EU-14 countries.* The difference between the average values of the EU-13 and EU-14 country groups is 32 %. Table 2 summarizes descriptive statistics on the issue of comparing the share of women with basic digital competences and the general population having these basic digital competences. It can be summarized that, on average, there is indeed a lower proportion in the sample of women achieving basic digital skills (55.05 %) compared to the general population (56.29 %). However, the difference is not very significant and amounts to 1.24 percentage points. The highest proportion of women achieving at least basic digital skills is in Finland (80.16 %), which is even more than in the general population, then in the Netherlands (76.94 %) and Ireland (71.87 %). The lowest proportion of women achieving at least basic digital skills is in Poland (40.93 %), Bulgaria (31.24 %) and Romania (25.71 %). **Research question RQ2 was also verified and confirmed.** *The share of women in EU countries reaching at least the basic level of digital competence is on average lower than occurs in the general population.*

Table 2: Descriptive Statistics of the Criteria (2022)

Indicator	Mean	SD	Median	Variance	Min	Max
At least basic digital skills (I_2) (% of individuals)	56.29	12.10	55.31	146.52	27.82	79.18
Females having at least basic digital skills(I_5)(%of individuals)	55.05	12.25	55.27	149.96	25.71	80.16

Source: European Commission (2023a), own processing

5. Conclusion

Online provision of key public services for citizens is an important policy objective of the European Union. To achieve this objective, users of digital government services need to have the necessary digital skills. The paper is focused on the assessment of digital competences of population in the European Union countries. The digital competence of the users is considered a necessity, for the further implementation of digital and technological innovations in the public sector. The evaluation is based on the application of the weighted-sum method and uses actual Digital Economy and Society Indicators, which are used by the European Commission to assess its digitalisation targets. **The research objective was met.** *The result of the research is an assessment of the level of digital competences of the population in the European Union countries with respect to the individual groups of EU-27, EU-13 and EU-14 countries.* The research was supplemented by *two research questions RQ1 and RQ2 that were verified and confirmed*. Large differences were found between the results of different groups of EU countries. EU-14 countries performed much better than EU-13 countries, especially Finland, the Netherlands, Ireland, Sweden, Luxembourg and Denmark. Italy, Romania and Bulgaria are the countries with the lowest scores in digital competences. EU-13 countries scored on average 32% lower than EU-14 countries. The research also focused on assessing the basic digital competencies of women compared to the general population. It was discovered that the share of women in EU countries reaching at least the basic level of digital competence is on average lower than occurs in the general population, however, the difference is not very significant (1.24 percentage points). The public sector is currently facing new challenges that will have to be dealt with in the future. The advent of artificial intelligence tools will enable faster and more transparent online public services that will provide greater convenience to clients. Their implementation is expected primarily for the quick administration of simpler first-level administrative proceedings without direct decision-making by an authorized official. For the future, artificial intelligence represents a key factor leading to higher quality and efficiency of public sector performance, including new requirements for the knowledge of officials and citizens.

Acknowledgements

This paper was supported by project No. SP2024/077 „*Approximation of exogenous and endogenous factors of effective allocation of public resources to support the implementation of digital and technological innovations in the public sector*“, Faculty of Economics, VSB – Technical University of Ostrava.

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Selected Aspects of Copyright in Architectural Works in the Selected European Country

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Abstract
This paper deals with copyrights linked with architectural and design works in the selected European country. Among the main issues addressed in the paper are the copyright relations between the architect and the designer, when one of them creates his work and the other builds on his work with his own part of the work. Another not entirely clear question is the situation of the owner of the building who wants to reconstruct his house, which will, however, change the original architectural design of the house. Another issue is the assessment of the resemblance of two similar projects - when it is an inspiration and when it is already a violation of copyright. Although the answers to these questions may seem simple at times, the legal solution to these questions requires more studying. These issues are often the object of harmonization of the European law and therethrough of the European integration.

Keywords: *architectural works, copyright, copyright protection, European integration, intellectual property rights*

JEL Classification: *K19, K29, K39*

1. Introduction

Copyright aspects of an architectural work are a current and necessary topic in connection with the current construction boom, which leads to the creation of many unique architectural works. Unfortunately, in the Czech Republic the issue of the protection of architectural works is still faced with a lack of literature and jurisprudence related to it. It is a shame, because the right to copyright protection is one of the fundamental human rights, like for example the freedom of speech. (Bartes, 2022)

This is a big difference from some Western European countries (mainly Germany) or Anglo-Saxon countries. In countries with Anglo-Saxon law, the concept of *copyright* is distinguished from the concept of *moral rights*, which represents the creation of intellectual activity, especially visual arts. (Adler, 2024)

Nevertheless, interesting questions related to copyright issues and even more interesting solutions can be seen in Czech legal practice, or rather in the Czech architectural and civil engineering practice. These questions and topics are the subject of the paper and may be an inspiration for legislation and scientists in other states, particularly in the European Union. Currently, it is possible to observe various efforts to amend the European legislation regarding copyright, which is also written about by various foreign authors (Kraetzig, Lennartz, 2023)

The European Union itself is trying to harmonize the copyright law of the member states. In this respect, one can observe and above all talk about the transfer of part of sovereignty from a given Member State to a supranational organization - the European Union. (Bartes, 2020) Nevertheless, we must not forget that the process of European integration does not only involve legislative changes, but is also a process involving the political and economic spheres. (Bartes, 2018)

As an example of the harmonization of European law, we can mention the directive of the European Parliament and of the Council regulating the so-called "teaching" citation, which allows the use of a work in scientific research whose purpose is not to achieve direct or indirect economic or commercial benefit". (Directive 2001/29/EC) As Myška points out, "*the scope of use of the work based on this legal license may not exceed the intended purpose, i.e. the implementation of scientific research*". (Myška, 2017)

These acute topics are devoted to copyright and the copyright relationship between the architect and the designer (civil engineer) when one of them prepares his work (e.g. an architect prepares an architectural study of the building) and the other follows up on this work with own part of work (e.g. a designer, or rather civil engineer prepares the statics and ventilation of the building). The question in this case is, whether the other one can use the work of the previous one. Another acute topic in this paper is a situation when a building owner, or rather investor wants to change the building (e.g. to build additional floor or to reconstruct a roof), thereby changing the original architectural study.

Currently, it is quite common to provide architectural outputs in electronic form, e.g. in dwg. format. However, what about providing these electronic files to other architects or designers and what are the limitations of providing? Aforementioned topics are examples of questions addressed in the given paper.

The aim of this paper is to analyze acute topics linked with copyright and architectural works or rather designer (civil engineering) works in the Czech legal and architectural practice. I state the following as a hypothesis for the paper: "Copyright of architects is always protected by the Copyright Act".

2. Problem Formulation and Methodology

In order to achieve the aim of the paper, I use the analysis and synthesis method, the description method and in some parts of the paper the method of comparison. When drawing up the paper, I base it primarily on the Czech concept of copyright and on legal regulation. I also take into account relevant specialized literature.

Before practical questions and topics of copyright in architecture will be addressed, at the outset, it is necessary to mention that copyright develops in two main movements, namely in the Anglo-Saxon legal system (i.e. the term *copyright*; or rather *common law copyright*) based on utilitarianism and in the European continental legal system (i.e. the term *author's rights*, or rather French term *droit d'auteur*;) based on natural law theory.

The term *copyright* has already become so common, that is why it is used in everyday speech and this term is also used in the case of the European continental legal system (for which the term *author's rights* is better suited). For the same reason, I use the term *copyright* in my paper.

Whereas the Anglo-Saxon legal system of copyright prefers the interests of society over the interests of the author of the work, in the European continental legal system (including the Czech Republic or for example Germany), the author's rights are recognized regardless of the influence of these rights on society and the role of a state is just to establish the method of

protection and exercise of a natural right by the relevant Copyright Act. Conception of natural law is based on the natural nature of the creation of an author gifted with various personal qualities and abilities, whose work is a manifestation of his personality, and therefore "*each artistic or scientific (creative) product of the human spirit is rare in that it is unique in its origin and nature, cannot be created repeatedly*". (Telec, 2014)

The Supreme Court of the Czech Republic has previously ruled in this regard, stating that "*the subject of copyright (a work) is inalienable, as it is of a natural extralegal nature, intrinsically linked to the personality of the creator*". (Supreme Court, 2007) It can be stated that the European continental legal system thus places the author and his personality rights in a leading position of interest, while the public interest, which is, on the contrary, preferred in the Anglo-American legal system, plays a subordinate role here. This difference also predetermines different methods of protection of the architectural works, or rather works of civil engineers and various ways of exercising these copyright protections in practice.

Although I have outlined some differences between the Anglo-Saxon and European legal systems, in my paper, I would like to focus (also with regard to the aim of the paper) on copyright in the European continental system. Within the European continental legal system, compared to other intellectual property rights (e.g. patent law, trademark law), copyright protects both the property and moral rights of the author (whose duration is much longer than, for example, in the aforementioned patent law). A crucial aspect of copyright protection is its informal origin, i.e. the author is not required to register his work (on the contrary, a work enjoys copyright protection at the moment of its creation according to the Copyright Act).

3. Copyright and Project Documentation Prepared by Another Person

Everyone can imagine the following situations – an investor wants to build his dream family detached home and turns to an architect to help him design the house and create an original architecture rendering. In such a case, a contract for the work is concluded at the beginning according to the Civil Code between the investor (the client) and the architect (the contractor). The architect prepares the architectural work and provides it to the investor for a fee (this is a typical private legal relationship). At this moment, the investor has a valuable aesthetic architectural creation (in the electronic or in the physical form), but cannot yet build, because he is required to obtain a building permit under the Building Act (on the contrary, this is a typical public law element).

According to the Czech Building Act, in order to obtain a building permit, it is necessary to prepare project documentation with the requirements of the Building Act. According to the Czech Building Act, the project documentation consists of the documentation for zoning proceedings (hereinafter DZP), the project documentation for the building permit (hereinafter DBP) and the documentation for the realization of the building (hereinafter DRB).

Only by obtaining a building permit can the purpose of the original architectural study be realized. However, here comes the first copyright question arises – is a designer (civil engineer) entitled to use and modify an original architectural study provided by an investor to draw for example ventilation, electrical, etc.?

This issue related to copyright is governed by the Section 61, Paragraph 1 of the Copyright Act, according to which: "*If the work is created by the author on the basis of a contract for the work, it means that the author has granted a license for the purpose resulting from the contract, unless otherwise agreed. The customer is entitled to use the work beyond the scope of such a purpose only on the basis of a license agreement, unless otherwise stipulated by this law.*" This provision implies that the legislator establishes a rebuttable presumption of granting

a license to the work for the purpose of its realization. The purpose of an architectural work is, of course, a three-dimensional expression of the building, i.e. its realization, within which an architecture work is used.

In practice, this means that the architectural work will be followed up by the first designer who develops the DZP and the DBP and subsequently by the second designer who develops the DRB. Drawing up of the individual phases of the project documentation by other persons (different from the original architect) is not a violation of the architect's copyright, because it is in accordance with the purpose of the contract for the work (to realize the building, for which it is necessary to prepare the project documentation according to the Building Act). In this case, the rebuttable presumption according to the Section 61, Paragraph 1 of the Copyright Act on the granting of a license to use an architectural work is used.

If the investor does not ask for two independent designers, he can turn to a design office in which the designers work together. In this case, the designers cooperate and prepare the project documentation as a whole. From the point of view of copyright, it concerns co-authors and the copyright belongs to them jointly and severally according to the Section 8 of the Copyright Act. The share of individual co-authors in the joint proceeds from the copyright to the work of the co-authors is proportional to the size of their creative contributions. It is necessary to underline that in the Czech Republic an architectural study is not a mandatory part of the process for the preparation of a building according to the Building Act.

3.1 Follow-up with Unfinished Project Prepared by Previous Subject and Architect's Fee

The previous text in this subchapter is conceived from the investor's point of view. Let's imagine the situation when the architect prepares an architectural work for his client (e.g. a project of the house), but his client doesn't like an architect's attitude to design of the house. For this reason, the client decides to change his architect. Is possible to use unfinished project for follow-up by another designer or architect?

The starting point is the Section 2, Paragraph 3 of the Copyright Act which states: "*Copyright applies to the completed work, its individual development stages and parts,…*". Another condition is the fact, that the relevant part or part of the architectural work is expressed in an objectively perceptible form. It is necessary to mention, that the architectural idea is not protected by copyright (see Section 2, Paragraph 6 of the Copyright Act). Additional condition is that unfinished project has to comply with features of the architectural work (i.e. it has to be a work of art, the work has to be unique and be a result of the author's creative activity). It can therefore be stated that even a part of the architectural work is protected by copyright and cannot be freely used anymore.

In the context of the protection of the author's work part, the European Court of Justice stated in the *Infopaq International* case, that for example only eleven words (as a small part of the author's work) can be protected by the Copyright Act. If these words are expression of author's own spirit production (and are unique and expressed in an objectively perceptible form), it is necessary to get an author's agreement to distribution of these eleven words. (European Court of Justice, 2007) It is possible to add that the European Court of Justice requires fulfill a lower standard related to an originality of the author's work (as a part of a creative author's activity) than Czech or another courts of member European countries.

For that reason, it is necessary to contractually regulate the legal relationship between the architect and the investor in case of non-realization of the building or dissatisfaction of the investor with the architect (although he wants to use part of the designs). The crucial fact is

that the architect's permission is required for completion by another architect. At the same time, it must be noted that the above goes beyond the purpose of the contract for the work in the sense of the Section 61, Paragraph 1 of the Copyright Act.

A "stricter" legal regime applies to architects (in contrast to designers). Architects are part of the professional chamber (i.e. the Czech Chamber of Architects), which introduced the Professional and Ethical Code (i.e. PEA CCHA). According to the Section 26, Paragraph 3 of the PEA CCHA, the architect must inform in writing and ask the previous architect about dealing with the client. The other architect has 15 days to respond (this period is considered a rebuttable presumption of consent).

Another manifestation of the stricter legal regime for architects is the fact that, according to the Section 26, Paragraph 4 of the PEA CCHA, an architect needs written consent of another architect when using his unfinished work. This written consent can be replaced by the conclusion of a license agreement between the two architects. It can therefore be concluded that an architect needs the permission of a previous architect to continue his study.

In the event that the architectural work is not completed (i.e. the work is unfinished), the contractual relationship between the architect and the investor must be terminated and financially settled. The architect acquires copyright *ex lege* according to the Section 9, Paragraph 4 of the Copyright Act: "*Copyright in a work arises the moment the work is expressed in any objectively perceptible form*". If the architectural work is unfinished, the architect must receive a fee for the relevant scope of the completed work.

3.2 Providing the Source Files or Parts of the Project Documentation to the Investor

Source files (e.g. .dwg) fundamentally fall under the protection of the copyright when they fill in the characters of an author's work according to the Section 2, Paragraph 4 of the Copyright Act. In practice, it is common for the investor to provide the architect's source files to other designers so that his intended project can be realized. The question of providing source files is usually already resolved in the contract for the work, where the conditions for how the files can be used should be adjusted.

From the point of view of the copyright, the issue of providing source files is regulated in the already mentioned Section 61, Paragraph 4 of the Copyright Act. This is based on the purpose of the contract for the work, which is the realization of the building in three-dimensional form. In view of this section, the provision of source files to an investor should be in accordance with copyright. However, if the investor starts providing the source files to other designers for money (so that the designers get to an interesting architectural work), it is necessary to conclude an exclusive license with the original architect.

The same legal construction can also be used for the issue of individual parts of project documentation – the so-called workshop documentation. These individual parts of project documentation relate to, for example, to information about materials or the construction of the building in the form of drawings. For that reason, it is possible to use individual parts of the project and provide them to other designers who are supposed to help with the realization of the intended building. This is in accordance with the rebuttable presumption in the Section 61, Paragraph 1 of the Copyright Act. However, if the purpose for which part of the project is provided would exceed the original purpose of the contract for the work, the architect and the investor need to enter into an exclusive license, just as in the case of source files.

3.3 An Architectural Work that doesn't Meet the Requirements of Regulations

Architectural works are usually interesting and original solutions that have a high aesthetic value – this fact expresses their aesthetic, or cultural value. However, an architectural work must also meet technical, legislative and practical criterions – this expresses its functional value. It follows that an architectural work that is beautiful but does not meet legislative and technical requirements cannot be realized in real life in a three-dimensional form.

In such a case, the legal starting point is again the Section 61, Paragraph 1 of the Copyright Act. If the architectural proposal does not meet the requirements (contains factual or legal errors) that make it impossible to produce the building in three-dimensional form, or make it impossible to obtain a building permit according to public law regulations, the purpose of the work contract again takes precedence and the mentioned provisions of the Copyright Act must be applied.

This fact makes it possible to provide the architectural work to another designer who will correct these defects. These defects can be corrected, although the architect would not agree, because the purpose is to realize the construction. Nevertheless, the architect must be informed about the change and the reason for the change (a written form can be recommended). However, these changes must only be to the necessary measure and must not affect the interests of the author according to the Section 29, Paragraph 1 of the Copyright Act.

The absolutely necessary measure expresses the creation of only minimal changes so that the original value of the architectural work is preserved and at the same time it is possible to realize the work with regard to the technical and legislative aspects. The prohibition against affecting the legitimate interests of the author means that it is not possible to transform the original author's work, for example, into a defamatory form (e.g. the same building project but painted in a lascivious color which resembles a "naughty house").

4. Changes Related with the Realization of Buildings

In this chapter, I will focus on two general situations. The first situation (subchapter 4.1) is the case when the investor wants to make a change to the building (e.g. to change the material, construction), which is already built. The second situation (subchapter 4.2) is the case when the investor wants to make a change to the building (e.g. to change the layout of the room), which is still under construction.

4.1 Change of Completed Building

If the building is built and the investor wants to modify or reconstruct it, it is necessary to proceed according to the law in such a way as not to interfere with the copyright of the architect.

The legal starting point is the Section 38d letter b) of the Copyright Act, according to which "*the person who uses an architectural work expressed by a building, drawing or plan for the purposes of maintenance work or changes to the completed building to the extent absolutely necessary and while preserving the value of the architectural work does not encroach on copyright*". The condition for the application of the aforementioned provision of the Copyright Act is to make changes to the building only to the extent necessary and at the same time preserve the value of the architectural work.

What do the changes mean to the extent necessary? For example, it is the reconstruction of the roof (which leaks), the repair of the facade (which crumbles), the new facing of the stairs

(which slip in winter), the change of material or construction solution (which is necessary from the point of view of static calculation). In practice, it is more of a problem with preserving the value of the architectural work, which must be preserved cumulatively. The assessment of the limits of preservation of the value of an architectural work is assessed by the court, based on submitted expert opinions from the field of architecture.

On the basis of the above and with regard to the legal regulation, it can be stated that, paradoxically, it can be much easier to demolish and rebuild a building than to significantly reconstruct it. Demolition of a building is not a copyright infringement – that is not prohibited by the Copyright Act.

4.2 Change of Building Under Construction

The Copyright Act does not explicitly foresee a situation where a building under construction should be changed. Nevertheless, the Section 29, Paragraph 1 of the Copyright Act can be considered as a starting point, according to which "*Exceptions and limitations of copyright can only be applied in special cases established by law and only if such use of the work does not conflict with the normal way of using the work, nor is it disproportionately legitimate interests of the author are affected*". Such a case established by law is the Section 2375, Paragraph 2 of the Civil Code, according to which "*The acquirer may modify or otherwise change the work or its name, only if it has been agreed...*". It follows from the aforementioned provision of the Civil Code that in case of future modification of the architectural project, it is necessary to include this possibility of change in the contract with the architect from the beginning. While this situation is relatively clear in terms of law and its predictability, the following situation can become a nightmare for many investors.

It may be a situation where a building plot is sold with a building under construction. Since the superficial principle applies, the building under construction is part of the land. In case of land sale, the new owner automatically exercises the rights from the building permit, as it is an administrative act *in rem*. This means that the building permit is not bound to the owner of the land, but to the building plot. Two situations can occur at this stage:

The first situation consists in the fact that the new owner of the land also acquires the ownership right to the architectural work incl. copyright permission. The second situation may be that the new owner of the land completes the building according to a different architectural work. In such a case, it is necessary to obtain the consent of the original architect (author), as it may be an interference with the inviolability of the work.

For this reason, it is recommended to include a clause on the builder's "succession" in the contract for the work between the architect and the investor. The transfer of property copyright from the original to the new owner of the land is outside the scope of the purpose of the contract for the work in the sense of the Section 61, Paragraph 1 of the Copyright Act (i.e. a rebuttable presumption of the granting of a license).

5. Conclusion

The aim of the paper was to analyze acute topics linked with copyright and architectural works or rather designer (civil engineering) works in the selected European country and its legal and architectural practice. I also stated the hypothesis for the paper as “Copyright of architects is always protected by the Copyright Act”. The paper then discussed the issue of copyright both from a theoretical and a practical point of view.

In the framework of the theoretical part, the crucial doctrinal aspects of copyright in the Anglo-Saxon and European continental systems were mentioned. In the practical part, which was the main subject of the paper, selected aspects of the issue of copyright related mainly to the architect, or rather designer and the investor were discussed.

The paper described the pitfalls of providing an architectural work to other architects, or designers. The situation when an architectural work must be provided by the investor to another architect or designer, who will improve the original architectural work in terms of functionality, is very common in practice. However, not everyone knows what the limits of this provision are. The article answers this question through the important Section 61, Paragraph 1 of the Copyright Act, which appears to be a fundamental starting point for assessing the permissibility of providing copyright work to other persons.

This provision of the Copyright Act (i.e. the Section 61, Paragraph 1 of the cited act) envisages the possibility of granting a license to the author's work to other persons when the author's work has been processed on the basis of a contract for the work and the providing of the author's work is in accordance with the purpose of its realization according to the contract for the work.

This important legal provision is also a solution for situations in which the investor needs to provide a part of the project, or individual electronic files to another designer for the purpose of complete project realization. These individual parts of the project or electronic files (such as e.g. .dwg format) can be provided by investors or designer to another designer when they are provided for the same purpose as the contract for the work – i.e. realization of the building, or rather the author's work. Similarly, parts of the project or electronic files can be provided on another designers for modification when the original part of the project or electronic files do not comply with the applicable legislation.

The paper also introduced the issue of changes associated with the realization of the building. In the contribution, it was demonstrated that it is necessary to make distinctions in the assessment of changes in the stage of reconstruction of the building (i.e. already completed building) and in the stage of building under construction, when the investor wants to deviate from the original architectural work.

Whereas within the case of change of completed building (i.e. reconstruction) it is necessary to make changes of original author's work (i.e. completed building) only to the extent necessary and at the same time preserve the value of the architectural work, in the second case – within the case of change of building under construction – it can be recommended that the investor should have a written agreement with the architect that reasonable changes to the building can be made during its construction.

Within these intentions, the paper presented the analysis of selected acute problems associated with copyright in the field of architecture and civil engineering. It is possible to state that the aim of the paper was therefore fulfilled. Given the analysis of selected copyright issues and the finding that copyright is not always protected by copyright law, as there are various limitations of copyright, the stated hypothesis can be refuted.

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Financial Literacy and Debt Responsibility among Czech Youth in the EU Context

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Abstract
Financial indebtedness represents a significant economic challenge for many citizens in the Czech Republic, particularly when such debts are incurred during childhood. This issue is being addressed by member states globally. A potential solution to this problem lies in the adoption of a new strategy focused on improving financial literacy, spanning from elementary education through to adulthood. The issue of childhood debts has previously presented challenges within Czech legislation, which is now being addressed through amendments to the insolvency law. These amendments facilitate young debtors' access to debt relief, albeit under certain conditions that must be met for successful debt discharge. Studies on financial literacy in elementary and high schools have revealed no significant difference in the level of knowledge among students, indicating that students in higher educational levels do not necessarily possess better financial literacy than those in elementary education. Therefore, there is a need for a focused implementation of financial literacy education in schools, ensuring adequate time and curriculum scope as defined by the Financial Literacy Standards. This can be achieved by enabling schools to fulfill these requirements through their educational programs, which are tailored by individual schools based on their specific considerations and teacher schedules.

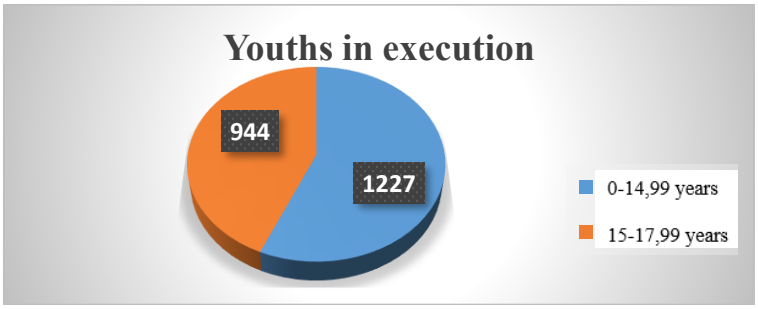
Keywords: *childhood debts, debts, discharge, financial literacy education*

JEL Classification: *G34, G30, G01*

1. Introduction

The issue of child debts has been a persistent challenge in Czech law, where it was not unusual for individuals over 18 years of age to become indebted for obligations that originated during their childhood, frequently due to unpaid waste fees or fares for public transportation. The recently approved amendment to the Civil Code also stipulates that a minor under 13 years old should not bear the financial consequences of any damage they cause, but potentially only face educational and moral repercussions. The person who failed to adequately supervise the minor, which is typically the parents, should be responsible for compensating the damage caused by such a minor (Bařinová and Dlabajová, M., 2022). There are two exceptions to this principle: damages resulting from an intentional criminal act and situations where the minor's economic circumstances allow for the payment of damages - for instance, if the child inherits a substantial estate.

Figure 1: Total Number of Minors in Execution



Source: Own elaboration (2024)

Young people whose debts are at least two-thirds childhood debts can get out of debt within three years - just like seniors. (www.penize.cz, 2021)

The child debt rules apply retrospectively to people up to the age of 21 from July 2021. In particular, public bodies such as town halls and transport companies can now forgive old child debts without fear of breaching their asset management duties.

1.1 Characteristics of the Current Situation

The current situation in the European Union with regard to youth debt and financial literacy among young people is quite complex and shows significant differences between Member States. In general, however, debt levels among young people in the EU have been increasing in recent years and financial literacy is often insufficient. According to available studies, young people in the EU face various financial problems such as high student loans, unemployment, low incomes and rising living costs. This leads to many young people going into debt to cover their basic needs. Countries such as Greece, Cyprus and Ireland have the highest levels of youth debt, while countries such as the Czech Republic, Slovenia and Malta have relatively low levels.

At the same time, surveys show that the financial literacy of young Europeans is often low. Many have problems understanding basic financial concepts, managing their personal budgets or planning long-term financial goals. Inadequate financial education in schools and in families contributes to reckless borrowing. There are efforts within the EU to address this problem, for example by promoting financial education, regulating lending, debt counselling, etc. Different countries have taken different approaches to this issue. The Czech Republic is one of the EU countries with a lower level of youth debt, but even here their debts have been increasing in recent years. At the same time, the financial literacy of Czech youth is rather below average in European comparison. There is therefore room for improving financial education and preventing over-indebtedness among the young generation in the Czech Republic as well. Overall, the issue of youth debt and financial literacy in the EU is complex and requires continuous attention and targeted measures at national and European level to prevent serious social and economic consequences in the future.

1.2 Literature Review

(Gathergood, 2012) *investigates the intricate relationship between self-control, financial literacy, and the predisposition towards over-indebtedness among UK consumers with consumer credit debt. Utilizing survey data from a representative sample of UK households, the research delves into how behavioral traits, specifically self-control issues and financial*

literacy, correlate with over-indebtedness. The study establishes a robust association between self-control problems, lower financial literacy, and increased over-indebtedness, with self-control issues playing a more dominant role in consumer over-indebtedness. Consumers with self-control issues are not only more inclined to utilize high-cost credit but are also more susceptible to financial shocks, indicating a broader implication of impulsive behaviour on economic outcomes. (Gutierrez-Nieto and al., 2017) *conducted survey in Spain—a nation notably impacted by a mortgage crisis— that serves as the empirical foundation for the research. The results reveal a divergence in the attribution of over-indebtedness causes between individuals and experts. While individuals predominantly blame external circumstances such as economic crises and pressures from financial institutions, experts point to the lack of financial literacy and a propensity to conform to materialistic societal norms as significant factors*.

(French and McKillop, 2016) *investigated the relative impacts of numeracy and money management skills on financial outcomes, focusing on consumer debt behavior and household net worth among credit union members in socially disadvantaged areas. What stands out from the findings is the significant emphasis on the importance of money management skills over numeracy in influencing financial outcomes within the studied cohort. Despite previous literature suggesting the critical role of numeracy in managing financial affairs, particularly in calculating interest payments and making informed debt decisions, this study found that numeracy played a negligible role. Instead, it highlighted those individuals, even those lacking precise numerical calculation abilities, could still achieve better financial outcomes by leveraging good money management practices. These skills allowed them to distinguish between high and low-cost sources of borrowing, ultimately leading to improved debt-to-income ratios and net household worth*.

(Carlsson Hauff and Nilsson, 2020) *investigate over-indebtedness determinants among young adults, focusing on mortgage borrowing. They discover: 1) Presenting monthly payment information rather than total mortgage reduces excessive borrowing; 2) Borrowing amounts are influenced by lender-provided loan amount guidelines; 3) Overconfidence in financial abilities leads to higher borrowing. The findings suggest policy interventions geared towards transparent communication and borrower self-awareness could mitigate over-indebtedness risks*. (Gedvilaite and al., 2022) *analyze financial literacy among young individuals in the Baltic States, focusing on the age group of 15-30 years. Estonia emerges as the frontrunner in financial literacy, with Lithuania and Latvia following. A notable aspect of the study is the correlation it establishes between financial literacy and the sources of financial knowledge. For instance, Estonian youths primarily rely on public media, contrasting with their Lithuanian and Latvian counterparts, who lean more towards familial guidance. Additionally, the research draws an intriguing connection between financial literacy and sustainable financial behaviors, although this relationship appears to be more complex and not uniformly applicable across the observed states.* (Caplinska and Ohotina 2019) *investigates the financial literacy among the youth of Daugavpils. The results derived from the questionnaires reveal a paradox; while over half of the participants rated their financial literacy positively, the overall assessment indicates that the level of financial literacy among Daugavpils youth remains not as high as expected. This discrepancy underscores a significant gap between self-perception and actual financial literacy levels.*

(Gutierrez-Nieto, Serrano-Cinca and de la Cuesta-Gonzalez, 2017) *focus on the analysis of the causes and consequences of over-indebtedness and present a model that includes both causes and consequences on the debtor, the creditor and society. The research was conducted on a sample of 497 individuals experiencing over-indebtedness. The consequences of indebtedness usually include an increase in poverty and a decrease in the welfare of borrowers due to a*

decline in their basic consumption. (Camoes and Vale, 2020) *examined the relationship between households' perceptions of house prices and household debt in Portugal using survey data on household finances and consumption. Estimates by income and wealth classes revealed that the effect of wealth on housing varied across groups; for example, non-mortgage debt tended to increase among lower-income households, while over-indebtedness was more common among wealthier households*. (Angel and Heitzmann, 2015) *examined country-level factors contributing to household over-indebtedness in the EU. The analyses involved 196,158 respondents from 27 countries and used multilevel regression. The average level of economic literacy in a country had a significant impact on the risk of over-indebtedness, as did the country's affiliation to a particular employment regime (tradition) and net compensation in the case of long-term unemployment*. (Betti and al., 2007) *quantified and characterised the extent of consumer over-indebtedness in the EU in order to evaluate alternative measures of over-indebtedness and to identify over-indebted households based on European household survey data. The study used theories of consumption behaviour on a permanent income/life-cycle basis and adopted a subjective approach to identify over-indebted households. The study analysed survey data from 14 European countries and identified over-indebtedness in 12 of them. Overall, 10 % of households in the EU were over-indebted. An inverse relationship was found between the extent of consumer borrowing in each country and the severity of the over-indebtedness problem. Countries with higher levels of consumer borrowing, such as Austria and Germany, had lower levels of over-indebtedness, while countries with lower levels of borrowing, such as Greece and Portugal, had higher levels of over-indebtedness. Over-indebted households are most often headed by young people with low levels of education and low incomes. These households often consisted of a single parent or a married couple with one child*. (Niemi, 2012) *analysed over-indebtedness in the EU, based on a survey of 54 000 households in 27 Member States. 8% of EU households are over-indebted, with a debt-to-income ratio of more than 60%. There is considerable variation in over-indebtedness between Member States, with the highest levels in Greece, Spain and Portugal and the lowest in Finland, the Netherlands and Denmark. Over-indebtedness is associated with a number of negative consequences for households, including financial hardship, psychological distress and social exclusion. The results also showed that over-indebtedness is more common in low-income, low-education and single-parent households*.

2. Problem Formulation and Methodology

The chi-square test was chosen as the method of evaluation, which is a statistical non-parametric method used to determine whether a demonstrable significant relationship exists between two traits. The essence was to compare the observed and expected frequencies. The calculation was based on the null hypothesis, which assumed that the proficiency level of high and Elementary school students was the same.

2.1 Model and Data

The chi-square test is a statistical method used to assess the goodness of fit between observed data and expected values, as well as to evaluate the independence of categorical variables. It is widely employed in various fields, including psychology, biology, and social sciences, to analyze the relationship between variables and to test hypotheses.

The chi-square statistic is calculated using the following formula (1):

$$\chi^2 = \Sigma [(O - E)^2 / E] \quad (1)$$

where: χ^2 = chi-square statistic Σ = sum of O = observed frequency E = expected frequency

The expected frequency is calculated based on the null hypothesis, which assumes that there is no significant difference between the observed and expected values. The chi-square statistic measures the deviation of the observed frequencies from the expected frequencies. A larger chi-square value indicates a greater discrepancy between the observed and expected values, suggesting a significant difference or association between the variables.

One of the prominent authors who has extensively studied and applied the chi-square test is Karl Pearson, a British statistician and mathematician. In his seminal work, "On the Criterion that a Given System of Deviations from the Probable in the Case of a Correlated System of Variables is Such that it Can Be Reasonably Supposed to have Arisen from Random Sampling" (Pearson, 1900), Pearson introduced the chi-square test as a method for assessing the goodness of fit between observed and expected frequencies.

In light of the current economic climate, characterized by a significant number of individuals facing foreclosure, it was imperative to assess the present state and level of financial literacy among Elementary and high school students, as well as to investigate the potential correlation between this knowledge and future over-indebtedness. Statistical methods were employed to ascertain whether there existed a disparity in the level of financial literacy knowledge between Elementary and high school pupils. Furthermore, it was crucial to examine the potential causes of future over-indebtedness. To determine the current level of financial literacy and to identify any differences in knowledge between Elementary and high school students, educational institutions in the Moravian-Silesian region were approached. The city selected for the study had a foreclosure rate of 10.87%. Among the contacted schools, one Elementary and one high school consented to participate in the survey. The low response rate was attributed to the epidemiological measures implemented in response to the Covid-19 pandemic. The study sample consisted of 74 eighth-grade Elementary school students and 73 high school students. The aim of this research was to provide insights into the current state of financial literacy among young individuals and to identify potential factors contributing to future financial instability.

2.1.1 Model Calibration

The questionnaire consisted of three dichotomous questions, with 6 possible answers in the first question and the option to select multiple answers. The second question had 8 sub-questions and respondents were given the option to answer yes, no and don't know. The third question had the option to answer yes, no and don't know.

In total, the questionnaire contained 10 questions. The individual questions of the questionnaire, the evaluation of the answers and the conclusion are given below.

- ***Question n. 1:*** *Whether elementary and high school students face the same problems in financial literacy (FL).*

  Hypotheses:

  H_O The financial literacy problems of elementary school pupils are the same as those of high school pupils.

  H_1 The financial literacy problems of elementary school pupils are not the same as those of high school pupils.

  Significance of chi-square test: **0.285**

  The value of statistical significance achieved is greater than 0.05, therefore we do not reject the null hypothesis, the problems in financial literacy of Elementary school

students are the same as those of high school students. The students at higher level of education are in the same condition with financial literacy knowledge as the students at Elementary level of education. Responses may be influenced by the perception of financial literacy according to the level of education of individual pupils. Pupils' personal experiences also influence pupils' financial literacy.

- ***Question n. 2:*** *Do you understand the concept of a family budget?*

  Hypothesis:

  H_O Elementary and high school pupils are as familiar with the concept of a family budget as high school pupils.

  H_1 Elementary and high school pupils are not as familiar with the concept of a family budget as high school pupils.

  Significance of chi-square test: **0.549**

  The statistical significance value achieved is greater than 0.05 We do not reject the null hypothesis; elementary and high school students are equally oriented in family budget. Students at higher level of education orient family budget in the same way as students at elementary level of education. The level of education does not affect the understanding of the family budget. The analysis shows that pupils are interested in and experienced with family budgeting. This experience comes mainly from their own experience of managing their pocket money.

- ***Question n. 3:*** *Do you know how credit works?*

  Hypothesis:

  H_O Elementary and high school students know how loans work at the same level.

  H_1 Elementary and high school students do not know how loans work at the same level.

  Significance of chi-square test: **0.849**

  The value of statistical significance achieved is greater than 0.05 We do not reject the null hypothesis; elementary and high school students know at the same level how credit works. Pupils at higher level of education are equally knowledgeable about credit as pupils at Elementary level of education. The analysis shows that both elementary and high school pupils have heard the term credit. They may have come across the term in advertising or from their parents.

- ***Question n. 4:*** *What are the elements of a loan agreement?*

  Hypothesis:

  H_O Elementary and high school pupils know at the same level what the elements of a credit agreement should be.

  H_1 Elementary and high school pupils do not have the same level of understanding of the requirements of a loan agreement.

  Significance of chi-square test: **0.900**

  The statistical significance value achieved is greater than 0.05. We do not reject the null hypothesis; elementary and high school students are equally familiar with the details of credit agreements. Pupils at higher level of education are equally familiar with the details of credit agreements as pupils at elementary level of education. Since the question was

asked in general terms, it cannot be accurately inferred that elementary school pupils know the details of a credit agreement to the same extent as high school pupils.

- ***Question n. 5:*** *Do you know the risks of using contactless payments?*

  Hypothesis:

  H_O Elementary and high school students are equally aware of the risks of using contactless payments.

  H_1 Elementary and high school pupils do not have the same level of understanding of the risks of using contactless payments.

  Significance of chi-square test: **0.194**

  The achieved value of statistical significance is greater than 0.05 We do not reject the null hypothesis; elementary and high school students know the risks of contactless payments at the same level. Pupils at higher education level are equally aware of the risks of using contactless payments as pupils at elementary level.

- ***Question n. 6:*** *Are you familiar with the term insolvency and do you know what it means?*

  Hypothesis:

  H_O Elementary and high school pupils know the concept of insolvency at the same level and know what it means.

  H_1 Elementary and high school pupils do not know the concept of insolvency at the same level and do not know what it means.

  Significance of chi-square test: **0.734**

  The value of statistical significance achieved is greater than 0.05 we do not reject the null hypothesis; elementary and high school students know the concept of insolvency and know what it means at the same level.

- ***Question n. 7:*** *Do you know what a postal order is for and can you fill it in?*

  Hypothesis:

  H_O Elementary and high school pupils know at the same level what a postal order is for and can fill it in.

  H_1 Elementary and high school pupils do not know at the same level what a postal order is for and do not know how to fill it in.

  Significance of chi-square test: **0.031**

  The achieved value of statistical significance is less than 0.05 The null hypothesis is rejected; elementary and high school students do not know at the same level what a postal order is used for and do not know how to fill it in. Pupils at the higher level of education do not know as much about postal orders as pupils at the elementary level of education. The analysis shows that high school pupils are likely to have already encountered a postal order, while elementary school pupils have no experience of a postal order.

- ***Question n. 8:*** *Do you know the concept of foreclosure and how to counter it?*

  Hypothesis:

  H_O Elementary and high school pupils know at the same level the concept of foreclosure and how to face it.

  H_1 Elementary and high school pupils do not know the concept of foreclosure at the same level and do not know how to face it.

  Significance of chi-square test: **0.065**

  The achieved value of statistical significance is less than 0.05 We reject the null hypothesis at the level, elementary and high school students know the concept of foreclosure at the same level and know how to face it. Pupils at the higher level of education are equally familiar with the concept of foreclosure as pupils at the elementary level of education. The asymmetry of information in the knowledge of the concept of foreclosure may result from the possibility of an experience with foreclosure that high school pupils would perceive more intensively compared to Elementary school pupils.

- ***Question n. 9:*** *Are you familiar with the concept of non-bank credit and do you know its risks?*

  Hypothesis:

  H_O Elementary and high school pupils are equally familiar with the concept of non-bank credit and its risks.

  H1 Elementary and high school pupils do not have the same level of familiarity with the concept and risks of non-bank credit.

  Significance of chi-square test: **0.262**

  The value of statistical significance achieved is less than 0.05 We reject the null hypothesis; Elementary and high school students know the concept of non-banking loans at the same level. Pupils at the higher level of education are equally aware of the risks of non-bank loans as pupils at the Elementary level.

- ***Question n.10:*** *Does your lack of financial literacy knowledge cause you problems in everyday life?*

  Hypothesis:

  H_O Elementary and high school students do not face problems in their daily lives due to a lack of knowledge in financial literacy.

  H_1 The lack of financial literacy knowledge causes problems for elementary and high school pupils in their everyday lives.

  Significance of chi-square test: **0.695**

  The statistical significance value achieved is greater than 0.05. We do not reject the null hypothesis, lack of knowledge in the area of financial literacy does not cause problems for elementary and high school students in everyday life. The lack of knowledge in financial literacy does not cause problems for pupils at higher level of education in their daily life as it does for pupils at elementary level of education.

3. Current State of Financial Literacy

The current state of financial literacy is reflected in the foreclosure map, which shows that in 2023 the Moravian-Silesian Region is the fourth worst of the 14 regions in the Czech Republic in terms of the share of people in foreclosure. The average number of people in foreclosure in 2023 is 8.95%, in 2022 it was 9%, and the number of people in foreclosure over 15 years old is 85 477, while the number of people under 15 years old in the Moravian-Silesian Region is 40. The average number of foreclosures per person is 6.2 and the average amount recovered per person is CZK 7,559.82. The bankruptcy map shows the number of persons in personal bankruptcy in the Moravian-Silesian Region is 14,443, of which the number of persons in personal bankruptcy aged 18 to 29 is 1,207, which is 8% of the total number of persons in personal bankruptcy (Mapa exekucí, 2023).

Schools have a significant influence on the level of financial literacy, and on the basis of the framework educational programmes and the rules set out in them, individual schools create their own implementation programme documents - school curricula. *The school curricula should take into account the Financial Literacy Standard* (Národní ústav pro vzdělávání, 2017), *which, depending on the level of school - Elementary or high - precisely defines the content of financial literacy*. Schools are free to set the scope of financial literacy, so each school can choose how many hours to devote to the subject. *According to current practice, schools are less likely to introduce a separate subject of financial literacy, most of the time addressing the different parts of financial literacy separately, e.g. budgeting or calculating interest in mathematics, introduction to financial products in civics, etc., a significant share of financial literacy teaching in schools is project-based learning, where a practitioner visits the school and leads a teaching block. Many schools do not introduce financial literacy at all, the reason being lack of certified teachers or the willingness and desire of the school management to introduce something new. Teaching financial literacy in Elementary and high schools should be included as a priority, ideally as a separate subject, to better prepare pupils for their future lives and prevent them from becoming over-indebted* (Ministerstvo školství, mládaže a tělovýchovy, 2023).

3.1 Measuring Financial Literacy

Monitoring financial literacy has been an optional part of the Organisation for Economic Organisation and Development's (OECD) international programme for assessing pupils - PISA - since 2012 (18 countries have participated). The Czech Republic's participation in the 2012 financial literacy survey3 was an important milestone for the explicit introduction of this topic into the Czech curriculum. The re-engagement of the Czech Republic in the survey of pupils' financial literacy in 2022 will make it possible to determine the development of the level of knowledge and skills. The assessment of pupils' financial literacy levels was based on a test format, with a total of 40 tasks divided into five areas of financial literacy - 'Money and payment', 'Personal finance', 'Household management', 'Financial products and services' and 'Taxes'. The format for answering the questions was either closed or partially open-ended. 25 569 high school students took the test. The type of education of the pupils, their gender and their socio-economic status were taken into account in the evaluation of the pupils' results; on the test as a whole, pupils achieved an average success rate of 59.0%, with boys performing slightly better and, as expected, grammar school pupils and pupils with a high socio-economic status performing significantly better.

In an international comparison of youth financial literacy outcomes according to the OECD and PISA 2018 measurements, Estonia emerged as the country with higher youth financial literacy, followed by Finland.

Boys scored a small but significant 2 points higher than girls in the PISA 2018 financial literacy assessment on average across OECD countries/economies. Socio-economically advantaged students performed better in financial literacy than disadvantaged students - by about one proficiency level, on average across OECD countries/economies.

Ministry of Finance measured the level of financial literacy of the adult population of the Czech Republic. The research was carried out by ppm factum research, data collection took place in January 2020. Part of the data collected will be used by the International Financial Education Network (International Network on Financial Education) of the Organisation for Economic Co-operation and Development (OECD) for international comparisons of adult financial literacy. Respondents were stratified according to their level of financial knowledge and economic responsibility, and the survey results tell the story of the current state of financial literacy levels.

Respondents can be divided into four categories according to a combination of different levels of financial knowledge and economic responsibility:

1: higher level of economic responsibility and higher level of financial knowledge (green field) – 44 % of the population belong here

2: higher level of economic responsibility and lower level of financial knowledge (yellow box) – 25 % of the population belong here

3: lower level of economic responsibility and higher level of financial knowledge (grey box) – 5 % of the population belongs here

4: lower level of economic responsibility and lower level of financial knowledge (red box) – 26 % of the population belong here

For the purpose of targeting financial education, the Ministry of Finance sees great potential in group 2 - i.e. those with a higher level of economic responsibility and a lower level of financial knowledge.

3.2 Discussion

The background and conclusions presented in this article on the current state and development of the practice of debt relief and financial literacy in the Czech Republic provoke interesting comparisons with research and analyses conducted within the Czech Republic and in the wider context of the European Union.

In the context of deleveraging, it is important to mention the study by Hulmák and al. (2020), which focuses on the impact of legislative changes on deleveraging practice in the Czech Republic. *Here, the authors point to the increasing number of applications for debt relief following the amendment of the Insolvency Act, which corresponds with the observations in our article on simplifying access to debt relief. This analysis confirms the tendency to lower the barriers to starting the insolvency process, but also highlights the risks associated with possible abuse of the system*. According to Hulmák and al. (2020), *mechanisms need to be set up to prevent the potential abuse of debt relief as an easy solution to finance irresponsible management of personal finances*. A comparison with the European Union is provided by Szymański and al. (2021), which focuses on the analysis of the deleveraging practices in selected EU countries. The authors emphasise the diversity of approaches to insolvency across countries and highlight the need to harmonise certain elements of insolvency procedures in order to promote the protection of creditors' rights while providing effective assistance to debtors. From this perspective, the Czech Republic appears to be a country with a relatively liberal approach, which may be beneficial for debtors but also raises questions about the

protection of creditors' claims (Szymański and al., 2021). In the area of financial literacy, it is crucial to mention the study of the Ministry of Finance of the Czech Republic (MFČR, 2020), which maps the level of financial literacy of the Czech adult population. The results show that although part of the population boasts a relatively high level of financial literacy, there is still a significant proportion of people with insufficient knowledge. This situation has a direct impact on personal financial decision-making and can lead to a higher risk of financial instability and over-indebtedness. A comparison with international research by the OECD (2020) reveals that the problem of insufficient financial literacy is global and highlights the need for targeted education and interventions to improve individuals' ability to manage their finances effectively.

4. Conclusion

The payment morale of debtors is expected to continue deteriorating due to adverse economic and social factors. The loss of employment, increasing prices of essential goods and services, and high inflation rates are putting significant financial strain on individual households. This situation is further exacerbated by the increasing availability of fast and cheap credit, which has led to a normalization of taking out loans as a part of everyday life. Aggressive marketing campaigns on television, billboards, and the internet contribute to this issue by promoting easy access to credit.

The current system of financial literacy education in Elementary and high schools in the Czech Republic is largely dependent on the willingness of individual schools to engage with the topic. This inconsistent approach deepens the problem of financial illiteracy among young people. Research has shown that education plays a crucial role in developing financial literacy skills, with students from higher socioeconomic backgrounds and those attending gymnasiums demonstrating better financial knowledge.

The Moravian-Silesian Region ranks as the fourth worst in terms of the proportion of people in bankruptcy in the Czech Republic. This highlights the need for targeted interventions to improve financial literacy and prevent over-indebtedness in the region. There are concerns about the potential for abuse of the debt relief process, with some individuals submitting dishonest debt relief proposals. The increasing accessibility of debt relief, while beneficial for many, also creates opportunities for system exploitation.

Looking ahead, the Czech government is preparing an amendment to the Insolvency Act to address some of these issues. However, a comprehensive approach that includes improved financial education, responsible lending practices, and support for those facing financial difficulties will be necessary to tackle the complex problem of over-indebtedness and promote better financial health among Czech citizens.

Acknowledgements

This paper was created within the project SGS The impact of direct taxation and over-indebtedness on household consumption and corporate investment spending in EU countries SP2024/079.

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Does a Big Enterprise Mean a High Wage? The COVID-19 Pandemic, the Energy and Inflation Crisis, War Refugees from Ukraine, European integration, and the Czech Labour Market

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Abstract
This paper concentrates on the amounts of wages paid to employees in enterprises of different sizes. The main objective is to find out what effect the number of employees of the enterprise has on the amount of wages of these employees. An equally important objective is to monitor the gradual change in the shape of entire wage distributions over time and, in particular, to capture the impact of the COVID-19 pandemic, the energy and inflation crisis, especially the crisis associated with the war conflict in Ukraine and European integration on the entire wage distributions. Part of this research is not only the prediction of the wage level according to the size of the enterprise, but the prediction of the entire wage distribution. Three-parametric lognormal curves represent the basis of wage distribution models, the method of moments is used to estimate the parameters of these curves. Exponential smoothing of time series is used as part of the predictions. It is found that in 2022, the number of employees of Ukrainian origin on the Czech labour market is almost triple times higher. These are mainly women employed in low-skilled jobs.

Keywords: *COVID-19 pandemic, European integration, models of wage distribution, number of enterprise employees, refugees from Ukraine*

JEL Classification: *E24, E25, J31, C22, C51*

1. Introduction

The connection between the amounts of wages and the size of the enterprise is researched by a number of scientific articles. A study by Chava, Oettl and Singh (2023) found that wage growth caused by a higher federal minimum wage leads to a deterioration in the financial health of small enterprises, particularly small enterprises, young enterprises that experience financial stress because they are located in low-income areas. A study by Cobb and Lin (2017) argues that large firms in the United States are prominent institutions in the labour market and that large US firms compensated for the work performed by workers with low and medium wages through a special bonus. The authors found that although all private sector workers benefited from a wage premium due to firm size, the premium was significantly higher for lower- and middle-level individuals. Contreras (2022) finds a gender wage gap between men and women for the Peruvian labour market, and when it comes to women, the negative facts are that they are women, non-white, work in small enterprises, violate labour rights. The author finds that working in a small enterprise and the intensity of the job search negatively affect women more than men. A pair of authors Oi and Idson (1999) acknowledges that work varies along many dimensions including firm size and that a wage gap due to firm size of 35 % is

comparable to the gender wage gap. The authors see the rationale in that large firms demand a higher quality of work defined by such observable characteristics as education, job retention, and a higher proportion of full-time workers. The scientific study Sultoni, S. (2020) deals with the effect of the inflow of foreign direct investment on the level of wages paid by private domestic firms within the Indonesian manufacturing sector while controlling for firm characteristics such as level of technological sophistication and firm size. Supiyah, Komariah, Hubur, Chauhan and Artha (2021) report that differences between men and women in Japan are significantly different from how these relationships have developed in the West. The focus of Tanggisalu's (2021) research is 52 companies out of 170 manufacturing companies on the Indonesian Stock Exchange. Research shows that the size of the enterprise, its growth and capital structure or corporate social responsibility have a positive, but not significant, effect on profit. Tangngisalu, (2021) also addresses the question of whether enterprise size, business growth, capital structure and social responsibility can affect corporate profits. The topic of COVID-19 is the subject of research in a number of professional articles, too, for example Fojtíková (2022) or Hakalová, Kryšková, Palochová, Pšenková (2022).

The aim of this paper is to capture not only the wage levels of Czech employees separated by the size of the enterprise they work in, but also the development of the entire wage distribution of these employees in the period 2009–2022, including predictions for the period 2023–2025. The purpose is to evaluate to what extent the size of the enterprise in terms of the number of its employees affects the amounts of wages of these employees. An important objective of this article is to evaluate the impact of the crisis associated with the COVID-19 pandemic, the energy and inflation crisis and the crisis associated with the Russian-Ukrainian war conflict on wages in the Czech Republic, separated by company size.

When time series modelling and for the construction of predictions, exponential smoothing is used. Curves of three-parameter lognormal distribution and the moment method of parameter estimation are used in the construction of wage distribution models.

2. Data and Methodology

The data for this research was taken from the official website of the Czech Statistical Office. Three-parameter lognormal curves represent the basis of models of entire wage distributions.

2.1 Data

There are the secondary aggregated data for the period 2009–2022. The statistical unit is the employee. The nominal gross monthly wage of employees (in CZK) is the investigated variable. With the use of consumer price indices, the nominal wage was converted to a real gross monthly wage, the consumer price indices are also taken from the Czech Statistical Office website. The wage of employees is examined according to the size of the enterprise, divided into six categories according to the number of employees of the enterprise: Enterprises with no more than 9 employees, with 10–49 employees, with 50–249 employees, with 250–999 employees, with 1,000–4,999 employees and enterprises with at least 5,000 employees.

Wages are due to employees for work performed in the private (business) sector, salary in the budgetary (state, public, non-business) sector. From the point of view of the analysed data from the Czech Statistical Office, the term wages includes both wages in the business sector and salaries in the non-business sector.

2.2 Methodology

The beginning of lognormal curves is formed by the minimum wage in the respective year. In the period from January to July 2013, the minimum wage meant CZK 8,000, and in the period from August to December 2013, the minimum wage meant CZK 8,500. For the year 2013, the minimum wage was considered proportionally in the amount of CZK 8,292.

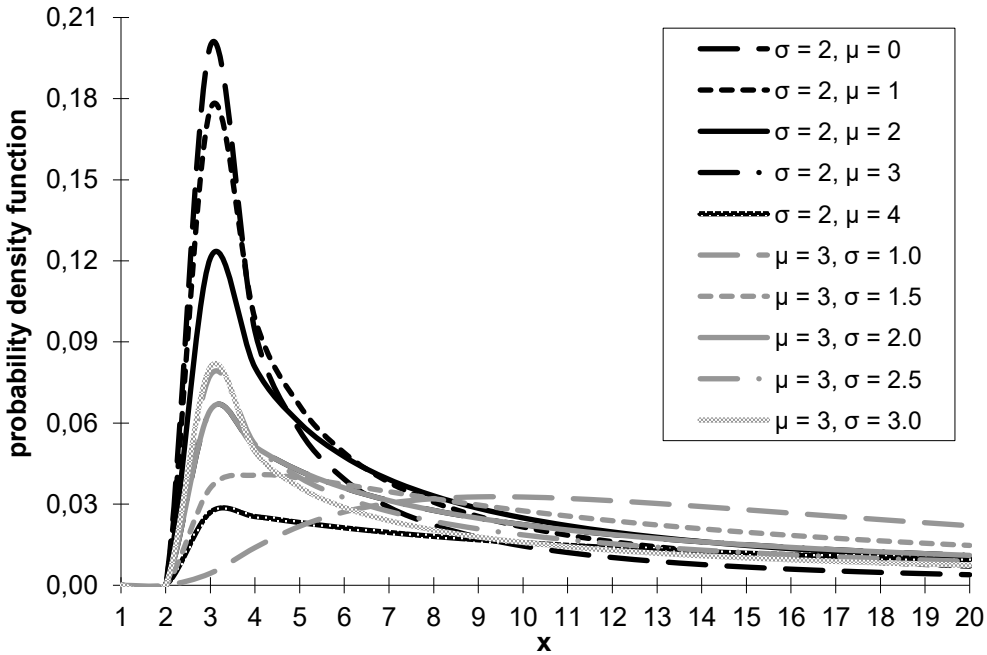
A random variable X follows a three-parameter lognormal distribution if its probability density is of the form

$$f(x;\, \mu,\, \sigma^2,\, \theta) = \frac{1}{\sigma \cdot (x-\theta) \cdot \sqrt{2\pi}} \cdot \exp\left[-\frac{[\ln(x-\theta)-\mu]^2}{2\sigma^2}\right], \quad x > \theta, \qquad (1)$$

$$= 0, \quad \text{else},$$

where $-\infty < \theta < \infty$, $-\infty < \mu < \infty$ and $\sigma > 0$, see Figure 1.

Figure 1: Probability Density Function of the Three-Parameter Lognormal Distribution Depending on the Parameter Values (θ = 2)



Source: Own elaboration (2024)

The parameter θ is the theoretical minimum of the three-parameter lognormal curve, the parameters μ and σ mark the expected value and standard deviation of the logarithms of the distance of the wage from the theoretical minimum θ. The formulation $\exp(\mu)$ is the distance of the wage median from this theoretical minimum.

The parameters μ and σ are estimated using the moment method of parameter estimation. In the framework of the moment method, we equate theoretical and corresponding sample moments, while common and central moments can be combined. In the given case, we put sample average equal to the expected value of the three-parameter lognormal distribution and

sample variance equal to the theoretical variance of the three-parameter lognormal distribution. A system of lognormal equations is obtained

$$\overline{x} = \theta + e^{\tilde{\mu} + \frac{\tilde{\sigma}^2}{2}}, \tag{2}$$

$$s_x^2 = e^{2\tilde{\mu} + \tilde{\sigma}^2} \cdot (e^{\tilde{\sigma}^2} - 1) . \tag{3}$$

Solving the system of moment equations (2) and (3), we obtain moment estimates of the parameters

$$\tilde{\sigma} = \sqrt{\ln\left[\left(\frac{s_x}{\overline{x} - \theta}\right)^2 + 1\right]} \tag{4}$$

$$\tilde{\mu} = \ln(\overline{x} - \theta) - \frac{\tilde{\sigma}^2}{2}. \tag{5}$$

Exponential smoothing is suitable for obtaining a short-term forecast of a time series trend. This is a technique that develops the idea of time series smoothing using moving averages. This method uses all previous values of the time series, while the weight of these observations decreases towards the past by the exponential function $w_t = (1 - \alpha) \cdot \alpha^{n-t}$, where t is a time variable, n is the number of observations, that is the length of the respective time series and α is a constant for smoothing taking on values from the interval (0; 1). The statistical software automatically evaluates the most favourable combination of values for the smoothing constants α and β in the case of Holt's linear exponential smoothing. Table 1 presents the types of exponential smoothing used and the values of the smoothing constants. Appropriate exponential smoothing is chosen based on the interpolation criteria.

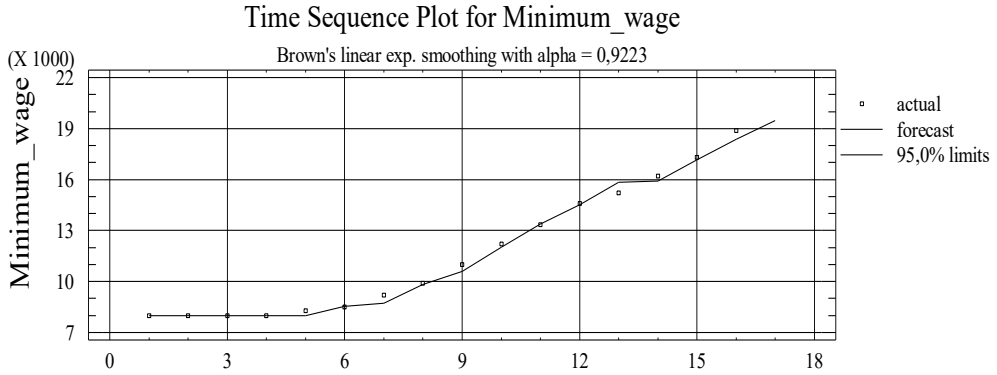
Table 1: Exponential Smoothing of Time Series

	Number of		Equalization constant	
	employees	Exponential smoothing	α	β
Minimum wage		Brown's linear exponential smoothing	0.9223	−
Inflation rate		Brown's linear exponential smoothing	0.7051	−
Sample average	**–9**	Brown's linear exponential smoothing	0.8031	−
	10–49	Brown's linear exponential smoothing	0.8707	−
	50–249	Brown's linear exponential smoothing	0.9425	−
	250–999	Holt's linear exponential smoothing	0.9999	0.2147
	1,000–4,999	Holt's linear exponential smoothing	0.9999	0.2368
	5,000–	Holt's linear exponential smoothing	0.9999	0.2079
Sample standard deviation	**–9**	Holt's linear exponential smoothing	0.9999	0.1074
	10–49	Holt's linear exponential smoothing	0.9992	0.1271
	50–249	Holt's linear exponential smoothing	0.9999	0.1073
	250–999	Holt's linear exponential smoothing	0.9613	0.0758
	1,000–4,999	Brown's linear exponential smoothing	0.3819	−
	5,000–	Brown's linear exponential smoothing	0.3969	−

Source: Own elaboration (2024)

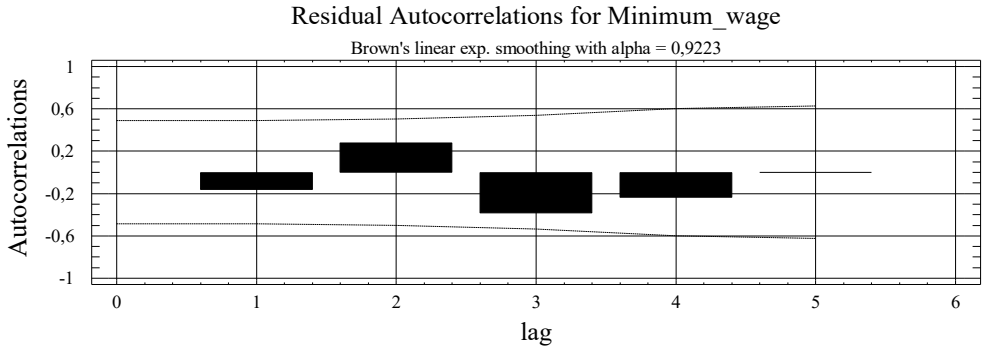
Exponential smoothing is one of the adaptive approaches to time series modelling, it uses a weighted least squares method, while the weights decrease exponentially towards the past. The advantage of exponential smoothing lies in the fact that we assign the most weight to the most recent observations.

Figure 2: Brown's Linear Exponential Smoothing for the Nominal Monthly Minimum Wage Time Series



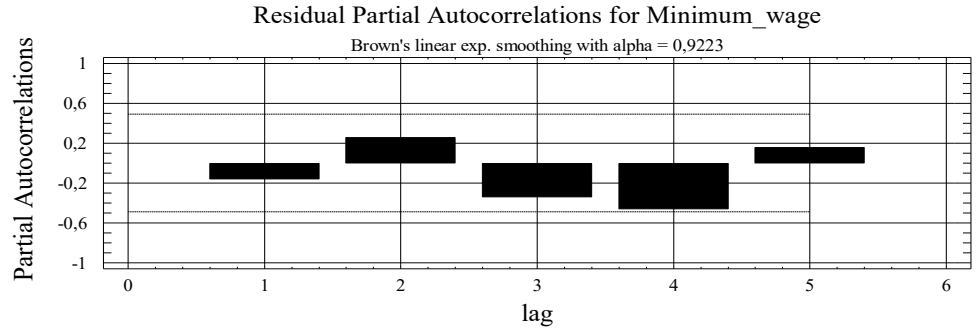
Source: Own elaboration (2024)

Figure 3: Residual Autocorrelation Function for Brown's Linear Exponential Smoothing for the Nominal Monthly Minimum Wage Time Series



Source: Own elaboration (2024)

Figure 4: Residual Partial Autocorrelation Function for Brown's Linear Exponential Smoothing for the Nominal Monthly Minimum Wage Time Series



Source: Own elaboration (2024)

The suitability of the chosen models was verified using the sample residual autocorrelation function and the sample residual partial autocorrelation function and the Durbin-Watson statistic calculation.

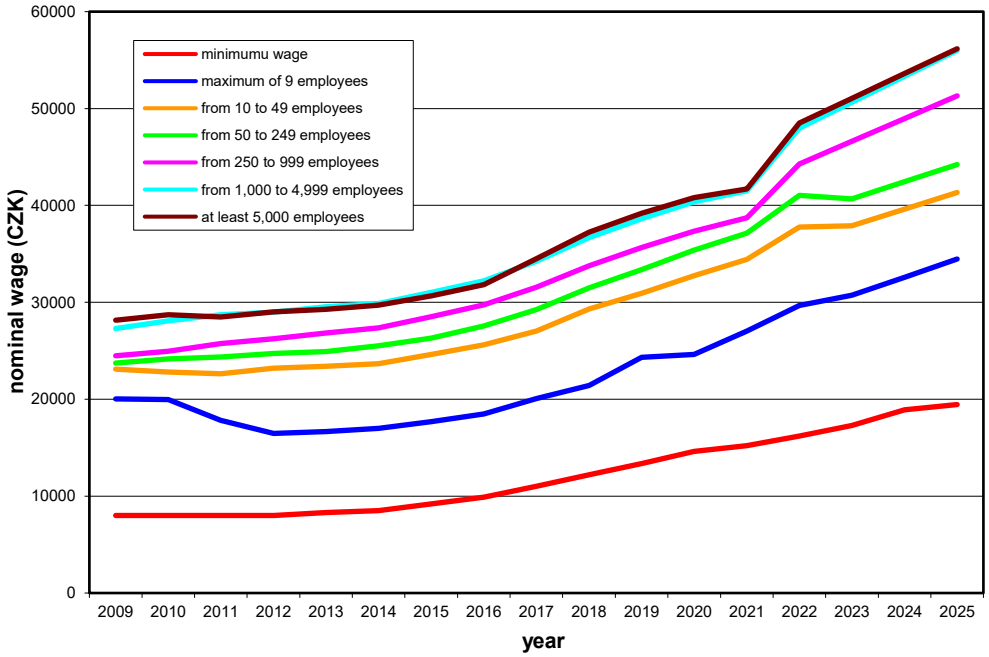
In the case of the minimum wage, the value for the years 2023 and 2024 was known, and therefore it was necessary to predict the value of the minimum wage only for the year 2025 (CZK 19,450). An illustrative example of the use of exponential smoothing for modelling the time series of the minimum wage and the construction of the prediction for the year 2025 is presented in Figure 2. Figure 3 shows the corresponding residual autocorrelation function and Figure 4 shows the corresponding residual partial autocorrelation function. In general, the correlation coefficients and partial correlation coefficients represented by the bars are insignificantly different from zero if the bars do not exceed (above or below) the dashed boundaries. It can be seen from Figures 3 and 4 that none of the estimated correlation coefficients and estimated partial correlation coefficients cross the dashed line. Thus, at the 5% level of significance, we did not demonstrate statistical significance of any of these estimated coefficients. It is therefore clear that the unsystematic component does not show autocorrelation, and therefore the chosen exponential smoothing is satisfactory.

3. Results

The data are processed using the SPSS statistical package and the MS Excel spreadsheet.

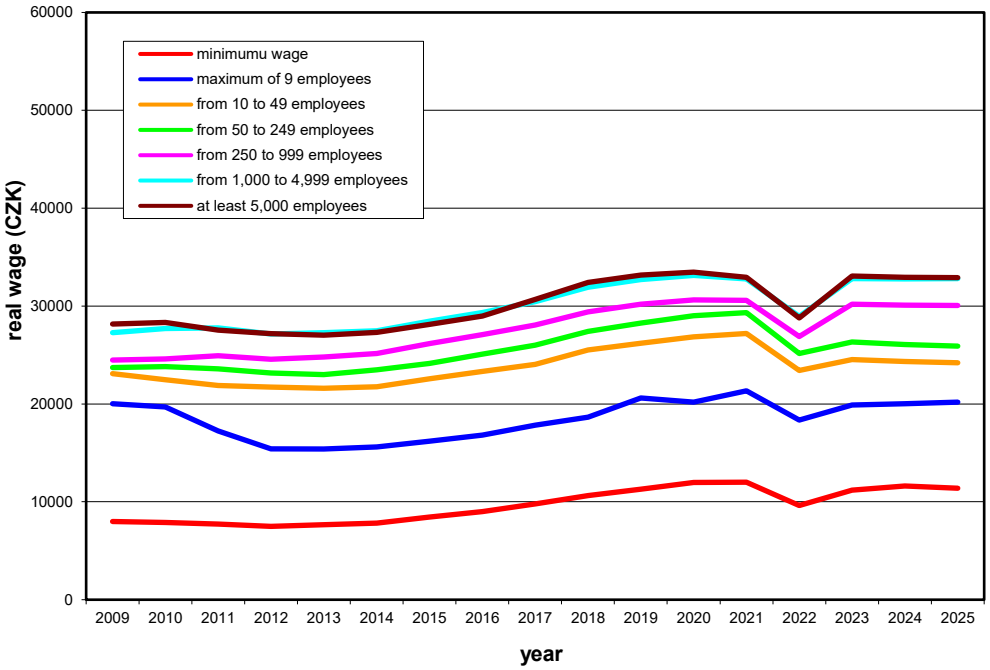
Figures 5 and 6 represent the development of nominal and real minimum gross monthly wages and nominal and real average gross monthly wages, real wages are based on 2009.

Figure 5: Development of Nominal Minimum Gross Monthly Wage (CZK) and Nominal Average Gross Monthly Wages (CZK) in the Period 2009−2022, Including Predictions of This Development for the Period 2022−2025



Source: Own elaboration (2024)

Figure 6: Development of Real Minimum Gross Monthly Wage (CZK) and Real Average Gross Monthly Wages (CZK) in the Period 2009−2022, Including Predictions of This Development for the Period 2022−2025



Source: Own elaboration (2024)

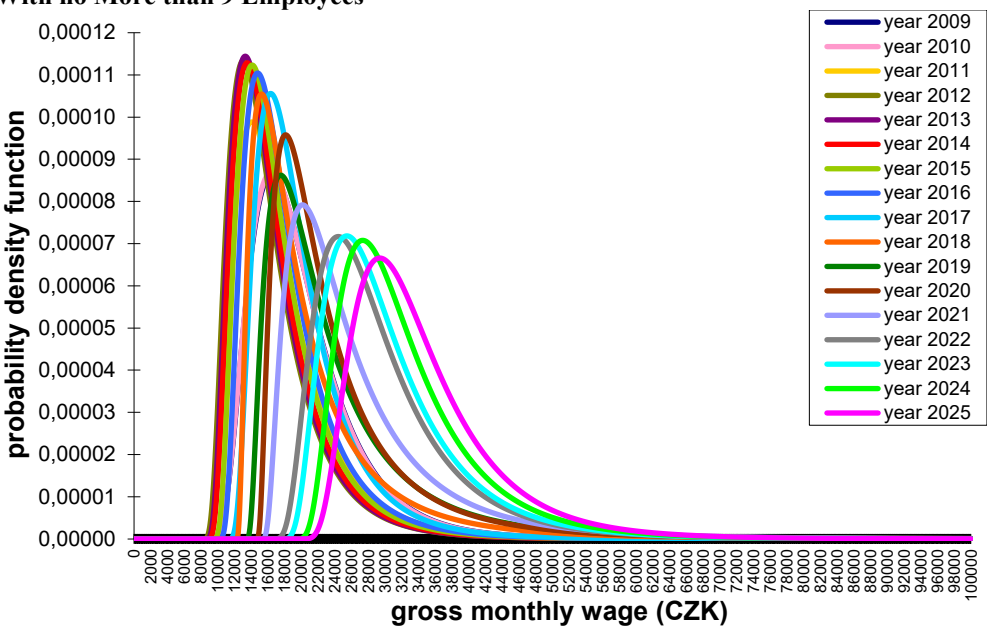
Figure 6 shows a significant drop in real wages in 2022 in connection with the energy and inflation crisis and crisis associated with war conflict in Ukraine for all curves representing enterprises of different sizes, as well as a drop in the real minimum wage. Figures 5 and 6 show an increase in the level of wages as the size of the enterprise increases, but for enterprises with 250 employees or more the wage level is approximately the same.

Figures 7–12 represent the development of the entire wage distribution models in the period 2009–2022, including predictions for the years 2023–2025, separated by enterprise size. From these figures, it can be seen that the wage distributions of enterprises with fewer employees have higher kurtosis and skewness, with lower level and variability. As the number of employees in the enterprise grows, the kurtosis and skewness of wage distributions decrease and their level and variability increase. The wage distributions of the two categories of the largest enterprises are practically no longer different.

Figures 7–12 also show the highest kurtosis and skewness of wage distributions with the lowest level and variability at the beginning of the monitored period in 2009. Over time, kurtosis and skewness of wage distributions tend to decrease, while their level and variability increase over time.

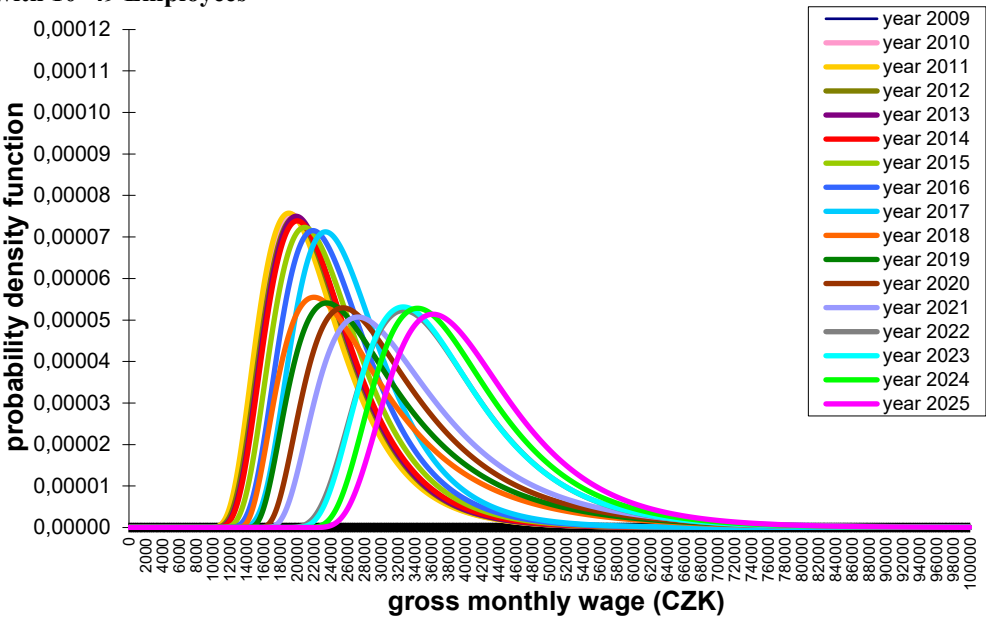
Figures 7–12 likewise demonstrate a break in the development of wage distributions in connection with the COVID-19 pandemic, followed by the energy and inflation crisis and the war conflict in Ukraine, i.e. starting in 2020. From the results, we can conclude that the pandemic COVID-19 has resulted in a certain reduction in the shares of employees (mainly women) receiving a wage at the minimum wage level.

Figure 7: Development of the Entire Distribution of Nominal Gross Monthly Wage in the Period 2009–2022, Including Predictions for the Period 2023–2025 for Enterprises With no More than 9 Employees



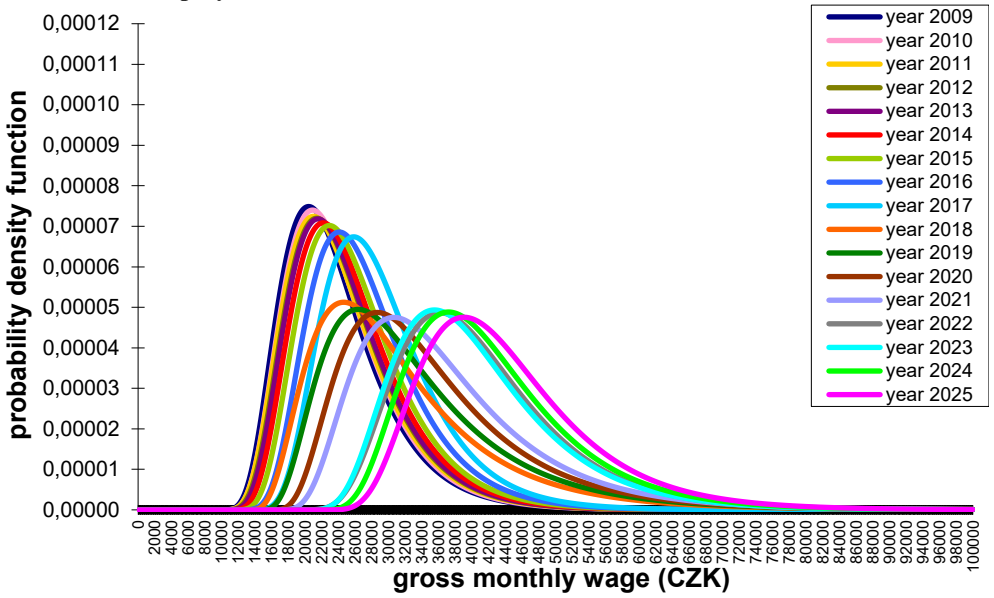
Source: Own elaboration (2024)

Figure 8: Development of the Entire Distribution of Nominal Gross Monthly Wage in the Period 2009–2022, Including Predictions for the Period 2023–-2025 for Enterprises with 10–49 Employees



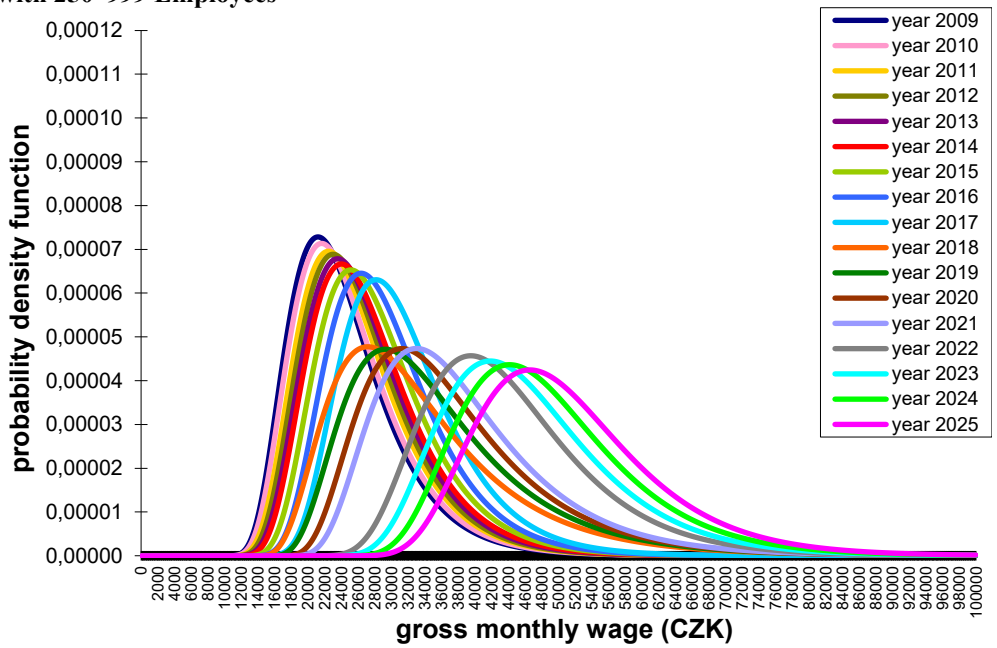
Source: Own elaboration (2024)

Figure 9: Development of the Entire Distribution of Nominal Gross Monthly Wage in the Period 2009–2022, Including Predictions for the Period 2023–2025 for Enterprises with 50–249 Employees



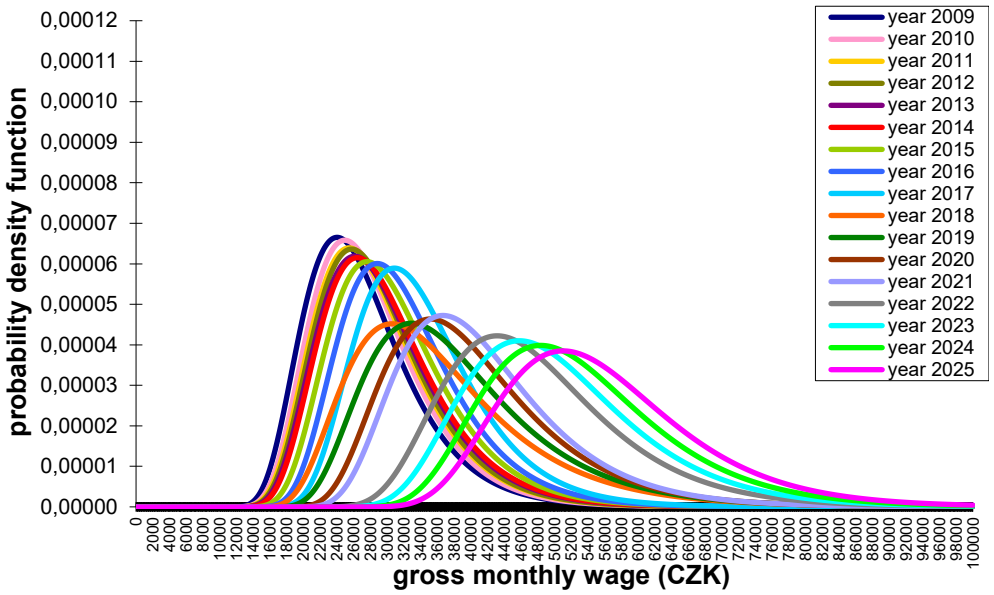
Source: Own elaboration (2024)

Figure 10: Development of the Entire Distribution of Nominal Gross Monthly Wage in the Period 2009–2022, Including Predictions for the Period 2023–2025 for Enterprises with 250–999 Employees



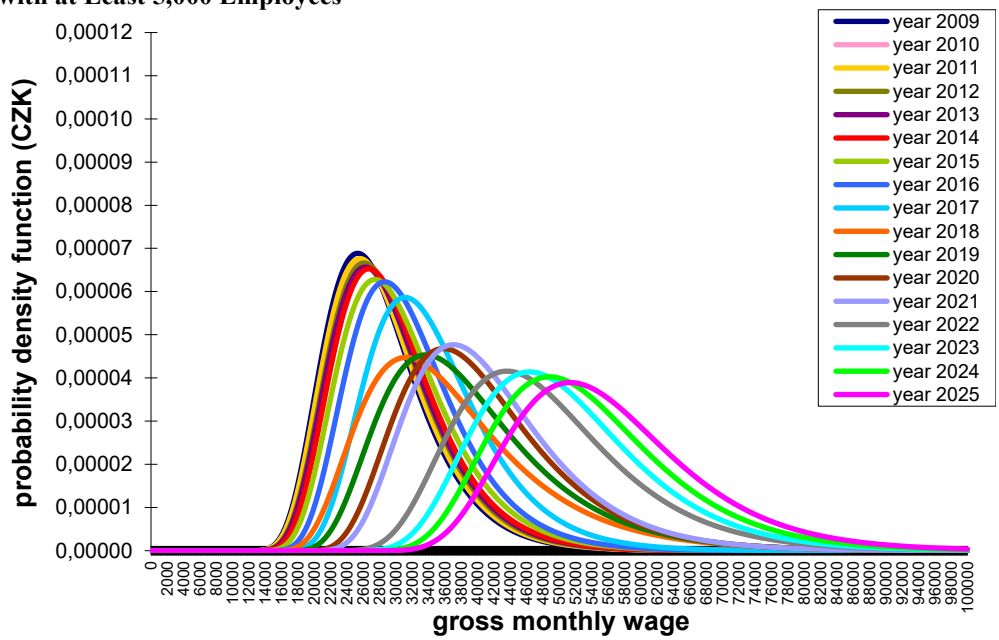
Source: Own elaboration (2024)

Figure 11: Development of the Entire Distribution of Nominal Gross Monthly Wage in the Period 2009–2022, Including Predictions for the Period 2023–2025 for Enterprises with 1,000–4,999 Employees



Source: Own elaboration (2024)

Figure 12: Development of the Entire Distribution of Nominal Gross Monthly Wage in the Period 2009–2022, Including Predictions for the Period 2023–2025 for Enterprises with at Least 5,000 Employees



Source: Own elaboration (2024)

4. Conclusion

After the onset of the COVID-19 pandemic in the Czech Republic, mainly low-income women were laid off, as the median of gross monthly wage of employed women grew much faster than the median of gross monthly wage of employed men.

The research further shows that in 2022, in connection with the Russia-Ukraine war conflict, the number of employees of Ukrainian origin almost tripled compared to the previous period. However, these were mainly women who held professions with the lowest qualifications on the Czech labour market. They mainly worked as cleaners and housekeepers in households, as cleaners in hotels, industrial and administrative buildings, as childcare workers, or teaching assistants, and as caregivers in medical and social facilities. These are generally jobs with payments at the minimum wage level, despite the fact that there were also university-educated women among the Ukrainians. In conclusion, it can be stated that, above all, the crisis associated with the war conflict in Ukraine significantly reduced the level of real wages in enterprises with different numbers of employees.

During the 2020–2021 period of the COVID-19 pandemic, a slight decrease in real wages is evident in larger enterprises, while the wages of smaller enterprises, where the wage level is generally lower, still grew slowly. In 2022, i.e. the year of beginning of high inflation and the energy crisis, when the war conflict in Ukraine also began, the real wage fell for enterprises of all sizes, but we note a sharper drop for large enterprises. The decrease in the wage level then reflects the entire wage distribution models. A significant increase in the number of employees of Ukrainian origin on the Czech labour market in 2022, when women predominate in jobs with low qualifications, but which spread to enterprises of all sizes, could have resulted in a slight tendency to a decrease in the level of wages in enterprises of all sizes, which subsequently will also affect the prediction of these distributions.

Acknowledgements

This paper was subsidized by the funds of institutional support of a long-term conceptual advancement of science and research number IP400040 at the Faculty of Informatics and Statistics, University of Economics and Business, Czech Republic.

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Flexibility of Eligibility: A Case of European Union and United States Trade Preferences

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Abstract

Trade preference schemes are considered one of the most effective tools to support the development of poor countries. Although the literature on trade preferences is rich, some of their important elements are ignored. Eligibility conditions, which ensure the conditionality of preferential schemes, support their effects, and help promote human rights, are widely neglected in the literature. The main goal of the article is to find out whether the two largest preference providers, the European Union and the United States, respond to eligibility breaches as they have committed themselves. The results of the study suggest that Everything but Arms preferences are provided to beneficiaries regardless of whether they meet the conditions set by the EU. These findings are in stark contrast to findings concerning the United States, which responds to violations quickly and flexibly, and closely monitors compliance.

Keywords: *eligibility, European Union, least developed countries, trade preferences, United States*

JEL Classification: *F10, F13, O10*

1. Introduction

According to the United Nations (UN), there are currently 195 countries in the world (United Nations, 2021). They differ in dozens of various aspects such as size, demographics, state system, culture, religion, etc. One of the dimensions in which the differences between countries are most pronounced is their level of economic development. According to Todaro and Smith (2012), differences in development between countries stem mainly from their initial conditions. Furthermore, globalization, which indeed benefits all countries, but distributes profits unevenly, has contributed to widening the gap between rich and poor countries even more (Shashoua and Basu, 2015). The countries at the high end are represented by rich industrialized countries, while at the bottom of the development pyramid are the poor underdeveloped countries associated into the group of the least developed countries (LDCs). Least developed countries face many constraints that hinder their development, which they are unable to overcome on their own. Therefore, international society has been making a concerted effort to support them (United Nations, 2021).

One of the most widely used instruments of support for developing countries are trade preferences provided under the preferential schemes of developed and some developing countries. The main objective of trade preferences is to facilitate the access of recipient countries to the market of preference providers (UNCTAD, 2015). Reduced or zero tariffs help recipients of preferences increase exports and improve their participation in international trade

(Nicita and Rollo, 2013; Ornelas and Ritel, 2020). Higher export earnings and improved trade performance then bring them enhanced economic growth and development (World Bank, 2021).

Facilitated market access provided under the preference scheme helps generate sustainable economic growth only if the recipient countries have appropriate domestic policies in place. For this reason, recipients must strive to create an environment that supports the effects of preferences. As an incentive for the recipient country to do so, eligibility conditions were established. The eligibility conditions set out the rules that the recipient countries must comply with to benefit from the preferences. They seek to impel countries to apply best practices that would create a favourable environment, attract trade and investment, and support the country's development (United States Trade Representative, 2000). Eligibility conditions also fulfil the secondary objective of preferential schemes, i.e., the promotion of human rights and fundamental values in the world (Velluti, 2016).

Both human rights deficit (Richards et al., 2001; Siraj, 2011; Webster and Cingranelli, 2019) and trade preferences (Davies and Nilsson, 2020; Gradeva and Martínez-Zarzoso, 2016; Klasen et al., 2016; Page and Hewitt, 2002; Tadesse and Fayissa, 2008; Wamisho, 2015) have received great attention in the empirical literature on developing countries. However, eligibility conditions, which are the interconnection of these two areas, as they complement the effects of preferences and at the same time serve as a means of promoting human rights, are a generally neglected topic in the literature. Although some studies briefly mention them (Shaffer and Apea, 2005; Wamisho, 2015), there are no studies that examine them closely.

We delve into the issue of eligibility conditions much deeper than anyone before. The purpose of our study is to shed light on the use of eligibility conditions and their importance in achieving the objectives of preferential schemes.

The study focuses on the two largest and most discussed preferential schemes, the Everything but Arms (EBA) of the European Union (EU) and the African Growth and Opportunity Act (AGOA) of the United States (US).

The main aim of the study is to find out whether the European Union and the United States respond to violations of eligibility conditions built into their preferential schemes designated for the world's poorest countries. We examine whether the eligibility conditions of EBA and AGOA serve their purpose or are an unnecessary and unused construct that is intended only to act as an effort by the EU and the US to promote fundamental rights and values in the world.

The aim of the study is achieved by answering two main research questions:

- **Research Question 1:** To what extent are the eligibility conditions of EBA and AGOA similar?

Based on research of the legislative acts of both preferential schemes, we examine similarities and differences between the eligibility conditions of EBA and AGOA.

- **Research Question 2:** Do the EU and the US respond to breaches of eligibility conditions, and if so, to which breaches do they respond most often?

We examine how many times since the introduction of the preferential schemes, each provider has withdrawn its preferences in response to the breach of eligibility. In addition, we also examine the reaction time, that is, how long it takes the provider to react from the onset of the reason for withdrawal.

In each case of recorded withdrawal, we also identify the main reasons behind this withdrawal. This allows us to identify the conditions that are the most difficult for the recipient to meet and the conditions the provider considers the most important.

The following section of the study outlines the background on the least developed countries and trade preferences. The third section presents the data sources and methods that were used in the study. In the fourth section, we present the results in the form of answers to the assigned research questions.

2. Least Developed Countries and Trade Preferences

The group of the least developed countries was defined by the United Nations in 1971. This group includes the 46 poorest countries in the world (as of 2021), located mainly in Africa. The LDCs are highly vulnerable to both internal and external shocks (Acharya, 2012) which can be of economic, environmental, or social nature. They are often disadvantaged by an unfavorable environment and the lack of natural resources. The majority of the LDCs have been scarred by their violent history that projects into current events in these countries, such as land disputes, religious and tribal disputes, permeable borders, strong migration, etc. (Doleželová, 2019). The above-mentioned constraints hinder the economic development of individual LDCs to varying degrees. Together, they are the main reason why the LDCs record economic levels so much lower than other countries.

After the colonial era ended for most LDCs in the 1960s, they alone were unable to generate sufficient resources to fund their development and thus had to rely on external sources (United Nations, 2021). This dependence has increased over the years and has become one of the common features of the LDCs economies. In this regard, international trade and its empirically proven positive impact on economic growth (Singh, 2010) offer LDCs great potential. However, a weak domestic economic infrastructure, insufficient production capacity, and a lack of technological progress resulting in low competitiveness significantly hinder the participation of LDCs in international trade and prevent them from reaping its benefits. Therefore, trade promotion measures have been introduced to improve trade performance and participation of LDCs (and developing countries in general) in international trade.

The main trade facilitation tool is unilateral trade preferences, which guarantee recipients easier access to the provider‘s market. Unilateral preferences are granted within the framework of the preferential schemes of the individual providing economies. Unilateral preferences are vital for most LDCs, as they are often the only way LDCs can be competitive in the markets of high-income countries.

The main building block of trade preferences is the Generalized System of Preferences (GSP) that was introduced in 1968. The GSP is a “*generalized, non-reciprocal, non-discriminatory system of preferences in favour of the developing countries, including special measures in favour of the least advanced among the developing countries…*” (United Nations, 1968). The GSP was instituted in 1971 under the auspices of UNCTAD. Currently, there are 13 GSPs provided by developed and developing countries.

As a testament of awareness of the significant differences in the economic level among developing countries, some providers, e.g., the US and the EU, later also introduced preferential schemes designed specifically for the poorest countries. In the following years, other countries modified their GSPs or launched new preference schemes granting duty-free and quota-free market access for exports of the LDCs.

The two most extensive preference schemes for LDCs are the Everything but Arms of the European Union and the African Growth and Opportunity Act of the United States.

Everything but Arms introduced in 2001 is one of the three arrangements comprising the EU´s GSP. The other two arrangements are the General Arrangement for low and low-middle income countries and GSP+ promoting sustainable development and good governance (UNCTAD, 2015). The legal basis for the EBA scheme is enshrined in Council Regulation No. 416/2001 of 28 February 2001. This regulation says: *„In the light of the real risk of the LDCs becoming increasingly marginalized in the world economy, the Community must go even further than these undertakings and grant all products from LDCs, except arms and munitions, duty-free access without quantitative restrictions immediately*." The EU provided special treatment to LDCs in the medium term before through the Lomé Convention and the Cotonou Partnership Agreement. However, it was not until EBA that a comprehensive long-term framework was provided for unrestricted duty-free access to all LDC products. Compared to the other two arrangements of EU´s GSP the EBA is not subject to periodic renewal and its validity is unlimited. Everything but Arms has one of the largest product coverages of all LDCs preference schemes, i.e., 99,8 % (UNCTAD, 2017).

The African Growth and Opportunity Act is the United States preference scheme that was signed into law on 18 May 2000, with the purpose of promoting stable and sustainable economic growth and development in sub-Saharan Africa (AGOA, 2021). Although AGOA is provided not only to LDCs, but also to some developing countries, the vast majority of its beneficiaries are LDCs. Therefore, it is generally referred to as a preferential scheme for the LDCs. The AGOA is enshrined in the Trade and Development Act of 2000 and was amended several times. Originally, AGOA validity was planned only until 2008; however, it was later extended until 2015 (AGOA, 2021). Due to great success declared at the 114th Congress of the United States of America in 2015, the AGOA was extended even further. The Congress concluded that AGOA greatly contributed to strengthening trade relationships between the US and African countries, enhancing trade and job creation, and building and promoting democracy in sub-Saharan Africa. From 2000 to 2015, bilateral trade between the US and sub-Saharan Africa increased three times and investment increased almost six times (AGOA, 2021). AGOA enables beneficiary countries to export more than 6500 products quota-free and duty-free (WTO, 2021).

3. Data and Methods

To achieve the objective of the article, we have developed two research questions for which clear and unambiguous answers can be provided. Within the first research question, we conducted in-depth research of all legal acts of the European Union and the United States that pertain to the eligibility for the AGOA and EBA preferential schemes. Regarding the AGOA, these were mainly legal provisions enshrined in the AGOA legislation. As for the EBA, in addition to the Council Regulations on EBA and the GSP, the international conventions to which the legislation referred were also reviewed.

To answer the second research question, in the case of the AGOA, we worked primarily with materials published in the Federal Register, notifications to Congress issued by the Office of the Press Secretary, notifications of the Office of the United States Trade Representative, and presidential proclamations regarding AGOA withdrawals. In relation to the EU s EBA, we drew on the materials published mainly by the European Commission and the European Parliament. To assess the events that led to the withdrawals, we reviewed Human Rights Reports published by Human Rights Watch and reports from the UN Office of the High Commissioner for Human Rights.

Although both EBA and AGOA are officially referred to as preferential schemes for the least developed countries, the scope of their recipients is a little different. Within EBA, the country´s

access to the scheme depends on its status as the least developed country (UNCTAD, 2015). Any country recognized and classified by the UN as the least developed country will automatically have access to EBA, regardless of the country's location. This means that the number of countries for which EBA is available always equals the number of LDCs plus countries in the transition period.

Table 1: Countries Eligible for the EBA and the AGOA

EBA, AGOA	Only EBA	Only AGOA
Angola	Afghanistan	Botswana
Benin	Bangladesh	Cabo Verde
Burkina Faso	Bhutan	Congo
Central African Republic	Burundi	Côte d'Ivoire
Chad	Cambodia	Eswatini
Comoros	Equatorial Guinea	Gabon
The Demo. Rep. of the Congo	Eritrea	Ghana
Djibouti	Haiti	Kenya
Ethiopia	Kiribati	Mauritius
Guinea	Lao People's Democratic	Namibia
Guinea-Bissau	Mauritania	Nigeria
Lesotho	Myanmar	South Africa
Liberia	Nepal	
Madagascar	Solomon Islands	
Malawi	Somalia	
Mali	South Sudan	
Mozambique	Sudan	
Niger	Timor-Leste	
Rwanda	Tuvalu	
Sao Tomé and Principe		
Senegal		
Sierra Leone		
Tanzania		
The Gambia		
Togo		
Uganda		
Zambia		

Source: Authors´ creation (2024), Database on Preferential Trade Arrangements (2023)

AGOA is available only for countries located in sub-Saharan Africa. Hence, AGOA includes not only the LDCs in sub-Saharan Africa but also developing countries located there. There are 49 sub-Saharan African countries (out of which 12 are non-LDCs) that are potential candidates for AGOA. To become beneficiaries, countries need to declare their interest in the scheme and request access by themselves. The only two sub-Saharan countries that never officially requested access to the AGOA are Somalia and Sudan (U.S. Government Accountability Office, 2015). Compared to AGOA, the EBA might seem more easily accessible, as the potential candidate status is assigned to countries passively and no action is required on their part.

Although a scheme might be available for a country, it does not mean that the country is automatically eligible for the preferences. Availability means that the country is considered a potential candidate for the preferential scheme. By eligibility we mean that a country meets the eligibility conditions in the relevant time period and can benefit from preferences. Therefore, the number of countries eligible for a specific scheme is often different from the number of countries for which the scheme is permanently available.

There were 48 countries eligible for EBA in 2021, that is, 46 LDC plus Equatorial Guinea and Vanuatu that already graduated from LDCs but remained in the EBA transition period. According to the Annual Review of Country Eligibility for Benefits Under AGOA for 2021, the President designated 39 countries as eligible beneficiaries. As ineligible were found Burundi, Cameroon, Eritrea, Mauritania, Seychelles, Somalia, South Sudan, Zimbabwe (United States Trade Representative, 2021). Table 1 shows an overview of the countries that were eligible for both schemes in 2021, eligible only for EBA and only for AGOA.

4. Results

The following section presents the answers to individual research questions.

4.1 Research question 1

Both the EU and the US have set out in their preference schemes the eligibility conditions that recipients must comply with to benefit from the preferences. Although eligibility conditions have the same goal, for each preferential scheme they are formulated differently. For AGOA, the eligibility conditions are set as requirements that countries should comply with to obtain the preferences and bases for ineligibility that must be avoided. For EBA, these conditions are formulated as withdrawal provisions which state the situations the countries should avoid in order to stay eligible.

The EU´s eligibility conditions are anchored in Article 19 of Regulation (EU) No 978/2012 of the European Parliament and of the Council and they apply to all EU´s GSP arrangements. Part of these conditions are formulated as commitments to respect 15 core human and labor rights UN / ILO conventions and twelve conventions related to the environment and governance principles. To remain eligible for EBA, the country must refrain from serious and systematic violations of the principles laid down in the conventions. The remaining eligibility conditions are explicitly listed in Article 19.

The eligibility requirements for AGOA are enshrined in Section 104 of Public Law 106/200, also known as the Trade and Development Act of 2000. Compared to EBA, AGOA does not refer to international conventions and explicitly lists all eligibility conditions in the relevant legal act. To be eligible for AGOA, the country must also be eligible for US general GSP. However, the eligibility conditions for AGOA and US GSP overlap. In addition to eligibility requirements, the United States laid the bases on which the country is automatically found ineligible. By combining the eligibility requirements and the bases for ineligibility, the eligibility conditions for AGOA are more extensive and detailed than the EBA eligibility conditions. Thus, maintaining eligibility within the AGOA may seem more difficult.

For a better comparison, we have divided the eligibility conditions into categories that correspond to the main areas they cover. To provide a more detailed comparison, we have also created subcategories for some areas. This overview includes the eligibility conditions that are explicitly listed in the relevant legislative documents of EBA and AGOA.

The first category is the eligibility conditions regarding the *Level of the Economic Development* of a beneficiary country. Within EBA, this condition is mediated by the fact that its beneficiaries can only be LDCs, which acquire their status based on the assessment of their economic development by the United Nations. Within the AGOA, the economic level, including gross national product per capita and living standard of inhabitants, is considered by the President when appointing a country eligible. AGOA also requires the existence or progress towards a market economy.

Both AGOA and EBA impose an obligation on the recipient country to respect and enforce *Workers' Rights* enshrined in the relevant International Labor Organization´s conventions.

The category *Protection of Human Rights* includes eligibility conditions aimed at the promotion and protection of human rights in a recipient country. In addition, EBA emphasizes the country's obligation to seek the elimination of all forms of racial discrimination and discrimination against women.

Table 2: Areas Covered by Eligibility Conditions

CATEGORIES OF CONDITIONALITY	AGOA	EBA
Level of Economic Development	X	X
Market-Based Economy Requirements	X	
Workers' Rights	X	X
Right of Association	X	X
Right to Organize and Bargain	X	X
Prohibition of Forced and Compulsory Labor	X	X
Non-Discrimination in Employment	X	X
Child Labor	X	X
Protection of human rights	X	X
Elimination of All Forms of Racial Discrimination		X
Discrimination Against Women		X
Civil and Political Rights	X	X
Rule of Law	X	
Communist Regime	X	
Corruption	X	X
Economic, Social, and Cultural Rights	X	X
Protection of Provider´s Market	X	X
Facilitation of Access to Recipient's Market	X	
Unfair Trading Practices with Effect on Provider´s Economy	X	X
Terrorism	X	X
Drug Trafficking		X

Source: Authors' creation (2024)

Both AGOA and EBA include conditions concerning *Civil and Political Rights*. Within this category, the eligibility conditions of both schemes are similarly focused. Additionally, AGOA requires the beneficiary country to have established or made progress toward establishing a

rule of law. AGOA also includes bases for ineligibility with respect to the communist regime that list the reasons why a country can be considered eligible despite its communist regime.

Economic, Social, and Cultural rights are covered within EBA through the International Covenant on Economic, Social and Cultural Rights of 1966. AGOA addresses these rights as requirements for the beneficiary country to have established or show continuous progress in "*building economic policies to reduce poverty, increase the availability of health care and educational opportunities, expand physical infrastructure, …*" (U.S. Code, 2021).

Due to the non-reciprocal nature of preferences, there is a very unbalanced relationship between the EU, the US, and the beneficiary countries. Therefore, both providers have incorporated eligibility conditions protecting their domestic markets *(*category *Protection of Provider´s Market).* The EU included provisions relating to the prohibition of systematic unfair trading practices that have an adverse effect on the EU industry and that are prohibited or actionable under the WTO agreements. The EBA eligibility conditions also include provisions to prevent "*the massive increases in imports into the Community of products originating in LDCs in relation to their usual levels of production and export capacity"* (Council Regulation No. 416/2001). For AGOA, a country that benefits from other preferential treatment that could adversely affect US commerce is automatically found to be ineligible. Incompatible with eligibility are also any beneficiary´s actions that may jeopardize US intellectual property. In fact, a relatively large part of the AGOA eligibility conditions is devoted to protecting trade, business and property. Within this category, AGOA contains a notable condition, which is the elimination of barriers to trade and investment in the United States. Furthermore, the United States requires the creation of an environment conducive to domestic and foreign investment, protection of intellectual property, and the resolution of bilateral trade and investment disputes (Trade and Development Act of 2000, 2000).

Another eligibility conditions common to AGOA and EBA are related to *Terrorism*. As for AGOA, prohibited is the beneficiary's support of acts of international terrorism. The beneficiary should cooperate in international efforts to eliminate human rights violations and terrorist activities (Trade and Development Act of 2000, 2000). In this regard, EBA refers to the United Nations Convention against Corruption (2004). AGOA has also added a requirement for beneficiaries to not engage in activities that undermine the interests of the United States' national security or foreign policy.

Unlike AGOA, EBA also includes eligibility conditions related to *Drug Trafficking*. The EU requires beneficiary countries to avoid violating the principles enshrined in the United Nations Single Convention on Narcotic Drugs (1961), the United Nations Convention on Psychotropic Substances (1971), and the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (1988). One of the biggest differences is that EBA addresses one large area that the AGOA does not mention, and that is the environment. Regarding the environment, the EU requires compliance with the principles enshrined in eight international conventions.

4.2 Research Question 2

Following legal acts regulating EBA and AGOA, the EU and the US should react to a breach of eligibility conditions by withdrawing the preferences of the beneficiary responsible. However, there are significant differences between the withdrawal processes. As for EBA, withdrawal follows the procedural requirements laid down in Articles 19–21 of the Regulation (EU) No 978/2012 of the European Parliament and the Council. If the Commission concludes that there is sufficient ground to justify the withdrawal, it initiates the withdrawal procedure. Together with the public announcement on the initiation of the withdrawal procedure, the

Commission contacts the beneficiary concerned. The beneficiary is then provided with information on the reasons for withdrawal and notification about the six-month period for which the Commission will monitor the situation in the beneficiary country. Within these six months, the Commission decides either to terminate the whole process of withdrawal or to comply with it and withdraw the preferences. After this follows another six-month period in which the monitoring period is legally concluded and the final report is submitted. If the situation improves and the reason for withdrawing preferences is no longer present, the Commission adopts delegated acts reinstating the preferences (UNCTAD, 2015). The AGOA preference withdrawal process is faster and more direct than EBA. Eligibility for AGOA is granted or withdrawn at the discretion of the President. Within AGOA, the beneficiary has no recourse to dispute settlement. Therefore, the decision is autonomous on the part of the United States. This one-sidedness and irrevocability are one of AGOA's biggest weaknesses in its affability towards beneficiary countries. The AGOA preferences might be withdrawn fully or partially, and the withdrawal lasts until the situation is resolved. The US conducts an annual comprehensive eligibility review for each AGOA beneficiary. On the basis of these reports, decisions shall be implemented, which take effect on 1 January of the following year.

Table 3: Withdrawals of Preferences Due to Violation of Eligibility Conditions

AGOA+ EBA	Zero hour	Areas of infringed eligibility conditions	AGOA	EU
Central African Republic	2003	political and civil rights, rule of law	2004	X
Dem. Rep. of Congo	2010	human rights, rights of children	2011	X
Guinea Bissau	2012	corruption, political rights, drug trafficking	2013	X
Madagascar	2009	human rights, political rights	2010	X
Mali	2012	human rights, political rights	2013	X
South Sudan	2013	human rights, children rights	2015	X
Guinea	2008	political rights, rule of law	2010	X
Niger	2009	rule of law	2010	X
Only AGOA				
Burundi	2015	human rights, rule of law	2016	-
Cameroon	gradually	human rights	2020	-
Cote d´Ivoire	2002	human rights, political rights	2005	-
Eritrea	gradually	human rights, political rights	2004	-
Eswatini	gradually	human rights, worker rights,	2015	-
Gambia	2014	human rights, civil rights	2015	-
Mauritania	gradually	worker rights	2006, 09, 19	-
Only EBA				
Cambodia	gradually	human rights, civil and worker rights	-	2020

Source: Authors' creation (2024)

Table 3 provides an overview of all cases reported since 2000, in which the EU under EBA or the US under AGOA have temporarily or permanently withdrawn preferences from LDCs. The table is divided into three sections. Section *AGOA+EBA* includes cases of withdrawals

where a country was a beneficiary of both preferential schemes. The *AGOA* section contains cases only of beneficiaries of the US AGOA. The *EBA* section includes cases where the country was only a beneficiary of the EBA. Column *Zero hour* indicates the year in which the situation that led to the withdrawal occurred or the year in which the long-term situation escalated. The term *Gradually* refers to situations where preferences have been withdrawn based on negative long-term developments in compliance with eligibility conditions. The *AGOA* and *EBA* columns contain the year in which the preferences were withdrawn. *X* indicates the fact that within the given preferential scheme, the US or the EU did not react to the violation of the conditions. The table also contains information on the area of eligibility conditions that have been violated.

As can be seen, the US responded to eligibility breaches significantly more often than the EU, as only one case of withdrawal of preferences has been reported under EBA in more than 20 years. AGOA reported a relatively large number of withdrawals, with the most frequent reason being violations of human and political rights.

5. Conclusion

The purpose of eligibility conditions is to encourage beneficiaries to create an environment that supports the effects of preferential schemes in achieving sustainable growth and development. The eligibility conditions also reflect the efforts of preference-granting countries to worldwide promote the human rights and fundamental values that the society of developed countries embraces.

If the provider does not monitor compliance with eligibility conditions and does not respond to their violations, they do not fulfil their purpose, and thus become a groundless component of preferential schemes.

We focused on the two most important preferential schemes - Everything but Arms of the European Union and the African Growth and Opportunity Act of the United States. The results showed that the eligibility conditions of EBA and AGOA, although formulated differently, have a very similar focus. However, the extent to which they are utilized by providers varies greatly.

We found that the eligibility conditions in the case of the European Union do not fulfil their purpose as they are often infringed without resulting in the restriction or withdrawal of preferences. The analysis showed that the European Union sanctions countries rather by reducing or suspending development aid to the beneficiary concerned. The European Union itself identifies trade preferences and their conditionality as one of the main instruments for promoting human rights in developing countries. However, the results of our study raise some doubts about the veracity of this statement.

Compared to the European Union, the United States uses the possibility of withdrawing preferences much more often and responds to eligibility violations quickly and flexibly. The United States' withdrawal mechanism is stricter and more direct than the EU´s. Nonetheless, this simplicity makes AGOA preferences a very flexible tool for responding to the situation that has arisen.

These findings will be followed up by our future research. We will focus on examining potential reasons that could be a source of the EU's reluctance to withdraw preferences due to eligibility violations.

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Analysis of Health Quality in the Selected Developed Countries

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Abstract
Crucial aspects of both qualitative and quantitative and objective and subjective aspects of health related to wellbeing and quality of life are evaluated in this work. A composite index), the Health Quality (HQ) index, is calculated by a method of rescaling the values of four indices and aggregating them as geometric means in a sample of 31 countries, including the European Union and other developed countries, for the period 2013–2021. Based on the HQ index, the highest performance was achieved by Malta, Sweden, and Norway. The three Baltic countries and Romania had the lowest performance. Health status and the qualitative and subjective aspects of health care are determined by a number of factors. Ireland, followed by Norway, are the best-performing countries as regards the highest values of both national income and HQ index.

Keywords: *European Union, quality of life, health, sustainable development, wellbeing*

JEL Classification: *I10, I14, I15, O11, Q01*

1. Introduction

Health is a crucial component of wellbeing and quality of life. Therefore, health economics as a scientific discipline and its practical application (explained in Figure 1) have gained importance. The construction of appropriate indicators reflecting health status and quality of healthcare at the country's level and comparisons among them should help motivate countries to improve the performance of the national health sector and the quality of health of their citizens. The aim of this research is to evaluate the performance of 31 countries in the sample in the period 2013–2021 in the constructed HQ index. This index reflects the performance in the selected aspects of health. The relationships between the HQ index and GDP per capita (pc) are also assessed. The structure of the remainder of this paper is as follows: Section 2 formulates the research topic and methodology applied, with a literature review included in subsection 2.1, and then in subsection 2.2, the data (2.2.1) and methods used (2.2.2) are presented. Section 3 includes the results and the discussion of them. Section 4 contains the conclusions of the paper.

For the purposes of this analysis, new member countries are those that have joined the EU since 2004. The remaining EU countries are referred to as *older member countries*. The northern countries are Norway, Sweden, Denmark, Finland, and Iceland. The southern countries include Greece, Italy, Spain, and Portugal.

2. Problem Formulation and Methodology

In this subsection, the theoretical background of this work, the data sources, and the methodology are described.

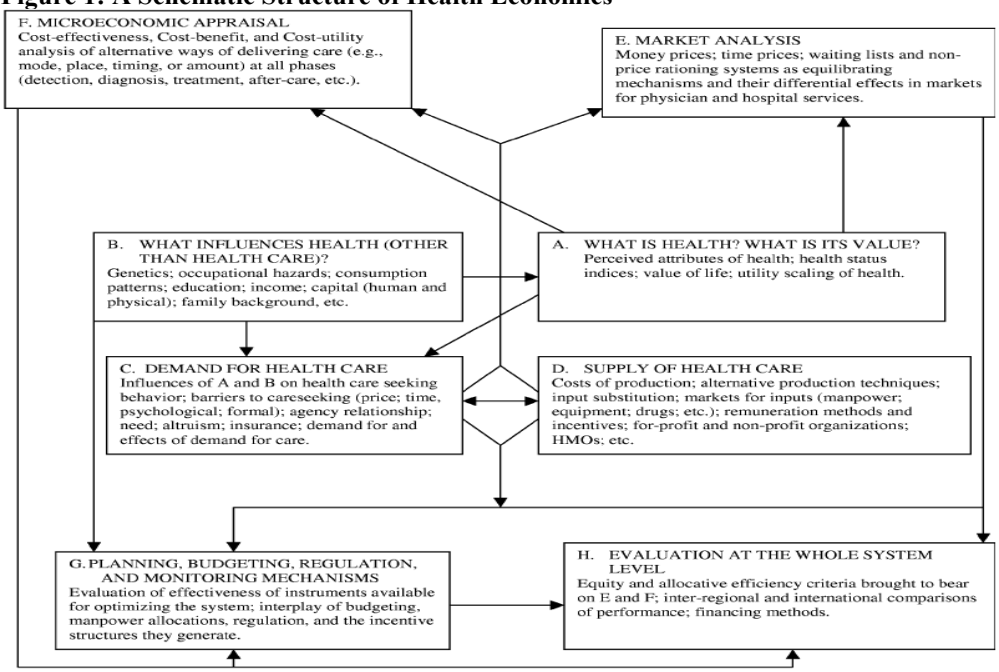
2.1 Literature Review

First, health economics is defined. Second, the relationships between health and sustainable development are described in more detail.

2.1.1 Definition of Health Economics

Health economics is an applied field of economics. As a scientific research programme, it shows both substantial theoretical growth and significant application. Its core of neoclassical economics, especially welfare economics, is itself a part of the current developmental agenda of the subject. A crucial schematic structure of health economics is displayed in Figure 1 (Culyer and Newhouse, 2000). There are partial boxes A–E explained below.

Figure 1: A Schematic Structure of Health Economics



Source: Culyer and Newhouse (2000)

Box A contains the conceptual foundation, which is health, and a multi-disciplinary literature is involved in which various specialists even work together. The central aspects in this box are related to the meaning of *health*, its relationship with *welfare*, and the development of and reliable measures of it. Box B is concerned with the determinants of health, broadly genetic and environmental, as human capital, not only as a stream of discounted benefits over an expected lifetime but as a way of handling health itself. It is understood as a capital stock that can be invested in and depreciates. The demand for it affects and is affected by the demand for other human investments. The interactions between a health production function and a health demand function are concerned.

Box C comes after boxes A and B, and it covers the demand for health care. This demand is derived from the demand for health. In this box, utility interdependencies (externalities) also appear, the tensions between *need* and *demand* are considered, and questions associated with the normative significance of revealed demand have been discussed. Box D involves aspects related to supply-side economics, such as hospital production functions, input substitutions, behavioural relations, labour markets, and industrial regulation. The health care industry is composed of health care organisations like hospitals and general practices; the medical supplies sector, such as pharmaceuticals and equipment; and also other public and private caring agencies, often dealing with specific client groups like the elderly or the disabled.
Box E indicates the ways in which markets in all these sectors operate. It is a major part of applied health economics, especially in countries with substantial dependence on market institutions for the provision of health care insurance and the delivery of health care. Even when no formal markets exist, the health care system operates as a kind of quasi-market. The material in this box is both *positive*, i.e., concerned with "what happens," "what happened," and "what is predicted to happen" if... and *normative*, evaluating the performance of markets using the tools of welfare economics.

Box F is more specifically evaluative and normative. It involves the economic evaluation of healthcare. Box G is primarily American in its content, largely because of the broad range of health care delivery institutions, insurance and reimbursement mechanisms, and a variety of roles played by federal and state agencies. New forms of organisation, financing, and monitoring and control have evolved. Box H is about the highest level of evaluation and assessment across systems and countries. The internationally observed differences between the mechanisms, expenditure rates, objectives, and outcomes are phenomena to be explained.

2.1.2 Relationships between Health and Sustainable Development

The focus on wellbeing and quality of life, along with health as their fundamental factor, must be concerned in the area where SD plays a role and in the context of achieving SD and sustainability at all levels. SD and sustainability involve the aim of improving the quality of life for present and future generations. The most famous definition of SD, as conceptualized, is that from the World Commission on Environment and Development (WCED). SD is defined here as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987). Since the adoption of this definition, many definitions have been developed (see more in Drastichová (2022a, 2023)). There can be various definitions of sustainability, but in relation to SD and in the context of this work, it is understood as a desirable state of sustainability, while SD represents a process of change that is sustainable and leads to this state (see more in Drastichová (2018, 2023)). Nevertheless, this state is not a constant but a dynamic equilibrium, a result of constantly increasing wellbeing and quality of life within environmental limits.

A crucial aspect, related to both sustainability and SD, is the three-pillar concept of sustainability, involving economic, social, and environmental sustainability. It has become generally used in this research area. These pillars also form SD and are necessary to move towards the path of SD and overall sustainability. It means that SD consists of several goals that belong to and combine the aspects of these pillars, and sustainability is the result of SD whose dimensions are constantly being improved and balanced (for a more detailed and critical analysis of the three-pillar conception, see Barbier (1987), Purvis et al. (2019), and Drastichová (2023)). Moreover, there are also particular concepts of sustainability, and for the analysis in this work, the human development (HD) approach must be considered. Within the HD approach, the current focus on the economic, environmental, and social dimensions of SD must be expanded to cover a human dimension. This focuses on people and their opportunities

and choices. The contribution of HD can be understood in a consideration of development that has moved away from a purely economic-based understanding measured in GDP and from a purely state-centred understanding to one where the people become the main agents of development.

The most recent global political agenda towards achieving SD is the UN Agenda 2030, including the set of Sustainable Development Goals (SDGs). This is the most comprehensive SD agenda adopted by the UN in 2015, i.e., a comprehensive global policy framework concerning the most crucial economic, social, and environmental issues (see more in Drastichová, 2022a). In terms of the agenda, 17 Sustainable Development Goals (SDGs) were outlined (UN, 2015). The agenda provides a policy framework worldwide towards achieving SD, and at the EU level, the EU, along with its member states, have committed themselves to its implementation. The EU's answer to this agenda is outlined in the 2016 European Commission's Communication (European Commission, 2016), and the EU SDG indicator set was developed. The SDGs contain 169 related targets and 213 measurable indicators (see, e.g., Gue et al., 2020), and the EU's set, which is structured along the 17 SDGs, comprises around 100 indicators. For each SDG, a focus is on aspects that are relevant from an EU's viewpoint. The overall research area is still very broad, but in relation to health, wellbeing, and quality of life, the indicators included in SDG 3 were chosen for the analysis.

The aims contained in SDG 3, defined as to *ensure healthy lives and promote wellbeing for all at all ages,* involve achieving health and wellbeing for all at all by improving reproductive, maternal, and child health; ending epidemics of major communicable diseases; lowering non-communicable and mental disorders; as well as reducing behavioural and environmental health-risk factors. In the EU context, monitoring SDG 3 focuses on the topics of healthy lives, determinants of health, causes of death, and access to health care. Health is a crucial factor in wellbeing and quality of life and an inevitable aspect of achieving sustainability and SD in all three dimensions.

2.2 Problem Formulation and Methodology

In this subsection, the data sources and the methodology are introduced.

2.2.1 Data Applied

Four indices from the SDG 3 topic were chosen for the analysis in the period 2013–2021, where the data were available for these indicators in the majority of the countries in the sample. Life expectancy (LE) at certain ages indicates the mean number of years still to be lived by a person who has reached a certain exact age if subjected to the current mortality conditions throughout the rest of life (age-specific probabilities of dying). LE at birth (total, year) is defined as the mean number of years that a new-born child can expect to live if subjected to those conditions. It is one of the most frequently used health status indicators (see more in Drastichová and Filzmoser (2020)). In this analysis, it is used as the first indicator to construct the HQ index. Since this is an objective and quantitative macro-indicator of health status, other types of indicators are added.

The second is the indicator of healthy life years (HLY), which estimates the number of remaining years in which a person of a specific age is expected to live without any severe or moderate health problems. It is a composite indicator that combines mortality data with health status data. In this article, the Healthy Life Years in absolute value at birth (HLY) indicator (total, year) is used to reflect quality of life in relation to health. The concept of a health problem for Eurostat's HLY reflects a dimension of disability and is based on a self-perceived question that aims to estimate the extent of any limitations for at least six months because of a

health problem that may have affected respondents as regards activities they usually do (the so-called Global Activity Limitation Instrument). Hence, this indicator is also referred to as disability-free life expectancy (DFLE). In summary, HLY reflects the quality of life spent in a healthy state rather than the quantity of life, as estimated by LE (Eurostat, 2024).

The self-reported unmet need for medical examination and care (SUN) indicator (total, 16 years or over, percentage) measures the share of the population aged 16 and more who reported unmet needs for medical care due to one of three reasons, while all three reasons are cumulated. They involve financial reasons, a waiting list, and being too far away to travel. SUN is a person's own assessment of whether medical examination or treatment (dental care excluded) was needed but not obtained or sought. The indicator is derived from self-reported data. Hence, it is affected by respondents' subjective perceptions and their social and cultural backgrounds. The different organisation of health care services can play a role as well. These factors must be taken into account when interpreting the data. The share of people with good or very good perceived health by sex (PPH) indicator (total, 16 years or over, percentage) is a subjective indicator of the extent of how people judge their health in general on a scale from *very good* to *very bad*. This ratio is measured as the share of the population aged 16 or older perceiving itself to be in *good* or *very good* health. Such indicators may serve as a good predictor of people's health care use and mortality.

The four indicators reflect qualitative (HLY, PPH, SUN) and/or quantitative (LE, SUN—to some extent) aspects and simultaneously objective (LE, HLY) and/or subjective (PPH, SUN, HLY) aspects of quality of life and health in the social pillar of SD. In the monitored period, data for several indicators included in some years were missing in some countries. For the UK, it was the case for all the indicators in the period 2019–2021, and for Iceland, for three indicators, i.e., HLY, PHP, and SUN, in this period. Then data are not available for HLY in Finland (2013) and for SUN in Italy (2020). In these years, the HQ index has not been calculated for the mentioned countries. Except for the PHP indicator, the data for the remaining three indicators are also available in 2022. This year is therefore used for interpretation, when necessary, but the HQ index is not calculated.

2.2.2 Methodology and Model

The construction of the HQ index was inspired by the construction of the SWB index (Drastichová, 2022b), the Sustainable Society Index (SSI) (Saisana and Filippas, 2012), and the Sustainable Development Index (SDI) (Drastichová, 2018). The methodological basis is also provided by Nardo et al. (2005) and Saisana and Filippas (2012), who provide a detailed description of the procedure for the construction of composite indicators.

The HQ index is constructed as a geometric mean of four indices described in subsection 2.2.1. The years with missing data were omitted for particular countries with missing data. The indices are expressed in different units, including percentage shares of the population aged 16 and over for PPH and SUN, and years for LE and HLY. Thus, there are different ranges and variances. Therefore, a normalization to a common scale is desired. After the initial stages of the data adjustments, normalisation is carried out before the data aggregation. Indicators are normalised in order to allow for comparisons. A number of normalisation methods exist, such as ranking, standardization, i.e., z-scores, rescaling, distance to a reference country, categorical scales, indicators above or below the mean, cyclical indicators, balance of opinions, or percentage of annual differences over consecutive years (Freudenberg, 2003; Jacobs et al., 2004). The most commonly used methods involve standardization, i.e., z-scores, and rescaling. Standardization converts the indicators to a common scale of mean zero and standard deviation of one. Thus, the above-average performance of a given indicator is assigned higher scores

than consistent average scores across all indicators. Rescaling normalises indicators to an identical range [0, 1], where higher scores are consistent with higher performance. A crucial advantage of this procedure over standardization in the context of the HQ index is the widening of the range of an indicator. This is beneficial when indicators with a small range of values are the subject of the analysis since differentiation between countries with similar values is allowed. Nevertheless, it is not appropriate when extreme values or outliers are present that can distort the normalized indicator. To control for this, extreme values, which could bias the results, must be avoided. The method of rescaling was chosen because of its appropriateness for the analysis. There are no substantial differences in the sample of 31 developed countries, although in terms of the EU (Europe), some of the countries are more developed and others are less developed.

The four indicators are normalized by the min-max method, considering the direction of their effect. For indicators for which higher raw values lead to better results, i.e., the PPH, LE, and HLY indicators, the formula applied is:

$$F(X) = \left(\frac{X_i - \min(x)}{\max(x) - \min(x)}\right).9 + 1. \quad (1)$$

For indicators for which lower raw values are desirable, i.e., the SUN indicator, the indicator values are transformed by means of the equation:

$$F(X) = \left(\frac{\max(x) - X_i}{\max(x) - \min(x)}\right).9 + 1. \quad (2)$$

The normalised indicators are expressed on a 1–10 scale. The next step is the weighting of indicators; most composite indicators apply equal weighting. Hence, equal weights are allocated to the indicators used (Nardo et al., 2005; Saisana and Philippas, 2012). Aggregation methods vary as well. The crucial methods include linear, geometric, and multi-criteria aggregation methods. The linear method is useful when all sub-indicators have the same measurement unit, while geometric aggregation is more appropriate for non-comparable and strictly positive sub-indicators expressed on different ratio scales. Nardo et al. (2005) also identified compatibility between aggregation and weighting methods. Equal weighting is compatible with geometric methods.

The most frequently used aggregation methods are the arithmetic and geometric means (AM, GM). Several arguments against the use of the AM involve: perfect substitutability, i.e., weak performance in one indicator can be fully compensated by good performance in another; no punishment for an unbalanced performance; no impact of weak performance: the AM does not consider that the lower the performance in a particular indicator, the more urgent the improvement in that indicator is. Conversely, GM implies only partial substitutability, i.e., weak performance in one indicator cannot be fully compensated by good performance in another; it rewards balance by penalizing uneven performance between indicators; and it provides incentives for improvement in the weak aspects: the lower the performance in a particular aspect, the more crucial it is to achieve improvements in the relevant indicator (see more in Drastichová, 2022b; Saisana and Philippas, 2012).

In this work, the Pearson correlation coefficient (r) is used to assess relationships between the developed HQ index and GDP per capita (current prices, purchasing power standard (PPS, EU27 from 2020), per capita (pc)).

3. Problem Solution

In this section, the results and discussion are included. In Table 1, the values of the HQ index for the 31 countries in the period 2013–2021 are displayed. In each year, the values are ordered from the lowest to the highest, and the lowest and highest values for each year are highlighted in bold. On the bottom of Table 1, the missing values for particular countries are also highlighted for each year because of the missing data for the indicators included in the HQ index.

Table 1: The Values of HQ Index for the 31 countries, 2013-2016

C	2013	C	2014	C	2015	C	2016	C	2017	C	2018	C	2019	C	2020	C	2021
LV	**2.09**	**LV**	**2.34**	**LV**	**2.71**	**LV**	**2.91**	**LV**	**2.34**	**EE**	**2.45**	**LV**	**3.18**	**LV**	**3.35**	**LV**	**3.05**
LT	3.65	EE	3.51	LT	3.03	EE	3.11	LT	3.64	LV	2.82	EE	3.22	LT	3.44	LT	3.73
EE	4.00	LT	3.63	EE	3.33	LT	3.30	EE	3.71	LT	3.61	LT	4.01	EE	4.10	BG	4.33
HR	4.30	PO	4.35	PO	4.40	PO	4.88	PO	5.06	PO	5.12	SK	5.35	RO	5.23	EE	4.43
RO	4.40	RO	4.62	RO	4.70	RO	5.17	SK	5.27	SK	5.35	PO	5.37	SK	5.26	RO	4.50
PL	4.87	SK	5.03	HU	4.89	HU	5.39	RO	5.28	RO	5.37	HR	5.55	PO	5.48	SK	4.77
SK	4.88	HU	5.09	HR	4.96	HR	5.45	HU	5.40	HR	5.51	RO	5.57	BG	5.62	PO	5.17
HU	4.94	PL	5.14	SK	4.99	SK	5.45	HR	5.49	HU	5.66	HU	5.62	HR	5.76	HR	5.49
PO	5.04	BG	5.36	PL	5.16	PL	5.50	SL	5.53	PL	5.70	PL	5.81	HU	5.79	HU	5.51
BG	5.13	HR	5.39	BG	5.42	GR	5.79	PL	5.75	SL	5.71	FI	6.00	PL	5.82	PL	5.70
DE	6.09	DE	6.02	GR	5.92	BG	5.90	BG	5.87	BG	6.06	BG	6.22	FI	6.06	DK	6.21
CZ	6.25	GR	6.33	FI	6.30	FI	6.38	FI	6.33	FI	6.16	CZ	6.49	CZ	6.34	CZ	6.45
SL	6.41	FI	6.41	SL	6.38	SL	6.42	CZ	6.37	CZ	6.56	DK	6.73	DK	6.68	FI	6.94
IT	6.50	CZ	6.52	CZ	6.43	CZ	6.48	GR	6.56	AT	6.67	AT	6.74	AT	7.06	SL	7.09
GR	6.76	SL	6.53	IT	6.54	AT	6.61	AT	6.62	UK	6.93	SL	6.77	SL	7.19	GR	7.27
AT	6.95	AT	6.69	AT	6.72	DK	7.00	DK	6.97	GR	7.03	GR	7.32	DE	7.40	DE	7.27
DK	7.02	IT	6.74	DK	6.81	LU	7.23	LU	7.10	DK	7.10	FR	7.59	FR	7.48	NL	7.29
NL	7.26	DK	7.11	UK	7.21	UK	7.35	UK	7.36	LU	7.23	BE	7.59	GR	7.50	AT	7.45
FR	7.31	UK	7.40	NL	7.28	FR	7.42	NL	7.46	NL	7.31	DE	7.59	NL	7.66	FR	7.63
BE	7.56	CH	7.42	DE	7.42	NL	7.48	DE	7.53	DE	7.50	NL	7.61	BE	7.67	ES	7.75
LU	7.67	FR	7.45	FR	7.51	DE	7.53	FR	7.56	FR	7.60	LU	7.77	LU	7.90	LU	7.85
UK	7.72	NL	7.68	LU	7.51	BE	7.58	BE	7.66	IS	7.65	CY	7.92	CY	8.05	BE	7.99
CH	7.73	BE	7.68	BE	7.62	CH	7.68	IS	7.71	BE	7.71	CH	8.08	CH	8.22	CY	8.25
CY	7.75	LU	7.87	CH	7.67	IT	7.73	CH	8.02	CY	7.93	IT	8.49	ES	8.25	CH	8.26
ES	8.00	CY	7.89	ES	8.01	IS	8.12	CY	8.23	CH	8.01	NO	8.64	IR	8.63	IT	8.37
IR	8.18	ES	8.20	CY	8.02	ES	8.37	IT	8.42	IT	8.24	ES	9.08	NO	8.70	SE	8.45
SE	8.27	IR	8.23	IS	8.23	IR	8.64	IR	8.72	ES	8.69	IR	9.08	MT	8.90	MT	8.57
IS	8.33	IS	8.26	IR	8.41	MT	8.78	ES	8.87	NO	8.85	SE	9.17	**SE**	**8.99**	**IR**	**8.60**
NO	8.60	MT	8.96	MT	8.76	NO	8.82	NO	8.95	IR	8.96	**MT**	**9.18**	IS	-	IS	-
MT	**8.63**	NO	9.00	NO	8.92	CY	8.82	SE	9.02	SE	9.01	IS	-	IT	-	NO	-
FI	-	**SE**	**9.08**	**SE**	**9.04**	**SE**	**8.94**	**MT**	**9.09**	**MT**	**9.09**	UK	-	UK	-	UK	-

Source: Own elaboration (2024); (source of the data: Eurostat, 2024)

As regards the concrete values, three Baltic countries had the lowest values in the sample each year. In 2021 only, Bulgaria had the third lowest value and Estonia the fourth lowest value in the sample. Latvia had the lowest value each year, except for 2018, when Estonia had the lowest value. Regarding the other two less developed EU countries, i.e., Bulgaria and Romania, the values of Romania were among the lowest in each year as well, but those of Bulgaria significantly decreased (this should be especially related to the highest drop of LE in the sample). Sweden and Malta had among the highest values each year, but in the last

monitored year, 2021, both countries were surpassed by Ireland, which also achieved an increase against 2013 (and the highest increase of LE in the sample). Norway and Iceland also had among the highest values, but over the monitored period, the values of Norway increased only slightly, while those of Iceland significantly declined (not available from 2019 onwards; they were among the highest, especially until 2016). The other two northern countries, Denmark and Finland, had lower values. The Benelux countries are close to one another and also close to France, and since 2015, they have also been close to Germany (the third highest increase in the sample). In the group of the southern countries, Spain had higher values, but it was surpassed by Italy, which experienced the highest increase in the sample. The values of Greece were medium or lower, and those of Portugal were among the lowest in the sample. The values of Austria and the UK were often medium; the higher difference was only seen in 2013 (those of the UK were always higher but significantly decreased and the countries got closer to one another). Switzerland and Cyprus, which were close to one another in 2013, achieved higher increases and have been close to one another since 2017, currently showing the highest values in the sample (2014–2016: Switzerland had lower values).

In the whole monitored period, the HQ index decreased in seven countries (DK, BG, UK, IS, ES SK, MT) and in the first partial period in eleven countries (GR, EE, LU, UK, LT, AT, IS PT, CH, FI, DK) (ordered from the highest to the lowest declines).

It is also important to investigate the values of the partial indicators to discover the rationale behind the values of the HQ index and their development. First, the values of HLY and LE should be compared since they reflect qualitative versus quantitative aspects, respectively. HLY also monitors health as a productive economic factor. An increase in HLY is one of the main goals of the EU's health policy. It would both improve the situation of individuals and reduce public health care expenditures. If HLY is increasing more quickly than LE, people are living more years in better health. Almost all the new member countries had low or lower LE values. They are higher in Slovenia and, in relative expression (in this group of countries), also in Czechia and Estonia. Malta and Cyprus also had higher values, with an increase in the first and a higher drop in the second. Currently, Malta has among the highest values in the sample, which was the case for Cyprus at the beginning of the period. Bulgaria, Romania, Latvia, Lithuania, and Hungary had the lowest values each year. From the northern countries, Denmark and Finland had lower values with the increases in both of them. In the group of the more developed countries, Switzerland had among the highest values each year. The remaining Northern countries, Norway, Sweden, and Iceland, exhibited higher increases, especially Norway (the highest increase in the sample). All three have had among the highest values recently. France also had higher values, but Germany, Austria, and the UK had lower values. In the Benelux countries, the values were higher, especially in Luxembourg. From the southern countries, Spain and Italy had among the highest values in the sample, while those of Portugal and Greece were lower (with an increase in the first but a high drop in the second). As regards HLY, similarly to LE, the lowest values prevailed in the new member countries, especially the three Baltic countries (slightly higher in Lithuania) and Slovakia. However, in the more recent period, the values are substantially higher in Slovenia (similar to LE), but also in Poland and Hungary after high increases. Moreover, when compared to LE, the values are slightly higher in Romania and high (in the sample) in Bulgaria. Germany achieved the highest increase in the sample from low to relatively high values, and the growth in the number of years is higher than that of LE. Malta, Norway, and Sweden, followed by Ireland, had among the highest values in the sample. However, in the case of Norway and Ireland, which had the highest increases in LE, respectively, the increase in HLY was only slight in Ireland, and a drop occurred in Norway. A high decrease also occurred in Malta, and the highest drop in the sample occurred in Iceland. Although Malta still had one of the highest rankings (the highest HLY in

2021), that of Iceland substantially worsened, and it is not compatible with a high increase in LE. As regards the southern countries, Italy experienced the third highest increase in the sample and currently shows among the highest values. The opposite is true of Spain, whose ranking worsened after a relatively high decline occurred. The values are also high in Greece and Cyprus (slight increases), but low in Portugal (the second highest drop in the sample). For this indicator, the values in the Benelux countries are not that close to one another, with the highest prevailing in Belgium (except for 2019, when the highest value was in Luxembourg) and the lowest in the Netherlands. From the remaining more developed countries, the values were also high in France (often close to Belgium) and in the UK at the beginning of the period, and the decreases occurred. The values were predominantly low in Austria and Switzerland. Hence, in many of the analyzed countries, differences in the development of LE and HLY were identified.

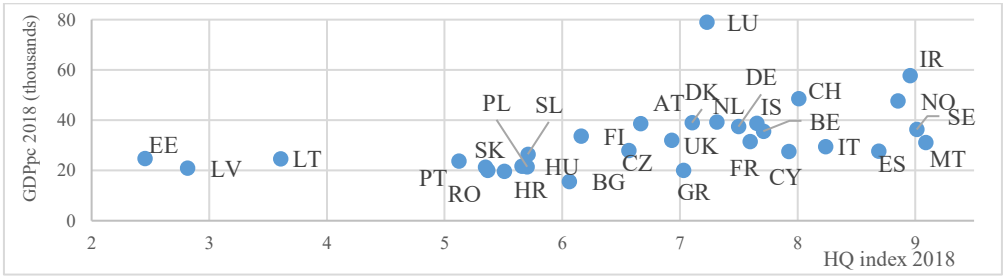
Second, the values of PPH and SUN should be investigated together to evaluate the subjective satisfaction of people with their health, along with reporting unmet needs for medical care simultaneously. All the new member countries had low PPH values, and a number of them had high SUN values. For PPH, the values were among the lowest in the three Baltic countries and in Portugal. Lithuania showed the lowest values, except for 2013, when Latvia had the lowest value. Along with these countries, Poland, Hungary, and Croatia had among the lowest values. In the most recent period, Czechia and Slovenia have achieved higher values (after relatively higher increases, especially in Czechia). They were low in Germany and in the group of the northern countries in Denmark and Finland in 20222 (not included in the analysis; all three had among the lowest values in the sample). In Denmark, however, it was not the case at the beginning of the monitored period, but the second highest drop in the sample, following Sweden, occurred. For Sweden, this means a substantial drop in the ranking from the third highest value in the sample in 2013. Although the decreases also occurred in the remaining two northern countries, Norway and Iceland, their shares were still relatively high in the more recent period as well (lower in Norway, especially in 2019). Moreover, Switzerland, Ireland, Cyprus, two Benelux countries (the Netherlands and Belgium until 2020, and Belgium and Luxembourg since 2021 (a high increase in Luxembourg and a high drop in the Netherlands), and Greece (especially more recently after a high increase occurred) had among the highest values. Italy achieved a significant increase and has had higher values more recently. Spain, being often close to Greece, has exhibited a decrease (lower values than Italy and Greece since 2021). From the remaining more developed countries, Germany had low values; they are slightly higher in France and medium in Austria and the UK.

Nevertheless, for the SUN indicator, Austria and, since 2015, also Germany had among the lowest values. The values are also low in Malta, Spain (but a high increase occurred), two Benelux countries, the Netherlands and Luxembourg (slightly higher values since 2021 after a high increase), and more recently, Cyprus, which exhibited a significant drop (in 2021 and 2022—the lowest value in the sample). The values were also low in Switzerland and Spain, but Spain showed a relatively high increase. Italy had high values at the beginning of the period but exhibited a high drop, and the values are close to Belgium since 2021, which also showed a high drop. From the new member countries, the adverse development took place in the predominantly good-performing country, Slovenia, which had the highest increase in the sample—from the lowest value in 2013 to one of the highest. The values are also low in Czechia and, after a decrease, among the lowest in the sample. The sample of countries with the highest SUN values is more diverse. Latvia, Estonia, and Romania had among the highest values each year, although in all of them the value declined. Latvia, followed by Bulgaria, Romania, and Poland, had the highest drops in the sample. Hence, Bulgaria and Poland, having the highest values in the first part, have recently had lower values (mainly Bulgaria). Lithuania

had the lowest values among the Baltic countries. On the contrary, after the increases, France had higher values in the more recent period, and Finland also had among the highest values in the sample (in the majority of the years), and its ranking was worsening.

Next, the relationships between the HQ index and national income, i.e., GDPpc, are investigated. The *r* values were calculated in the period 2014–2021, and their values were around 0.5, slightly higher in 2014 and 2015 (0.568; 0,586). Although it was confirmed that the GDP (income) of the country explains a high share of the variance in the level of health expenditure (see more in Culyer and Newhouse (2000) or Newhouse (1977), it is not that unambiguous for the combination of the important aspects of the health status as measured by the HQ index constructed in this work. The relationships are displayed in Figures 2 and 3. The most recent year for which the data are available in all the countries for both indicators is 2018. Hence, in Figure 2, the relationships between GDPpc and the HQ index can be seen.

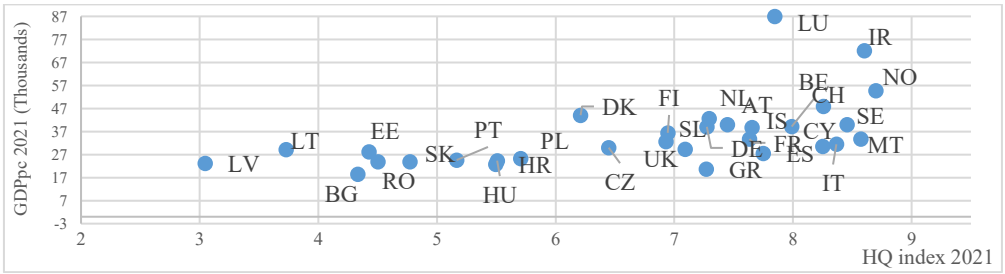
Figure 2: The Values of the HQ Index and GDPpc for the 31 Countries, 2018



Source: Own elaboration (2024); (source of the data: Eurostat, 2024)

The most recent year for which the HQ index is calculated, i.e., 2021, is useful to display in order to evaluate current trends in development (Figure 2). However, there are limitations in terms of missing values of the HQ index for Iceland, the UK, and Norway (the values of 2018 are used for the first two, and the value of 2020 for Norway) and the data of GDPpc for Switzerland and the UK (for the first, the data of 2020 and for the second of 2019 are used).

Figure 3: The Values of the HQ Index and GDPpc for the 31 Countries, 2021



Source: Own elaboration (2024); (source of the data: Eurostat, 2024)

In Figure 2, several groups of countries can be identified. The Baltic countries are isolated (with low GDPpc values), since only in the year 2018, Estonia had the lowest HQ index, but in 2021, it was the fourth lowest. The other new member countries, Portugal, Finland, and Austria, are in the middle with low and medium GDPpc values. The remaining more developed EU countries and the southern countries are more in the right, but some of them, especially the southern countries, have low GDPpc values (in both Figures 2 and 3). In Figure 3, the group

of all the new member countries and Portugal are more in the left part (Bulgaria had the lowest GDPpc in both years), while Czechia got closer to the more developed countries and Denmark to the new member countries as regards the HQ index.
Due to the decreases in the HQ index in two of the best performing countries, i.e., Malta and Sweden, Ireland is the best performing country in 2021, and in both years, it is the country with the highest GDPpc (following Luxembourg, which is an outlier). The group of the best performing countries in the HQ index, i.e., Ireland, Norway, Sweden, and Malta, are placed in the very right parts of both Figures 2 and 3, but Sweden and Malta had significantly lower GDPpc values than Ireland and Norway. Overall, there can be many factors influencing health status, although national income is a crucial factor in health expenditure.

4. Conclusion

The aim of this research was to evaluate the performance of 31 countries in the sample in the period 2013–2021 in the constructed HQ index, which reflects the performance in the selected aspects of health. The supplementary aim was to discover the relationships between the HQ index and GDP per capita.

Three Baltic countries and Romania were the worst performers, and Malta and Sweden were the best performers. Most recently, Italy, Cyprus, and Switzerland had the highest values as well. Ireland, followed by Norway, are the best-performing countries as regards the highest values of both the GDP per capita and HQ index. Although the national income of the country explains a high share of the variance in the level of health expenditure, health status and the qualitative and subjective aspects of health care are determined by a number of factors.
Although the values of the HQ index were influenced by the development of individual indicators, the applied geometric means as an aggregation method imply only partial substitutability, i.e., weak performance in one indicator cannot be fully compensated by good results in another. The weaker or worsening the performance in a particular indicator, the more urgent it is to achieve improvements in this indicator. The significant drop in PHP in the best-performing country is challenging.

The simultaneous development of HLY and LE on the one hand and SUN and PHP on the other in the sample was investigated. HLY also monitors health as a productive economic factor. If HLY grows more quickly than LE, people will live more years in better health. In many of the analysed countries, differences in the development of LE and HLY were identified. Bulgaria, Germany, and Switzerland must be especially highlighted (high values of HLY in the first two (in Germany since 2015) and low values of LE; the opposite is true for Switzerland).

I am aware of the limitations of this research, especially those related to the construction of composite indices and the macroeconomic background of the calculated index, which does not cover all the aspects related to health (described in more detail in Figure 1). The challenges for future research include advancing the methodology of the measurement of health care, which would combine both macro and microeconomic aspects, efficiency and sustainability of health care, and which would allow for implementing actions leading to the highest possible improvement of health status and quality of life provided limited (scarce) resources.

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Impact of Government Consolidation Package on Economic Activities of Commercial Corporations and Their Employees in Internal Market of the European Union

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Abstract
The paper deals with the analysis of selected significant measures that are part of the government's new „recovery" consolidation package, which entered into force on 1 January 2024; its main objective is to reduce the budget deficit in the Czech Republic in 2024 and 2025 not only through tax changes. These measures, which involve more than 65 amendments to legislation, have implications for the economic activities of commercial corporations in the Czech Republic doing business in the European Union as well as for employees and the public. The paper analyses selected significant changes, not only from the perspective of commercial corporations, but also from the perspective of employers and employees. Some of the measures are also related to already set trends in digitalization of public administration in accordance with the requirements of the European Union.

Keywords: *accounting, business corporation, employee, European Union, taxes*

JEL Classification: *H25, K34, M40, M41, M48*

1. Introduction

From 1 January 2024, a long-prepared government consolidation package of changes enters into force in the Czech Republic (hereafter only CR), bringing a large number of austerity measures aimed primarily at stabilising public finances and helping to reduce the deep state budget deficit. The state budget for 2022 was in deficit, amounting to -360.4 billion CZK; a deep deficit was recorded for the third year in a row. The aim of some previously approved changes in 2022 (such as the introduction of the windfall tax on extraordinary profits) was to reduce this deficit by about 80 billion CZK already for the year 2023, when the state budget deficit reached -288.5 billion CZK. The new consolidation package with a planned reduction of the budget deficit in 2024 and 2025 should therefore contribute to a further reduction of the state debt by a total of at least 150.7 billion. CZK (Ministry of Finance of the Czech Republic, online, 2023). Therefore, more funds will flow into public budgets in the coming years and the overall balance should be level out (Krajňák, 2021).

The effects of the consolidation package on the Czech economy, Czech companies and Czech households can be seen from several perspectives. At first glance, some measures have the potential to slow down the economic activities of companies, especially the increase in corporate income tax by 2% (from 19% to 21%), but also many other changes, primarily tax

changes. However, from another point of view, this summary of all changes can also be understood as essential measures leading to the necessary stabilization of public finances with an anti-inflationary effect, which could also lead to an increase in the confidence of foreign investors and their willingness to invest in CR. As part of the consolidation package, there are changes not only in direct taxes but also in indirect taxes. Measures affecting all self-employed individuals include, for example, an increase in social insurance contributions and an increase in the minimum assessment base for social insurance. There will also be a change in the progression of personal income tax and the abolition of the possibility of claiming some deductible items and tax credits, which will also affect employees. Due to the negative balance of the health insurance account in the amount of -8 billion CZK, a mandatory health insurance levy of 0.6% was introduced for employees. The consolidation package will not only affect entrepreneurial individual and employees, but a number of measures also apply to commercial corporations, not only in the area of direct taxes such as an increase in the corporate income tax rate or a reduction of some tax relief when purchasing cars but also increase in real estate tax and other things. Supporting tax deductions for research and development and making them more attractive, especially for smaller companies that should use this tool more, appears to be a positive measure. Within the scope of indirect taxes, VAT rates have been adjusted and some goods and services have been reassigned to a lower or higher tax band. There is also a gradual increase in consumption taxes. A truly ground breaking change is seen in the accounting, namely the possibility of keeping accounts in a foreign (i.e. functional) currency if several conditions are met. Until now, all Czech accounting entities had to keep accounts only in Czech crowns (Hakalová, Palochová, Pšenková, Bieliková, 2018). A significant change is also the option of excluding unrealized exchange rate differences from taxation. As a result of approving the consolidation package, the supply of national subsidy titles will also be reduced across the board in most ministries. Last but not least, there is also a reduction in the volume of funds for salaries in the state sector by 2% as a result of the reduction of state agendas, state organizational components and state-funded organisations, the slowing of the growth of salaries of constitutional authorities, the abolition of territorial offices of the Financial Administration and other austerity measures. As part of the digitization trend, for example, duty stamps are being abolished and electronization of administrative orders is being introduced. (Ministry of Finance of the Czech Republic, online, 2023).

2. Problem Formulation and Methodology

In the paper, the exploration method was used, including description and classification; furthermore, methods of analysis and synthesis were chosen that match the paper's content and focus. A dialectical benefit, for which each phenomenon can be understood as a part of the whole, can be considered as a methodological basis. Individual economic categories and economic phenomena are not examined in isolation but are based on principles of integrity of economic phenomena and the principle of dialectical unity. Apart from the mentioned methods, the method of procedure was used, which comes from simple categories to their increasingly complex determination, to their mutual relations. The findings are summarized primarily using the method of synthesis and scientific explanation.

3. Effects of Government's Consolidation Package on Public Budget

As already mentioned at the beginning of this paper, the government consolidation package represents a large number of austerity measures, and during its creation three basic consolidation principles were established by the government:

- streamlining of the state (savings on salaries and state operations),
- simplicity (removing the absurdities of the tax system),
- social reconciliation (reduction of VAT on basic goods), (Ministry of Finance of the Czech Republic, on-line, 2023).

The Government of the Czech Republic anticipates positive impacts of the adopted measures on individual items of the state budget in 2024 and 2025, see Table 1.

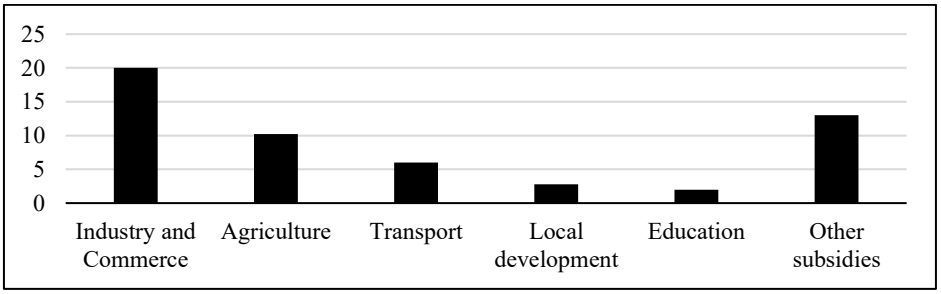
Table 1: The Impact of Measures on the State Budget in Billion CZK in 2024 a 2025

	2024	2025	Total
Expenditures	**62.6**	**15.9**	**78.5**
Subsidy	45.6	8.8	54.4
Operation of the state	6.1	5.1	11.2
Salaries in the public sector	9.9	0	9.9
Other expenditure	1	2	3
Revenue	**35.2**	**37.1**	**72.3**
Corporate income tax increase	0	21.8	21.8
Introduction of sick pay	11.9	1.1	13
Real estate tax increase	9	0.3	9.3
Tax exemptions	2.3	5.3	7.6
Deductions of a self-employed person	3	4.5	7.5
Tobacco tax increase	3.2	2.8	6
Increase in gambling tax	4.2	0	4.2
Personal income tax adjustment	1.7	0.9	2.6
Deductions from agreements to complete a	1.8	0.2	2
Alcohol tax increase	0.5	0.6	1.1
Other income	-0.3	-0.1	-0.4
Revision of value added tax rates	-2.1	-0.2	-2.3
Total	**97.7**	**53.0**	**150.7**

Source: Ministry of Finance of the Czech Republic (2023); own elaboration (2024)

The consolidation package brings a reduction in the amount of subsidy titles that will affect most ministries. The largest reduction will fall on the Ministry of Industry and Trade of the Czech Republic, see Figure 1. In addition to subsidy titles, there is also a reduction in expenses for state operations, salaries of constitutional authorities and others, amounting to 62.6 billion CZK in 2024, and a savings of 15.9 billion CZK are expected in 2025.

Figure 1: Subsidy Reduction in 2024 to 2025 in Bill. CZK



Source: Ministry of Finance of the Czech Republic (2023); own elaboration (2024)

If the consolidation package achieves its expected goals, it may also have certain positive effects on the business sector, given that the significant deficit of public budgets contributes to the growth of the price level in the economy. Consolidation of public finances will therefore affect not only the stabilization of public finances, but indirectly also the reduction of inflation. In the short term, the consolidation package will have a rather negative effect on the economic activities of commercial corporations and business entities, but in the long term, not only public finances, but also the entire economy will stabilize. In the future, we can expect positive macroeconomic and at the same time microeconomic benefits, such as stabilization of the price level.

4. Effects of Government's Consolidation Package on Commercial Corporations

The law on the consolidation of public budgets, called consolidation package, brought many new measures and changes in the taxation and accounting that will affect individual commercial corporations. One of the most fundamental changes from 2024 is an increase in the corporate tax rate for commercial corporations. From the original 19%, the rate is has now increased to 21%, bringing the Czech Republic closer to the European average. The increase in this tax will significantly affect the disposable profits of corporations, which may have a negative impact, for example, on the volume of their investments, or some corporations may pass on a higher tax burden to consumers through higher prices of their products and services. In terms of the corporate income tax rate, in 2023 the Czech Republic had a below-average rate and was ranked 18th-20th place from the 27 countries of the European Union, see Table 2.

Table 2: Corporate Tax Rates in the European Union in 2023

EU countries	%	EU countries	%	EU countries	%
Malta	35.00	Luxembourg	25.00	Poland	19.00
Portugal	31.50	Denmark	22.00	Slovenia	19.00
Germany	29.83	Greece	22.00	Romania	16.00
Italy	27.81	Slovakia	21.00	Lithuania	15.00
France	25.83	Sweden	20.60	Cyprus	12.50
Netherlands	25.80	Estonia	20.00	Ireland	12.50
Austria	25.00	Finland	20.00	Bulgaria	10.00
Belgium	25.00	Latvia	20.00	Croatia	10.00
Spain	25.00	Czech Republic	19.00	Hungary	**9.00**

Source: FXstreet (2023); own elaboration (2024)

Parent companies of large multinational and national groups will pay a countervailing tax in accordance with the rules of the Organization for Economic Co-operation and Development (OECD). The proposal is based on the European directive, which the member states have committed to implement from the beginning of 2024 and which sets the conditions for the taxation of large companies. The change mainly concerns multinational giants. All companies operating in the EU, which are part of groups with an annual consolidated revenue of over 750 million EUR, will have to pay a minimum income tax of 15% from the beginning of 2024.

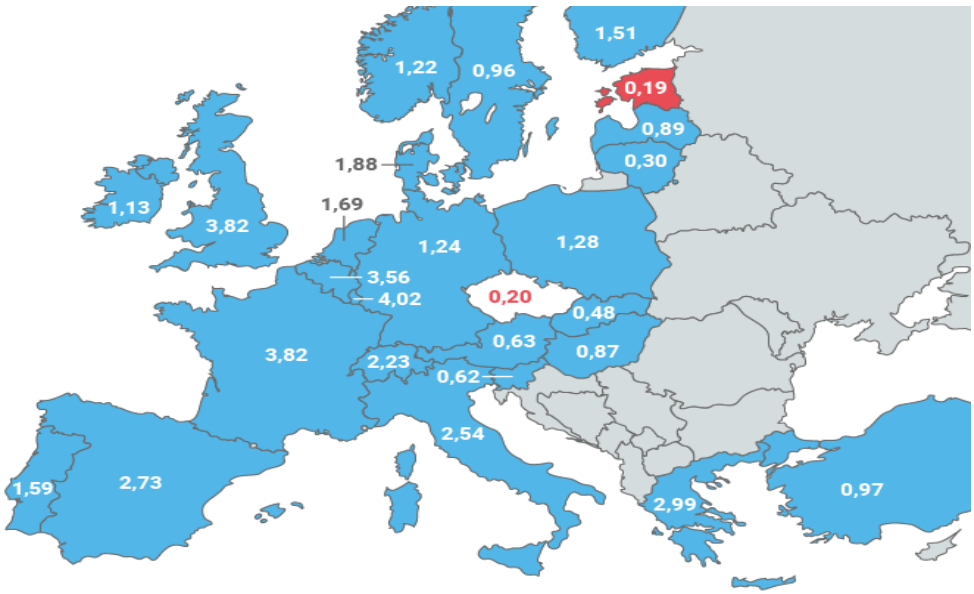
Another change for business corporations is the possibility to exclude unrealized exchange rate differences from the tax base in the period of their creation and to include them in the tax base only in the period when the exchange rate difference is realized. The benefit of using this scheme is at the discretion of each taxpayer as due to the development of exchange rates the

exclusion of unrealized exchange rate differences can both reduce and increase the tax base. Furthermore, according to the Act on Accounting that was valid until the end of 2023, accounting entities were required to keep accounts in monetary units of the Czech currency. From 2024, corporations that have the majority of their transactions in a foreign currency can keep their accounts in the functional currency (namely EUR, USD or GBP). Functional currency is the currency of primary economic environment in which the accounting entity operates. However, it will not be possible to use the foreign currency to fill out the income tax return. When calculating the tax, it will be based on the resulting profit or loss in a foreign currency. The items stated in the tax return will be converted to Czech crowns based on the exchange rates of the Czech National Bank (usually the exchange rate at the end of the tax period). The tax can be paid in Czech crowns or in a foreign currency (KPMG, on-line, 2024).

From 1 January 2024, a limitation on the tax deductibility of expenses for the purchase of passenger cars for business purposes is introduced into the Income Tax Act. Regardless of the actual purchase price of the M_1 category vehicle, it is possible to reflect depreciation or instalments of the financial leasing in tax-deductible costs, or expenses only in the amount up to 2 million CZK. Depreciation on the amount over 2 million CZK is no longer a tax-deductible expense. The limitation of the VAT deduction is closely related to the limitation of the entry price for income tax purposes, so the maximum possible VAT deduction will be 420,000 CZK (21% of 2,000,000 CZK). For emission-free cars purchased between 1 January 2024 and 31 December 2028, extraordinary depreciation can be applied, whereas the advantage of extraordinary depreciation lies in a significant reduction of the total depreciation period to 24 months (Hakalová, Kryšková, Palochová, Pšenková, 2023). In connection with the support for the use of company emission-free vehicles, the tax burden for the use of these cars by employees for their private purposes is reduced to 0.25% of the entry price. Employees will thus pay less in income tax and health and social insurance contributions than in previous years.

Costs for property owners will also increase due to an rise in the real estate tax rate, which for 2024 increases by an average of 80%. In the following years, this tax will increase according to the amount of inflation for the previous year. The Ministry of Finance of the Czech Republic justifies this increase by the fact that real estate taxation in the Czech Republic is very low compared to other European countries, as illustrated in Figure 2. The share of real estate tax collection on GDP in the Czech Republic in 2022 reached a negligible share of 0.2%, which ranks the Czech Republic 24th in EU countries and 36th out of 37 OECD countries with an average value of 1.8% of GDP. Even with the proposed increase in the real estate tax, the share of GDP will still be significantly below the average of EU countries (Ministry of Finance of the Czech Republic, on-line, 2023).

Figure 2: Share of Real Estate Tax Collection in GDP



Source: Ministry of Finance of the Czech Republic (2023)

From 1 March 2024, the price of vignettes increased by 800 CZK, from 1,500 to 2,300 CZK/year. The option of buying a one-day vignette has been newly introduced. The reason behind is a new European directive, which orders EU member states to put this option into practice by 25 March 2030 at the latest. This increase again represents higher costs for corporations, but also for the public.

A fundamental change in the area of value added tax is the reduction of the number of VAT rates from three to two. The basic VAT rate remained at 21%. The reduced rate is now 12% (so far there were two reduced rates of 10% and 15%). A number of goods and services are thus moved to another category. The reduction to a lower VAT rate of 12% applies to all food, including basic ones such as bread, milk, meat, vegetables and fruit, medical devices and children's car seats. Conversely, items without demonstrable social or health significance are moved to the basic VAT rate. These include hairdressing and barbering services, draft beer, repair of shoes, leather goods and bicycles, cleaning work and others. A special item is books which are not charged with VAT at all because they are taxed at zero rate. (Ministry of Finance of the Czech Republic, online, 2023). In the area of indirect taxes, consumption taxes are also being increased significantly, such as the tax on tobacco and other products, spirits, or gambling, which is in line with the principles of public health protection, the fight against addictions and the set principles and procedures of the European Union. At the same time, the high tax burden creates relatively stable revenues for the state budget. This fact confirms the importance of excise duties. (Krajňák, 2023)

5. Effects of Government's Consolidation Package on Employees

The new government measures also contain a number of changes in the area of income tax from dependent activity and social security contributions from employee salaries. From 1 January 2024, sickness insurance is reintroduced for employees in the amount of 0.6% of the

assessment base. By introducing this measure, the Ministry of Finance of the Czech Republic expects to balance the balance of the health insurance account (Ministry of Finance of the Czech Republic, on-line, 2023). The total contributions to the employee's social security in 2024 thus amount to 7.1% (6.5% pension insurance and 0.6% sickness insurance), instead of 6.5% in previous years (together with health insurance, the insurance premium from the employee's salary amounts to 11.6%). The duty on the employer's side remained unchanged and amount to a total of 33.8%, i.e. including health insurance. (Pšenková, 2016).

Within the scope of items deductible from the tax base according to Section 15 of the Income Tax Act, the option to reduce the tax base by contributions paid by an employee to a trade union has been abolished. Also, from 2024, the option of claiming a tax advantage to a non-working spouse has been limited. Applying the discount to the spouse is now only possible if the taxpayer lives in a jointly managed household not only with the spouse, but also with a dependent child under the age of 3, while maintaining the spouse's income limit of up to 68,000 CZK/year. As part of the personal income tax rate, the threshold for applying the 23% income tax rate has been reduced from 48 times to 36 times the average monthly wage from 2024. Changes in tax rates are also reflected in the monthly calculation of self-employment tax advances, from 4 times to 3 times the average monthly wage. (Ministry of Finance of the Czech Republic, online, 2023). The tax discount for placing a child in a preschool, also called kindergarten fee, and the student tax discount were also abolished. There is an increase in the progressivity of the personal income tax due to the rise of the tax relief per taxpayer. On the other hand, social security contributions are both nominally and real linear (Krajňák, 2022).

Another change is the change in the exemption limit for non-monetary benefits provided to employees. In 2024, they are exempt from personal income tax for the given tax period on the part of the employee only up to half of the average wage, which amounts to 43,697 CZK in 2024 (Ministry of Finance of the Czech Republic, on-line, 2023). In the consolidation package, the list of existing benefits for employees has not changed, only the tax exemption has been reduced.

6. Conclusion

With its measures, the consolidation package without doubt increases the tax or levy burden, which certainly cannot be characterized as a positive impact not only on commercial corporations, but also on their employees and the entire public. The impacts of so many measures may contribute to economic uncertainty for commercial corporations in 2024 and 2025. However, if its goals are fulfilled, i.e. the stabilization of public budgets, it may also have certain positive effects on the business sector, considering that due to the increase in direct and indirect taxes and the validity of other austerity measures, commercial corporations must very carefully consider where to find reserves and savings to ensure the stability of their economic activities and maintain financial health, which the authors of this paper consider to be key aspects. They must look for ways to increase turnover with an emphasis on maintaining the quality of the goods and services offered and still be competitive, which is a way towards higher efficiency, or business productivity. However, not every corporation has a real possibility to significantly reduce their costs in the short term or be able to quickly increase their revenues, which may be a really big challenge for them in 2024. The consolidation package continues the trend of effective digitization, automation and reduction of administration, which can be perceived positively. Meaningful regulation and appropriately set rules and processes are necessary prerequisites not only for the competitiveness and increasing the attractiveness of the business of domestic companies in the Czech Republic, but also for the influx of foreign investors. The authors of the paper intend to address the issue in the following periods from 2024 to 2026 in further detailed research that will focus on the real

impact of the adopted measures on activities of commercial corporations doing business within the European Union.

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Evaluation of Innovation Performance in the European Union Countries

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Abstract
The paper examines innovation performance in EU countries using the Summary Innovation Index. The aim is to assess innovation performance according to the Summary Innovation Index in EU countries and their changes between 2020/2010 and 2023/2020. Using an analytical approach, the results show that Innovation leaders for the period 2010-2020 and in 2023 were Denmark, Sweden and Finland. On the other hand, the position of Emerging innovators was held by Romania and Bulgaria in the years under study. For most EU countries, there was an increase in overall innovation performance in 2020 compared to 2010. An increasing trend in innovation performance in the finance and support dimension in 2020/2010 was found for most countries. In contrast, more than half of the EU countries showed a decline in innovation performance in the human resources dimension in 2020/2010. For almost half of the EU countries, innovation performance also showed an increasing trend in 2023 compared to 2020.

Keywords: *EU countries, innovative performance, innovation leaders, summary innovation index*

JEL Classification: *O32, O33, P51*

1. Introduction

The European Research Area (ERA) is made up of a series of programmes, documents and policies with a transnational perspective. The main objective of the ERA is to create a single market for research, innovation and technology, which should serve to improve international cooperation (Decyk, 2023; European Commission, online, 2024). Building on a series of innovation processes, the ERA also focuses on delivering investment and reform, improving access to excellence and increasing researcher mobility (Zhylinska et al., 2020; European Commission, online, 2024). Each EU country is part of the European Research Area (ERA) and develops its own research, development and innovation policy (Setyaningrum and Wulandari, 2024). Research, development and innovation policy is a shared policy in which the principle of subsidiarity is applied. Each country has to respect and implement in its national policies strategic objectives, methods and practices based on the specific features of the region (Ferraro et al., 2023). The EU intervenes only in activities that cannot be effectively managed by the individual countries themselves (e.g. financial support and setting of objectives and priorities interpreted in EU strategic documents). However, there is considerable fragmentation of R&D across EU countries and this problem also affects other

sectors (education, environment, etc.). The importance of innovation activities in the EU should therefore also be emphasised in the context of R&D policy and other public policies.

The aim of the paper is to assess the innovation performance of EU countries according to the Summary Innovation Index and to evaluate the changes between 2020/2010 and 2023/2020. The paper assesses 1) the overall innovation performance of EU countries over the period 2010-2020 and 2) the innovation performance in two dimensions (Finance and Support; Human Resources). Furthermore, the trend of innovation performance in EU countries in 2023 after the end of the Europe 2020 phase is evaluated. To meet the objective, the research questions are verified. *RQ1: Can changes in innovation performance by groups of innovators be tracked over time? RQ2a): Did innovation performance for most EU countries follow an increasing trend in 2020/2010? RQ2b: Do EU countries show an increasing trend in innovation performance in 2023 compared to 2020?*

2. Theoretical Background and Literature Review

Research and development (R&D) is a term describing government or corporate activities that are part of the cycle by which innovation is achieved. As stated by (Kijek and Matras-Bolibok, 2018; Klímová and Lelková, 2020; Filippopoulos and Fotopoulos, 2022; López-Rubio et al., 2022) innovation plays an essential role in economic and technological progress. It is a complex phenomenon that gives rise to competitive differences between companies and regions. Innovation has received attention in all sectors of R&D implementation, but the business sector is the most focused on innovation (Constantin et al., 2021; Klímová et al., 2022). According to a number of authors (e.g. Prokop et al., 2021; Dmytrenko et al., 2024), innovation to the greatest extent ensures the competitiveness and socio-economic development of a country and has a positive impact on its exports.

Innovation is also closely linked to innovation performance, where a distinction can be made between innovation efficiency and innovation profitability. Some authors (Bielinska-Dusza and Hamerska, 2021; Fabri et al., 2023; Xu et al., 2023) argue that there is no clear-cut approach for measuring innovation performance because each innovation is unique and requires a different measurement approach. Zhao (2023) assesses the role of competition and collaboration on different types of connected innovation. Thus, his research greatly enriches the theory of innovation network effects on innovation performance. Lu et al. (2023) provide deeper insights into the relationship between open innovation and small and medium-sized enterprises' (SMEs') innovation performance and reveal the mediating mechanism of open innovation on SMEs' innovation performance. Bonilla-Chaves et al. (2024) examined the determinants that influence the adoption of human resource analytics in business organization, along with the influence of the innovation performance. Other authors (Prokop et al., 2021; Xu et al., 2023) assessed the factors that may influence companies‘ innovation performance, R&D intensity and innovation efficiency in EU countries. The authors found that expenditures arising from different sectors of R&D implementation yield different results in innovation activity. Innovation performance is assessed using different indicators (simple, composite) and there are also different approaches to measuring it (Xu et al., 2023). Innovation performance can be measured between business entities and between territorial areas. As noted by some authors (e.g. Zhylinska et al., 2020) it is the transformation of innovation inputs into outputs, which implies that it is usually measured at the end of the innovation process at the time of marketing an object. Although there is no clear approach for measuring innovation performance many authors (Hauser, et al. 2018; Bielinska-Dusza and Hamerska, 2021; Wahyudi et al., 2023) create their own indicators for measuring innovation activities.

3. Methodology

The sample consists of the 27 Member States of the European Union. The European Commission data is used for processing, focusing on the European Innovation Scoreboard (EIS), (European Commission, online, 2023a). It examines the issue of research, development and innovation in the European dimension with a focus on innovation performance. The innovation performance is assessed using the Summary Innovation Index (SII) based on an analytical-descriptive approach, with an emphasis on the time period 2010-2020, and the year 2023. Specifically, three years with a five-year time lag (2010, 2015 and 2020) as well as the year 2023 (the last available year) were selected to provide a sufficient overview of the developments. The years chosen (2010, 2015 and 2020) map the state of R&D in the EU countries at the inception, mid-term and end of the Europe 2020 document. The year 2023 then assesses the most recent trend in innovation performance.

The Summary Innovation Index is part of the European Innovation Scoreboard, a composite indicator that provides a comprehensive overview of innovation performance in European countries. The SII allows cross-comparisons in sub-areas of research, development and innovation. The SII consists of four main areas: 1) *Framework conditions* (covering human resources, attractive research systems and innovation-friendly environments); 2) *Investment* (covering finance and support and firm investment); 3) *Innovation activities* (innovators, linkages, intellectual property); and 4) *Impacts* (impacts on employment, medium and high-tech exports), **(**European Commission, 2023b). The EIS is published by the European Commission and based on the comprehensive results, countries are classified into Innovation leaders, Strong innovators, Moderate innovators and Emerging innovators (European Commission, online, 2023b, 2023c).

In the period 2010-2020, two sub-dimensions (Finance and Support and Human Resources) are assessed according to the SII. The selected sub-dimensions of innovation performance according to the SII cover key areas of research, development and innovation (R&D&I) policy in each country. It assesses (1) overall innovation performance and (2) innovation performance according to the selected dimensions in EU countries in 2010, 2015 and 2020 and their changes in 2020 compared to 2010. In addition, the trend in innovation performance after Europe 2020 and the position of EU countries in 2023, including changes compared to 2020, are assessed (European Commission, online, 2023a, b, c).

4. Results and Discussion

For the assessment of innovation performance using the Summary Innovation Index in EU countries for the period 2010-2020, three years 2010, 2015 and 2020 are specifically selected. In addition to the assessment of innovation performance according to the overall SII results, two of its selected dimensions (Finance and Support and Human Resources) are also assessed**.** Subsequently, the trend of overall innovation performance according to the SII in EU countries after the end of the Europe 2020 Strategy in 2023 is assessed.

4.1 Types of Innovators and Innovation Performance in EU Countries using the Aggregate Innovation Index

Innovation performance indicators include simple indicators (input, output or financial and non-financial) and composite indicators (Summary Innovation Index, Global Innovation Index and Innovation Output Indicator), (Hauser, et al., 2018; Staníčková and Melecký, 2018). Bielinska-Dusza and Hamerska, 2021). One of the initial simple indicators of innovation

performance is the R&D intensity indicator or total R&D expenditure as a percentage of GDP. The higher the total R&D expenditure, the higher the innovation performance of a country. Typical innovation indicators used in EU countries are, for example, the number of enterprises with innovative activities, the number of innovative enterprises cooperating with other enterprises in R&D&I activities, and the turnover of enterprises from new or improved products.

Due to the continuously evolving environment, the SII has undergone a number of changes over the years and the criteria for categorising countries according to groups of innovators have also had to be changed (European Commission, online, 2023b; 2023c**)**. Using the CII, countries are divided into 4 categories: *Innovation leaders, Strong innovators, Moderate innovators and Emerging innovators* (see table 1).

Table 1: Types of Innovators by Summary Innovation Index in EU Countries

Types of innovators	Year 2010 and 2015	Year 2020	year 2023
Innovation leaders	Above 120% of EU average	Above 125% of EU average	Above 125% of EU average
Strong innovators	Between 90-120% of the EU average	Between 95-125% of the EU average	Between100-125% of EU average
Moderate innovators	Between 50-90% of the EU average	Between 50-95% of the EU average	Between 70-100% of the EU average
Emerging innovators	Below 50% of the EU average	Below 50% of the EU average	Below 70% of the EU average

Source: author's elaboration according to European Commission (2023b, 2023c)

Table 1 documents the criteria and evolution of innovation performance in 2010, 2015, 2020 and 2023 according to the Summary Innovation Index. The results show changes over time and a slightly increasing trend in innovation performance by group of innovators in %. We can therefore answer research question RQ1 in the affirmative.

Innovation performance by SII in EU countries in 2010, 2015 and 2020 and changes in 2020/2010 are shown in Table 2. The results of Table 2 show that EU countries have undergone changes and developments in innovation performance over the period 2010-2020. However, the position of countries according to the different groups of innovators can change from year to year. Sweden, Denmark and Finland were among the Innovation leaders in 2010, 2015 and 2020. In 2020, the Netherlands and Belgium were also Innovation leaders. Strong innovators in all years surveyed were France, Ireland and Slovenia and moderate innovators were e.g. the Czech Republic, Poland, Hungary, Lithuania, Portugal or Spain. In 2020, Croatia, Latvia, Hungary, Poland and Slovakia were moderate innovators. Only two EU countries (Romania and Bulgaria) fall into the Emerging innovators group each year and have not increased their innovation performance. The results (Table 2) also show that 24 out of 27 EU countries showed a positive evolution of innovation performance over time between 2010 and 2020. Malta, Lithuania, Estonia and Italy had the largest increases in innovation performance in 2020/2010. The only exceptions are Romania (SII value decreased by 8.6) and Bulgaria (SII value decreased by 2.8). The results show that the innovation performance of countries according to the SII is closely linked not only to changes in innovation conditions and evaluation criteria, but also to the overall maturity and competitiveness of countries. Based on the findings (see Table 2 for details), we can answer research question RQ2a) in the affirmative.

Table 2: Innovation Performance according to the Summary Innovation Index in EU Countries

EU Country	2010	2015	2020	Change 2020/ 2010	EU Country	2010	2015	2020	Change 2020/ 2010
BE	117.5	124.9	138.0	20.5	**HU**	69.5	69.4	71.1	1.6
EN	49.3	48.0	46.5	-2.8	**MT**	69.1	86.1	108.0	38.9
EN	89.7	81.8	89.6	-0.1	**DE**	127.4	121.7	130.0	2.6
DK	139.0	136.9	145.5	6.5	**NL**	119.6	132.3	139.0	19.4
EE	86.1	85.8	112.7	26.6	**EN**	53.3	55.2	60.0	6.7
FI	12.9	129.6	138.8	5.9	**PT**	86.4	88.4	89.4	3.0
FR	105.1	116.9	115.8	10.7	**AT**	112.0	125.5	127.6	15.6
HR	56.0	57.5	69.0	13.0	**RO**	46.8	35.6	38.2	-8.6
IE	113.8	123.6	121.9	8.1	**GR**	69.4	64.0	81.0	11.6
IT	75.7	83.1	102.1	26.4	**EN**	62.8	66.0	65.8	3.0
CY	89.9	79.5	109.1	19.2	**SI**	95.9	100.9	96.0	0.1
EN	55.0	72.0	83.5	28.5	**ES**	76.2	88.9	93.1	16.9
EN	48.1	51.4	56.9	8.8	**SE**	143.1	138.8	147.8	4.7
LU	121.2	129.1	132.8	11.6	**Average EU**	89.3	92.3	100.3	11.0

Source: author's elaboration according to European Commission (2023a, 2023c)

4.2 Innovation Performance according to the Aggregate Innovation Index and selected Dimensions in EU Countries

To assess the SII in EU countries in 2010, 2015 and 2020 according to the two dimensions, they are chosen from framework conditions (human resources) and investment (finance and support). *SII under the finance and support dimensio*n falls under investment and reflects the focal area for the evaluation of R&D&I policy. The assessment of the SII under the finance and support dimension in EU countries is documented in Table 3.

The 2010 SII results in the finance and support dimension showed that the top-ranked EU countries in innovation performance were Finland and Sweden. On the other hand, Malta, Slovakia and Greece scored worst in innovation performance. In 2020/2010, 20 out of 27 EU countries increased their innovation performance in the Finance and Support dimension. The countries that dominated innovation performance in 2020 were Denmark, Finland, Germany and Sweden. The results confirm that Finland and Sweden are the top-ranked countries for the whole period 2010-2020. In contrast, the countries that lagged behind in innovation performance in 2020 and 2015 compared to 2010 include Bulgaria and Slovakia. Malta, Cyprus, Lithuania and Latvia showed the largest upward trend in innovation performance over time in the Finance and Support dimension. For these countries, innovation performance in 2020 increased significantly compared to 2015 and 2010. In contrast, Bulgaria, Finland and Sweden experienced a large drop in innovation performance in 2020, with much higher innovation performance in 2010 than in 2015 and 2020 (see table 3). Differences in innovation performance and changes over time across countries can be partly explained by different trends and priorities of national R&D&I policies.

Table 3: Comparison of SII by Dimension Finance and Support in EU Countries

EU Country	2010	2015	2020	Change 2020/ 2010	EU Country	2010	2015	2020	Change 2020/ 2010
BE	108.4	112.2	124.0	15.6	**HU**	45.8	87.3	67.2	21.4
EN	90.7	34.5	33.1	-57.6	**MT**	8.5	47.9	101.5	93
EN	116.1	92.7	84.2	-31.9	**DE**	103.5	93.7	135.3	31.8
DK	121.8	95.7	153.3	31.5	**NL**	117.5	102.5	125.8	8.3
EE	89.3	108.1	109.9	20.6	**EN**	44.6	52.6	64.4	19.8
FI	176.7	105.7	144.9	-31.8	**PT**	80.3	91.9	98.9	18.6
FR	106.8	145.9	133.0	26.2	**AT**	83.7	126.3	112.4	28.7
HR	36.6	47.6	58.9	22.3	**RO**	48.3	32.2	62.6	14.3
IE	125.3	95.9	84.0	-41.3	**GR**	29.2	38.4	77.4	48.2
IT	58.1	66.7	77.5	19.4	**EN**	17.0	34.4	44.8	27.8
CY	52.6	36.9	10.2	56.6	**SI**	53.5	101.5	44.9	-8.6
EN	47.8	66.7	99.2	51.4	**ES**	90.5	82.8	94.2	3.7
EN	36.7	51.2	107.5	70.8	**SE**	162.6	107.3	134.7	-27.9
LU	114.4	81.6	109.2	-5.2	**Average EU**	80.0	79.3	95.9	19.9

Source: author's elaboration according to European Commission (2023c**)**

If we assess the innovation performance of EU countries according to *the SII in the human resources dimension* (Table 4), the Scandinavian countries were again the best ranked in 2010. On the other hand, the lowest ranked countries in 2010 were Bulgaria, Romania and Malta. A change in innovation performance (in the human resources dimension) was evident for Finland in 2015, which ceased to be among the three highest ranked EU countries) and a slight change in innovation performance was also evident for Romania, Bulgaria, Hungary.

Table 4: Comparison of SII by Human Resources Dimension in EU Countries

EU Coun -try	2010	2015	2020	Change 2020/ 2010	EU Country	2010	2015	2020	Change 2020/ 2010
BE	112.5	112.2	117.1	4.6	**HU**	64.7	40.7	40.7	-24,0
EN	32	35.1	35.1	3.1	**MT**	59.2	72.2	77.0	17,8
EN	76.2	68.5	73.4	-2.8	**DE**	98.4	94.9	94.9	-3,5
DK	178.9	168.1	163.3	-15.6	**NL**	146.1	163.7	163.7	17.6
EE	93.3	116.1	116.1	22.8	**EN**	75.1	49.3	49.3	-25.8
FI	184.3	157.9	153.1	-31.2	**PT**	123.1	113.4	113.4	-9.7
FR	142.1	127.9	118.2	-23.9	**AT**	129.1	113.3	113.3	-15.8
HR	48.8	53.5	48.7	-0.1	**RO**	40.7	41.6	17.4	-23.3
IE	139.5	147.8	152.6	13.1	**GR**	70.1	60.5	60.5	-9.6
IT	55.1	62.7	57.8	2.7	**EN**	76.9	84.3	69.7	-7.2
CY	99.9	96.1	100.9	1.0	**SI**	119.6	165.4	131.5	11.9
EN	106.9	105.6	100.7	-6.2	**ES**	95.6	115.2	144.3	48.7
EN	64.7	77.8	68.1	3.4	**SE**	209.8	185.5	170.2	-39.6
LU	137.3	136.0	165.1	27.8	**Average EU**	102.3	102.4	100.6	-1.7

Source: author's elaboration according to European Commission (2023c)

An assessment of the changes in SII in 2020 compared to 2010 found that only 11 countries out of 27 experienced positive developments in innovation performance in the human resources dimension (see table 4). In 2016, one sub-indicator was renewed for the SII in the human resources dimension. However, this change has hardly been reflected in the evolution of SII values in EU countries between 2015 and 2020. Larger differences are then evident in 2020 compared to 2010. However, from the results it can be concluded that the changes in 2020 for some countries were not due to the change in the HR sub-indicator in 2016. Positive developments in innovation performance in the human resources dimension have occurred, for example, for Spain, Luxembourg and the Netherlands, whose values have increased dramatically in 2020 compared to both 2010 and 2015. In contrast, there was a decline in SII values for e.g. Finland, Denmark, France and Hungary. These countries achieved much higher values in innovation performance (in the human resources dimension) in 2010 than in 2015 and 2020 (see table 4).

4.3 Trends in innovation performance in EU countries between 2020 and 2023

Innovation performance in EU countries according to the SII is further assessed (after the Europe 2020 Strategy) in 2023, including an assessment of changes compared to 2020. Table 5 shows that Denmark was the new top innovator with the best performance in the EU in 2023, overtaking Sweden after a few years in leading position. Other Innovation Leaders were Sweden, Finland, the Netherlands, and Belgium. Strong innovators with performing above the EU average were Austria, Germany, Luxembourg, Ireland, Cyprus, and France in the 2023. Table 5 also shows that Moderate innovators were ten country (Estonia, Slovenia, Czechia, Italy, Spain, Malta, Portugal, Lithuania, Greece, Hungary) and Emerging Innovators was six country (Croatia, Slovakia, Poland, Latvia, Bulgaria and Romania).

Table 5: Trend in Innovation Performance of EU Countries by SII in 2023

EU Country	2020	2023	Change 2023/2020	EU Country	2020	2023	Change 2023/2020
BE	117.1	125.8	8.7	**HU**	40.7	70.4	29.9
EN	35.1	46.7	11.6	**MT**	77.0	85.8	8.8
EN	73.4	94.7	21.3	**DE**	94.9	117.8	22.9
DK	163.3	137.6	-25.7	**NL**	163.7	128.7	-35
EE	116.1	98.6	-17.6	**EN**	49.3	62.8	13.5
FI	153,1	134,3	-18,8	**PT**	113.4	85.6	-27.7
FR	118.2	105.3	-12.9	**AT**	113.3	119.9	6.6
HR	48.7	69.6	20.9	**RO**	17.4	33.1	15.7
IE	152.6	115.8	-36.8	**GR**	60.5	79.5	19
IT	57.8	90.3	32.5	**EN**	69.7	65.6	-4.1
CY	100.9	105.4	4.5	**SI**	131.5	95.1	-36.4
EN	100.7	83.8	-16.9	**ES**	144.3	89.2	-55.1
EN	68.1	52.5	-15.6	**SE**	170.2	134.5	-35.7
LU	165.1	117.2	-47.9	**Average EU**	100.6	94.3	-6.3

Source: author's elaboration European Commission (2023a)

Table 5 shows that for 13 out of 27 EU countries there is a positive increase in innovation performance in 2023 compared to 2020. Italy and Hungary document the largest changes associated with innovation performance growth in 2023/2020. However, for more than half of the countries, a decline in innovation performance in 2023/2020 was found. Spain, but also Ireland, Slovenia and Sweden recorded the largest decline in innovation performance. This can

partly be explained by the increasing demands on the ranking of the different categories of innovators, but also by content changes in the sub-dimensions of the Summary Innovation Index. Given the fact that the upward trend in innovation performance has been evident only in a minority of EU countries, the answer to research question RQ2b is negative.

Based on the results, it can also be said that there exists a positive correlation between innovation performance (according to SII) and sustainable development. As Constantin et al. (2021) argue, innovation and R&D activities are essential factors that help overcoming global societal challenges and set the path to economic prosperity in tight connection with sustainable development progress. The changes to a more innovative and sustainable path for the EU countries as Emerging Innovators then implies especially the responsibility of high levels of R&D expenditure.

5. Conclusion

There is no single approach to measuring innovation performance. In our case, innovation performance in EU countries was assessed using the composite index-Summary Innovation Index-between 2010 and 2020 and in 2023. From the results according to the SII in EU countries, it was found that for the period 2010-2020 and in 2023, the Scandinavian countries were Innovation leaders. On the other hand, Emerging Innovators were the least developed EU countries Romania and Bulgaria for the whole period under review. Based on the findings in 2020, most EU countries (24 out of 27) showed an increase in overall innovation performance according to the SII compared to 2010. The upward trend in innovation performance in 2020/2010 was also confirmed for most countries (20 out of 27) in the finance and support dimension. Conversely, a decline in innovation performance in the human resources dimension in 2020/2010 was demonstrated in more than half of the EU countries (16 out of 27). The largest changes associated with growth in innovation performance in EU countries in 2020/2010 were found in Malta, Lithuania, Estonia and Italy. The largest changes associated with a decline in innovation performance in 2023 compared to 2020 were found for Spain, followed by Ireland, Slovenia and Sweden. Conversely, the largest increases in innovation performance in 2023/2020 were observed in Italy and Hungary. The findings may be particularly useful for public policy makers and innovation strategies in European countries. The authors see the evaluation of innovation performance over a longer period of time after the Europe 2020 phase, but also with a focus on the individual dimensions and content areas of the Summary Innovation Index, as a topic for future research.

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Impact of Social Responsibility on Brand Values and Financial Performance: Case of Vietnam's Banking Sector in the Context of EU Integration

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Abstract
This research examines the relationship between corporate social responsibility (CSR) and corporate governance within the banking industry spanning 2009 to 2020. The objective of the paper is to analyze the impact of corporate governance measures on corporate social responsibility in Vietnamese banking sectors in the context of EU integration. Panel data regression model is applied to assess the suitability of three primary methods: Pooled Least Squares (POOLED OLS), Fixed Effects model (FEM), and Random Effects model (REM). The results show that the FEM model is the most suitable for studying factors affecting business performance and the relationship between CSR and brand value (BRV). The results suggest that CSR has an impact on financial performance using a transmission mechanism that amplifies brand value. This finding explains CSR activities as integral to enhancing brand value, ultimately leading to increased financial gains for commercial banks in Vietnam's banking sector.

Keywords: *banking sector, brand value, Corporate Financial Performance (CFP), corporate social responsibility, european integration*

JEL Classification: *G21, M2, M14, O16*

1. Introduction

To build a socially responsible image, French and Dutch companies offer prominent activities related to production processes and traditional promotions (Forte, 2013). In Việt Nam, although some large companies have implemented CSR programs, an implementation may not be as uniform. Businesses in Europe often have a more developed and comprehensive approach to CSR, while Vietnam is starting to integrate with this trend and has a lot of development potential. In addition to regulations promoting corporate responsibility for the environment and sustainable economic development, Directive No. 2014/95/EU in Europe and Circular 155/2015/TT-BTC in Viet Nam require listed companies to disclose non-financial information on environmental and social impacts. Compliance with societal requirements is crucial for enterprises, especially banks, in contexts like the COVID-19 pandemic, where public opinion may demand actions, such as reducing interest rates. Balancing profit motives with societal needs poses a challenge for banks. Since Bowen's seminal work "The Social Responsibilities of Business" in 1953, the concept of Corporate Social Responsibility (CSR) has evolved significantly. This evolution has led to the integration of various methodologies and scholarly terminologies into organizational theories, although it remains controversial. CSR is gaining importance, especially in banking sectors where institutions seek to enhance financial

stability and customer service and overcome financial obstacles. Central banks, particularly since the 2008 financial crisis, have advocated for CSR and financial stability. In the age of integration and globalization, banks must improve operational efficiency to remain competitive and maintain their market position. Operational efficiency is seen as the best measure of corporate governance (Friedman, 1970), as corporations are expected to create value for shareholders and meet society's norms and sustainable development goals. However, the link between CSR and financial performance is also debated, with some studies showing no correlation (Soan, 2011) while others show a positive correlation with financial performance (Erhemjamts, 2013). Corporate CSR principles may not put profits first, but the effectiveness of CSR implementation brings long-term growth of businesses now and in the future Ramona Simut and C Simut (2022). Within the debate framework from different perspectives, the author aims to delve into a practical phase, a specific model space, implementing CSR effectively for commercial banks. The author intends to contribute a fresh perspective to the literature on the link between CSR and commercial banks' financial performance. That is precisely why the author chose the topic as the main theme for this research.

2. Literature Review

In finance and banking, the link between Corporate Social Responsibility (CSR) and Brand Value (BRV) is directly or indirectly observed through intermediary variables. Research by Chomvilailuk and Butcher (2010) in Thai commercial banks found that CSR commitment significantly influences brand preference, particularly among older customers. Similarly, a study on Iranian commercial banks by Salehzadeh et al. (2018) revealed a direct impact of CSR on brand identity and a subsequent direct impact of brand identity on BRV.

Hafez (2018) found that brand awareness plays a mediating role in the relationship between Corporate Social Responsibility (CSR) and Brand Value (BRV) in Bangladeshi commercial banks. Wu and Shen (2013) suggest that banks engage in CSR practices like environmental protection and charitable activities to boost their reputation and brand.

Previous studies have highlighted the direct relationship between Corporate Social Responsibility (CSR) and Brand Value (BRV). Still, the mediating role of BRV in the connection between CSR and Corporate Financial Performance (CFP) remains unexplored. The author suggests this hypothesis is significant as it implies a causal chain from CSR to CFP through BRV. Specifically, in Vietnam, implementing CSR by commercial banks is expected to enhance their image, leading to increased customer awareness and product usage (i.e., higher BRV), ultimately positively impacting financial performance.

CFP stands out as the paramount metric for evaluating the efficacy of corporate governance, given businesses' responsibility to enhance shareholder value (Friedman (1970). Some studies fail to identify a significant relationship between CSR and CFP, and, in some instances, report an opposing effect (Baird, Geylani, and Roberts, 2012).

Soana (2011) investigated the relationship between Corporate Social Responsibility (CSR) and Corporate Financial Performance (CFP) among 31 Italian banks. The results indicated no statistically significant relationship between CSR and CFP. Sekhon and Kathuria (2019) found no evidence of a connection between CSR and CFP and even observed a negative impact of CSR on CFP when measured by Return on Equity (ROE). However, numerous studies have demonstrated a positive correlation between CSR and CFP for the Chinese economy, Erhemjamts (2013), Wu et al. (2021) and Wu et al. (2023). The authors discovered that positive CSR activities enhance the financial performance of companies, especially when the competitive intensity within the industry is high. In the banking sector, banking products are

intangible and highly susceptible to replication. Therefore, investing in Brand Value (BRV) is a sound strategy to differentiate from competitive counterparts (Fernandez-Feijoo et al., 2014). The outcome is that BRV not only contributes to Corporate Financial Performance (CFP) but also helps mitigate the operational risks of a bank, as perceived positively by the market. (Krueger et al., 2010).

3. Methodology Description

The mathematical formulation of three dependence models, including the formulation of the CSR indicator and sample data, is introduced.

3.1 Models Formulation and Input Data

To answer the question: the role of the intermediary variable BRV in the relationship between CSR-CFP to test hypothesis. Based on the research of Baron and Kenny (1986). The general equation is expressed as follows:

$$BRV_{it} = \zeta_0 + \zeta_1 CSR_{it} + \zeta_2 Size_{it} + \zeta_3 Lev_{it} + \upsilon_{it}, \quad (1)$$

$$CFP_{it} = \theta_0 + \theta_1 CSR_{it} + \theta_2 Size_{it} + \theta_3 Lev_{it} + \upsilon_{it}, \quad (2)$$

$$CFP_{it} = \gamma_0 + \gamma_1 BRV_{it} + \gamma_2 CSR_{it} + \gamma_3 Size_{it} + \gamma_4 Lev_{it} + \upsilon_{it}, \quad (3)$$

here BRV and CFP are dependent variables representing brand value and financial performance, respectively. CSR is the independent variable that captures corporate social responsibility. Size and Lev are, respectively, the size and financial leverage of the company, playing the role of control variables in the model. i = 1, 2..., N (representing observations from companies), t = 1, 2, ..., T (representing the time period of the sample), and υ_{it} represents the model errors.

Brand value (BRV) is demonstrated to be a mediating variable if and only if the following factors simultaneously satisfy: ζ_1, θ_1, γ_1 are statistically significant and $\gamma_2 < \theta_1$. Specifically, ζ_1 is statistically significant, indicating the relationship between CSR and BRV, similarly for θ_1 and γ_1 in the relationships between CSR-CFP and BRV-CFP. Furthermore, $\gamma_2 < \theta_1$ indicates that the presence of the variable BRV diminishes the relationship between CSR and CFP; in other words, BRV plays a mediating role in the relationship between CSR and CFP.

3.2 Measurement of Data and Data Collection Sources

The formula for determining the CSR_{it} index value for commercial bank *i* at time *t* is as follows: The formula for determining the CSR_{it} index value for commercial bank *i* at time *t* is as follows:

$$CSR_{it} = \left(\sum_{k=1}^{16} GTTC_{it,k}\right)/16 \quad (4)$$

where $\sum_{k=1}^{16} GTTC_{it,k}$ the value of the k th criterion in the set of 16 applied criteria (commercial bank *i* at time *t)*. From equation (4), it can be observed that $CSR_{it} \in [0;1]$. This implies that the CSR_{it} of a commercial bank *i* at time *t*, closer to the value 1, indicates a higher CSR, whereas closer to the value 0 indicates a lower CSR.

The study measures Brand Value (BRV) according to the proposal by Money and Hillenbrand (2006) on the enterprise's market value through the assessment of its intangible assets. BRV is calculated by the average scores of customer deposits and loans.

Variables measuring financial performance (CFP) in this study, is measured using return on equity (ROE) indicator, following findings from previous studies, specifically those by Forcadell and Aracil (2017). ROE is calculated by the ratio of Net Income and Total Equity. Larger commercial banks possess more resources to implement SCR, thereby gaining several advantages to enhance brand value and ultimately generate profits for commercial banks (Wahba and Elsayed, 2015). The control variable measuring the size of commercial banks (Size) is calculated by the logarithm of the total assets.

Control variable measuring the level of financial leverage (Lev explains commercial banks' risk-bearing capacity, possibly influencing their ability to carry out CSR activities (Waddock and Graves, 1997). Lev is calculated by the ratio of assets to equity.

3.3 Sample Data

The paper uses 27 Vietnamese commercial banks during the period 2009-2020 which were divided into two groups, 4 state-owned banks and 23 privately-owned banks, to complete two main experimental tests. Specifically, for the research question, models to the entire dataset of 27 banks to test the relationship between CSR and financial performance are applied.

4. Results and Discussion

The calculated results are described, especially the basic statistical parameters of the variables and regression model results.

4.1 Descriptive Statistics of Variables

Table 1 provides an overview of the statistical data for the variables included in the model. This table presents important statistical indicators such as mean (Mean), median (Median), maximum value (Maximum), minimum value (Minimum), and standard deviation (Std. Dev.) With 324 observations per variable, this table is a comprehensive reference for understanding the distribution and characteristics of variables used in model analysis.

Table 1: The Statistics of the Variables Included in the Model

	CSR	BRV	LEV	ROE	SIZE
Mean	0.254	4.801	11.231	9.96%	2.841
Median	0.249	4.778	10.678	9.2%	2.898
Maximum	0.726	6.113	37.148	27.1%	4.267
Minimum	0.028	3.237	1.659	0.008%	0.431
Std. Dev.	0.129	0.588	5.193	5.52%	0.685
Observations	324	324	324	324	324

Source: Conducted by the authors (2024)

The statistical table summarises CSR, BRV, LEV, ROE, and SIZE information in a data sample of 324 observations. First, the CSR variable, representing Corporate Social Responsibility, has an average performance level of 0.254 and a median value of 0.249, indicating uniformity in distribution. However, the wide variation from 0.028 to 0.726 implies diversity in the level of CSR implementation among businesses. The maximum value is 0.726 for State-owned commercial banks with Industry and Trade in 2018 and 2020, Foreign Trade

during 2018-2020, Agriculture in 2019-2020, and Investment and Development in 2020. Simultaneously, the two commercial banks with the minimum scores, Shinhan and Viet Capital, reached 0.028 points in 2018 and 2009, respectively. This result indicates that commercial banks with state capital lead in the implementation of CSR in Vietnam.

The next observation for BRV (Brand Value) shows that the mean value is 4.801, and the median value is close to the mean, indicating stability in the distribution. The variation of BRV from 3.237 to 6.113 demonstrates the diversity of brand values in the data sample. Besides, the degree of financial leverage (LEV) has an average value of 11.231, and the median value is close to the mean. Leverage levels vary widely from 1.659 to 37.148, showing great diversity in financial leverage levels among businesses. Furthermore, for financial performance (ROE), the mean value is 9.96%, and the median value is 9.2%. The variation in ROE from 0.008% to 27.1% represents a wide range of financial performance in the sample.

The correlation matrix, significance levels, and VIF coefficient for each of the model's variables are displayed in Table 2. This table aids in comprehending the relationships between variables and assesses how they affect the prediction power of the model.

Table 2: Correlation Matrix Including Significance and VIF

	BRV	CSR	LEV	SIZE	VIF
BRV	1				4.972643
CSR	(0.56777) ***	1			1.484462
LEV	0.68323 ***	(0.36747)***	1		2.335212
SIZE	0.72879***	(0.45707)***	0.27607 ***	1	2.668313

*****p < 0.01, **p < 0.05, and *p < 0.1.**
Source: Conducted by the authors (2024)

It is apparent from Table 2 that the independent variables correlate with each other, with coefficients below 0.8. The multicollinearity test, considering variables with VIF coefficients showing values below 5. As a result, the model does not suffer from multicollinearity errors.

4.2 The Regression Results

For the three dependent models identified by (1), (2), and (3), three panel data regression models are applied to evaluate their suitability: Pooled Least Squares (POOLED OLS), Fixed Effects model (FEM), and Random Effects model (REM). POOLED OLS estimates a regression model using all panel data, regardless of individuals or time points. FEM focuses on the fixed effects of individuals in panel data, while REM assumes that the effects are random and estimates them using variance across individuals and time points. By comparing the effectiveness and suitability of these models, researchers can choose the most suitable model to analyze the relationship between variables.

Table 3: Models Dependencies Evaluation Due to POOLED OLS, FEM, and REM Panel Regressions

Equation (1)			
BRV dependent variable	POOLED OLS	FEM	REM
CSR	-0.679***(-5.08)	-0.493***(-3.407)	-0.679***(-5.084)
LEV	0.054***(17.75)	0.043***(11.4)	0.055***(17.75)
SIZE	0.452 *** (0.65)	0.334***(10.23)	0.453***(18.54)
C	3.073***(31.86)	3.488***(30.66)	3.073***(31.86)
Redundant test		Cross-section=0.000<0.05	
Hausman test		Cross-section= 0.000251<0.05	
Equation (2)			
ROE dependent variable	POOLED OLS	FEM	REM
CSR	0.089***(23.07)	0.0378*(1.75)	0.064***(3.2)
LEV	-0.0013**(-2.47)	0.0001*(1.72)	-0.00003.87(-0.07)
SIZE	0.0837***(23.07)	0.094***(19.27)	0.087611***(21.09)
C	-0.148***(-10.3)	-0.188***(-11.08)	-0.165(-10.67)
Redundant test		Cross-section=0.000<0.05	
Hausman test		Cross-section= 0.000142<0.05	
Equation (3)			
ROE dependent variable	POOLED OLS	FEM	REM
CSR	0.028962*(1.74)	0.000211*(0.01)	0.016962***(0.98)
BRV	-0.08846***(-13.23)	-0.07637***(-10.19)	-0.0837***(-12.2)
LEV	0.003706***(7.14)	0.0043***(7.32)	0.0039***(7.28)
SIZE	0.12376***(29.4)	0.119***(24.4)	0.1217*** (27.5)
C	0.123723***(5.25)	0.078	0.1103 ***(4.34)
Redundant test		Cross section=0.000<0.05	
Hausman test		Cross-section= 0.018247<0.05	

*****p < 0.01, **p < 0.05, and *p < 0.1. The value in brackets ( ) is the t-statistic**

Source: Conducted by the authors (2024)

The study employs the Redundant test (to select between POOLED OLS and FEM) and the Hausman test (to select between FEM and REM) of choosing the best estimation for each of the three regression models. The results of tests 1 and 2 for each equation show that the FEM method is the most suitable among the three. Results from the FEM model show the some characteristics as follows.

First, CSR positively impacts ROE with a coefficient of 0.0378, and it is statistically significant at the 10% level (equation 2). This indicates a practical relationship linking CSR and ROE; specifically, increasing CSR efforts favour Vietnam's commercial banks' ROE performance.

Second, CSR negatively impacts brand value (BRV), with the estimated coefficient being statistically significant at the 1% level (equation 1). This implies that when commercial banks engage in social responsibility, they elicit reactions from the public. If customers turn their negative perceptions into depositing and borrowing actions, it directly contributes to brand value. The results are similar to the study (Yang and Basile, 2019).

Third, BRV plays an intermediary function, with its coefficient statistically significant at the 1% level. Its existence lessens the impact coefficient of CSR on ROE (equation 3), suggesting an effect between CSR and ROE through BRV.

They were fourth concerning control variables. ROE is positively impacted by the Size variable, which is the size of commercial banks. The results are similar to the study of Masood (2012). Large commercial banks have more resources to provide higher value-added services. Regarding the debt leverage control variable (Lev), the results positively impact ROE. This shows that during business operations, businesses often use debt, on the one hand, to make up for the lack of company funding and, on the other hand, to raise the rate of return on equity. The results are similar to Lestari's study (2021).

In conclusion, the above analysis results imply that implementing CSR will bring positive results to ROE through the transmission mechanism of brand value.

5. Conclusion

Studies on the financial impact (CFP) of implementing Corporate Social Responsibility (CSR) in businesses have been conducted recently in Vietnam and worldwide. Most findings support the direct relationship between CSR-CFP and encourage its implementation. Commercial banks' activities involve specific financial services, resulting in fundamental differences in the impact of CSR on CFP. In Vietnam, there are currently few studies on CSR-CFP for commercial banks, even as CSR activities, especially at large commercial banks managed by the state, have been particularly vibrant recently. Furthermore, the intermediary factor hypothesis explaining the CSR and CFP transmission mechanism is absent in previous studies. Given this gap, the study contributes an empirical perspective to the literature on the ongoing partnership between CSR and CFP in Vietnam. The research yields the following findings.

The results confirm the validation of the hypothesis as the statistical data proves the existence of the stated transmission mechanism according to the Fixed Effects Model (FEM) method, with positive and statistically significant estimated coefficients. These findings suggest that CSR affects Corporate Financial Performance (CFP) through the transmission mechanism of increasing Brand Value (BRV). This elucidates why CSR activities are targeted as part of the solution to enhance brand value, subsequently leading to increased financial benefits for commercial banks. Moreover, research results show that CSR has a negative impact on brand value (BRV). This can be described in the process of implementing CSR. If a company prides itself on its CSR initiatives but fails to meet the expectations set by its stakeholders, it can lead to disappointment and backlash. This can happen if the company exaggerates its achievements, fails to deliver on its commitments, or if the public perceives a significant gap between its promises and actions.

Debt leverage has a positive effect on the profitability of commercial banks from the outlook of Return On Equity (ROE). Regarding the debt leverage control variable (Lev), the results positively impact ROE. This shows that during business operations, businesses often use debt, on the one hand, to make up for the lack of company funding and, conversely, with the desire to increase the rate of return on equity.

The results show that asset size positively impacts banks' profits. Positive impact reports show that banks with larger assets reach higher profitability.

It can be recommended to change the perception of CSR practices for the community and the commercial banks themselves. Experimental results indicate that well-implemented CSR creates conditions for commercial banks to reach more customers and enhances brand value, ultimately increasing business profitability. Conversely, if not done properly, it can adversely affect brand value.

Acknowledgment

The project VSB TU Ostrava, SP2024/045, supported the paper.

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Is New Industrial Policy Enough? An Essay on Path Dependence in the EU Automotive Industry

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Abstract
What is the outlook for the EU automotive industry when establishing the new EU industrial policy within a globally changing economic policy paradigm? The paper aims to answer this question through heterodox research design, collecting information from semi-structured interviews, news outlets and media, and the official EU communications, legislative proposals, and legislation. The findings a) point to an EU's competitive advantage in well-established carbon pricing, partly suppressing the need for excess subsidies for incentivising the domestic electromobility transition, b) stress the need to complement the new industrial policy with carefully designed innovation policy, and c) highlight the well-functioning EU Single Market as the key tool for pursuing European integration and boosting the global automotive competitiveness within a smart regulation leveling the playing field.

Keywords: *European integration, industrial policy, path dependence, technical change*

JEL Classification: *O33, D72, L52*

1. Introduction

The automotive industry is going through the most significant technical change in its modern history. The challenge of successfully transitioning towards electric mobility is due in the upcoming years to face the urgent need to lower carbon emissions and mitigate climate change. Such a change is of drastic rather than non-drastic innovation character and impacts the constantly evolving global value chains. Electrification and the new battery industry have so far been championed by Asian producers and, specifically, the Chinese industries and firms, which have benefited from various interventions through the state-led industrial policy, including the Energy-saving and New Energy Automotive Industry Development Programme, or Made in China 2025 (Gomes et al., 2023). Demand and supply shocks have marked the recent development of the world economy. Suddenly, a change in perception of trade dependencies and market vulnerability leads the EU (as well as the US and other regions) to reconsider its position in the shifting value chains and establish its industrial policies. Although not precisely defined, the EU aims to achieve a certain level of "open strategic autonomy," including technology, energy, and raw materials. Concerning the automotive industry, electric vehicles and batteries are the vocal points of trade dependence currently addressed by the European Commission initiatives.

While competition policy has been the leading success factor for European integration and the EU's automotive industry competitiveness in the past, recent pressures call for a new EU policy architecture to counter the global shift (Šaroch and Šmejkal, 2020). The competition

agenda and innovation policy (including smart specialisation, see Raszková, 2022) could adhere to the new industrial policy and integrate into the existing cohesion policy. As a result, the Central and Eastern European Member States (CEE) could benefit through upgrading their position in the automotive industry's value chain (Túry, 2020). This paper aims to answer the question of the outlook for the EU automotive industry when establishing the new EU industrial policy within a globally changing economic policy paradigm. It employs a theoretical framework of path dependence and technology lock-in in the prevailing fossil fuel-powered combustion engine cars, focusing on regulations including carbon pricing and subsidies as the driving force behind the directed technical change (Aghion et al., 2021). We assess the new industrial policy set forth by the European Commission, best exemplified by the Net Zero Industry Act, recently agreed upon by the Parliament and Council in the trilogue (European Parliament, 2024).

The paper is divided into three subsequent parts. First, we briefly overview the recent international developments in industrial policies and the automotive industry and frame the essay by a theoretical argument of path dependence, or else: why the technical change in the EU automotive industry might be slow in the face of increased global competition. We describe our heterodox research design based on triangulating information sources, including semi-structured interviews, news outlets and media, and the official EU communications, legislative proposals, and legislation. Second, we introduce the main findings of our research and summarise the state and outlook for the EU automotive industry within the changing economic policy paradigm—assessing a) the EU auto industry's international position and the policy frameworks under which it operates, b) the new EU approach to industrial policy, and c) the CEE region's perspective. Third, we discuss the findings and conclude with an outline of the future research avenues.

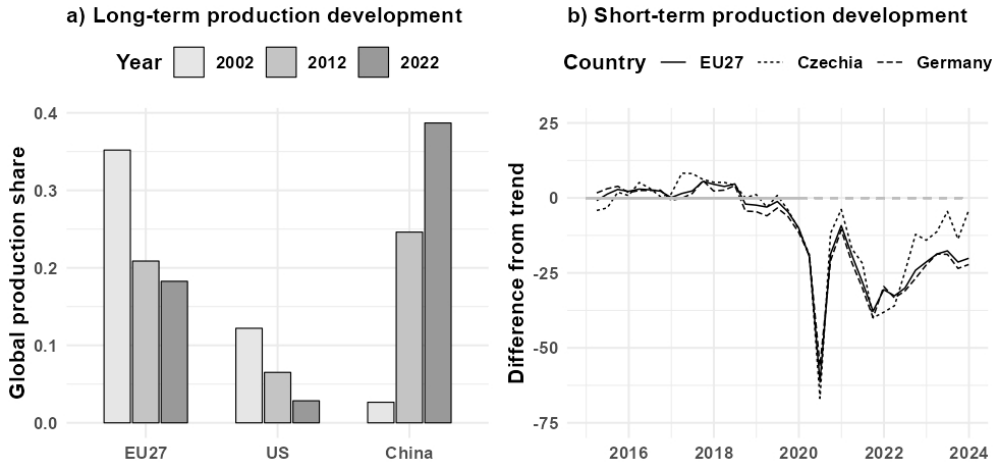
2. Where Does the Automotive Industry Stand

Free markets with limited state interventions but well-designed institutional frameworks, also known as the Washington Consensus or market fundamentalism, have been the leading political and economic paradigm on the transatlantic axis since the beginning of 1990. Industrial policies, or strategies consisting of policy tools and interventions to affect the domestic business sector's performance, were perceived mostly negatively among policymakers and economists yet poorly understood from the causal perspective (Juhász et al., 2023). At least since the Global Financial Crisis, "harmful" state interventions to trade have increased, and many geopolitical and global events have led to a paradigm change in economic policy. Intergovernmental institutions establish new conceptual lens through which to frame these policies (Criscuolo et al., 2022), and international efforts are made to launch new observatories and assess the actual developments (Evenett et al., 2024).

From its early history, industrial policies and state interventions have often targeted the automotive industry—a relatively concentrated, capital-intensive, innovation-driven industry with a handful of final producers reaching global car markets. These firms take the actions of other competitors into account, which influences their innovation activity and may affect the overall technological frontier (Hashmi and Biesebroeck, 2016). In the last decades, firms have taken advantage of globalisation through cost optimisation, search for favourable labour markets or abundant energy sources, and production spread worldwide, especially into China when considering total production (see Figure 1a). The shift has been, however, also significant within the EU borders, primarily due to the search for competitive advantage by multinationals across the core and periphery production areas, benefiting the CEE region (Pavlínek, 2020). With the recent shift towards electromobility under the guidance of climate

policies, the established value chains of the EU automotive industry are under increased pressure from import competition of new technology rivals, in many cases allegedly subsidised by the respective foreign governments. This development leaves many thinking that a *laissez-faire* approach could subsequently lead to the contraction of today's EU domestic industry facing "unfair" competition (although many EU and US brands benefit from China-based production for exports to the EU) and the establishment of new extra-EU headquartered industrial production base.

Figure 1: Long- and Short-term Development of the EU Automotive Industry



Source: own elaboration based on OICA (2024) and Eurostat (2024); figure a) is calculated as a share of global passenger car production (in units) of countries that form EU27 today; figure b) is calculated as a difference from country-specific linear 2010-2019 trends in quarterly production volume index (2015=100, seasonally and calendar adjusted, based on value for NACE C29—Manufacture of motor vehicles, trailers and semi-trailers)

While many industrial organisation economists have welcomed open competition, a key element of the EU Single Market for an innovation-driven economy, the competition should follow the same rules on a level playing field. However, the EU could face unfair competition within the industry. Then, one could be even more cautious, as companies have incentives and disincentives to innovate depending on industry structure, firms' heterogeneity, technology space, or distance to technology frontier (Griffith and Van Reenen, 2021). As Hashmi and Biesebroeck (2016) show, the automotive industry might face a situation where the increased competition leads the incumbent (or legacy) automotive firms to slow down their innovation activity, especially those far from the technology frontier and quality laggards. While we do not argue that EU automotive firms are actual "laggards," the electromobility shift can negatively affect their short- and mid-term productivity compared to new industry entrants, with long-term consequences. After all, the EU firms are stepping up new activities, such as the production of electric vehicles, without prior technology-specific accumulated knowledge and with a significant dependence on battery technology transfer from Chinese firms, hence an opposite direction of knowledge transfer.

2.1 Theoretical Background and Methodology

In theory, the observed slow technical change and transition of the incumbent firms towards electromobility is due to path dependence and technological lock-in. Path dependence is a "barrier" to climate change mitigation and the desired maintenance of EU competitiveness. This reasoning calls for a) setting a proper regulatory framework, including carbon pricing of fossil fuels, and b) subsidising the technology "push" within a relatively short window of opportunity before new entrants possibly outcompete the incumbent firms.

An early proposition of path dependence by David (1985) and a simplified model introduced by Arthur (1989) explain how technologies and markets can unfold in time. David gave an example of a QWERTY keyboard, which, although not the most efficient, dominated the market. According to the story, it was a combination of early events boosting *economies of scale* (and learning by doing as knowledge accumulates, or similarly a network effect of increased number of users), *technical interrelatedness* (or interrelatedness between hardware and the users), and *quasi-irreversibility of investments* (or sunk costs), supported by Arthur's view on *increasing returns to technology uptake*. Such market domination of a single technology could lead to a lock-in when new and better technologies hardly dethrone the dominant technology due to the forces operating in favour of the status quo. Both authors assumed the automotive industry as a case in point, with internal combustion engines spread worldwide and hardly contestable by other technology, including electromobility.

Following the same logic, Aghion et al. (2021) conceptualise path dependence and the automotive technology lock-in as a second negative externality in the industry next to carbon emissions, a strong reason for state intervention. They understand path dependence as knowledge accumulation in "dirty" technologies (including internal combustion engines), which directs the automobile firms to continue innovating in the dirty technology due to learning by doing and profitability of such firm activities. Moreover, regional spillovers reinforce this effect if other firms have accumulated "dirty" technology knowledge. However, such an effect applies to "clean" technologies, too (including electric vehicles); hence, path dependence is a double-edged sword that can also boost the transition towards clean technology once a threshold of clean knowledge is accumulated. Aghion et al. (2016) build their reasoning on a model of directed technical change with the endogenous direction of innovation through price effects, for example, affected through a carbon tax or R&D subsidy to break the path dependence of dirty innovation activities.

To qualitatively assess the role of regulation with emphasis on the new industrial policy in shaping the outlook for the EU automotive industry's technical change and competition, we follow a mixed-method triangulation design for industrial policy research as used, for example, by Gomes et al. (2023). We critically discuss the EU automotive industry state and outlook and deliver a top-down overview starting from a) the EU auto industry's international position and the policy framework under which it operates, b) the new EU approach to industrial policy, and c) the CEE region's perspective. Our method relies on collecting and assessing information from three data sources. Namely, we a) conducted interviews with selected economic and policy experts, b) included supporting information from a systematic reading of news sources and media, and c) gathered information from the official EU communications, legislative proposals, and legislation. We held 14 semi-structured interviews between July and October 2023, both online and in person, averaging 62 minutes per interview. All interviews have been recorded and transcribed. Table 1 in the Appendix gives an overview of the roles and affiliations of the interviewees, including the interview number, to which we refer when making an interview reference in the text, such as [#1], [#2], and up to [#14]. The subsequent chapter introduces the key research findings, and discussions follow in the last chapter.

3. Assessment of the New EU Industrial Policy

Industrial and climate policies across the globe now largely overlap. These new policies are introduced through national and subnational government strategies or, as in the case of the EU, at the union level. While the implementing jurisdictions pursue their interests, they must consider the global markets and international trade. Climate policies, such as carbon pricing, may introduce competitive disadvantages for domestic industries if other jurisdictions pursue subsidies instead (Clausing and Wolfram, 2023). The new industrial policies may greatly complement the climate policies or offset their possibly adverse effects on global competition. Some of them, however, also introduce new protectionist measures.

3.1 An International Perspective

Carbon dioxide (CO_2) pricing is considered the first best economic solution to climate change mitigation (if feasible to introduce it with a reasonable price tag), albeit not a silver bullet. While some countries push subsidies instead of carbon pricing (hence select subsidising instead of cost-imposing, see Clausing and Wolfram, 2023), the complementarity of both solutions in a single economy would lead to the best outcome (Aghion et al., 2016). The EU, having implemented carbon pricing measures for almost two decades, is notably ahead of the leading global competitors, the US and China [#9]. The EU emission trading system (EU ETS) will soon apply to fossil fuels for daily car usage (EU ETS 2), foreseeably increasing fuel prices. This framework is considered a competitive advantage in the transition to electromobility [#14]. It should strongly incentivise firms competing for the EU market, hand in hand with the CO_2 and local emissions standards and the agreed milestone of 2035. By then, all sold new cars should be zero-emission when accounting for CO_2 equivalent exhaust emissions, *de facto* only electric vehicles (EVs). While the EU is championing the decarbonisation agenda on the political and regulatory level (EU Green Deal), it has recently taken steps towards a new industrial policy, the Green Deal Industrial Plan, of a mostly responsive nature due to developments in China, with long-established industrial subsidy programs, including the push in the technological frontier in electromobility, and the new industrial policy of the US [#6].

The US established its new economic policy program, i.e., "Bidenomics," best represented by the US Inflation Reduction Act (IRA), prioritising domestic economic growth, job creation, and clean energy take-off. The act primarily aims to increase domestic production with “Buy American” quotas, affecting electric vehicles and batteries [#10, #13]. With the threat of a negative "China shock" for the US industries in mind, the act limits the role of Chinese businesses profiting from the open-ended industrial policy budget for tax credits and subsidies. The domestic production quotas partly hit the EU-based auto producers, having no formal EU-US free trade agreement in place. While the EU was caught off guard when the US enacted the IRA, only anecdotal and preliminary evidence exists about the actual effect of this act on the EU businesses, and more data is needed to assess its impact. Nevertheless, some decisions in the automotive industry have already worried EU policymakers, including postponing a new Volkswagen battery production facility planned to be built in the CEE region (Reuters, 2023). Concerns linger regarding the potential negative impact of US subsidies attracting the EU auto producers [#4, #10]. In reaction to the IRA, the EU has introduced a communication on the Green Deal Industrial Plan and its critical Net Zero Industry Act (NZIA), to which we turn in the following section.

Despite differences in approach, there is potential for cooperation between the EU and the US on competition, innovation, or technology standards in the automotive industry, including battery production [#12]. The ongoing debates underscore efforts to identify common ground

and align industrial policies [#10]. However, some of the debates only happen due to the necessity for formal meetings [#4] and bring no tangible results (Politico, 2024a). Unfortunately, the latest developments and divergent approaches to the clean technology transition between the EU and the US highlight slight tensions, particularly in dealing with China [#11, #12]. Moreover, the established trade framework, including high tariffs for Chinese car exports to the US, makes the EU a particularly tempting export market for Chinese EV production. Today, Chinese exports face 25% import tariffs in the US compared to 10% in the EU. The EU, in general, sees increased competition from Chinese producers with potentially harmful effects on the domestic industries (Friesenbichler et al., 2024), bearing in mind the possible threat of a decrease in innovation activity by laggard auto producers (Hashmi and Biesebroeck, 2016).

The EU's approach to China is regarded as rather pragmatic, with a commendation for its strategic handling of foreign subsidies and trade defence [#3, #4, #12], also exemplified by its ongoing anti-subsidy probe into Chinese EVs, which could materialise in potential consideration of tariff changes in July 2024 (Bloomberg, 2023). However, some consider it to bring no tangible changes in trade [#14]. For the EU, maintaining a strong trade partnership with the US and China remains essential, not only because of the EU and US brands that produce and export from China. Chinese investments in the EU are generally viewed as beneficial (for example, in the battery industry) if they contribute to local business ecosystems [#4, #14]. Moreover, opportunities arise from leveraging China's cost-competitive production capabilities, aiding in scaling the electromobility transition [#8]. This, however, must align with the EU Single Market rules. A neat warning against harsh protectionist measures exists; it's cautioned that these interventions could have adverse consequences and backfire in trade retaliations. Acknowledgment of a certain level of dependence on China for the clean technology transition is tempered by concerns about the implications of economic decoupling, including higher transition costs [#9, #14], hence the instead vaguely defined term of "derisking," preferred by the European Commission (Financial Times, 2023).

3.2 An EU Perspective

Over the past five years, there has been a noticeable shift in the stance of the European Commission towards competition and industrial policy. It has been catalysed by events such as Brexit, the COVID-19 pandemic, semiconductors' supply shocks, the Russian-induced war in Ukraine, and the fast-escalating influence of alleged Chinese market distortions and the US IRA. The Commission's internal awakening has been exemplified by opening new discussions on global competitiveness and mergers and acquisitions (M&A) in response to the red light for the Siemens-Alstom merger case in 2019. The merger had been pushed forward by both German and French companies, especially on the grounds of competitiveness in the global markets (in rail transport) and the threat of losing jobs and EU market share in the face of Chinese rivals [#9]. Yet the concerns about cornering the market and violating the competition policy won back then (see Šaroch and Šmejkal, 2020). Today, the proud feeling of tradition in car production and its legacy issues, such as fossil fuel dependence, further compound these challenges [#13] and highlight its path dependence. Some business representatives argue that more M&A will be necessary for the EU automotive industry facing increased competitiveness in electrified mobility (Reuters, 2024), driven by Stellantis, a product of a merger of Fiat Chrysler and Peugeot in 2021.

The NZIA (European Commission, 2023a), recently approved by the European Parliament and Council in the trilogues, is a response to new geopolitics and economic policy paradigm change. The act paves the way towards achieving (or maintaining) a strong EU manufacturing

base across clean technologies, simplifying permitting processes and lowering the bureaucracy burden, supporting innovation and increase in human capital, fostering public-private cooperation, and mobilising private investments. Industrial initiatives, including the NZIA, are viewed as providing clarity and creating a better institutional framework for cooperation and coordination among different economic stakeholders, ensuring any aid is simple and fast while aligning with long-term goals [#4, #6, #10]. Despite strengths in EU R&D through Horizon Europe and other complementary EU initiatives, there is recognition of the need to improve market scale-up efforts with better access to finance [#9]. Moreover, as the EU heads to the June 2024 elections, voices appear that push for further steps in the new EU industrial policy, and two independent reports are about to be presented to policymakers on the state of the EU Single Market and the EU competitiveness (Politico, 2024b), which could navigate the policy debates after the elections.

The NZIA seems much more limited in terms of finance. Although calls for prudent resource allocation discourage the EU from engaging in subsidy wars with the US [#11], criticism stems from a perceived need for more clarity on funding, with questions raised about how to surpass the scale of the US IRA [#4]. Carbon pricing, while important, introduces competitive distortions and adjustment costs [#14]. The agreed NZIA act only introduces a so-called Strategic Technologies for Europe Platform (STEP) with little new money and a possibility of allocating national carbon pricing revenues to support new investment projects (Euractiv, 2024). The previously proposed common funding through the new EU Sovereignty Fund has yet to materialise (if ever), especially looking beyond the Recovery and Resilience Facility (RRF) and towards a new multiannual financial framework. Still, however, the NZIA and current industrial policy debates have a significant top-down character and big aspirations [#14]. For the automotive industry, this approach introduces an indicative plan for 2030, when up to 90% of the EU sales of EVs should be matched by domestic battery production. For the whole pool of technologies prioritised by the NZIA, the act aims to achieve 40% production "self-sufficiency." However, electric vehicles and batteries are technologies progressing dramatically, and the EU automotive industry is urged to prioritise innovation over current mature technologies, recognising the importance of staying ahead of the curve [#9]. Investments in the technology frontier are pivotal for long-term success [#6]. And this is different from what the NZIA is designed for, hence the calls for well-designed innovation and horizontal, mission-oriented policies complementing the NZIA.

Direct subsidies remain attractive for automotive firms, and there is a call for more targeted subsidies for the future of mobility (in R&D), also asserting the EU's position in global trade [#12, #14]. Subsidies gain priority in industrial policy and are still preferred over protectionist measures [#9]. The NZIA and the existing Temporary Crisis and Transition Framework (European Commission, 2023b) relax state aid rules within the EU Single Market and the EU competition policy, primarily supporting production capacity investments and not necessarily R&D activity. Hence, concerns arise over the risk of the EU Single Market's fragmentation, potentially exacerbating regional disparities and limiting opportunities for economic integration [#7]. Tensions between EU Member States regarding fiscal constraints and disparities in the amount of state aid add to the challenges, including fragmented capital markets, variations in access to venture capital, and different innovation capacities [#4, #9, #10]. Structural challenges linked to automotive industry dependence underscore the complexities within the EU [#6]. The automotive-heavy member states, for example, in the CEE region, could anticipate incurring significant social costs and job displacement, may the shift in the automotive industry negatively affect the region [#3]. Developing human, technological, and innovation capabilities remains challenging [#8], and structural issues in

the labour market pose additional hurdles [#4]. Until today, uncertainties persist regarding the "just" calibration and enforcement of the EU Green Deal transition [#1].

3.3 A Regional Perspective

Competition policy has safeguarded the CEE countries and businesses and helped them to integrate into the EU Single Market. Until recently, the CEE region could largely omit complex industrial policy due to the overarching framework of the EU Single Market serving the purpose of competition and industrial policies and benefit from national investment promotion activities, state aid, or the Important Projects of Common European Interest (IPCEI; see European Commission, n. d.). The past success of CEE through incoming foreign direct investments (FDIs) and a factory economy model might not repeat itself [#6]. However, under several conditions, CEE could remain attractive for various FDIs, including the automotive industry [#3], particularly from Asian investors of Chinese, Korean, and Japanese battery producers, potentially benefiting the region in overall development [#4]. Currently, Hungary is the main bridge between the EU and Chinese automotive and battery producers (Politico, 2023), partly from a strictly political closeness and partly from a clearly articulated Hungarian national strategy for the battery industry.

Structural ties in the EU automotive industry demonstrate the CEE region's interconnectedness with key European economies and have recently posed significant risks. The heavy reliance on Germany underscores a double dependency on both old (Germany) and new (China) industrial powers [#8]. The slowly yet persistently shrinking German automotive industry faces increased global competition in the electromobility transition (see Figure 1b), and the media asks what could happen if Germany stopped producing cars (The Economist, 2023). While interventions to propel the automotive transition may not align with conventional economic recommendations, they are seen as crucial for the region's development [#14]. Concerns about Germany's alleged over-subsidisation of its industries may not materialise. However, a late 2023 EU approval of matching state aid shows the German government's dedication to attracting large battery FDIs (Financial Times, 2024). The CEE region also possesses significant financial resources to support industries and to attract future investments [#4] thanks to the cohesion and regional policies, which can be well utilised in the upcoming NZIA framework with additional benefits for cohesion and just transition regions.

Like other economies worldwide, the CEE region grapples with a "dual track" economy model, characterised by highly productive foreign multinationals and less productive local companies, highlighting the need to increase spillovers in the future. Economic upgrading in CEE, particularly shifting from the production of cars with combustion engines towards EVs, necessitates diversification beyond the automotive industry, as change from the assembly of one car to another does not lead to any significant value added. However, the regional functional specialisation in fabrication is very persistent [#6]. Moreover, concerns over geopolitical and macroeconomic risks prevail, particularly given the region's proximity to Ukraine [#1, #4] and possible high energy prices limiting one of the critical competitive advantages in fabrication. Some interviewees see the CEE region as underrepresented in new EU industrial policy discussions, and reportedly, little proactivity in Brussels comes from local businesses [#4, #6, #14]. Alas, in such a setting, stranded assets (and people) in legacy industries without appropriate funding pose additional risks in the CEE [#7]. Another limiting factor to previously strong advantage is the tight labour markets in some CEE countries [#5], and weak social dialogue and institutional coordination impede bottom-up discussions about restructuring labour markets, hindering effective policy formulation and implementation [#2].

3.4 Results and Discussion

The results of our assessment are not unambiguous, and more evidence is needed to assess the impact of the new EU industrial policy on the automotive industry and its unfolding in time. We set forth three tentative findings of our research.

1. From an international perspective, the EU's carbon pricing mechanism is a competitive advantage that incentivises the cost-effective transition of the automotive industry. If adequately framed and complemented by pragmatic and measured rules-based trade and investments, the EU will not be forced to allocate resources ineffectively through an excessive subsidy race. Yet, a certain level of subsidies is deemed crucial, especially in R&D.
2. While the Net Zero Industry Act aims to scale up the battery production capacity within the EU borders (among others) and improve the automotive business environment, one of the critical aspects of long-term competitiveness remains in the innovation agenda and human capital. Hence, there are voices to complement the industrial policy with a carefully designed innovation policy, enabling scale of R&D and follow-up activities to market the innovations.
3. From the perspective of the CEE region, the EU Single Market remains the most powerful economic tool in pursuing European integration goals. Moreover, it also boosts competitiveness from an international perspective. Considering new evidence, overly strong ties to the Germany-centred automotive industry are perceived as risky. Since there is no new common EU funding yet (as a follow-up to RRF), state aid-driven subsidies must not lead to more EU Single Market fragmentation.

4. Conclusion

This paper aimed to answer the question of the outlook for the EU automotive industry when establishing the new EU industrial policy within a globally changing economic policy paradigm. It employed a theoretical framework of path dependence and technology lock-in in the prevailing fossil fuel-powered combustion engine cars, focusing on regulations and subsidies as the driving force of technical change. Although the EU has a well-designed climate policy framework set through the EU Green Deal, ambitions outlined in the new EU industrial policy, the Green Deal Industrial Plan, aim to complement carbon pricing, boost domestic battery manufacturing, and incentivise the competitiveness of the EU automotive industry, while reversing possible adverse effects of climate policies on global competition.

While this paper qualitatively discussed the outlook of the EU automotive industry, limitations exist due to the applied heterodox research design, and many answers still need to be answered, including the empirical evidence of causal effects since the new industrial policy needs time to prove itself. The paper also aimed to prepare the ground for our future quantitative research to answer the question of how policy and regulation impact the automotive industry and its electromobility transition with increased competitive pressures by new industry entrants, building on Aghion et al. (2016) and Hashmi and Biesebroeck (2016) and framing the future work within the path-dependent nature of directed technical change.

Acknowledgements

This paper was written within the IGS project no. F2/34/2024 at Prague University of Economics and Business. Michal Hrubý also benefitted from the *ReThink.CEE* fellowship of the German Marshall Fund of the United States.

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Appendix

Table 1: Semi-structured Interviews Between July and October 2023

No.	Role	Affiliation	Date	Length	Form
#1	Senior economist	EU institution	07/19	60	Online
#2	Senior researcher	Research institution	07/24	53	In-person
#3	Analyst	Research institution	07/26	85	In-person
#4	Deputy head of unit	EU institution	07/27	41	In-person
#5	Co-founder	Research organisation	08/09	84	Online
#6	Economist	Research institution	08/23	49	Online
#7	Programme officer	Intergovernmental institution	08/30	53	Online
#8	Senior researcher	Research institution	09/06	73	In-person
#9	Economist	EU institution	09/07	71	In-person
#10	Senior director	International research organisation	09/12	60	In-person
#11	Research fellow	Research institution	09/20	53	In-person
#12	Senior advisor	International research organisation	09/21	51	In-person
#13	Policy advisor	US institution	09/27	54	Online
#14	Senior fellow	International research institution	10/18	78	In-person

Source: own elaboration (2024)

Assessment of Individual Income Tax Burden in Czech Republic and Poland in the Light of National and European Tax Law

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Abstract
This paper compares the tax burdens of two types of taxpayers: taxpayers without children and taxpayers with two children in the case of two European countries the Czech Republic and Poland from 2018-2023. The basis for comparison is the average wages in individual years, and only income from dependent activity, i.e., income from employment, will be considered the tax base. According to the observation results, the significant differences are not identified in the structural elements of taxation but in individual details such as the amount of the tax rate, the amount of the child relief, and the non-taxable part of the tax base. For selected types of taxpayers, it was found that in the case of an average wage, the tax burden was lower in Poland, and conversely, in the case of five times the average wage, the tax burden was lower in the Czech Republic in the observed period. Tax law regarding income taxation in both countries was considered from the national and EU point of view.

Keywords: *European tax integration, personal income tax, tax burden, tax reliefs*

JEL Classification: *H24, K34, E62*

1. Introduction

European integration and European Union regulations allow the free flow of capital, goods, services, and work. In every country, income from work is taxable. Free movement of people allows European Union citizens to move and raise a family in any Member State. For this reason, the analysis and comparison of competitive tax burden in neighbouring countries becomes a particularly important issue.

The aim of the study is to compare the tax burdens of two types of taxpayers: a taxpayer without children and a taxpayer with two children in two countries: the Czech Republic and Poland. These types of taxpayers were chosen for research due to the average type of family in both countries. An assessment of the level of taxation will be made for income from dependent activity.

2. Personal Income Tax in the Czech Republic and Poland

Income tax is levied on a taxpayer's income. The income can include salary and wages, rental received, the proceeds of business operations, and the profit resulting from the increased value of assets or assets sold. The personal income tax is a relatively young tax that was used for the first time in the eighteenth century for the financial Napoleonic war. Personal income tax is currently widely used in tax systems due to its positive features such as progressivity of taxation; as a good macroeconomic stabilizer, it can influence changes in GDP, it does not cause price distortion, and it complies with the solvency principle (Široký, Krzikallová, Krajňák, 2020).

The calculation of the tax liability depends on determining the tax base, on the form of non-taxable or deductible items on the tax base, and on tax reliefs that decrease final tax liability. The purpose of tax deductions and tax reliefs is to support certain microeconomic goals or changes in the behaviour of taxpayers. The existence of deductions and tax credits causes the real tax burden differs from the nominal tax rate.

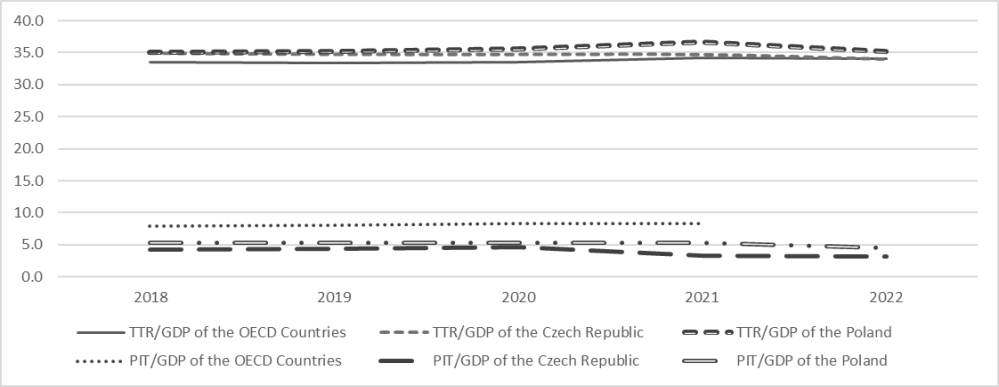
Different countries' individual approaches to designing personal taxation details lead to considerable variation worldwide (Krajňák, Krzikallová, Friedrich, 2022). Efforts towards tax harmonization within the EU also play a certain role in this regard. Indirect taxes affect the decision-making on investment activity, formation of trading companies, development of new jobs, and thus employment growth (Hakalová, Palochová, Pšenková, Bieliková, 2018, p. 391).

Tax revenues constitute a significant part of each country's budget. Data for total tax revenues (TTR) and tax revenues from individual income (TRPI) compared to GDP for Poland, the Czech Republic, and OECD countries are presented in Figure 1. As can be seen from the table, the analyzed data varied. For TTR in the case of Poland, in each of the years under study, increases in the variable were observed, but with different strengths. The largest increase was recorded in 2021 (1,1% compared to 2020). For TRPI in 2020, the increase was also the highest (0,09%). Unfortunately, in the case of this variable, a 0,83% decrease in value was observed in 2022 compared to 2021. This result was undoubtedly influenced by numerous changes in Polish tax law regarding the taxation of individual personal income. All these changes, such as tax thresholds, tax rates, and tax-free amount, are discussed below.

Regarding Czech data, a trend can be observed for TTR; it means stable development without large changes but with a slight decrease in the selected period. In 2022, the value of this indicator was the lowest. Comparing proportions of TTR in both countries, they are similar, and they don´t exceed the value of 40 % and are not lower than 30 %. With regard to the personal income tax quota, the Czech data shows a significant decrease at the end of the observed period. Changes in the main aspects of tax calculations caused it. The tax liability of individuals was influenced by a modified version of gross income called super gross income, which was the sum of gross income and social and security contributions paid by the employer. This way of determining tax liability has been used since 2008, and this approach was used for the last time in 2020. As it is clear from the data in Figure 1, this decision caused a sharp drop in tax revenues in the order of tens of billions of crowns. Based on the facts mentioned above and respecting the average values of OECD data, it can be concluded that the tax quota of total tax revenues is higher than the value of OECD in both assessed countries, with the Polish value being the highest during the observed period. In contrast, the personal income tax quota of Poland and the Czech Republic is lower than the average of OECD countries. In the case of the Czech Republic, the tax quota reaches the lowest value.

From the comparison of both countries with average OECD data, it can be stated that the total tax quota values of Poland and the Czech Republic were higher. On the other hand, the tax quota of both countries in the case of individual taxation does not reach the OECD values in the given period. The OECD total tax quota 2022 and personal income tax quota 2022 were unavailable during paper writing.

Figure 1: Total Tax Revenues, Tax Revenues from Individual Income as % of GDP in Poland, the Czech Republic, and OECD in 2018 – 2022



Source: Own elaboration on the OECD database (2024)

2.1 Czech Tax Law in Income Taxes

The greatest demands are placed on income tax. It should consider taxpayers' social situation and support the subjects' desired behavior. When determining the tax base and tax liability, it is necessary to consider everything that could affect it. Taxpayers must be sure of what is subject to taxation and what is subject to income tax or which incomes are exempt from tax. The purpose of income taxation is to tax only the taxpayer's disposable income (Vančurová, Zídková, 2022).

In the case of the Czech Republic, different partial tax bases can be distinguished, which are determined differently. They can be divided into income from activity (wages and business income) and income from property (capital income, rental income, and other income.) As far as income from dependent activities is concerned, they cannot be reduced by related expenses. From 2008 to 2020, a specific way of tax calculation was used. The tax base was increased by the SSC insurance paid by the employer. The tax base was equal to the gross income increased by almost 34 %.

Regarding personal income taxation from activity, the tax rate has stabilized at 15% since 2008. The solidarity surcharge was 7%, a so-called tax of the rich, as it was paid in addition to the classic 15% tax by persons with the above-mentioned incomes. The amount of solidarity tax was not subject to passive income from the sale or rental of real estate and income from capital assets. The main principle was that the tax base exceeding 48 times the average wage has been subject to the solidarity surcharge since 2013. However, it was abolished in 2021 and replaced by a tax rate of 23%, valid for incomes exceeding 48 times the average wage (according to the data of the Ministry of Labor and Social Affairs of the Czech Republic). Income below this limit is subject to a tax rate of 15% (Krajňák, 2021).

Tax deductions and tax reliefs are used to determine the final tax liability. Deductions are deducted from the tax base, each independently of the others. These deductions, therefore, have a regressive effect, which is mitigated by the limits of these deductions. (Krajňák, 2020). Deductions include, for example, interest on housing loans, private life insurance premiums, and pension insurance contributions.

Final tax liability can be decreased by tax relief. Reliefs can reduce the tax liability, while everyone can apply the basic tax relief, but other reliefs are applicable only if the specified conditions are met. The value of basic relief varied during observed periods and generally can be claimed that it increased from CZK 24,840 (2018), CZK 27,840 (2021) to CZK 30,840 (2022). The tax relief related to children is an example of a relief that can lead to a negative tax as a positive tax transfer. That is, in the situation where the taxpayer does not pay any tax and, on the contrary, can receive income in the form of a so-called tax bonus. A tax bonus arises if the calculated personal income tax is lower than the applied tax relief for children. Therefore, the calculated tax bonus is the difference between the tax benefit and the calculated income tax.

2.2. Polish Tax Law in Income Taxes

Income taxes are considered one of the most important structures in the systems taxes of modern countries (Mazurek-Chwiejczak, 2022, p. 154). The concept of income is intuitively associated with material benefits, brought to the individual by his/her activity (activity).

Tax reliefs are an inherent element of the Polish tax law system - the legislator he has introduced them many times to achieve various goals, both economic and as well as strictly political ones (Ciupa, 2022, p.6). A progressive income tax schedule creates kinks in the budget set at income bracket thresholds, where the marginal tax rate below the threshold is lower than the rate above. This creates incentives to locate or “bunch” right below the threshold, creating bunching on the distribution of taxable income at those income thresholds (Johnson, Villabrille, Breunig, Zaresani, 2023, p. 1-2).

A progressive taxation system involves the legislator establishing a tax-free amount that is deducted from the tax base. The tax-free amount is a specific subjective preference in personal income tax. Higher income families may have better access to care as well as more opportunities to purchase care, whereas people with lower income may be confronted with more stressful situations, which are detrimental to health (Lenhart, Chakraborty, 2024, p. 1). That is why tax preferences are so important in tax law. The economy is populated by a continuum of households, who differ by age, labor productivity and entrepreneurial ability (Macnamara, Pidkuyko, Rossi, 2023, p. 3). Because of that tax preferences should be dedicated to specific group of people for example couples with children or childless persons.

A fairly common relief in personal income tax is the relief related to raising children. It has been in operation since January 1, 2007. The annual amount of relief in the years examined was: a total of PLN 1,112.04 for the first child. In the case of a second child, it is eligible legally the amount was the same. In turn, for the third child, the monthly amount was PLN 166.67 PLN, and the annual amount is PLN 2,000.04. The fourth and subsequent children were entitled to a monthly discount in the amount of PLN 225, which translated into an annual relief of PLN 2,700 (Furman, Szerląg, 2023, s. 5).

As a rule, the progressive tax scale should burden most the highest income. Generally, in Poland there is a tendency to gradually decrease tax progression. Since January 1st, 2009, there have been two tax rates (18% and 32%). As a result, the tax progression for the tax payers in the second as well as in the third tax rate range diminished. In 2019, 18% tax rate was replaced

by 17% tax rate, this time, to the benefit of tax payers from the first tax range (Lewkowicz-Grzegorczyk, 2021, p. 88). All changes are illustrated in table 2.

Particularly important changes in personal income taxes in Poland included in 2019, 2021 and 2022. In 2019 of the reduction of the PIT rate from 18 to 17%, an increase of the tax deductible amount, PIT exemption for persons below the age of 26 (Journal of Laws of 2023, item 28). In 2021 of the Polish Deal regulations through: an increase (to PLN 30 thousand) of the non-taxable amount; an increase of the tax threshold from PLN 85 thousand to PLN 120 thousand. In 2022 of the reduction of, *inter alia*, the PIT tax rate applied in the first range of the progressive scale from 17% to 12% (Act of 9 June 2022 – Journal of Laws of 2022, item 1265) (Kowalska, 2022, p. 105-106).

3. Problem Formulation and Methodology

As mentioned, neighbouring countries tax systems in the case of individual income tax can be similar or differ. The person with only one kind of income (from the dependent activities) is tested respecting his or her individual situation (childless taxpayer, and taxpayer cares about two children). For better comparison assessment, the only tax burden is used concerning the value of the average wage and its multiplication in the observed period.

3.1 Model and Data

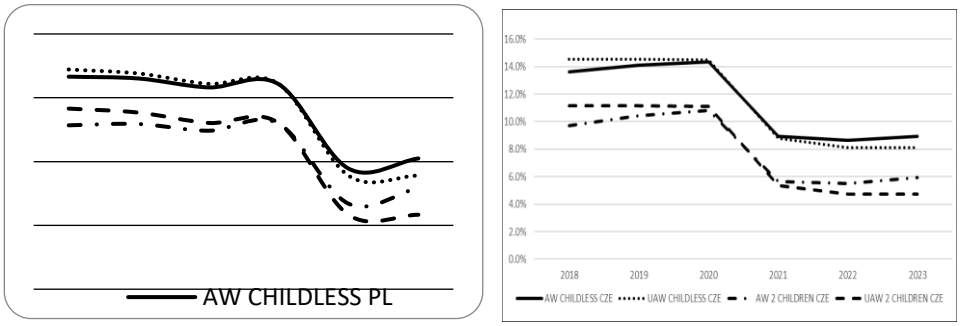
Data from the OECD database, the Ministry of Finance, and the Central Statistical Office were used to study the Polish and Czech taxpayers' tax burden. We used these formulas for calculating tax burden it:

$$TB = \frac{PIT}{AW} \tag{1}$$

$$TB = \frac{PIT}{UAW}, \tag{2}$$

where AW (equation 1) is the annual average wage, UAW (equation 2) is the unified average amount of the annual average wages of the observed period, PIT is personal income tax, and TB is the tax burden. The tax burden determined for each year is influenced by the amount of the average wage of the given year. It gradually grew in both countries in the observed period. To eliminate this influence, the determination of the tax burden was modified by calculating a single amount of average wages (UAW) for the entire period 2018-2023 for each country separately. Figure 2 shows changes in the tax burden of selected types of taxpayers concerning the selected entry dates.

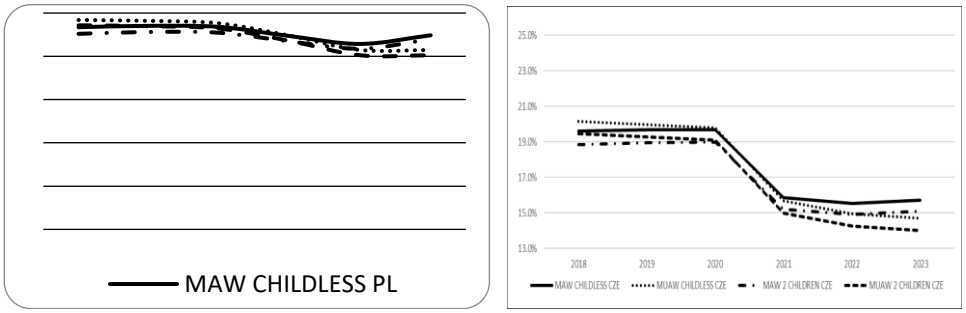
Figure 2: Tax Burden for AW and UAW in Poland and the CR 2018-2023



Source: Own elaboration (2024)

Figure 3 shows the same calculations for the selected types of taxpayers; only the amount of income is higher, in the amount of five times the stated values of average wages (MAW and MUAW). In this way, the situation of high-income taxpayers is also captured.

Figure 3: Tax Burden for MAW and MUAW in Poland and the CR 2018-2023



Source: Own elaboration (2024)

In the case of Polish data from the calculations and Figures 2 and 3 for AW and UAW, the difference between a taxpayer without children and one with two children is significant. For AW in 2023, the difference between taxpayers in TB is 2.3%, but for 2018, it was much larger, as much as 3.9%. In turn, for the UAW, the difference for both taxpayers in 2023 is 3.1% and for 2018, 3%. In this case, standardization of the average resulted in reduced differences. In turn, for MAW, the difference between both taxpayers is 0.4%, while in 2018, it was 0.8%. For MUAW, the resulting difference in 2023 is 0.6%, while in 2018 it is 0.6%. We again observe a shallower difference between the tax burden in both variants for the unified multiplied variable. It is also visible that the tax amount for AW and UAW decreased in the research period. This may be related to changes in Polish tax law regarding a reduction in the tax rate and an increase in the amount exempt from taxation.

The Czech data of Figure 2 devoted to comparing selected types of taxpayers in the case of the average wage shows important differences in tax burden between both types of taxpayers. Generally, it can be concluded that the tax burden has declined. The highest decrease is connected with the changes of the year 2021. This decrease was caused by a change in determining the tax base and the increase of basic tax relief. A slight decrease can be observed in 2022 due to increased basic tax relief from CZK 27,840 to CZK 30,840. On the contrary, a slight increase for both types of taxpayers was evident in 2023 despite the unchanged method

of determining the tax, the amount of tax relief for taxpayers, and tax relief for dependent children. The only reason for this development was the growth of the average wage. For AW in 2023, the difference between taxpayers in TB is almost 3 %, but for 2018 it was larger than 4 %. In turn, for the UAW, the difference for both taxpayers in 2023 and 2018 was 3 %. In turn, for MAW, the difference between both taxpayers is not so high and reaches 0.73 %. For MUAW, the difference is 0.65 %. Using a standardized average wage thus contributed to reducing differences in the tax burden between taxpayers in this case.

4. Comparison of Taxation of Individual Income Tax in Poland and the Czech Republic in Selected Situations

In the previous text, the basic rules for determining the taxpayer's tax liability in the case of personal income tax were mentioned, focusing on the situations of a childless taxpayer and a taxpayer with two children. Based on the established facts and data, the following comparison of the taxation of Polish and Czech taxpayers can be made. The structural elements of taxation are identical in both countries and include tax base, items reducing the tax base, tax reliefs, and tax rate.

Suppose we focus on determining the tax base itself. In that case, it can be stated that both the Polish and Czech tax systems consider taxation from dependent activity within the framework of personal income tax. When it comes to the tax base, in both countries, its amount is given by the amount of the taxpayer's final wage. This wage cannot be reduced by expenses related to this type of income.

Regarding items reducing the tax base, in Poland, items deductible from the tax base can be used to eliminate the tax burden for all taxpayers in a certain fixed amount. On the contrary, in the Czech Republic, these items are used only when the given conditions are met by the taxpayer, and in no case can it be claimed that they can be used for all taxpayers in the same amount. Table 1 below shows the items reducing tax base that can be applied for all types of taxpayers in individual years in a fixed amount.

Table 1: The Value of the Basic Tax-deductible Item in 2018 - 2023

Year	Tax-deductible item in PLN	Tax-deductible item in CZK
2018, 2019, 2020, 2021	**8,000**	**0**
2022, 2023	**30,000**	**0**

Source: The Act no. 586/1992 Coll., on Income Taxes; Journal of Laws of 2023, item 28; Journal of Laws of 2022, item 1265

In the case of tax rates, countries were found to use progressive taxation, which taxes higher incomes at a higher tax rate, as is clear from Table 2. Both countries use two tax rates. The lower tax rate in the case of the Czech Republic is lower than the same rate in the case of Poland at the beginning of the observed period. However, in 2022, this rate was reduced to 12% in Poland and is thus lower than the 15% rate in the Czech Republic. Thus, the low tax rate in Poland was reduced from 18% to 12%, but in the Czech Republic, it remained unchanged throughout. However, what changed in the Czech Republic was a higher tax rate. This increased over the period from 22% to 23% in 2021. More precisely, in 2021, the solidarity increase of the basic 15% tax rate by 7% was cancelled, and a second 23% tax rate was introduced. It is also interesting to compare the amount from which the income is taxed at a higher tax rate. In the case of the Czech Republic, it is 48 times the average wage, and in the case of Poland, the higher tax rate applies to incomes exceeding: PLN 85.5 thousand till 2020 and PLN 120 thousand in 2021-2023.

Table 2: The Tax Rates in 2018 - 2023

Year	Marginal tax rates in % Poland		Marginal tax rates in % CR	
2018	**18**	**32**	**15**	**15 + 7**
2019	**17,75**	**32**	**15**	**15 + 7**
2020	**17**	**32**	**15**	**15 + 7**
2021	**17**	**32**	**15**	**23**
2022	**12**	**32**	**15**	**23**
2023	**12**	**32**	**15**	**23**

Source: The Act no. 586/1992 Coll., on Income Taxes; Journal of Laws of 2023, item 28; Journal of Laws of 2022, item 1265

In the case of tax reliefs, they are used by both countries when determining tax liability. Both countries, the Czech Republic and Poland use this tool to consider the number of supported children in households. However, the amount of relief is different. The amount of child relief does not differentiate whether it is the first or second child in Poland and is, therefore, the same. In the case of the Czech Republic, the relief for the first child is smaller than the discount for the second child, as seen in Table 3.

Table 3: The Tax Relief Related to Children in 2018 - 2023

Year		Tax relief in PLN	Tax relief in CZK
2018, 2019, 2020	**1st child**	**1,112.04**	**15,204**
	2nd child	**1,112.04**	**19,404**
2021, 2022,2023	**1st child**	**1,112.04**	**15,204**
	2nd child	**1,112.04**	**22,320**

Source: The Act no. 586/1992 Coll., on Income Taxes; Journal of Laws of 2023, item 28; Journal of Laws of 2022, item 1265

It can be argued that in the case of Poland in the observed period, the amount of tax relief for one child does not even reach 2% of the average wage of the given year, and as the average wage increases, this value further decreases. At this point, it is worth mentioning another social privilege for families with children, which has been in operation since 2016 and constitutes an additional payment of PLN 500 for each child. However, it is in no way related to income and tax. In the case of the Czech Republic, due to the average salary of the given year, tax relief for the first child decreased from 3.9% to 2.9% and for the second child from 5% to 3.8%. Thus, despite the growth of tax relief for the second child, it was not enough to increase the average wage and have a regressive impact on the taxpayer's tax.

5. Conclusion

The research problem in this study was to compare the tax burden for Czech and Polish taxpayers, including the deduction of all tax reliefs related to having children. It can be concluded that construction items of individual income taxation are the same, and differences were identified in the intensity of use of items reducing the tax base, in the amount of the tax relief for children, and in the amount and changes in the tax rate. Generally, a significant decline in the income tax burden was observed in Poland and the Czech Republic during the period under study. The most significant decrease in the tax burden was observed in the year 2021 in the Czech Republic and in Poland one year later in 2022.

Table 4: Tax Burden of Selected Types of Taxpayers in 2018 and 2023

Taxpayer	Tax burden in % Poland		Tax burden in % CR	
	2018	2023	2018	2023
AW childless	**12.7**	**6.2**	**14.11**	**8.94**
AW 2 children	**8.8**	**3.9**	**10.45**	**5.96**
MAW childless	**23.4**	**22.4**	**19.69**	**15.71**
MAW 2 children	**22.6**	**22.0**	**18.96**	**15.11**

Source: Own elaboration (2024)

If we focus on comparing the tax burden of selected taxpayers, it is clear from Table 4 that the tax burden in Poland is lower than in the Czech Republic in the case of incomes reaching the level of an average wage. On the contrary, it is the case at a higher average wage level, as was tested in this contribution at the level of five times it. The tax burden of this wage level is not lower in Poland, but higher.

Acknowledgements

The project VSB TU Ostrava, SP2024/045 supported the paper.

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Attitudes towards Energy Drinks among University Students in the European Context

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Abstract
The main objective of the presented study was to identify university students' attitudes towards energy drinks (abbrev. EDs). The study was conducted in 2024 among 205 university students in the Czech Republic (145) and Slovakia (60). EDs consumption habits, e.g. frequency of consumption and single intake of EDs were also evaluated. The results suggest only small differences between two countries in the frequency of drinking as well as in the single intake of EDs. General attitudes to EDs seem to be much more positive in the sample of Slovak university students (solely men respondents) than in the Czech sample. Lower or no drinking of EDs is associated with more negative attitudes to EDs. Attitude scores differ by gender in both countries.

Keywords: *attitudes, energy drinks, European Union, university students*

JEL Classification: *M31, C83, C40, I10*

1. Introduction

The legislation of the European Union does not specifically know the term "energy drinks". Beverages with high levels of caffeine or foods with added caffeine are regulated (OJEU, online, 2011). In general, ED is a highly caffeinated soft drink, which has no alcohol amount. It may also contain other added substances like sugars, other additives such as riboflavin and pyridoxine (Miller, 2013) as well as legal stimulants such as taurine or guarana. Although there are diet versions on the market, the average amount of calories and sugar in regular energy drinks is higher than in other regular soft drinks (HM Government, online, 2019). ED producers often communicate many positive effects associated with drinking of this type of beverage, e.g. energy enhancement to increase physical and cognitive performance (Česká pediatrická společnost, online, 2020), but the research to support these statements is limited (Alsunni, 2015).

Since the first appearance on the market, the EDs category has grown dramatically (Alsunni, 2015). Some health authorities recommend to restrict sales of EDs to children (Česká pediatrická společnost, online, 2020). Consumption of EDs among children and adolescents is very common in EU states (Puupponen, Tynjälä, Välimaa and Paakkari, 2023).

1.1 Energy Drinks Market in the Czech Republic and Slovakia

According to the study for EFSA (European Food Safety Authority) prevalence of EDs consumption in Europe was 82 % in the group of adolescents and 40 % in the group of children (Zucconi et al., 2013). Czech children and adolescents belong to the highest consumers compared to other European countries (Euractiv, online, 2024). Newer data from 2018 suggest a declining trend in consumption of soft drinks in general, excluding EDs. In Slovakia, 45% of children and adolescents have experience with EDs (MPSVR SR, online, 2023).

In the first 10 months of 2022, the sales of energy and sports drinks reached 52 million litres in the Czech market (2.2 % annual increase). Total revenue for the same period was around 2.4 billion CZK (16.6 % annual increase) (Bachárová, 2023). In Slovakia, 23 mil. litres of EDs were sold in 2018 (a year-on-year increase of 1 2% in sales and 13 % in volume) (Tovar a predaj, online, 2019).

1.2 Regulation of Energy Drinks on the EU and National Level

EDs category is regulated on the EU as well as national level. At EU level, for the labelling of EDs specific provisions are envisaged, implemented in the Food Information to Consumers Regulation (EU) No 1169/2011 (OJEU, online, 2011). This legislation constitutes harmonised European law and is applicable in all EU member states. In accordance with the latter regulation, the labelling of energy beverages (only those containing over 150 mg/l of caffeine) includes the indication “High caffeine content. Not recommended for children or pregnant or breast-feeding women” (UNESDA, online, 2022).

Some of the EU member states banned the sale of EDs under a certain age level. In 2014 Lithuania became the first country in the world to ban the sale of EDs to minors (Ministry of Foreign Affairs of the Republic of Lithuania, online, 2014) followed by Latvia in 2016 where the restrictions also pay for EDs served as tastings or given as gifts, i.e. free of charge. In Latvia also retail trade of EDs is prohibited in the premises and territory of educational institutions (Legal Acts of the Republic of Latvia, online, 2016). In 2019 Great Britain (former EU member state) ended sale of EDs to children under the age of 16 (HM Government, online, 2019). Poland started a strict regulation of EDs in 2024 (Euractiv, online, 2024). In the Czech Republic a discussion about EDs restrictions for minors under 15 years old is held (Český rozhlas, online, 2023).

1.3 Consumer Behaviour on the Energy Drinks Market

If we discuss a group of products whose use is not desirable for a particular segment of consumers, as in the case of alcohol, tobacco products or EDs, knowledge of consumer behaviour is crucial for another reason than in the case of non-problematic products. It enables to understand the attitudes and motivations for undesirable behaviour and then take action to minimise them particularly at government and local authorities’ level (Chen, Liu, Jaenicke and Rabinowitz, 2019). It does not have to be a direct restriction at the legislative level, but, for instance, educational campaigns focusing on explaining some possible negative consequences of using such products to target groups. Then of course also the change in attitudes can be measured as the result of such a campaign (Spáčil, 2016). The issue of EDs consumption among young people has been described in many studies.

The negative effects of EDs consumption are mainly due to the high content of sugar or sugar substitutes, caffeine and other substances such as taurine and guarana (Pomeranz, Munsell, Harris, 2013). The effect of these ingredients can result in poorer sleep quality (Chaput et al., 2018; Nuss, Morley, Sculy and Wakefield, 2021), heart rhythm disturbances and increased

blood pressure (Mandilaras, Li, Dalla-Pozza, Haas and Oberhoffer, 2022), and frequent consumers are more prone to obesity (Damiri et al., 2021; Lee and Lee, 2019). Richards and Smith (2016) in their review give an overview of articles that mention negative effects such as higher levels of anxiety, stress and depression, and on the other hand, lower levels of well-being in relation to EDs consumption.

Studies describing various determinants of EDs consumption come from different countries and focus on different groups of young consumers. The most frequent target groups of the research are primary school pupils (Girán et al., 2023), adolescents (Trapp et al., 2022; Kaldenbach, Strand and Holten-Andersen, 2023; Żyłka and Ocieczek, 2022a, 2022b) and university students (Thiab et al., 2023; Kuş, Keten, Güvenç and Gümüştakım, 2022; Pavlovic et al., 2023). Review of many studies states that the prevalence of EDs consumers is higher among men (Protato et al., 2023). One of the characteristics of EDs consumer behaviour is the frequency of use, which is higher among men and older adolescents and university students. Trapp et al. (2022) report other factors significantly associated with the use of EDs such as higher disposable income, having sensation-seeking personality, having friends who use EDs and parents who are willing to give them EDs, and having EDs available at home. The most discussed issues are the reasons for EDs consumption. Kozirok (2017) states that for younger consumers the taste and the desire to quench thirst are essential, while for older users the main reason is to overcome fatigue and stimulate the body and mind. The boosting effect is cited in studies as the most common reason for consuming energy drinks. The need for more energy is most often associated with studying or sports performance (Protato et al., 2023). The link between the use of EDs and other addictive substances such as alcohol and tobacco has also been investigated (Protato et al., 2023).

1.4 Consumer Attitudes toward Energy Drinks

Attitudes are one of the attributes that influence the intention to behave in a certain way (e.g. to buy a certain product) and subsequently the behaviour itself. This effect was explained by Ajzen (1991) in the theory of planned behaviour. The latter theory specifies that we can predict future individual behaviour by examining intentions (Pawlasová, 2016). For this reason, knowledge of the attitudes of existing and potential users is essential in the case of EDs as these attitudes can predict actual consumption.

In the area of attitudes towards EDs, Żyłka and Ocieczek (2022a) highlight an issue that frequently appears in research articles. Although these articles have the word attitudes in the title, they often focus more on research and description of knowledge about EDs, or on consumer behaviour, i.e. ED consumption. Insofar as articles already deal the issue of attitudes (Kozirok, 2017; Kuş, Keten, Güvenç and Gümüştakım, 2022; Thiab et al., 2023) their measurement lies in averaging the results (presentation of average values of scale responses). Therefore, Żyłka and Ocieczek (2022a) decided to design and validate a scale to measure attitudes towards EDs, specifically for a target group of adolescents. Final version of their scale consists of 21 statements and its reliability has been proved. In the following study, Żyłka and Ocieczek (2022b) conducted research among 709 Polish adolescents aged 13-19 years to identify their attitudes toward EDs and also to investigate associations between these attitudes and consumption behaviours.

2. Problem Formulation and Methodology

This part of the paper describes the initial research problem, defines research objectives and the chosen method for their fulfilment.

2.1 Problem and Objective Formulation

Regarding present or intended regulations on the various European markets, it can be crucial to take overall attitudes of consumers into consideration. There are not many studies on attitudes towards EDs and typical characteristics of consumer behaviour in the Czech and Slovak contexts. Research studies are usually focused on the category of children and adolescents while a category of university students is not very common in both markets.

The main objective of the presented study was to identify university students' attitudes to EDs. The scale for EDs attitudes measurement was adopted from Żyłka and Ocieczek (2022a, 2002b). Also, EDs consumption habits were investigated. The research was conducted in two European countries (Czech and Slovak Republic), so the particular aim of this paper was also to verify and compare the results with those from Poland presented by Żyłka and Ocieczek (2022a, 2022b). EDs consumption habits and attitudes to EDs were also evaluated in detail by additional variables, e.g. gender, age and study results of university students.

2.2 Materials and Methods

This subsection describes the method of measuring attitudes towards EDs as well as the method of collecting quantitative data. The sample structure is included.

2.2.1 Scale for Measurement of Attitudes towards Energy Drinks

In the present study, attitudes were measured on a 21 statements scale which was developed by Żyłka and Ocieczek (2022b), see Table 1. The scaling technique employed in presented research was a non-comparative itemised rating scale, specifically 5–point Likert scale. The respondents expressed their own degree of agreement (5-strongly agree) or disagreement (1-strongly disagree) with each statement. Statements with negative meaning were then recoded for the purposes of further analysis. For a negative statement, a disagreement means in fact a positive response, e.g. a score 1-strongly disagree was replaced by a score 5-strongly agree in statements number 6, 7, 10, 11, 13, 14, 15, 17, 20 and 21. Because of the intent to apply a Polish model of Żyłka and Ocieczek (2022b) into the conditions of the Czech and Slovak Republic, statements towards EDs were divided into three groups as follows: (1) positive, (2) ambivalent and (3) negative. Overall scores for each respondent for all measured statements were counted and a new variable was added into a dataset. The positive attitude was indicated by the overall score from 78 to 105, ambivalent attitude was denoted by the range from 49 to 77 and negative attitude was indicated by the range from 21 to 48.

2.2.2 Energy Drinks Consumption Habits

In order to gain a deeper and more detailed understanding of university students' attitudes towards EDs, other characteristics related to consumption behaviour were also investigated, i.e. a frequency of EDs consumption and a single intake of ED in ml. The respondents were asked to indicate their frequency of drinking from 'never' to 'several times a day', a total number of options was 6. The single dose of ED varied from 'less than 250 ml' to 'more than 500 ml' with a total number of 5 options. Both questions were adopted from Żyłka and Ocieczek (2022b) in order to compare the Polish market with the Czech and the Slovak markets. Also, other characteristics were used for the purposes of analysis, i.e. gender, age and study results (students evaluated their study results subjectively as 'excellent, average, below average').

Table 1: Statements to Measure Attitudes towards EDs

Statements
1. EDs improve well-being
2. EDs are tasty
3. EDs improve concentration and make learning easier
4. EDs stimulate
5. EDs improve physical condition
*6. Positive effects of EDs are not proven by scientists
*7. Parents should prohibit children and adolescents from drinking EDs
8. I can drink EDs
9. For me, there is nothing wrong in EDs
*10. EDs should be allowed only to adults
*11. EDs should not be sold to children and adolescents
12. EDs can provide a source of vitamins
*13. EDs contain too much sugar
*14. EDs can be addictive
*15. Drinking EDs poses health risks
16. Negative opinion on EDs is exaggerated
*17. EDs are redundant and unnecessary
18. Drinking EDs is safe
19. I would like to try EDs, even if I do not know how I would feel afterwards
*20. EDs are carcinogenic
*21. There are too many types of EDs available in stores

* Statements with negative meaning which were recoded
Source: Adopted from Żyłka and Ocieczek (2022b)

2.2.3 Population and Sample

The presented study was conducted in 2024 among 205 university students in the Czech Republic (145) and Slovakia (60). Judgemental sampling, i.e. non-probability sampling technique was used to obtain the samples. Anonymous online questionnaires were used to get the data from both samples, which were then characterised by gender, study results and age (see Table 2).

Table 2: Sample Structure

		Czech Republic		Slovakia	
		Frequency	**Percent**	**Frequency**	**Percent**
Gender	Male	92	63.4	37	61.7
	Female	53	36.6	23	38.3
Study results	Excellent	44	30.3	24	40.0
	Average	95	65.6	34	56.7
	Below average	6	4.1	2	3.3
Age	–	22.7*	±1,85**	21.9*	±1,78**

*Mean value, **Std. deviation
Source: Own elaboration (2024)

3. Problem Solution

This section describes the results of the research, i.e., EDs consumption habits of university students and their attitudes towards EDs.

3.1 Energy Drinks Consumption Habits

Study was also focused on evaluating some additional issues that could help to explain the observed attitudes. The frequency of EDs consumption was the first one and the single intake of EDs was the second variable to examine. Very small differences in the frequency of EDs consumption between Czech and Slovak university students were observed (see Table 3). In both markets, almost one half of students (49 % in Czech Republic, 48.3 % in Slovak republic) do not drink any EDs. Compared to the study by Żyłka and Ocieczek (2022b) conducted on the sample of Polish adolescents, both Czech and Slovak university students are more ED non-drinkers. Slightly above one third of students in the Czech Republic (36.6 %) and almost one third in Slovak Republic (31.7 %) consume this type of soft drink 1-3 times a month (similar share as Polish adolescents). Only 3.4 % of Czech and 6.7 % of Slovak university students drink EDs at least once a day and more often while the share of Polish adolescents in this category was more than 10 % as Żyłka and Ocieczek (2022b) presented.

Table 3: Frequency of EDs Consumption (in %)

	Never	1-3 times a month	Once a week	Several times a week	Once a day	Several times a day
Czech Republic	49.0	36.6	4.8	6.2	2.1	1.3
Slovak Republic	48.3	31.7	3.3	10.0	3.3	3.4

Source: Own elaboration (2024)

The single intake of ED seems to differ between the Czech and the Slovak Republic. Slightly more than two thirds (67.1 %) of Czech university students consume 250 ml and less than 250 ml as a single intake. In Slovakia, it is 58.1 % (see Table 4). Almost the same result as in Slovakia was found in the Polish sample of adolescents in the study of Żyłka and Ocieczek (2022b). On the other hand, more Slovak university students consume larger packaging of EDs. Single intake of 500 ml and more was declared by 6.4 % of Slovaks, but zero Czechs, but more than 19 % of Polish adolescents (Żyłka and Ocieczek, 2022b).

Table 4: Single Intake of ED (in %)

	Less than 250 ml	250 ml	330 ml	500 ml	More than 500 ml
Czech Republic	34.2	32.9	9.6	23.3	0.0
Slovak Republic	19.4	38.7	16.1	19.4	6.4

Source: Own elaboration (2024)

3.2 Attitudes towards Energy Drinks

The evaluation of attitudes towards EDs shows some differences between Czech and Slovak university students (see Table 5). Ambivalent attitudes prevail among both nationalities. Negative attitudes were expressed a little bit more by Czech students. The biggest differences are found in positive attitudes, which are held by 0.7 % of Czech and 6.7 % of Slovak students. Compared to the study among Polish adolescents (Żyłka and Ocieczek, 2022b), Czech and

Slovak university students show roughly one times higher levels of negative attitudes. One reason for these differences may be that this paper examines the attitudes of university students, who may have more information and experience with EDs compared to adolescents. Also, the fact that the data for the Polish study was collected in 2018, and since that time there has been a much more intense discussion in the public space about the negative effects of EDs and their regulation, can be a reason for the different results.

Table 5: Attitudes towards EDs according to Gender (in %)

Attitudes towards EDs	Czech Republic			Slovak Republic		
	Total	Male	Female	**Total**	Male	Female
Negative	**42.8**	26.4	52.2	**38.3**	21.7	48.6
Ambivalent	**56.6**	71.7	47.8	**55.0**	60.9	51.4
Positive	**0.7**	1.9	0.0	**6.7**	17.4	0.0

Source: Own elaboration (2024)

As well as in the Polish study there were statistically significant differences in attitude scores by gender in the Czech and Slovak Republic. Positive attitudes were found only among men, with a higher proportion of Slovak students. The largest proportion of male respondents in both countries are ambivalent about EDs. Czech female students have predominantly negative attitudes, while Slovak female students have ambivalent attitudes, but the differences in response rates are not significant.

There were no statistically significant differences in attitudes towards EDs according to the study results. This is a bit at odds with the Polish study, where students with better academic achievements tended to have more negative attitudes towards EDs. The difference may lie in the way learning outcomes are assessed. While Polish adolescents were ranked on the basis of objective indicators (grade point average), Czech and Slovak university students evaluated their study results only according to their subjective perception.

The association between attitudes towards EDs and frequency of consumption was also examined, and statistical significance was proved. Students with negative attitudes most often reported not consuming EDs (80.6 % of Czech students, 87.0 % of Slovak students). On the other hand, one Czech student with a positive attitude consumes EDs several times a week and Slovak students with positive attitudes consume EDs also several times a week or more often. These findings are consistent with the Polish study.

Polish study also found an association between attitudes towards EDs and level of single ED intake. Among adolescents who took larger doses of an ED on a single intake (more than 500 ml), the largest group was made up of those with positive attitudes. Although Czech and Slovak university students also show a preference for higher levels of single intake among those with positive attitudes towards EDs and vice versa, no statistical significance was proved.

4. Conclusion

This paper discusses the attitudes of Czech and Slovak university students towards EDs. The method of assessing these attitudes was taken from a Polish study (Żyłka and Ocieczek, 2022b). It was found that almost half of the respondents in both countries do not consume EDs at all. It was also found that ambivalent attitudes prevail in both countries, more so among men. This fact poses a potential risk, as ambivalent attitudes may turn into positive attitudes, which is not desirable given the health risks posed by EDs. A relationship between attitudes

and frequency of EDs consumption was also found, with positive attitudes associated with more frequent use.

The question is to what extent university students perceive the potential risk of consuming energy drinks. Almost one half of the university students in this study identified themselves as EDs non-drinkers. This result suggests that at least one part of young adults' segment certainly perceives these potential negatives. In this sense, further research, probably qualitative, would certainly be needed with the aim to find out the main incentives, motivations and reasons, why they reject consumption of EDs. Based on further results, it would then be possible to formulate specific communication strategies with specifically tailored messages oriented on the target group of young adults. On the other hand, general education on healthy lifestyle should certainly start earlier, at the latest at the start of primary school where the expected effect on future consumer behaviour could be higher. A broader public debate at different levels (schools, regional and national institutions and authorities) could also be helpful.

It is necessary to point out that this research has its limitations, particularly with regard to the non-representativeness of the research and the sample size. For further research it would be interesting to find out what exactly shapes attitudes towards EDs, especially to what extent young people perceive the discussion of this issue in the public space, to what extent they allow themselves to be influenced by their surroundings, etc.

Acknowledgements

This paper was created within the project Students Grant Project (SGS) *Analysis of Mediators and Outcomes of Consumer Behaviour in the B2C Market.* Project registration number SP2024/094.

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Trends in Healthcare Workers Migration Between the USA and EU

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Abstract
In the world economy, it can be observed a shortage of health professionals, mainly caused by migration. Both developed and developing countries are struggling to cope with the challenges caused by the imbalance between the growing demand for health professionals and their limited numbers. The paper deals with the labour force migration flows situation analysis within the USA and EU to figure out the problematic aspects regarding the USA and EU healthcare sector labour markets development. To accomplish this goal, methods such as analysis, comparison, synthesis, and logical deduction are to be used by exploring data drawn from generally accepted international institutions. Analysed migration of healthcare workers between the world regions has revealed shrinking migration trends from EU to the USA, and conversely increasing migration from North America to Europe. Even though there are still more European migrants in the USA than vice versa, this trend has been reversed over the last two decades, with more migrants flowing from the US and Canada to the EU than vice versa.

Keywords: *doctors, healthcare professionals´ shortage, healthcare sector, labour migration, nurses*

JEL Classification: *F22, I11, J62*

1. Introduction

Healthcare workers are an important pillar of the healthcare system and a prerequisite for high quality and efficient healthcare delivery. The health care system faces many unexpected challenges and new trends in today's global world hence the healthcare depends mainly on workforce availability. Therefore, the management, planning and forecasting of healthcare workforce plays an important role as well as education, financing, up-skilling, professional development, and each country adapts it to its own needs and conditions (Ivanová, Grmanová, 2021). In many EU and the USA, there is growing concern about the acute shortage of nurses, doctors and health care professional specialists. Territorial imbalances are also causing difficulties in healthcare provision, along with the growing demand for healthcare from an ageing population, as well as an ageing population of health professionals who have no replacement. Healthcare provision is affected by long-standing labor shortages. It is therefore also the task of any national policy to face and respond to these changes in a timely manner, through migration policy (Vojtovič, 2013; Mynarzová, 2022). One of the fundamental issues or consequences of the deteriorating situation in the healthcare sector is the outflow of health professionals abroad. The healthcare workers shortage was evident during the COVID-19 pandemic, which initially halted migration but accelerated again in the post-pandemic era. This is also why every country should carefully plan its healthcare workforce supply so that it does

not have to rely on recruiting healthcare workers from abroad (Melecký, 2022; Nenička, 2022). Regarding the issues mentioned above, the paper based on the labour migration analysis between the USA and the EU, deals with the reasons for healthcare worker migration and sets out options for improving the situation.

2. Theoretical Background

The migration of healthcare labor represents only a part of the global migration, but the issue is even more serious because healthcare sector in the broader sense and health in the narrower sense are a very important aspects of individual life and the functioning of a society. Currently, countries in general are facing a shortage of healthcare personnel and this is the main reason for the migration of healthcare professionals from developing countries to developed countries (Tupá, 2020). However, this poses a major issue for developing countries where healthcare workforce shortages are exacerbated. Based on a report (WHO, 2023a) examining the evolution of healthcare supply and demand, the U.S. is likely to face a shortage of more than 446 thousand home healthcare assistants, 95 thousand nursing assistants, 98 thousand laboratory technicians and technologists, and 29 thousand nurses by 2025. Of course, the U.S. is not the only country plagued by these problems - the International Health Organization (WHO, 2023b) predicts a global shortage of more than 18 million health workers by 2030, with deadly consequences for patients, economies, and communities. Staff shortages will not be equal across countries but will be visible everywhere. The rising demand for healthcare workers will be felt most in upper middle-income countries (Tupá, Krajčo, 2019; Kordoš, 2022).

Healthcare sector is now considered to be one of the most complex areas of any economy and thus it may seem too complicated to deal with to the general public. Also, currently, the healthcare sector in many countries is considered inadequate in terms of the quality and quantity of services provided (Privara, Masárová, Tupá, 2023; Melecký, Staníčková, 2022). Many studies, books and scholarly articles discuss the issues that are at the heart of the deteriorating situation in healthcare sector. One of the main solutions in recent years has been the "importation" of healthcare personnel from external environments (Hawthorne, 2001; Szabo, et al. 2020). Thus, migration is becoming increasingly highlighted in terms of healthcare debates. Globally, the healthcare sector performs poorly in predicting and securing the number of properly trained healthcare workers. The World Health Organization (WHO) and the Global Workforce Alliance (GHWA) analyzed data for 183 countries, covering supply, skills, access to care, etc., and concluded that every single country faced a shortage of healthcare workers (Bourgeault, at al. 2023).

The number of health workers is a globally debated issue. With data from 194 Member States as of 2020, the global healthcare workforce was estimated at 65 million, reflecting a growth of 29% since the adoption of the Global Human Resources for Health Strategy in 2016 (Eurostat, 2023; OECD, 2023a). However, by 2030, WHO (2023b) expects 18 million healthcare worker shortages, mainly in lower- and middle-income countries. Two out of five doctors active today in the U.S. will be aged 65 or older in the next decade. Among lower-level healthcare workers (medical assistants, etc.), 3.2 million are projected to be missing over the next 5 years. In Germany, 14 000 nursing positions in hospitals and a further 8 000 in intensive care units were unfilled in 2021, with 5 000 positions for doctors (Gódány, et al. 2021; OECD, 2024). The lack of investment in education and training of health professionals in some countries and the mismatch between education and employment strategies in relation to healthcare systems and the needs of the population contribute to the healthcare workers shortage issue. This is compounded by the difficulty of deploying healthcare workers to rural, remote and

underserved areas. In addition, increasing international healthcare workers migration may exacerbate healthcare workforce shortages, particularly in low- and lower-middle-income countries (Humphries, et al. 2013).

3. Problem Formulation and Methodology

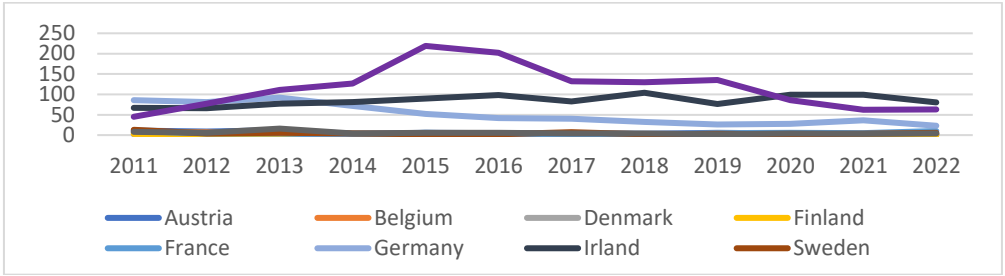
The research task of this paper is focused on the assessment how the healthcare sector migration changes are affecting the labour market stabilization within this sector in the USA and EU. The goal of the paper is based on the labour force migration flows situation analysis within the USA and EU to figure out the problematic aspects regarding the USA and EU healthcare sector labour markets regarding their parallels, symbiosis, synergies and further development. To accomplish this goal, methods such as analysis, comparison, synthesis and logical deduction are to be used. Subsequently the analysis will lead to synthesis and prognosis by means of abstraction method eliminating the less important factors to set general statements and opinions. The results of this analysis are to be interpreted by means of graphs and tables. Basic data being primarily used and examined will be drawn from generally accepted institutions to assess the migration flows and trends issues such as OECD, International Labour Organization, Statistics Canada, U.S. Census Bureau, World Health Organization and Trenčín, 23. Feb. 2024Eurostat.

4. Problem Solution

According to Figure 1, the annual inflow of doctors from Western and Northern Europe has been declining in recent years, with a 24% drop from 2011 to 2022, with most doctors coming from the UK, Ireland, and Germany. But even though the inflow as a whole has been declining since 2016, this does not mean that the numbers as a whole are declining; on the contrary, the number of doctors from Europe as a whole in the USA is rising - Table 2. Even though, a gradual slowdown can be predicted in the growth of the number of doctors from the EU in the USA and a gradual reversal of the trend (although this is already slowly happening, when observing the migration of doctors from the USA to Europe - Table 3). An even bigger decline can be seen from the areas of Eastern and Southern Europe (Fig. 2), where the inflow is dropping even more, with a 50% decline since 2014 (Table 1). On average, this represents a year-on-year decline of roughly 5-6%. The countries from where these doctors have flowed (and are flowing) are Poland, Greece and Hungary. This is a relative decline in the trend of annual inflows, and if aggregated all areas together, it can be figured out that in the first decade the average annual inflow of European doctors to the USA was 652 doctors per year, while in the second decade it was only 484. It is predicted that this trend would continue in subsequent periods, but if nothing changes, the number of European doctors in the USA will be increasing slightly (as will the number of U.S. physicians in Europe).

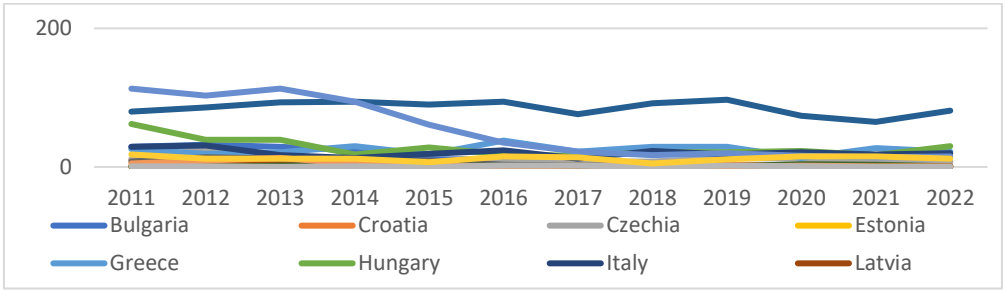
According to Table 1, over the observed period the inflow of nurses decreased by 74% (for West and North) and by 64% (for East and South). This, of course, may be due to several factors, such as the large wage differential (as in case of doctors´ remuneration) and the relatively high number of nurses in the USA (thus reducing the demand for nurse labour). The USA need to make up for the lack of medical care (by doctors) by substituting nurses, which is why the number of nurses in these countries is relatively high.

Figure 1: Annual Inflow of Doctors from Western and Northern EU to the USA



Source: own elaboration by OECD (2023); Eurostat (2023); U.S. Census Bureau (2023)

Figure 2: Annual Inflow of Doctors from Southern and Eastern EU to the USA



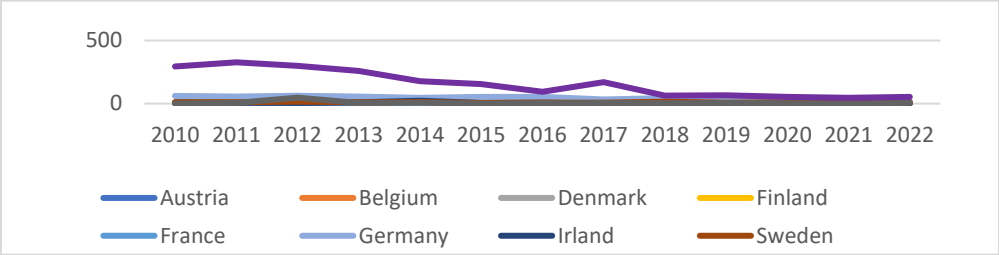
Source: own elaboration by OECD (2023); Eurostat (2023); U.S. Census Bureau (2023)

Table 1: Annual Inflow of Doctors and Nurses from the EU to the USA

Year	Doctors from Western and Northern EU to the USA	Difference in %	Doctors from Southern and Eastern EU to the USA	Difference in %	Nurses from Western and Northern EU to the USA	Difference in %	Nurses from Southern and Eastern EU to the USA	Difference in %
2011	252		395					
2012	261	-3,6	385	-2,5	433	6,1	179	21,8
2013	321	-23,0	381	-1,0	455	5,1	175	-2,2
2014	296	3,8	319	-16,7	361	-20,7	164	-6,3
2015	386	30,4	260	-18,5	286	-20,8	144	-12,2
2016	360	-6,7	258	-0,8	233	-18,5	117	-18,8
2017	274	-23,9	190	-26,4	179	-23,2	94	-19,7
2018	279	1,8	210	10,5	228	27,4	75	-20,2
2019	255	-8,6	215	2,4	140	-38,6	71	-5,3
2020	231	-9,4	188	-12,6	122	-12,9	77	8,5
2021	213	-7,8	174	-7,5	106	-13,1	45	-41,6
2022	191	-10,3	195	12,1	88	-17,0	38	-15,6
Change in %		**-24,2**		**-50,63**		**-74,1**		**-64,2**

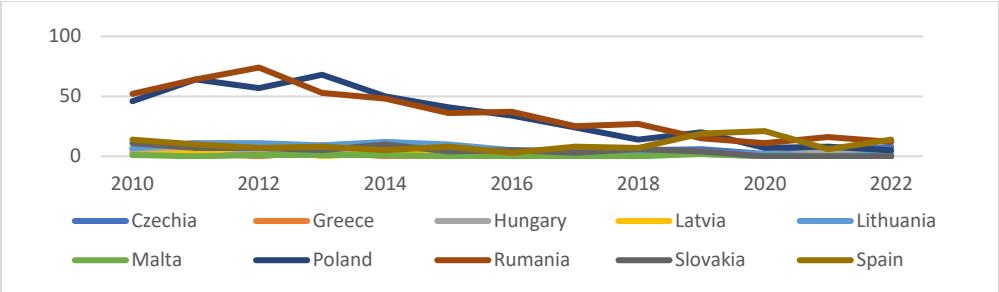
Source: own elaboration by OECD (2023); Eurostat (2023); U.S. Census Bureau (2023)

Figure 3: Annual Inflow of Nurses from Western and Northern EU to the USA



Source: own elaboration by OECD (2023); Eurostat (2023); U.S. Census Bureau (2023)

Figure 4: Annual Inflow of Nurses from Southern and Eastern EU to the USA



Source: own elaboration by OECD (2023); Eurostat (2023); U.S. Census Bureau (2023)

Table 2: Number of Doctors in the EU in the USA

Year	from Western and Northern EU to the USA	Difference in %	from Central and Eastern EU to the USA	Difference in %
2013	9622		11323	
2014	9712	0,9	11251	-0,6
2015	9704	-0,1	11232	-0,2
2016	10258	5,7	11376	1,3
2017	10921	6,5	11886	4,5
2018	11785	7,9	12392	4,3
2019	12245	3,9	12623	1,9
2020	12016	-1,9	12112	-4,1
2021	12055	0,3	11996	-1,0
2022	12242	1,6	11838	-1,3
Change %		**27,2**		**4,6**

Source: own elaboration by OECD (2023); Eurostat (2023); U.S. Census Bureau (2023)

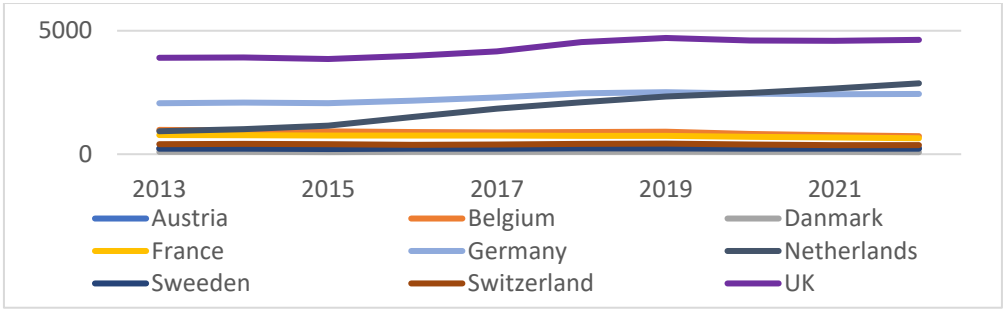
Table 3: Inflow of Doctors from the USA to the EU

Year	in the USA from Western and Northern EU	Difference in %
2010	423	
2011	431	1,9
2012	418	-3,00
2013	453	8,4
2014	491	8,4
2015	570	16,1
2016	564	-1,1
2017	581	3,0
2018	610	5,0
2019	637	4,4
2020	635	-0,3
2021	662	4,3
2022	662	0,00
Change %		**56,5**

Source: own elaboration by OECD, 2023; Eurostat, 2023; U.S. Census Bureau, 2023

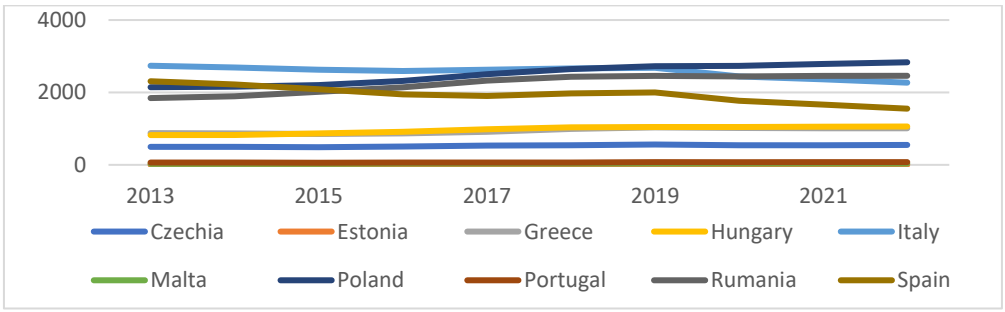
In Figures 3 and 4 it can be seen the annual inflow of nurses from the EU to the USA. For nurses, the United States is an increasingly less desirable destination. Over the observed period, a significant decline in the inflow of nurses from the EU to the USA is noticeable from 2012, particularly from the highest performing countries such as Poland, the UK and Spain. This results in the shortage of doctors in the USA. It is just by employing foreign doctors that these countries are relieving the pressures of demand. Of course, the wage in the USA is often several times higher than in some EU countries, being an important factor in attracting European doctors to the USA. However, these wages are caused by monopolistic practices (barriers to entry into the industry, limiting the number of applicants, licensing, etc.) by the American Medical Association (AMA), which is supported by federal and state authorities. It cannot be said that the USA is a magnet for foreign doctors because of the free market - quite the opposite. Thus, doctors´ compensation in the USA in no way reflects economic reality, and if training or licensure requirements were eased, those wages would also be lowered - as there would be more doctors and thus more supply for the same demand (ceteris paribus).

Figure 5: Number of Doctors in Western and Northern EU in the USA



Source: own elaboration by OECD (2023); Eurostat (2023); U.S. Census Bureau (2023)

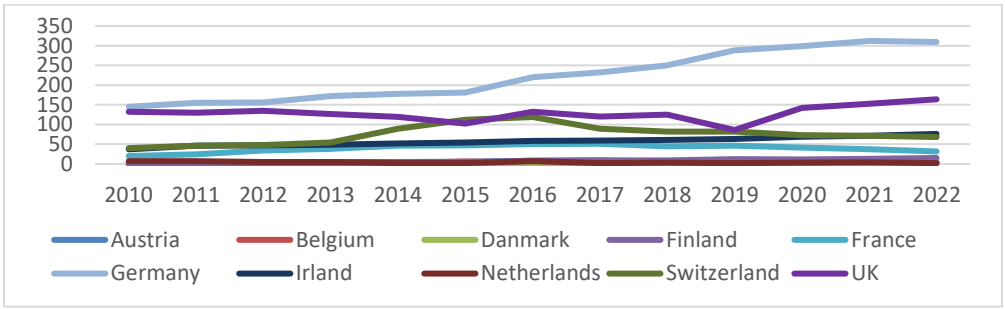
Figure 6: Number of Doctors in Southern and Eastern EU in the USA



Source: own elaboration by OECD (2023); Eurostat (2023); U.S. Census Bureau (2023)

An interesting finding can be seen in Figures 5 and 6 being the relatively large increase in the number doctors from the Western and Northern EU in the USA (compared to the South and East). It can be seen that initially (around 2006-2010) there were quite a few more doctors from the South and East EU than from the North and West EU in the USA. This was still a remnant of increased migration as a result of the collapse of the Soviet Union in the 1990s. But the trend has reversed in recent years, and more migrant doctors tend to come from the West EU, while the number of doctors from the East EU has stagnated or increased only very modestly.

Figure 7: Annual Inflow of Doctors from the USA to EU



Source: own elaboration by OECD (2023); Eurostat (2023); U.S. Census Bureau (2023)

Table 3 and Figure 7 illustrate the migration of doctors from North America to EU. As it can be seen, these are not significant flows - yet, as they are expected to increase in the upcoming years. However, the fact remains that their number in Europe has increased by more than 56% since 2008, especially in countries such as the UK, Germany, Ireland and Switzerland.

5. Discussion

By and large, although there are still more European migrants in the USA than Americans in Europe, this trend has been reversed in recent decades, with more and more Americans flowing into the EU, and conversely the number of Europeans in America declining. In general, the US migrants coming to the EU (or both those individuals who would have left the EU in the past and those returning to the EU from the US) take into account more the following aspects: bigger job security, social protection (unemployment, sick leave, family), less demanding, shorter, and less health-risk work - even at the expense of less opportunity for career advancement, and higher taxes and levies. In general, the more wages have increased over the years in the EU, the less people have felt the need to leave and have started to consider those aspects (rather social issues and security) more than before. In contrast, European migrants coming to the US (or even American migrants coming to the Europe) consider the following aspects less and less: higher wages, more opportunity for career growth, less taxes and more economic freedom, even on account of less opportunity for career growth and more taxes and levies. Although the level of economic freedom in the US is increasing, it has either stagnated or even declined in recent years. By contrast, economic freedom has been growing in Europe over the last decades. Hence it could be argued that given migration trends follow trends in changes in economic freedom - but it does not appear to be the case causality, rather a correlation and just a side aspect.

Based on the research findings, a slightly different situation arises when assessing the migration of doctors. US doctors are more and more coming to the EU - which follows the general migration flows from the USA to the EU, but also more and more EU doctors are coming to the USA - which is, for a change, at odds with general (labour) migration. Healthcare professionals therefore consider more: higher wages and flexibility of working hours, career and career development - despite more demanding work and longer working hours and, conversely, they consider social protection and job security less important. A likely explanation why this is the case relates to the nature of the work performed - or the level of skills required. Casual labour migration contains all three skill levels - high skilled, medium skilled and low skilled, but most medium and low skilled. In contrast, healthcare workers are classified as highly skilled and skilled, and it is those workers who do not have to worry about

losing their jobs. Additionally, in the USA there is a higher level of monopoly protection for doctors than in the EU, which ensures both job security and wage levels (which are the result of monopolistic practices and not free market transactions).

In terms of polemic and the claim that more healthcare workers are migrating to the USA than out of this country, the biggest difference is that the increase in the number of EU doctors in the USA does not follow a change in economic freedom. It is in those countries that economic freedom has stagnated or declined - but the number of migrant doctors has increased. That is, even although there are more EU doctors in the USA than American doctors in the EU (as with general labour migration with casual workers), the number is increasing year by year (which is in contradiction with general labour migration).

6. Conclusion

Based on the previous results assessment, it can be concluded that the issue of healthcare professionals' movement between the USA and EU appears to be a very serious issue that has a long-term character and significant impacts on social and economic development and labour market situation in both destinations. When it comes to analysed and discussed findings it can be summarized that when analysing the healthcare professionals´ migration between the observed destinations, decreasing migration trends from the EU to the USA, and on the contrary increasing migration from the USA to EU were revealed. Even though there are still more EU migrants in the USA than vice versa, this trend has been reversed over the last two decades, with more migrants flowing from the USA to the EU than vice versa. There are emerging issues necessary to be solved, as healthcare demands are increasing, the healthcare workforce is shrinking, with many workers reaching retirement age, threatening the sustainability of healthcare and access to healthcare. In destination countries, international migration can be used as a tool to address specific labour market gaps. However, migration alone would almost certainly not reverse the continuing trend of population ageing that is occurring in many parts of the EU and USA. Further research will be devoted to exploring the issues such as the healthcare spending on the healthcare workforce composition; the demand on health care labour in Slovak Republic and EU countries; a statistical analysis to explain the reasons behind the trends presented on the Slovak healthcare system labour force.

Acknowledgements

This paper was supported by the Slovak Ministry of Education's grant agency - Slovak Research and Development Agency: „Personnel management processes set-up in hospitals and their impact on the migration of physicians and nurses to work abroad". Project registration number: [Reg. No.: APVV-19-0579].

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Legal Challenges and Limits of Artificial Intelligence

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Abstract
The use of artificial intelligence (AI) in various fields brings both challenges and opportunities. Especially in the legal environment, these aspects become central in assessing the impact, liability, and regulation of AI, both at EU and Czech level. An important issue is the determination of legal liability for possible damage caused by AI, the protection of personal data and the security of privacy when using AI. Legal aspects associated with artificial intelligence also include issues of intellectual property and transparency of AI decision-making processes. This article focuses on analysing key legal aspects of AI to identify areas of potential legal disputes. As a result, we see a need for further development of the legal framework in the field of artificial intelligence, especially in the areas of intellectual property, liability for damage and data protection. According to the authors, the identified shortcomings and challenges require a comprehensive approach and close cooperation between lawyers, technology experts and regulators.

Keywords: *AI Act, AI, compensation of damage, copyright law, EU, European Integration, GDPR, liability*

JEL Classification: *G53, K10*

1. Introduction

Artificial intelligence is gradually being projected into personal and work areas, into almost all industries and services, many times even where we would not expect it. Artificial intelligence applications such as ChatGPT, GitHub Copilot, Stable Diffusion and others are used by the public and have impressed almost everyone with their ability to conduct even supernatural conversation with the user (McKinsey, 2023). Moreover, generative artificial intelligence technology is evolving faster than the public is familiar with the system. ChatGPT was released in November 2022. Four months later, OpenAI released a new large language model, LLM, called GPT-4 with significantly improved capabilities. In its report, the McKinsey Company (McKinsey, 2023) states that AI will have a significant impact on all industries, can change the way work is done and automate work activities.

There are countless definitions of artificial intelligence. If we ask ChatGPT how it defines artificial intelligence, we get the following answer: „*Artificial Intelligence (AI) refers to the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using that information), reasoning (using rules to reach approximate or definite conclusions), and self-correction. AI encompasses various subfields such as machine learning, natural language*

processing, computer vision, robotics, and expert systems. The ultimate goal of AI is to create systems that can perform tasks that typically require human intelligence, such as understanding natural language, recognizing patterns, solving complex problems, and adapting to new situations." (ChatGPT 3.5, 2024). Maisner (2023) states that there is no legal definition and if one is presented, it is a current state, as the development of AI is very fast and it is difficult to grasp and regulate the definition. Definitions in articles and studies differ when the reason is that the definition is derived for a specific field, field perspective, or application (Southworth et al., 2023).

With the rapid development of AI and its use across industries, legal and ethical issues and related first AI controversies are emerging and being discussed. According to preliminary estimates, it will be professions related to administration that will be most affected by these changes, as well as other professional services (see Addy et al., 2024; Kokorev et al, 2022; Mazzini and Bagni, 2023; Ramos and Ellul, 2024). As artificial intelligence is also used to automate repetitive simple tasks, it can very easily replace basic administrative and legal work. However, where we begin to discover the possibilities that the combination of artificial intelligence and law brings, we also encounter limits and questions that are still unresolved. The basis is, of course, liability. Whereas in the case of a personal consultation by an administrator or other expert, there is absolutely no doubt as to who is responsible for the advice provided. If such advice is given to you by a machine (an application based on artificial intelligence), all the schemes established so far will collapse on us like an imaginary house of cards. The aim of the article is to analyse the legal issues associated with the use of artificial intelligence and to identify possible areas of legal disputes regarding artificial intelligence.

2. Problem Formulation and Methodology

In legal services, the use of artificial intelligence runs into barriers in the form of ethics (Holmes et al., 2022), data protection and client data. However Dohnal (2023) states that AI can make common tasks easier for lawyers, e.g. by automating routine tasks, sorting documents, can predict for inspiration the results of disputes based on the analysis of previous negotiations, or streamline the processing of electronic data related to a specific case. AI certainly cannot replace legal services, even in relation to compliance and liability to clients. And as Šlemr and Pulgret (2023) states, artificial intelligence does not have reason and feeling. And, for example, several components must always be considered in the judiciary, put into context with the subjective decision of a person, and thus only a person should decide about a person. At the same time, it will be necessary to examine in more detail evidence in the form of photographs or videos, when the judge usually does not contradict them and accepts them as real footage. But as Preuss (2024) points out, with the rapid development and spread of AI to a wide audience, it is foreseen that fake footage and photos will be discovered in evidence in court.

Key legal aspects associated with artificial intelligence thus include issues of intellectual property, legal liability and damages, privacy protection and data security, discrimination, and transparency. Determining liability for potential damages caused by autonomous systems and AI decision-making algorithms, personal data security and privacy protection in the collection and processing of data using AI, questions regarding the ownership and protection of intellectual property created by AI are key areas to which the authors recommend paying attention. And this both in legal regulation and in further development of AI. It is precisely these selected legal areas that the authors focus on in this article, with the aim of analysing the current legal regulation for selected aspects, and thus outline possible disputes in this area.

The article uses the method of legal analysis to examine the legal aspects associated with artificial intelligence. This method allows the analysis of current legislation and its application to specific AI problems. The research of legal regulations is used to obtain an overview of the existing legal regulation regarding artificial intelligence and related topics. In this way, the authors identify gaps and shortcomings in the context of the current legal regulation in relation to artificial intelligence, which are explained in the next subsections.

3. Artificial Intelligence - Regulation and Selected Aspects

The authors of the article present views on key legal issues related to the use of artificial intelligence in the context of European and Czech law. We will focus on key areas that include legal regulation, protection of intellectual property, damages, protection of personal data, and prevention of discrimination. These aspects are crucial for the future development and application of AI in the European legal environment.

3.1 Legal Regulation of the European Union

The constant expansion of artificial intelligence systems into almost all areas of social life necessarily leads to legislative regulation. On 13/03/2024, the European Parliament approved a Proposal for a regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (AI Act) and amending certain Union legislative acts (hereinafter referred to as the "AI Act") (European Commission, 2021) The point of the act on artificial intelligence is based on an assessment of the risks that these systems bring to human society and, according to this assessment, certain procedures are practically declared prohibited or high-risk. The prohibition of certain practices is based on their extreme harmfulness and therefore incompatibility with the basic values of the Union, such as the protection of basic human rights. As for high-risk artificial intelligence systems, the act introduces a relatively strict risk management methodology so that their use is safe, in accordance with the basic principles of human rights protection in the European Union, and their use is always subject to human supervision (European Commission, 2021). Pehlivan (2024) says the AI Act is expected to become a model for AI governance around the world, in a similar way to how the General Data Protection Regulation (GDPR) has influenced data protection regulation outside of Europe.

First of all, it is necessary to ask what this act actually means by the term artificial intelligence system (European Commission, 2021): It is any software, developed using one of the techniques listed in the first annex of the act, and which can generate outputs such as content, predictions, recommendations or decisions that affect the environment with which this system communicates, for a certain goal defined by a person.

The regulation proposed by the act primarily establishes a list of prohibited artificial intelligence practices. These practices are considered unacceptable for contradicting the basic values of the European Union, for violating basic human rights.

Prohibitions refer to practices that can manipulate individuals through subliminal techniques without their knowledge. Alternatively, they exploit the vulnerabilities of specific vulnerable groups, such as children or people with disabilities, to influence their behaviour in a way that could cause them or another person psychological or physical harm. The proposal also prohibits the allocation of social credit based on artificial intelligence for the purposes of public authorities, which would lead to disadvantageous or unfavourable treatment of natural persons under the act of specified situations. Finally, the use of real-time remote biometric

identification in publicly accessible locations for law enforcement purposes is also prohibited (with certain limited exceptions).

Furthermore, the act lays down special rules for artificial intelligence systems that pose a high risk to health and safety or to the fundamental rights of natural persons. These high-risk artificial intelligence systems are permitted by the act on the condition that they meet certain mandatory requirements (Fraser and Villarino, 2023) and that an ex ante compliance assessment is carried out, i.e. before it is used. The list of high-risk artificial intelligence systems is contained in the third annex of the act. Specifically, it concerns technologies used in the field of (European Commission, 2021):

- critical infrastructure, for example road transport operations and water, gas, heating and electricity supplies;
- education and professional training, for example determining the access of natural persons to educational institutions or the evaluation of students of educational institutions;
- employment, staff management and access to self-employment, for example recruiting staff or deciding on career progression;
- access to essential private and public services and benefits, for example credit assessment;
- law enforcement, for example technology such as lie detectors and similar tools, or for the purpose of ascertaining the emotional state of a natural person, as well as the use of so-called deep fakes, evaluation of the reliability of evidence, detection, investigation or prosecution of crimes;
- migration, asylum, and border control management, for example the risk of illegal immigration, the verification of the authenticity of travel documents or the detection of fake documents; and
- the administration of justice and democratic processes, such as technologies designed to assist judicial authorities in examining and interpreting the law.

Crucially, the act imposes a duty of human supervision on the use of all high-risk systems. Human supervision is aimed at preventing or minimizing risks to health, safety or fundamental rights that may arise from the use of a high-risk artificial intelligence system in accordance with its purpose or under conditions of reasonably foreseeable misuse. Specifically, this means that all artificial intelligence technologies that the act classifies as high-risk must be designed and developed in such a way and with appropriate tools at the human-machine interface, that it can be effectively supervised by natural persons in situations where artificial intelligence is used. But as Kalodanis et al. (2023) explain, the difference between the proposed requirements and the available AI security countermeasures needs to be taken into account.

Finally, the act establishes the European Artificial Intelligence Board. This should consist of the national supervisory authorities of the individual member states represented by the head or equivalent high-level official of that authority and the European Data Protection Supervisor. Its mission should be to provide advice to the Commission in the field of artificial intelligence. Specifically, gathering and sharing expertise and best practices between member states, as well as contributing to uniform administrative practice in member states by issuing opinions, recommendations and other documents related to the implementation of the AI Act.

3.2 Artificial Intelligence and Intellectual Property

The issue of artificial intelligence and legal issues of intellectual property protection can manifest itself on several levels. The AI Act itself in Article 3 paragraph 1 (European Commission, 2021) defines an artificial intelligence system as software. The software is protected as an author's work from the point of view of Czech intellectual property law. On

the second level, some outputs of the artificial intelligence system may be considered copyrighted work. Finally, the artificial intelligence system can be in the position of inventor and its outputs could fulfil the criteria of patents.

If we look at an artificial intelligence system as software in the sense of copyright work. Software or computer program is, according to section 2, paragraph 2, Act No. 121/2000 Coll., on Copyright and Rights Related to Copyright and on Amendment to Certain Acts (the Copyright Act), as amended (hereinafter referred to as the "Copyright Act") (Act No. 121/2000 Coll., Copyright Act), considered to be a work of authorship and therefore entitled to the legal protection that copyright law provides to works.

The issue of legal protection of the outputs of the artificial intelligence system appears to be much more interesting, when the Copyright Act define in section 5 paragraph 1 (Act No. 121/2000 Coll., Copyright Act) that the author is the natural person who created the work. However, it must be remembered that the creative process of artificial intelligence is always guided by the hand of a person, who directs the autonomy of artificial intelligence and thus always contributes to the resulting creation (Zibner, 2022). Theoretically, it is possible to imagine the outputs of artificial intelligence without human invention, as the AI Act prescribes the obligation of human supervision only for high-risk systems.

It can be stated that at the international and national legal level, the pillars of copyright are still the natural law role of the author as a person, his rights, and the associated protection of the creative activity of a person. For this reason, it is unrealistic currently to think about shifting authorship towards artificial intelligence systems. Sápi (2024) also draws attention to the changing environment of copyright relations, which is caused by the development of AI and overall technological progress. On the other hand, regarding the above, it is necessary to consider that every work created by software also has its own human author, and the question is whether the copyright claim is the most important and to whom the authorship of the output in question should be allocated.

National legislation is just as negative in relation to artificial intelligence as an author as it is in relation to cases of artificial intelligence as an inventor. According to section 8 paragraph 1 of Act no. 527/1990 Coll., on Inventions and Rationalisation Proposals, as amended (hereinafter referred to as the "Patent Act") (Act no. 527/1990 Coll., Patent Act), the right to a patent belongs to the inventor of the invention or his legal successor. However, the right to a patent is tied to the personal activity of a natural person (Chloupek and Hartvichová, 2017). This means that only a natural person can be the originator of the invention. Current national legislation therefore does not allow artificial intelligence to be considered an inventor within the meaning of patent law. The rights associated with inventions therefore belong to the human creator of the artificial intelligence itself.

3.3 Artificial Intelligence and Compensation of Damage

The fundamental question associated with the issue of compensation for damages in the field of artificial intelligence is basically the same as in the case of intellectual property. The question is, who is the responsible entity in cases where harm occurs? Autonomous car driving is currently cited as the most frequently cited example of damage in connection with artificial intelligence (Coeckelbergh, 2020; Hevelke and Nida-Rümelin, 2015). So, for example, if an accident occurs with a car controlled by an artificial intelligence system, who will be the responsible entity? Car owner, car manufacturer or artificial intelligence software programmer? McDonald (2023) states that the AI Act introduced a system of strict, not culpable, liability for artificial intelligence systems. According to McDonald (2023), the goal is to make it easier to hold developers, manufacturers, but also users of artificial intelligence

technologies accountable and possibly require an explanation of how artificial intelligence systems were created and trained. One of the reasons for this step may be to make it easier for people and companies harmed by AI systems to sue for damages from the people responsible for AI systems. However, Coeckelbergh (2020) draws attention to a problem in technological development and programming, when usually many people are involved in the action in a causal connection, and there may be more people responsible.

However, there are many other areas of human life in which artificial intelligence actively interferes, and where damage associated with its use can occur (Hevelke and Nida-Rümelin, 2015). The AI Act considers some of these areas and includes them under high-risk cases, for example traffic control, energy supply, law enforcement, etc.

Czech legislation on liability for damage is primarily based on the principle of prevention. According to section 2900 Act No. 89/2012 Coll., Civil Code, as amended (hereinafter referred to as the "Civil Code") if the circumstances of the case or the habits of private life require it, everyone is obliged to act in such a way that there is no unreasonable harm to the freedom, life, health, or property of another (Švestka et al., 2021). The AI Act itself provides for prevention, as Article 9 defines the obligation to introduce, apply and document a risk management system. As for the development of artificial intelligence systems itself, Article 15 defines that all high-risk artificial intelligence systems must be developed in such a way that, with regard to their intended purpose, they achieve an appropriate level of accuracy, reliability and cyber security. Turner (2018) is also thinking about possible aspects that can be applied to artificial intelligence, from liability under civil law, product liability, mediated liability insurance options, to criminal law. Chesterman (2020), on the other hand, is thinking about the possibility of attributing some form of legal subjectivity to artificial intelligence and creating a new categorization of legal entities.

As for the facts regulated by the Civil Code, which would come into consideration in connection with liability for damage caused by an artificial intelligence system. From the point of view of the general facts of compensation for damages, i.e. breach of good morals, breach of law or breach of contract, in practice the most likely breach of contractual obligation will come into consideration.

Violation of good morals according to section 2909 of the Civil Code is a hard-to-imagine category of damages in the field of artificial intelligence systems. Artificial intelligence and its use in everyday life is not yet an established social value.

And due to the absence of relevant national legal regulation of artificial intelligence systems as such, when all considerations are at the de lege ferenda stage, the nature of the matter can also exclude the factual essence of a violation of the law according to section 2910 of the Civil Code.

Since the AI Act regulates the use of high-risk artificial intelligence systems, it appears to be an applicable factual basis establishing section 2925 liability for damage caused by especially dangerous operations. According to this fact, whoever operates a plant or other equipment in a particularly dangerous manner shall compensate for the damage caused by the source of increased danger. Operation is particularly dangerous if the possibility of serious damage cannot reasonably be excluded in advance, even with due care. Although this factual basis establishes a rebuttable legal presumption of special danger where it is an activity operated in a factory manner, the operation of an artificial intelligence system can be subordinated to the concept of other particularly dangerous equipment. Other particularly dangerous equipment is a typical vague legal term, the interpretation of which depends on the specific circumstances of the given case. Due to the continuous expansion of artificial intelligence into the most

diverse areas of the human person and the referenced European regulation, the artificial intelligence system can be subsumed under the concept of particularly dangerous equipment.

Liability for damages is itself a complex legal category. However, it is evident that in this area the challenges of using artificial intelligence systems are better legislated than in the case of intellectual property rights.

3.4 Artificial Intelligence and Personal Data Protection

The protection of personal data (Kozieł, 2018) is an often discussed issue in connection with the use of artificial intelligence systems (Quezada-Tavarez et al., 2022; Wulf and Seizov, 2022). However, it can be stated that European regulation does not forget about it and addresses it in connection with an interesting project, which the AI Act in Article 53 calls the *AI regulatory sandboxes.* It is broadly an innovation promotion measure, a controlled environment that facilitates the development, testing and validation of innovative artificial intelligence systems for a limited period before they are put on the market or put into operation. It is within this regulatory sandbox that personal data legally collected for other purposes may be processed according to Article 54 of the act. However, this is subject to relatively strict personal data protection rules and only for the purpose of developing an artificial intelligence system applicable in the area of:

- prevention, investigation, detection or prosecution of crimes or execution of sentences, including protection against threats to public safety and their prevention under the supervision and under the authority of competent authorities;
- public safety and public health, including disease prevention, control and treatment;
- high level of environmental protection and improvement.

As part of the development of these specified artificial intelligence systems, personal data must be processed in an isolated and protected environment, must not be transferred or transmitted to third parties, and must be deleted as soon as they are no longer needed within the sandbox or their retention period expires. Wulf and Seizov (2022) analysed the issue of personal data processing using artificial intelligence algorithms.

Creating new platforms for innovation always brings with it new legal challenges. However, it is clear from the act on artificial intelligence that in the case of personal data protection, the European standard provides the highest level of protection to personal data.

3.5 Artificial Intelligence and Discrimination

The AI Act seeks to prevent some negative phenomena associated with artificial intelligence, of which discrimination appears to be a relatively serious phenomenon. That is why the AI Act contains a list of prohibited practices. On the one hand, the use of artificial intelligence brings several advantages, on the other hand, some of its practices, especially in the field of social policy, can lead to violations of the prohibition of discrimination. One of the goals of the AI Act is precisely to minimize the risk of algorithmic discrimination, especially in data quality used by high-risk artificial intelligence systems.

The danger of algorithmic discrimination is also pointed out by Opinion of the Committee on Civil Liberties, Justice and Home Affairs of the European Parliament of 1 December 2022, No. 2022/2036/INI. The Committee said it was concerned that the use of an artificial intelligence system could reinforce existing discrimination, inequalities and social exclusion and misidentify or misclassify individuals belonging to certain groups. The Committee therefore called for the introduction of effective corrective measures, including human controls, effective complaint mechanisms and transparency regarding the use of artificial

intelligence in e-government. It should be noted that the current form of the act on artificial intelligence has fulfilled these requirements.

4. Conclusion

In the previous text of the contribution, several representative areas were described, which relate to certain controversial legal issues in the field of the use of artificial intelligence. It would be wrong to talk about the complete absence of regulation of artificial intelligence. At the European level, this is evidenced by the proposed act on artificial intelligence, which seeks to regulate the most fundamental matters in the most progressive areas in which artificial intelligence is used.

Nevertheless, especially at the level of the national legal order, there are a number of "blind spots" that cannot respond effectively to the onset of the use of artificial intelligence systems, which leads to many questions and subsequently disputes. A major deficiency is currently the national conception of the artificial intelligence system in the field of intellectual property law. National legislation does not allow an author other than a natural person. The same concept applies in the field of inventions. However, a change in the relevant legislation would be necessary in this area.

The issue of liability for damage compensation, or its legal anchoring, is more inclined to cases of artificial intelligence systems. The question is the correct subsumption of the assessed case for the relevant legal norm, the factual substance (Turner (2018) also points to this). This is a matter that can be resolved by relevant judicature. However, it is currently absent at the national level.

In connection with the use of artificial intelligence systems, especially by public administration bodies, the problem of personal data protection and protection against discrimination often resonates. Floridi and Cowls (2019) reflect on the principles and concept of ethical artificial intelligence, and the future creation of laws or rules. In the context of these questions, however, it can be stated that the proposed AI Act effectively responds to these matters and strives for the maximum possible protection of these fundamental democratic legal values. Bas et al. (2024) also considers Act AI to be regulation in line with political needs but pointing out some areas as insufficiently defined or clearly defined requirements.

It can be concluded that the AI Act is indeed a crucial regulatory tool for the use of artificial intelligence in member countries. It responds to the most pressing areas in which the abuse of artificial intelligence could have serious consequences in the field of protection of fundamental rights and values. Due to the constantly expanding use of these systems, it can be said that this is a very fundamental and necessary regulation (Fraser and Villarino, 2023). However, regarding the above, European regulation must also be accompanied by changes at the level of national legislation.

And as Maisner (2023) confirms, first there is progress and only then will the regulatory framework be prepared. According to the authors, the development of artificial intelligence cannot be stopped, nor can it be slowed down now. It is necessary to get used to the fact that elements of artificial intelligence will become an integral part of our lives, and it will only be a matter of time before the appropriate legal regulation is adopted to regulate the development of artificial intelligence and the first timid steps have already been taken. The authors of the article are aware of the article's limitations, and plan to supplement it with an analysis of court decisions with an AI accent, as well as insights from other disciplines, such as computer science, ethics, sociology, with the aim of bringing new perspectives and a more balanced view of the legal aspects of artificial intelligence.

Acknowledgements

This research was financially supported within the VŠB–Technical University SGS grant project No. SP 2024/060 (Artificial Intelligence - Law, Ethics and Opportunities in Education).

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Projectification in the Case of the European Union

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Abstract
In recent years, "projectification" has become a prevalent trend, indicating a rise in the importance of projects across various sectors. This trend emphasizes the need for effective project management to optimize resources and align projects with long-term strategies. However, it also raises concerns regarding sustainability and temporary employment arrangements. Projectification extends beyond traditional sectors to encompass public, non-profit, and private sectors, driven by challenges such as climate change and technological progress in today's volatile environment. At the EU level, projectification is seen as a means to enhance flexibility and innovation, particularly through the allocation of EU funds. Yet, there are gaps in project management practices and awareness of methodologies and project management standards. Future research should address these gaps and promote sustainable project practices within EU-funded projects.

Keywords: *European Funds, European Union, projectification, project management, project management standards*

JEL Classification: *H25, O31, R11*

1. Introduction

Recently, it is possible to notice that the number and importance of projects as instruments of change in society is increasing. This trend is referred to as “projectification” and has spread to various levels across the private, public, and non-profit sectors. This increases the importance of project management as a tool to successfully and effectively implement these projects.

Projectification brings a greater number of activities managed as projects, but also an ongoing organizational transformation that illustrates the shift from a functional perspective to a project-based perspective (Jacobsson and Jalocha, 2021). The term can also be used in connection with how public bodies and institutions shape their short-term and long-term policies (Montes and Escobar, 2023), but also how private companies fulfill their strategies in the form of a portfolio of projects and programs (McGrath and Kostalova, 2020). In the last few years, it is possible to note attempts to assess the advantages and disadvantages of projectification.

The advantages derive from the fact that projectification focuses on the optimization of economic resources, decision-making in projects is associated with the introduction of continuous control and monitoring measures, and the establishment of deadlines, milestones, and criteria for assessing the success or failure of these decisions. An advantage is also the

unequivocal connection of the projects to the long-term strategy, to which the projects contribute through their implementation.

"Projectification" is also associated with some disadvantages, e.g. Silvius et al. (2012) state the disadvantage of projectification consists in the fact that the project essentially overlooks the long-term view and focuses on the time of implementation and securing the project output in the most efficient manner, which, especially in the material outputs of the project, is contrary to the trend of sustainability. Evaluation of the tangible outputs of projects with regard to the entire life cycle of this product is not primarily required within project management. Projectification has an impact also on individuals who are involved in the implementation of projects, as it significantly changes the way of work from long-term to temporary, limited by the time of project implementation; people are hired and paid temporarily and no long-term employment is guaranteed, that means it tenders towards precariousness and insecurity (Wagner, 2022). Members of the project are required to be more and more agile and flexible in time, but also in attitude to solving problems in projects (Wagner, 2022). Several research studies confirm the negative consequences of projects on project managers, especially stress, frequent overtime work, and burnout (Aguilar Velasco and Wald, 2022).On the other hand, the projectification on individual lever brings a lot of opportunities for networking via different projects the member is involved (Jensen, 2012).

The term projectification combines the terms "project" and "organizational transformation" first used in 1995 by Christophe Midler when he analyzed how Renault became a project-oriented organization. Projectification is defined as an economic trend of increasing diffusion of projects, which is increasingly becoming a common form of business organization (Midler, 1995; Schoper and Thor, 2019).

Projectification is analyzed with interest by the academic community and experts in project management, it is analyzed how it spreads in all levels of society at the micro level (with impact on individuals), meso level (with impact on organizations and the transition to project-oriented organizations), macro level (with impact on various regions, national institutions) at the mega level (impact on states, transnational organizations), and at the meta level with an impact on entities with global scope (Montes and Escobar, 2023; Wagner, 2022).

Projectification does not only take place in typical areas such as construction, aviation, the automotive industry, the information and communication industry (ICT), or consulting (Wagner, 2022; Schoper, and Thor, 2019), but is increasingly visible in the public sector, the non-profit sector, or in the private sector, where the delivery of products or services to customers is very often presented as projects, and has become an integral part of the organization of research and development (R&D) activities (Jensen et al., 2016). Lundin et al. (2015) connect the projectification of society with changes in the field of technological development referred to as Industry 4.0.

What are the drivers of projectification? These currently include tackling the consequences of climate change, geopolitical problems, dealing with the flow of refugees due to economic reasons, conflicts and wars, poverty and environmental damage, technological progress, and much more (Wagner, 2022). The reason will also be the greater intensity of changes in society, which is related to the character of the current variable environment referred to as the VUCA environment, which is an acronym for Volatility, Uncertainty, Complexity, and Ambiguity, which is a comprehensive model for understanding the challenges and dynamics of today's business environment (Minciu et al., 2020). The proliferation of interconnected systems and challenges necessitates multifaceted, adaptive solutions are often best addressed through project-based endeavors. Volatility in markets, technologies, and socio-political landscapes amplifies uncertainty, prompting organizations to embrace projects as vehicles for

experimentation and risk mitigation. Projects serve as incubators for innovation, providing structured frameworks for exploration, experimentation, and learning.

A similar process can also be observed at the level of the European Union (EU). Here, too, projectification is perceived as a tool that helps to increase the flexibility and innovation of existing permanent structures (Godenhjelm et al., 2015). This trend is confirmed by the increasing number of specialized EU funds, the allocation of which in most cases is solved by the implementation of projects by the beneficiaries of support. EU support is implemented at the national level in the form of shared management and programs providing support according to the specific requirements of EU national members and their regions (Jalocha, 2019). At the EU level, EU programs are administered by the European Committee. The level of support at the national and international levels is constantly changing, at the national level the economic strength and development of the states and the region play a role. At the European level, the specification of programs is related to the strategic priorities of the EU (Melecký and Staníčková, 2022).

In any case, the size, numbers, and complexity of implemented projects with support from EU Funds are expanding and it is therefore desirable to support them with knowledge and skills in the field of project management (Godenhjelm et al., 2015).

In this area, many tools are offered, which are generally available and can be used for project management in the private, public, and non-profit sectors. The most widespread are international project management standards developed by international associations: Project Management Institute (PMI) from the USA (PMI, 2021), International Project Management Association (IPMA) (IPMA, 2024), an association active mainly in Europe, and Association for Project Management (APM) from Great Britain (Association for Project Management, 2019). These international project management standards offer project management methods and tools and recommended best practices specified based on a lot of practice experience and theoretical research. Association IPMA created three standards: the IPMA individuals competence Baseline, ICB version 4, The IPMA Project Excellence Baseline for excellence projects, and the IPMA Organizational Competence Baseline for organizations (IPMAWorld, 2024). IPMA presents in each country a national competence baseline, which reflects the national conditions and specifics. PMI presents its standards in PMBOK GUIDE – 7th Edition: A Guide to the Project Management Body of Knowledge (PMI, 2021), it is mainly a process-oriented standards, which recommend 9 areas of knowledge. PMI presents also other specific standards e.i. for Risk Management in Portfolios, Programs, and Projects, The PMI Guide for Business Analysis, The Standard for Program Management, The Standard for Organizational Project Management, and many others. APM presents the standards PRINCE2 (Standards for Project IN Controlled Environments), it is a process-based oriented standard used primarily in the public sector but used also in the private and non-profit sectors (Association for Project Management, 2019; Axelos, 2015; PRINCE2, 2022).

The EU has developed its own free methodology – PM^2 Methodology intended for the field of project management in general, but especially for a group of projects financed by European Funds on national and European levels (PM^2 Alliance, 2022). The EU is trying to develop this issue to increase the availability of know-how and strengthen the importance of project management and skills in this area within projects financed from the European budget (PM^2 Alliance, 2022).

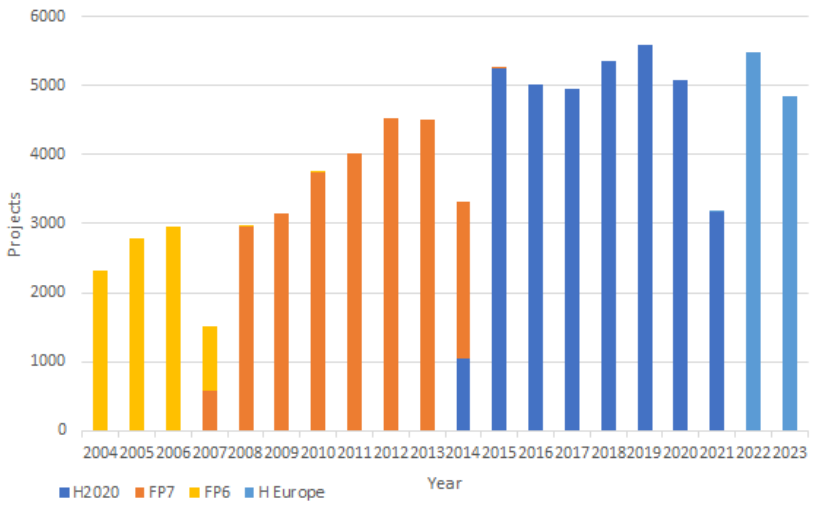
2. Problem Formulation and Methodology

Based on the definition of the concepts of projectification, their impact on society, advantages and disadvantages, and their closer relation to the EU, it is possible to formulate a research question, how projectification manifests itself at the international and national level in the scope of implemented projects, whether it expands over time and what are the consequences brings with it. The basic methodology of the research is based on a comparison of the development of the number and volume of redistributed finances of projects supported by the EU in individual framework programs. For EU countries, the development trend over the last 20 years is compared, for the Czech Republic, the time series is monitored from 2007, when the first of the projects after the Czech Republic's accession to the EU were evaluated. Based on the growing trends, the intention is to document the growth of projectification.This narrower overview will be the basis of further detailed research in the area of projectification, assessment of project management knowledge needed for the successful management of projects financed by EU funds, but also project management in general.

3. Problem Solution

The growing number of projects can be observed based on statistics of EU projects implemented in individual program periods. Although the number of projects fluctuates in individual years (decreases in the number of projects are noticeable at the start and end of the programming periods), the long-term trend shows an increasing number of projects, as can be seen from Figure 1., where the development of the number of projects in programs on European level FP6, FP7, Horizon 2020 and Horizon Europe over the last 20 years is shown. There programs offered and offer support of research and development activites across Europe and they are one of the most important programmes in the group of programmes on European level.

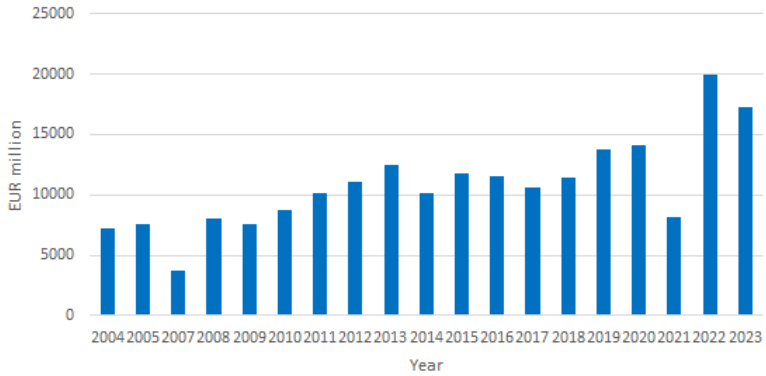
Figure 1: EU Projects 2004-2023



Source: Horizon dasboard (2024); Own elaboration (2024)

Over the past twenty years, a total of 80,524 projects have been implemented with the help of EU programs focused on research and development acitivites - FP6, FP7, Horizon 2020 and Horizon Europe (Horizon dashboard, 2024). Allocations to individual program periods are difficult to compare due to the different duration of individual program periods. However, the total cost of EU projects over the last 20 years also shows an increasing trend, which is evident from Figure 2.

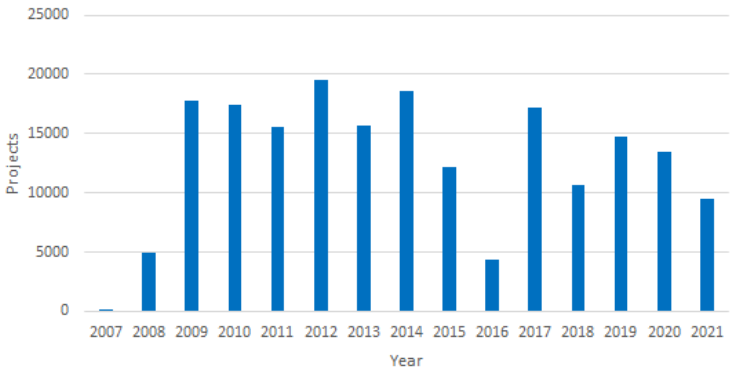
Figure 2: EU Projects total cost 2004-2023



Note: The extreme year 2006 was singled out from the graph, in which the total accounting of FP6 projects took place
Source: Horizon dasboard (2024); Own elaboration (2024)

In addition to the implementation of projects and support from EU programs, many times more projects and subsidy programs are implemented at the national level. Specifically, in the case of the Czech Republic, in the short EU project programme 2004–2006, 13,290 projects were implemented with total support CZK 62 billion CZK (MMR CR, 2022). Over the next 15 years (2007-2021) during two programming periods, when statistics are available and compiled, a total of 191,592 supported projects were recorded, the distribution of projects in individual years can be seen in Figure 3. The total costs of these projects amounted to CZK 3,610 billion (DotaceEU, 2024).

Figure 3: Total Number of Supported Projects in the Czech Republic 2007-2021



Source: DotaceEU (2024); Own elaboration (2024)

The amount of projects is high, for their management the implementation documentation offers basic recommendations for project management, but unfortunately not to a sufficient extent, at least that was the case in the program period 2007-2013 (Kostalova et al., 2015). However, the requirements for project management are gradually being expanded (EU Calls, 2024) at the national and European level, as evidenced by the creation of the PM2 methodology. However, it would be desirable to assess in more detail the shift in system support towards project management on the part of the providers, but also among the researchers, what is the awareness of these tools and what is the extent of their use in practice (Staníčková, M. and Melecký, L., 2020).

If we discuss about projectification on society level, the wholescope of the project activities of the entities in the Czech Republic can only be estimated based on the given data. The mentioned projects are an instrument of subsidy support from the EU and the Czech Republic and constitute only a fraction of all implemented projects. The vast majority of other projects are implemented without national or European subsidy support within the normal activities of businesses, public administration, non-profit organizations, associations and communities. Statistical data for these projects are not collected anywhere, and their numbers can only be speculated, however, with a qualified estimate, it is possible to consider their number in several times higher volumes compared to the above numbers. Similar situation is possible to expect also on European level.

4. Discussion

Projectification, marked by the growing dominance of projects as agents of change, presents both opportunities and challenges for organizations and society. The shift towards project-based structures offers benefits like resource optimization but also introduces concerns regarding temporary employment and sustainability oversights. Integrating sustainability principles into project management practices can mitigate these concerns, emphasizing lifecycle assessments and responsible resource management.

International standards and EU initiatives play vital roles in guiding project management practices, but awareness and utilization of these frameworks vary. The EU's PM^2 methodology aims to support project management practices, yet gaps remain in promoting maturity and resource utilization. Future efforts should focus on increasing awareness of international standards and fostering collaboration among stakeholders. Older research at the national level confirms that this is not the case and that there is not enough support from support providers (Kostalova et al., 2015; Kostalova et al., 2017). Recent research focused on the knowledge and use of project management tools in practice, carried out among project managers of projects financed by EU Funds (Kostalova, et al., 2023) confirmed that awareness of individual international standards of project management at the national level is relatively low (the most well-known was the PRINCE2 standard), the use of these standards in practice was even lower.

Insufficient knowledge of project management methods and tools, project management standards at the national level is indirectly confirmed by information from IPMA CZ regarding the number of certified project managers in the Czech Republic. Since the establishment of IPMA CZ in 1990, a total of 2,805 certified project managers in all levels of certification have been registered (IPMA CZ, 2024). The number of certified project managers within the framework of the international standards PMI and PRINCE2 in the Czech Republic is not known, however similar numbers to IPMA CZ can be expected. According to IPMA CZ, these are mainly project managers in the private sector, i.e. the number of project managers who use their competence to manage projects from European Funds in the form of certification is

several orders of magnitude lower than the number of projects financed from European funds and thus significantly lower than the expected numbers implemented projects in general.

Further research is needed to deepen our understanding of projectification's implications and bridge the gap between theory and practice. Longitudinal studies tracking the evolution of project-based approaches and their impacts will provide insights into sustainability and effectiveness. Efforts to maximize the benefits of projectification while mitigating drawbacks are essential for fostering sustainable project outcomes. The authors envisage further research in this area, especially in the verification of the level of knowledge of project managers in terms of achieving the certification of project management standards PMI, PRINCE2, IPMA and PM^2. The aim of the research is to compare to what extent the trend of the number of project managers is in line with the trends of the number of implemented projects. Any identified difference in trends may signal inefficient project management. The second line of research is the verification to what extent the project organizational structure is promoted in companies and whether its introduction stimulates the profitability and sustainability of business and employment.

5. Conclusion

In the conducted comparisons of the number and volume of funds allocated to projects at the EU level, it is possible to state that the increasing projectification is documentable. It is possible to document it not only in the number of projects and in the amount of funds in the budgets of these projects (even taking into account inflation in the monitored period), but also in other efforts of the EU connected with the support of knowledge of project management, development and the offering of available tools (e.g. in the form of the PM2 methodology) , by incorporating this approach in defining and delimiting support with an increasing accent towards increasing project management maturity.

In conclusion, projectification represents a significant shift in organizational and societal dynamics. By addressing challenges and harnessing opportunities, organizations can navigate this transition effectively and contribute to sustainable project outcomes.

Acknowledgements

This paper was created within the project “A new academic path for EU Project managers: narrowing the gaps to enable better project design and management in Europe (EUPM)” reg. n. 2021-1-IT02-KA220-HED-000035769 supported by Erasmus+ program.

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The Central European EU Member States as Donors of Official Development Assistance: Their Legislative and Strategic Priorities

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Abstract
Official development assistance (ODA) is one the external sources of finance that is provided to less developed countries to help them with progress towards sustainable development. The EU and its member states are the most important donors of ODA in the world. The EU member states implement their national development policies as well as contribute to the fulfilment of the EU development objectives. The Central European countries (Czechia, Hungary, Poland, Slovakia) are members of the DAC OECD that build their development policies as a part of their foreign policies and they link them with the EU development intentions. The paper presents the first findings from the initial phase of more complex research focused on the behaviour of Central European countries (CECs) as ODA donors. This initial phase aims to identify the objectives of development policies in the CECs, as well as thematic and territorial priorities in their ODA allocations. Using the review of the most important national documents, it was found that CECs linked their thematic priorities with the 2030 Agenda for Sustainable Development and identified their partners among the ODA recipient countries in Eastern Europe and the Western Balkans. As the meeting of the financial commitments to ODA was also considered a priority, attention was paid also to the fulfilment of the UN and EU targets concerning the ODA volumes during the period 2009-2022. However, it was found that in most years, the CECs lagged behind these targets.

Keywords: *development policy, EU emerging donors, ODA donors, official development assistance (ODA)*

JEL Classification: *F35, F63, H87*

1. Introduction

Development aid, resp. foreign aid represents a very important external source of finance in poor developing countries, where a lack of domestic financial sources constrains progress towards sustainable development and meeting of the Sustainable Development Goals (SDGs) adopted by the General Assembly of the United Nations for the period 2015-2030. The impact of development aid on economic growth and development has been discussed by many researchers so far, for instance by Groß and Nowak-Lehmann Danzinger (2022), Dreher et al. (2021), Izevbigie et al. (2020), Suphian and Kim (2016), Mallik (2008), Collier and Dollar (2002). Many studies also examined the importance of development aid for the reduction of extreme poverty or the end of the poverty traps (Mahembe and Odhiambo. 2020; Mallik, 2008; Sachs, 2005; Collier and Dollar, 2002). Therefore, the international community, represented

mainly by international organizations like the United Nations (UN), World Bank or Organisation for Economic Co-operation and Development (OECD) mobilize advanced industrialised countries to provide official development assistance (ODA) to developing countries with insufficient domestic sources of finance.

The Central European Countries (CECs) – Czechia, Hungary, Slovakia, and Poland are members of the official donor community, represented by the Development Assistance Committee of the OECD (DAC OECD) which gathers 32 ODA donors. The CECs as members of the European Union (EU) implement their national development policies as well as contribute to the fulfilment of the objectives of the EU development policy. Their development policies are designed as a part of their foreign policies, which is reflected in the main strategic objectives and priorities they follow in ODA recipient countries. However, in most years, the CECs did not meet the financial commitments to ODA because they spent on ODA less than 0,7 % of their GNI. The 0,7 % target was declared as the international target by the United Nations in the 1970s. However, the CECs did not also meet the EU recommendation concerning the ODA volumes, which was formulated for the EU member states being recognized as (re-)emerging ODA donors (0,33 % of GNI to ODA).

The paper introduces the first results from the initial phase of the research examining the most recent challenges for the development policies of CECs and changes in their donors' behaviour due to these challenges. The CECs are represented in the research by Czechia, Hungary, Poland, and Slovakia. This initial phase aims among other topics to identify the priorities of the CECs' development policies, and the main attention is paid to the formulation of strategic objectives in their development policies, as well as to the specification of their thematic (sectoral) and territorial (geographical) priorities. Therefore, the literature review is the main method used in this part of the analysis. As the fulfilment of the financial commitments to ODA is considered a priority of the CECs as well, the progress of CECs towards the targeted values of the ODA/GNI ratio (0,33 %, resp. 0,7 %) was assessed in the analysis as well. The period during which the fulfilment of the financial targets was analysed was specified as 2009-2022.

The main text of the paper is structured as follows: ODA as a form of foreign aid, international financial commitments to ODA, and the main specifics of Central European countries in providing ODA are introduced in Section 1. The research intention and aim, methods and data are specified in Section 2. The initial results and findings are presented in Section 3, and summarized in Section 4.

1.1 Official Development Assistance and Financial Commitments to ODA

The first definition of official development assistance was introduced by the DAC OECD in 1961. Later, in 1969, the DAC OECD adopted ODA as the gold standard of foreign aid (OECD, 2024a). Since then, ODA has been considered an external source of finance that can boost economic growth and development in poor countries with a lack of domestic financial sources and that can promote poverty eradication and welfare improvements in these countries. The main purposes of ODA are reflected in the most current ODA definition. The OECD (2024a) defines ODA as the *flows to countries and territories on the DAC list of ODA Recipients and to multilateral development institutions*, and specifies that the flows are i) *provided by official agencies, including state and local governments, or by their executive agencies*; ii) c*oncessional* (ODA flows include grants of soft loans) *and administrated with the promotion of the economic development and welfare of developing countries as the main objective*. ODA includes food aid and emergency aid, in-donor refugee costs, debt relief, and

certain specific peace-keeping operations focused on restoring infrastructure, demobilisation, or organisation of elections (Pacquement, 2014).

Several motives behind the ODA provision can be recognized in donor countries, including moral, political, and cultural motives as well as commercial ones (Francisco et al., 2021; Dufková, 2021). The moral motivation refers to the altruism of donor countries, while the commercial motivation considers ODA the way for the opening or strengthening of trade and investment relations between donor and recipient countries. ODA can be also regarded as a part of donors' social responsibility or as a tool that can help to increase the international reputation of donor countries (Leszczyński and Rabczun, 2018; Younas, 2008). However, some obstacles may arise on the side of donor countries that constrain their motivation. For instance, these obstacles can include economic and non-economic crises, fiscal deficits, the weak position of development policy within governmental preferences and priorities of foreign policies, the inability of development actors in donor countries to mobilize resources, or a low political and public will (Horký and Lightfoot, 2012).

In 1960, the first official targets defining the volumes of development aid, which should have been provided to poorer countries by more advanced countries, were discussed. In 1970, the resolution of the General Assembly of the United Nations introduced the first international commitment to ODA – to provide for ODA at least 0,7 % GNP, replaced by GNI in 1993 (United Nations, 1970). Later, a specific target was discussed for the recipient countries classified as the least developed countries, and donor countries committed to providing ODA equivalent to 0,15-0,20 % of their GNI to these countries (United Nations, 2019). For the least developed countries, ODA represents one of the key sources of external finance as they are underdeveloped and highly disadvantaged in international trade and investment (Doleželová, 2022). Both international targets concerning the values of the ODA/GNI ratio were reaffirmed by several international documents in the 2000s, for instance by the *Millennium Declaration* (2000), the *Financial Consensus from Monterrey* (2002), the *2030 Agenda for Sustainable Development* (2015), and the *Addis Ababa Action Agenda* (2015) (Kovářová, 2021a, b).

1.2 Central European Countries as the Emerging Donors of ODA

The European Union and its member states represent the largest donors of official development assistance in the world (Jančovič et al., 2021). In 2021, the EU and its members provided 43 % of global ODA and confirmed thus their leadership in the global agenda on sustainable development (Council of EU, 2022). The EU member states provide development aid through the EU institutions as well as through their national aid programmes framed by their national development policies. Development policies of the EU member states reflect differences in national comparative advantages, governmental political preferences, priorities of their foreign policies as well as historical relationships with the recipient countries (Hoekman and Shingal, 2024). However, development aid provided by the EU institutions and the member states is linked with several political preconditions concerning the improvement of democracy and the enhancement of good governance (Soyaltin-Colella and Cihangir-Tetik, 2022).

ODA donor countries can be recognized as being traditional (or old) or emerging (or new) donors. The term emerging donors is used for donor countries represented mainly by the EU member states accessing the EU after 2003 and now participating in the DAC OECD, and (or just) by new donor countries staying beyond the DAC OECD (donors like China, the United Arab Emirates, Brazil, India, Kuwait or Saudi Arabia) (Udvari, 2014; Woods, 2008). In some studies, the CECs are called re-emerging donors (Szent-Iványi and Tétényi, 2013) because of their former experience with development cooperation during their communist eras. However, emerging donors from Central Europe introduced new organizational and legal structures for

their development policies in the 1990s and strengthened them after accessing the EU (Szent-Iványi and Tétényi, 2013).

Several years ago, the group of emerging donors was considered a monolithic group differing from the traditional donors. However, now, it is obvious that many differences among them exist, particularly when the motives for aid provision are discussed. When the term emerging refers only to non-DAC OECD countries, emerging donors are characterized as donor countries seeking their narrow interests in recipient countries (Sato et al., 2011). When the term is applied to new ODA donor countries participating in the DAC OECD and being members of the EU, their behaviour is seen to be close to the behaviour of traditional donors. Opršal et al. (2016) explain that these emerging donors adopt their systems of development aid to conform to the model applied but other developed countries (traditional ODA donors).

Despite their former experience with ODA, the CECs often face important challenges in implementing their development policies. Particularly, their volumes of ODA are quite low compared with the average levels provided by other EU members participating in the DAC OECD (Szent-Iványi, 2012). According to the EU commitments to ODA introduced in 2005, the EU and its member states should achieve collectively the 0,7 % target by 2030. The member states accessing the EU after 2003 have to increase their ODA volumes to reach the recommended value of ODA/GNI ratio (0,33 % of GNI to ODA). However, in most years, the CECs lagged behind these targets. Other challenges faced by Central European donor countries can be seen in low political and public support, or quality and territorial allocation of ODA (Opršal et al., 2016). The CECs identify their partner countries among the ODA recipients from Eastern Europe and the Western Balkans as the CECs are motivated by their own experience with political and economic transformation (Kovářová, 2021a). On the other hand, the CECs pay less attention in their development policies to the least developed countries, for instance in sub-Saharan Africa (Jančovič, 2023).

2. Problem Formulation and Methodology

The findings presented in the paper should be considered as the first outcomes from the initial phase of more complex research that aims to examine the patterns of the behaviour of Central European countries as donors of official development assistance. The acronym CECs is used for four countries – Czechia, Hungary, Poland, and Slovakia. The initial phase of the research aims among other topics to identify the priorities of CECs' development policies, and the main attention is paid to the formulation of the strategic objectives of their development policies, as well as to the specification of their thematic (sectoral) and territorial (geographical) priorities. Therefore, the literature review is the main method used in this phase of the analysis. As the fulfilment of the financial commitments to ODA is considered a priority as well, the progress towards the targeted values of the ODA/GNI ratio (0,33 %, resp. 0,7 %) is assessed for four CECs as well. The meeting of the financial commitments to ODA is analysed during 2009-2022, but data for 2022 should be considered as the preliminary results. Data on ODA were downloaded from the OECD statistical database in March 2024 (OECD, 2023a).

Data on ODA are collected with the use of a reporting system controlled by the DAC OECD. According to the DAC OECD definition, ODA can be provided in two forms – grants and loans. By the end of 2017, data were collected with the use of the so-called cash or flow basis methodology, resulting in the same valuing of grants and loans in ODA flows. However, since 2018, the DAC OECD has applied improved methodology (so-called grant-equivalent) to show that grants and loans differ and represent different efforts of ODA donors (Kovářová, 2021a). The changes in methodology mean that only the grant portion of loans (parts of lending below the market rates) is considered to be a part of ODA flow (OECD, 2020).

The OECD reports several types of ODA data. The data on net ODA are reported in terms of commitments and disbursements. Commitments represent the intention of the donor countries and they offer an indication about future flows. Disbursements show actual payments made by donor countries every year. Therefore, they show the realization of the intentions and the implementation of the policies of ODA donor countries (OECD, 2023b). Therefore, data representing the disbursements (in mil. USD, constant 2021 prices) are used to assess the volumes of ODA allocated by the CECs in their partner ODA recipient countries.

3. Problem Solution

The Central European countries – Czechia, Hungary, Poland, and Slovakia started to build or rebuild their development policies at the beginning of the new millennium, but they had already had some experience with the development aid they provided during their communist eras (Szent-Iványi, 2012). During their economic and political transformation in the early 1990s, they were ODA recipients but soon they started to introduce their own ODA donor policies. Their donor positions have been strengthened by their membership in the EU and later by their membership in the DAC OECD.

3.1 Legislative Framework of the CECs' Development Policies

After accessing the EU, the CECs started to participate in the EU development policy. Development policy is a shared competence of the EU, which means that common development policy does not constrain member states to have their national development policies (Hergaden, 2023). The origins of the EU development policy go back to the establishment of the European Development Fund under the *Treaty of Roma* signed in 1957. Since 2017, the EU development policy and development policies of its member states have been framed by the *New European Consensus on Development* adopted as a response to the *2030 Agenda for Sustainable Development* (including 17 Sustainable Development Goals) that was adopted by the UN Generally Assembly in 2015 as the global agenda for change for the period 2015-2030. This "new" Consensus resulted from the review of the *European Consensus on Development* launched in 2005 to reflect the priorities of the 2030 Agenda. The 2030 Agenda highlighted the most urgent problems of developing countries, constraining their successful progress towards sustainable development. Therefore, the EU development policy and development policies of its member states follow the priorities concerning poverty and its consequences, inequality, weak governance, climate change, environmental degradation or unmanaged migration (Furness et al., 2020). Following the *Treaty of the Function of the European Union*, the primary objective of the EU development policy is still the eradication of poverty (European Union, 2017).

Czechia, Poland, and Slovakia were invited to the DAC OECD in 2013. Hungary became a member three years later, in 2016. The European Commission considers membership in the DAC OECD a strategic objective for the EU member states (OECD, 2024b). However, the membership of the EU member states in the DAC OECD is not automatic. Donors who aim to become its members have to meet specific criteria that are specified as follows: to have appropriate strategies, policies, and institutional framework for development cooperation; to prove an accepted development effort (proved through meeting the specific values of ODA/GNI ratio or ODA volumes); to have a system for the monitoring of the performance and evaluations (OECD, 2024b). Aiming for DAC OECD membership, the CECs were forced to adopt their national legislation on development cooperation and to create its institutional framework. Czechia adopted its Act as the first CECs in 2010, and it was followed one year later by Poland (see details in Table 1).

Table 1: National Legislation on Development Cooperation of the CECs

Country	Year	Title
Czechia	2010	Act on Development Cooperation and Humanitarian Aid, and Amending Related Laws
Hungary	2015	Act on International Development Cooperation and International Humanitarian Assistance
Poland	2011	Development Cooperation Act
Slovakia	2015	Act on Official Development Cooperation and Amendments to Certain Acts

Source: own processing

The Czech *Act on Development Cooperation and Humanitarian Aid* sets conditions for the provision of development cooperation, rules for its funding and competencies of the Ministry of Foreign Affairs, Ministry of Interior and Czech Development Agency. The main objective of Czech development cooperation is defined by the Act as the contribution to the eradication of poverty in the context of sustainable development, promotion of social and economic development, environmental protection, protection of human rights, and good governance in developing countries (Ministry of Foreign Affairs, Czech Republic, 2010).

The Acts of other CECs have similar content:

- The Hungarian Act, being in force since 1 July 2015, specifies the general provisions, planning, implementation and coordination of development cooperation, or its financing and transparency. The fourth paragraph defines the main objectives of the Hungarian development assistance – fight against poverty, promotion of human and minority rights, sustainable development, international security, and stability (Ministry of Foreign Affairs and Trade, Hungary, 2024).
- The Polish Act of 16 September 2011 describes general provisions and forms of Polish development cooperation, and its institutional framework - mainly the responsibility of the Ministry of Foreign Affairs. Article 2 defines the development aid and its objectives as follows - to promote and support the development of democracy and civil society (including for instance principles of good governance, and respect for human rights); to support long-term social and economic development in developing countries; and to undertake actions contributing to poverty reduction (Ministry of Foreign Affairs, Republic of Poland, 2024).
- The Slovak Act, being in force since 2015 and being amended in 2019, specifies basic terms and principles of Slovak development policy, its institutional framework, the role of the national development agency, and the forms of development assistance (Slovak Agency for International Development Cooperation, 2024).

Being a member of the DAC OECD means as well that the setting of development policy and the fulfilment of the financial commitments to ODA are peer-reviewed by the Committee regularly. The last revisions of the CECs' policies were held in different years. Polish and Czech development policies underwent a mid-term review in 2019, Slovak in 2022, and the first Hungarian peer review took place in 2023 (OECD, 2023a).

3.2 Strategic Priorities of the CECs' Development Policies

The acts of all CECs established and maintain the framework for their national development policies. However, the priorities of their development policies are further specified in more

detail by their national strategic documents adopted for specific periods. These documents particularly introduce thematic (or sectoral) priorities and countries (or regions) where ODA will be allocated during the programming periods. The most recent strategic documents of all CECs relate thematic priorities closely to the *2030 Agenda for Sustainable Development*, including the links with the Sustainable Development Goals (SDGs). Most thematic priorities are fully in line with the priorities of the EU development policy (see details in Table 2).

Table 2: Thematic/Sectoral Priorities of CECs in Providing ODA

Country	Period	Strategy/priories
Czechia	2018-2030	*Development Cooperation Strategy of the Czech Republic 2018-2030* • Good democratic governance; Sustainable management of natural resources; economic transformation and growth; agricultural and rural development, inclusive social development (declared links to SDGs nr. 2, 6, 7, 8, 13, 15, 16)
	2018-2030	*The Development Cooperation Strategy of the Czech Republic 2010-2017* • Environment, agriculture, social development (including education, social and health services), economic development (including energy), promotion of democracy, human rights and social transformation
Hungary	2020-2025	*Hungary's International Development Strategy for the period 2020-2025* • No thematic priorities specified
	2014-2020	*International Development Cooperation Strategy and Strategic Concept for International Humanitarian Aid of Hungary 2014-2020* • institutional development, green growth, environmental and climate protection, human development
Poland	2021-2030	*The Multiannual Programme for Development Cooperation for 2021 – 2030: Solidarity for Development* • SDG 16. Peace, justice and strong institutions; SDG 4. Quality education; SDG 8. Decent work and economic growth; SDG 10. Reduced inequalities; SDG 3. Good health and well-being; SDG 6. Clean water and sanitation, 11. Sustainable cities and communities, SDG 13. Climate action
	2016-2020	*Multiannual Development Cooperation Programme for 2016-2020* • Good governance, democracy and human rights, human capital, entrepreneurship and private sector, sustainable agricultural and rural development, environmental protection
Slovakia	2019-2023	*Medium-term strategy for development co-operation of the Slovak Republic 2019-2023* • Quality education, good health, good governance and building of civil societies, food safety and agricultural, supporting creation of market conditions (declared links to SDGs nr. 4, 3, 10, 11, 2, 1, 6, 11, 7, 15, 8, 9)
	2014-2018	*Medium-term strategy for development cooperation of the Slovak Republic for 2014-2018* • Education, healthcare, good governance and building of civil society, agricultural and forestry, water and sanitation, energy, support of market environmental development

Source: Ministry of Foreign Affairs, Czech Republic (2017); Ministry of Foreign Affairs and Trade, Hungary (2024); Ministry of Foreign Affairs, Republic of Poland (2024); Slovak Agency for International Development Cooperation, (2024); own processing

Fragmentation and proliferation of ODA are the most important and commonly addressed issues related to ODA quality and quantity. Too fragmented ODA is considered to hurt ODA effectiveness (Kovářová, 2021b). Fragmentation of ODA refers to the high numbers of donors with smaller shares in the project market (Knack and Rahman, 2004), while proliferation is associated with a large number of donors and projects (Kimura et al., 2007), or with donors allocating their ODA disbursements among a large portfolio of recipient countries (Acharya et al., 2004). Therefore, ODA donors are usually recommended by the DAC OECD peer reviews not to define many thematic and territorial priorities for their national development policies.

The CECs commonly cooperate in their development policies with countries located in Eastern Europe or Western Balkans, and they are less interested in cooperation with the least developed countries with a lack of external financial resources (Kovářová, 2021b). The ODA provided by the CECs seems to be fragmented in terms of its dispersion among countries they identify as being their ODA recipients. The national strategic documents of the CECs recognize many priority countries where the CECs' bilateral ODA is allocated. For instance, the *Development Cooperation Strategy of the Czech Republic for the period 2010-2017* acknowledged the negative effects of ODA fragmentation on its effectiveness. The Strategy was formulated to reduce the number of thematic priorities as well as the number of recipient countries (Kovářová, 2021b). The reduction of the number of partner countries is also a priority for Poland (see details in Table 3).

Table 3: Territorial Priorities of CECs in Providing ODA

Country	Period covered through the national strategic document	Number of partner countries (Regardless of the status)
Czechia	2018-2030	6 countries
	2018-2030	14 countries
Hungary	2020-2025	no countries specified
	2014-2020	no countries specified
Poland	2021-2030	10 countries
	2016-2020	12 countries
	2012-2015	20 countries
Slovakia	2019-2023	27 countries
	2014-2018	10 countries

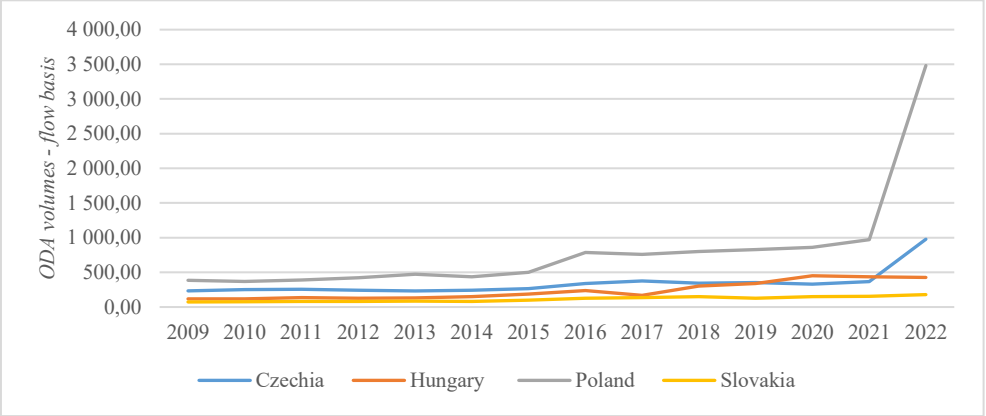
Source: Ministry of Foreign Affairs, Czech Republic (2017); Ministry of Foreign Affairs and Trade, Hungary (2024); Ministry of Foreign Affairs, Republic of Poland (2024); Slovak Agency for International Development Cooperation, (2024); Kovářová (2021a), own processing

3.3 Fulfilment of the Financial Commitments to ODA by the CECs

The DAC OECD members generally accepted the 0,7% target for ODA provision, at least as a long-term objective of their development policies. The EU and its member states declared that they would take steps to meet this targeted value of the ODA/GNI ratio by 2030. However, the EU acknowledged the emerging donor status of some member states, and these member states have to increase their volumes of ODA to reach the value of the ratio of 0,33 % by 2030.

During the last 13 years (2009-2021), the CECs did not make any significant progress in meeting the targeted values of the ODA/GNI ratio. However, the preliminary results for the year 2022 presented by OECD revealed the increase of ODA volumes allocated by some CECs as well as the increase in their values of the ODA/GNI ratio (see details in Figures 1 and 2). However, this increase is connected with the increase in in-donor refugee costs. These costs are mainly related to the refugees hosted by the CECs as a consequence of the Russian armed attack made on Ukraine in February 2022 that caused the war between Russia and Ukraine (still lasting).

Figure 1: ODA Disbursements of the CECs – Flow Basis Methodology (in mil. USD, 2021 constant prices)



Source: OECD (2023a), own data processing

In 2021, Poland provided 97,2 % of its ODA in the form of grants, while other CECs provided all ODA volumes in the form of grants. Lower shares of grants in Polish development aid led to the differences in ODA volumes when data using the flow basis and grant-equivalent methodology are compared (see details Table 4). The grant-equivalent methodology was introduced by the DAC OECD in 2018, therefore, no longer data series using this methodology are available.

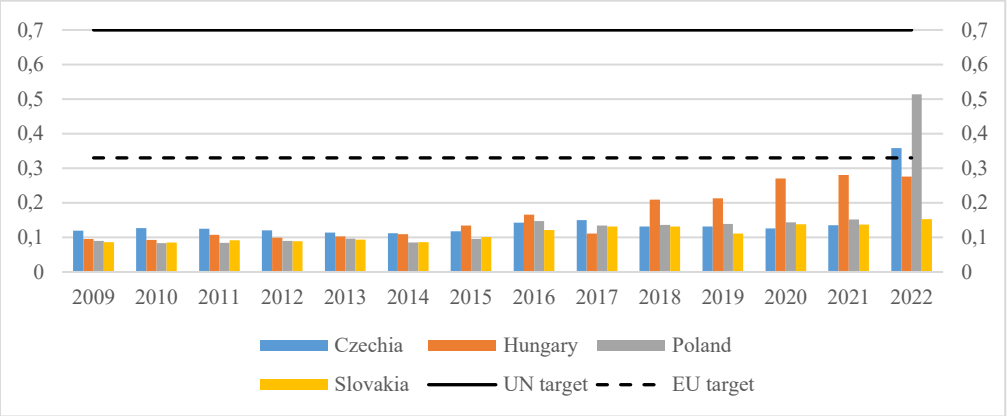
Table 4: ODA Disbursements of the CECs (in mil. USD, 2021 constant prices)

Year	Czechia		Hungary		Poland		Slovakia	
	Grant-equiv.	Net ODA	Grant-equiv.	Net ODA	Grant-equiv.	Net ODA	Grant-equiv.	Net ODA
2018	342,71	342,71	300,99	300,99	808,57	801,33	148,26	148,26
2019	352,50	352,50	338,36	338,36	845,79	828,88	128,18	128,18
2020	330,92	330,92	451,30	451,30	879,83	861,48	150,02	150,02
2021	366,11	366,11	435,06	435,06	983,51	971,22	155,28	155,28
2022	977,91	977,91	427,78	427,78	3 497,67	3 481,95	179,17	179,17

Source: OECD (2023a), own data processing

The highest growth of ODA between 2021 and 2022 was reached by Poland due to an increase in in-donor refugee costs that represented 64,6 % of total Polish ODA in 2022 (OECD, 2023a). Czech aid was increased between 2021 and 2022 as a consequence of the war between Russia and Ukraine too. However, excluding the in-donor refugee costs, Czech ODA fell in 2022, while Polish ODA was also increased because of the increased contributions to multilateral ODA channelled via international organizations. The increases in ODA volumes provided by the CECs led to increases in their values of ODA/GNI ratio. In 2022, Czechia and Poland met, resp. exceeded, for the first time the targeted value of the ratio recommended by the EU for its members with the emerging ODA donor status (0,33 %). Between 2021 and 2022, the value of the Czech ratio grew from 0,13 % to 0,36 %, and the Polish ratio from 0,15 % to 0,51 %. Hungary is the only Central European country that was close to meeting the targeted value formulated by the European Union In the last three years, the Hungarian value of the ratio was around 0,27 %.

Figure 2: Values of the ODA/GNI Ratio Reached by the CECs (in %)



Source: OECD (2023a), own data processing

4. Conclusion

This paper presented the first results from the initial phase of the research examining the most recent challenges for development policies of the CECs, represented in the paper by Czechia, Hungary, Poland, and Slovakia. This initial phase aims among other topics to identify the objectives of development policies in the CECs and their thematic and territorial priorities followed in ODA allocations. All analysed CECs are members not only of the European Union but also of the Development Assistance Committee of the OECD, which represents the official donor community. Being members of the EU and DAC OECD means that the CECs have to follow general recommendations concerning ODA and they have to meet financial commitments to ODA formulated by the European Union and United Nations.

The CECs define the main objectives of their development policies in their national legislation (acts) dealing with development cooperation and humanitarian aid. In all CECs countries, development cooperation is designed as a part of foreign policy and thus the main responsibility in development policy is assigned to the Ministry dealing with foreign affairs. The CECs specify the objectives of their development policies like poverty reduction, sustainable development as well as good governance and environmental sustainability. More specific formulation of the thematic and territorial priorities is introduced by the CECs in their national strategic documents adopted for specific programming periods. Thematic priorities of the CECs are fully in line with the objectives of the EU development policy and are linked with the *2030 Agenda for Sustainable Development*. Czechia and Poland also took steps to reduce the level of ODA fragmentation, because they introduced in their last strategies the reduced numbers of ODA recipient countries they aim to cooperate with.

The meeting of the financial commitments to ODA was assessed in the analysis too. The values of two indicators were followed during the period 2009-2022 – the ODA volumes (expressed using the net ODA disbursements in USD, constant 2021 prices), and the values of the ODA/GNI ratio. In most years, the CECs did not meet the targeted values of the ODA/GNI ratio. In 2022, the increase in ODA volumes resulting from the increases in in-donor refugee costs caused that Czechia and Poland exceeded the targeted value of the ODA/GNI ratio (the EU targeted value of 0,33 %) for the first time. However, Hungary was close to meeting the targeted value in the last three years, despite the decline in its ODA volumes in 2022.

Acknowledgements

The research which results are presented in the paper was supported with the project nr. SP2024/068 solved at the Faculty of Economics, VŠB – Technical University of Ostrava.

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The European Union – Civil or Normative Power?

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Abstract
The 20th anniversary of the largest enlargement of the Union is a good reason to think about the specifics of European integration. Why has it been developing both subject-wise, content-wise and territorially for more than seventy years. The number of areas managed by the Union is expanding, integration is deepening to other levels, and above all, its membership is growing. But it does not end there - the EU is able to promote its norms, standards and principles in the international system of trade, finance, environmental protection, security and peacekeeping, and the spread of democracy in the long term. It uses civilian means for this, offers cooperation, supports developing countries and their development, sets an example. What were the starting points for the formation of the European model? What makes it inspiring? Why is the EU real normative power -causes.

Keywords: *Brussels effect, civil power, EU, European standards, normative power*

JEL Classification: *F15, F55, N44, P16*

1. Introduction

This year is the twentieth anniversary of the biggest expansion of the EC/EU, when the so-called big bang happened - the EU suddenly expanded by ten new countries. The number of member states rose from fifteen to twenty-five, the population increased by 20%. This, of course, is evidence of a major change in itself, but the fact that in most cases these were states that had long been in the Soviet sphere of influence and its institutional and economic framework was more crucial (Krejčí, 2010; Kučerová, 2015). However, all candidate states must go through a convergence process, the progress of which is constantly monitored. Nevertheless, the degree of heterogeneity of individual economies is high A certain "burden" of the functionality of this EU enlargement, the issue of changes in decision-making rules, the setting of common policies and their financing was manifested in accelerated reform pressure in the institutional and decision-making sphere (Plechanovová, 2004).

Not only the continuous process of expanding the membership base from the original six to twenty-seven to twenty-eight countries, but also other states standing at the gates of the EU testify to the attractiveness of European integration. And also, in other regions of the world, many integration groupings refer to the reference and model of the EC/EU. Why? What makes European integration inspiring?

2. European Integration as a Bridge Between a Past Full of Wars and a Future of Peace, Stability and Prosperity

The specifics of the post-war development in Europe are the main determinant of the successful integration process, which helped to overcome centuries-old disputes. So successful that it became a model for other regions of the world economy. And thus the Federalists' theses regarding economic cooperation as a tool to achieve peace were confirmed.

Not only did both world wars break out in Europe, but it was also the space in which the Cold War developed, where the demarcation lines between the political West and East clashed very closely, both geographically, ideologically, security-wise, institutionally, economically. Also on a human level, the iron curtain caused often fatal problems - the breaking of traditional ties between families - above all, but not only, in Germany; between regions, states. And these are the fundamental roots of post-war European unification.

2.1. The European Model of Integration as a Pattern for Others

In connection with the post-war development of Europe, the concept of path dependency is often used, specifically the experiences from the two world wars that broke out in Europe and which significantly influenced considerations and negotiations about the post-war vision of the world. Path dependency thus influenced behavioural patterns, the entire political, economic and social development. Although this term was used for the first time only in 1985 (David, 1985), in retrospect, the ideological background of European integration is associated with this phenomenon and actually analysed. History matters - it is evident that people transfer their past experiences to make decisions about the future (North, 1990), modern currents of economics work with a similar concept, namely adaptive expectations. People, communities, governments make decisions on the basis of their lived experience and accordingly adopt a strategy for further development (Cagan, 1956).

Specifically, in Europe, it was mainly about ensuring peace, i.e. to overcome the centuries-old rivalry between nations and states, knowing that post-war Europe could not and did not want to be a military power. Some Western European states linked their defences to NATO with the dominance of the US in this alliance, some on the contrary with a vision of neutrality that lasted them throughout the Cold War and the development after the fall of the Iron Curtain until the invasion of Ukraine by Russia in 2022. Finland and Sweden reconsidered the status of neutrality and 2024 became members of NATO. Path dependency also played a role in the security sphere for the Central Eastern states of Europe, which, after the martyrdom of Soviet domination and dictatorship, rushed very quickly into Euro-Atlantic structures, first NATO, then the EU.

Nevertheless, Europe, Western Europe, has long profiled itself as a civilian power (Duchêne, 1972) based on its economic strength, market size and codification of rights and guarantees to individual economic subjects. With the fact that Europe's power will manifest itself in growing influence in the international environment, where it will pass on its procedures and patterns of behaviour based on solidarity and cooperation, i.e. that he will be a leader in the development of civilian forms of power. The concept of Europe's civilian power can be summarized as the ability to spread the European model of ensuring stability and security through economic and political means, rather than military ones (Sjursen 2007).

2.2 Membership in the European Union as a Guarantee of Stability and Prosperity

From the founding six countries of today's Union, the membership gradually grew to 28, today 27 countries. In addition to full membership, however, there is a rather complex fabric of relations with other states connected to the EU market and its budget. EEA e.g. - Norway, Iceland and Liechtenstein share a number of other economic and institutional levels of mutual cooperation with the EU. In terms of investment, capital or trade, European integration expanded further. In addition to the EEA project, the EC has long been building closer relations with developing regions within the framework of the ACP platform, which regulate various types of association agreements. It is clearly a transfer of European interests and values to practically the entire world. The Eastern Partnership project is another program for spreading European values. Always accompanied by a helping hand - financing of selected areas, cooperation. So, is the EU a model and a desirable partner? Of course, yes.

If we were to think about the input-output analysis of EU membership, for which there is no space here, then it clearly shows that the benefits exceed the costs (Kučerová, 2004, Beck, 2015), even with Brexit in mind. Years after Britain's departure from the EU, public opinion surveys repeatedly show a growing share of respondents regretting Brexit, as the economic problems associated with leaving the Union persist (Kučerová, 2018; Kučerová, 2021; Somai, 2021). On the other hand, we cannot ignore a certain hesitancy regarding the further development of integration even outside of Britain, when the first slowdown or disagreement with certain steps began to manifest already in the 1960s - see the policy of the empty chair leading eventually to the Luxembourg compromise, but also further vigilance. In addition to significant manifestations of integration enthusiasm spill-over effects, we are also talking about spill-back effects (Schmitter, 1970), or integration fatigue - it is therefore a negative attitude towards integration resulting from concerns about federalist tendencies leading to a disproportionate strengthening of the transnational level of the Union's decision-making sphere. Or, it is a matter of disagreement with some projects and goals of integration that seem to be ineffective - see the common agricultural policy and its financing, the ambitious Green Deal and the decarbonization of economies, somewhere even the issue of the common currency. In any case, the manifestation of the spill-back effect is associated with fears of the loss of state and national sovereignty. In the end, however, the forces connected with integration tendencies and their further shift and the spill-beck effect as a systemic approach won was excluded (Kučerová-Nedomlelová, 2015).

However, the process of European integration continues not only extensively, by expanding the membership base, with the exception of Brexit, but also by intensively and constantly deepening integration towards the creation of a homogeneous internal market with a common currency (Gazzola-Sepashvili-Lo Parco, 2016) and building a common security apparatus (Plechanovová, 2004). The mutual interweaving of the processes of deepening integration with the expansion of both integration activities and the membership base is a unique phenomenon in the world, although it is actually a logical connection. In order for the Union to achieve its political and social goals, its economic performance must develop adequately. And this, in retrospect, requires shifts in the levels of integration, because the level of political and social stability is a condition for economic sustainability (Kučera, 2022) and certain performance. Trying to cover a wide range of goals requires a wide network of tools. The expansion of integration areas thus needs a sufficient institutional background, which also distinguishes the EU from other international or integration organizations.

The European Union thus becomes a unique phenomenon of the international system, a sui generis organization with a relatively wide spectrum of its own bodies taking over part of the development dynamics of integration (Hix, 1999; Zbíral, 2007). The ambitions and needs of

EC/EU representatives go further than economic linkages and cooperation on security issues, coupled with the demands of a political platform that would strengthen Europe on the global stage. One of them is the European Political Community project of Emmanuel Macron, which he presented in Prague in October 2022, on which 44 European states agreed. Another pillar of the European Union's role as a global player?

The eastern enlargement of the Union, which continued in the following years, when the membership grew to 28 countries, was not only associated with increased costs for the original members, but the benefits of the growing economic base of the EU were also quantified, both in connection with the expansion of the internal market, but also at the level of security, political - exactly according to the goal of spreading the zone of stability, peace and prosperity, thus contributing to solidarity between nations and the protection of human rights (LT, 2007, art. 2, 3). However, the assumption of a successful continuation of the European model in the new millennium is based on the original ideological basis of European integration (Margan, 2022), i.e. above all, Schuman's and Monnet's ideas about the necessity of a technical connection of European economies so that no further war is possible. The goal of European integration immediately after the war was political and security reasons, and the tool was economic and technological interconnection. This makes Europe, the European Union, a model for other regions. If we include the EU's highly ambitious environmental and social goals, including increasing standardization, the Union, and therefore Europe, becomes a strong actor in international relations. Overall, the development of Europe's position in the system of international relations can be summarized by a simple causal nexus: political stability → economic prosperity → increasing living standards → expansion of social guarantees and at the same time increasing economic performance → increasing technological competitiveness made Europe, Western Europe, the second centre of the world economy. The EC/European Union thus acts as a model in many areas: political stability, negotiation skills, respect for the law, economic performance, although it lags slightly behind the USA, but social solidarity is probably Europe's most striking attribute.

And that even in the conditions of a truly crisis-like development over the last decade, when the EU dealt with at least five major crises, not only economic and social, but also security and sanitary. Nevertheless, it actually came out of these crises strengthened by the fact that in crises a part of national competences is transferred to the transnational level, the competences of the Union institutions increased (Kučerová, 2021; Pekarčíková-Staníčková, 2022).

The enlarged EU today, with 445 million citizens, means a large market with a high standard of living, which translates into a steadily higher and more demanding demand. It is thus an incentive for investors from all over the world, because the returns on scale are extraordinary. But it also has its costs for them, namely the high level of demands for meeting technical, sanitary, environmental and social standards. Nevertheless, we are talking about the so-called Brussels effect (Bradford, 2012, respectively 2020), when multinational companies voluntarily adopt EU standards, which thus become a common part of global business and trade. Thus, the European Union is getting into the position of a very influential superpower without having to it needed strength because the organization of the market in the Union creates such a market mechanism that it must be accepted by external entities, especially in the area of consumer protection, social rights safety of employees, personal data protection, antitrust rules, incl. of the latest phenomenon – regulation of artificial intelligence, etc. It is a indicator of natural Europeanization global trade and about the manifestation of Europe's civilian power.

Already in the year of the first expansion of the Community there is talk of a Pax Bruxellana on the verge of becoming a superpower: the EC spreads through of concentric circles

emanating from Brussels, deepening integration and transferring it to other states, which affects the rest of the world (Galtung, 1973).

Ana Bredford's original Brussels effect can also be extended from the adoption of European standards by external actors to the still persistent interest of some countries in full membership of the Union. In this case, it is not just a matter of harmonizing the legal and institutional environment, but of using the benefits of membership. Not only the drawing of resources from "Brussels", but also the opportunity to participate in the further shaping of the integration process, to be part of the great power Europe.

3. Normative Power of the European Union – Theoretical Analysis

If we proceed from the definition of the normative framework of the concept of promoting the interests of the EU, then we cannot ignore the political philosophy of John Rawls, when the principles of liberal democracy are not enforceable for all states, but essentially become general norms. Likewise, the political conception of justice based on the political, economic and social structure of society (Rawls, 1993). Although his reasoning applied to the US, we can apply his theory to Europe. The concept of normative power of the European Union follows its ability to promote implicitly through its values, norms its interests and its rules. However, it is necessary to realize that the system of values, their hierarchization is changing, which logically applies to Europe as well. From the accentuation of the Christian concept of values, through philosophical rationalism, interests gradually shifted towards individualism and economic benefit (Kučera, 2022) and respect for individual freedom of thought, conscience and religious belief. It is still true that the European Union is primarily a civilian power, but it clearly asserts itself as a normative actor in international relations.

Ian Manners came up with the concept of the normative power of Europe, when he partly defined himself against Duchêne's concept of civil power. The European Union must not neglect security needs, it is necessary to move more towards the military self-sufficiency of Europe (Manners, 2002). Yes, this is, inter alia, a reaction to the terrorist attacks in September 2001, when the world was taken by surprise and unprepared. Although the EU established a common foreign and security policy with the Maastricht Treaty, it was only on a declaratory level, as the willingness to transfer competences in the area of national security was minimal. And so, in 2022, the world and the EU were caught off guard by Russian aggression against Ukraine, again unprepared - by the way.

The European Union is an actor that asserts itself in a specific political form emphasizing human rights, social justice and solidarity, and the principles of democracy. The formation of the normative base of the EU is logically influenced by path dependency: historical experience led to the establishment of norms of peace and freedom; the cold war was reflected in the development of the norms of democracy, respect for the rule of law and human rights; intensifying competitive pressure in the labour market was behind the development of social solidarity, so different from the rest of the world; the accelerating internationalization of economies leading to economic globalization then required another norm, namely the concept of good governance as a guarantee of the enforcement of legal procedures in the public sphere (Manners, 2002).

The question is, however, how the standards expand, how, in our case, the European Union promotes its principles and values in the international environment. The mechanism of the spreading of norms is quite broad, and on a theoretical level at least Manners's considerations merge with the concept of Europeanization. And the neo-functionalist spill-over-effects cannot be neglected.

4. Normative Influence of the EU

If we perceive the normative effects of European influence on the international environment, then in the sense of the determinant of the bindingness of European rules, the bindingness of ethics.

Normative power is actually the ability to define the boundaries of norms that are presented as universal and are disseminated through dialogue, partnership and possibly shared responsibility (De Zutter, 2008). All these requirements of normative power spread from the originally institutional level of economic partnership to other areas of international relations, including security, thanks to Europe's potential not only economically, but also socially and politically.

Considering the EU as a normative power offers the possibility to leave the dichotomy of civilian versus military power, as both speak to the capabilities and capacity that the EU undoubtedly possesses. Normative power is actually a manifestation of the ability to formulate and promote the concept of normality, i.e. established systems of values and norms, principles (Manners, 2002). It is the method of enforcement that is an important aspect of the EU's informative power, because one thing is the formal adoption of European standards, but another is their enforceability – the so-called behavioural integration into the institutional system, hence the guarantee of the conditions for the fulfilment of these standards (Stehlíková, 2023).

Manners' concept is based both on Duchêne's perception of Europe as a civil power and also on John Galtung's thinking about the ideological power of Europe, arising from multiple sources. First of all, we cannot ignore the cultural dominance of Europe, which spread its culture for centuries by sword and trade, and even the bipolarity of the Cold War did not disturb this cultural dominance of Europe. However, the essential functional source of the EC's ideological power is their growing resource and structural power (Galtung, 1973). Manners continues his concept by analysing the normative power of Europe resulting from the normative base of the EU: freedom, peace, democracy, legal order, protection of human rights, solidarity, good governance (Manners, 2002). His concept was later expanded by Nathalie Tocci to include the category of EU normative foreign policy. The EU spreads these values as norms through its foreign policy defined as ethically "non-neutral", which is based on the assumption of the legitimacy of European norms and therefore their universality. Through international regimes and organizations, the foreign policy of the Union influences the political environment in the world. An example is the European promotion of multilateralism as a norm, whereby the Union strengthens its own power (Tocci, 2008).

Virtually no one doubts today the normative power of Europe, manifested in the long term in a number of levels of international relations. As for the setting of a different type of international relations, modern and progressive, then it is a political miracle of European democracy. Normative force operating outside Europe is connected with a good example of its own organizational model actually already defined in the Treaties of Rome and their subsequent reformulations. The source of this international normative power is the supremacy of European law (Cohen-Tanugi, 2021) – evidently because it is generally accepted as universal. However, criticism of this interpretation focuses on the fact that the European Union actually regulates access to its market with its normative power and thus builds competitive barriers for its commercial rivals.

5. Conclusion

The European Union has been an unmistakable actor in international relations since the very beginning of its development within the European Communities. The specificity of this unique political-economic model can be criticized in several points. First of all, the apparent dichotomy of political goals and economic-technical instruments of post-war integration. On another level, the uniqueness of the European project was manifested in the growing economic performance of the Community, built, among other things, on trade liberalization and the joint management of selected areas, primarily agrarian. The emphasis on the principles of democracy, the legal order and the protection of individuals while being able to maintain a competitive balance in international trade is considered another exceptionality of the European approach.

The European Union's institutional base, together with its comparable economic performance, but also its willingness to set the agenda for a number of issues concerning the entire world, is considered inspiring. Rules governing processes, standards concerning both economic, social and environmental issues are voluntarily (more or less) accepted by the majority of actors in international relations. The European Union thus has normative power, but it uses civilian means to enforce its practices.

I don´t see a contradiction between the concept of Europe, specifically the European Union, as a civil and normative power. The number of organizations openly declaring their inspiration in the goals and organizational model of the European Union also speaks for the EU as a model.

The 20th anniversary of the first phase of Eastern enlargement is not only an opportunity to reflect on the benefits (and costs) of membership, but also why the European model of integration works, spreads to other regions and affects the international system as such. This article is not and cannot be exhaustive, but it is an attempt to theoretically explain what we empirically perceive as success.

Acknowledgements

This work was supported by the Cooperatio Program, research area Political Science.

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Research on Modeling of Credit Spread Risk in The Banking Book

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Abstract
Credit spread risk in the banking book (CSRBB) is the risk of loss arising from changes in market credit spreads and liquidity spreads that affect the value of banking book assets. CSRBB has become an important risk facing the banking industry in recent years due to increasing financial market volatility. This paper reviews the definition of CSRBB, management and regulations, describes the guideline method, then EVE methods are applied in this paper and gives a method to measure the CSRBB under sensitive conditions, proposing direction for future research.

Keywords: *credit spread risk in banking book, economic value on equity, market credit spread, market liquidity spread*

JEL Classification: *G21, G24, O52*

1. Introduction

The main factors affecting fixed income securities are interest rates and credit spreads. Credit spread changes tend to have a bigger impact on value than interest rate movements. However, current banking regulations (Basel III) only consider interest rate risk for valuing the banking book. This means the impact of wider credit spreads hasn't been fully addressed, and many risk management tools (like Value-at-Risk models) and financial planning (asset-liability management) haven't accounted for it. This research explores credit spread risk in the banking book, as recently recommended by banking authorities like the Basel Committee and the European Banking Authority.

Capital Requirement Directive-CRD specified the criteria for evaluating institutions' interest rate risk of an institution's non-trading book activities. And in 2018, a new guideline was published, updating some elements, particularly on CSRBB assessment and monitoring non-satisfactory IRRBB internal system.

CSRBB stands for Credit Spread Risk in the Banking Book. It's a regulatory requirement set by the European Banking Authority (EBA) for banks to assess and manage the risk of changes in credit spreads on their banking book positions. On October 2022, the European Banking Authority (EBA) published the relevant guidance, and at the beginning of 2024, the CSRBB came into force.

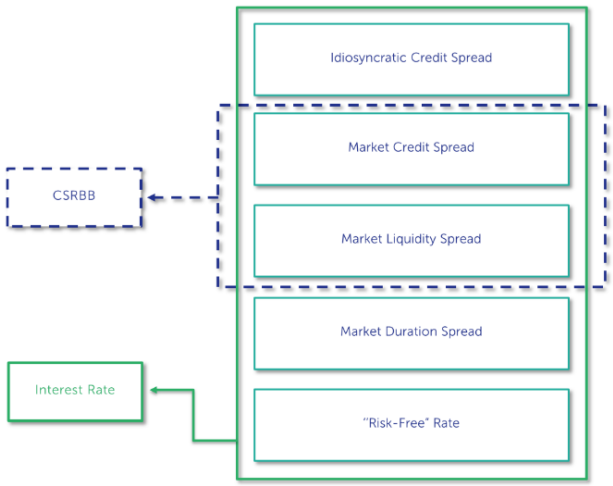
CSRBB is one of the market risk commercial banks that need to be noticed, and CSRBB is one part of Interest rate risk in the banking book (IRRBB), including the market credit spread and market liquidity spread, also the idiosyncratic credit spread can be considered but not mandatory.

Most of the existing literature is about IRRBB guidelines and relevant analysis of implications and impacts on the bank industry, such as (Bohn et al., 2023) describe the oversight of EBA regulations, (Claußen and Platte, 2023) assesses the validity of changes in the economic value of equity (EVE) and the net interest income NII) in bank daily risk management, also there are some papers mentioned preferential from EBA (Doleželová, 2022, pp. 102–114). In this paper, the policy and measurement are described, then management is raised, the most significant part is the modeling, EBA suggests two methods in CSRBB monitoring, net interest income (NII) and economic value on equity (EVE), here EVE is selected in empirical analysis. In this paper, considering the bank has bonds portfolio and swap portfolio conditions. In the empirical analysis part undertakes to establish the EVE model to measure the credit spread risk.

2. CSRBB Structure and Methodology

Normally, when a bank invests one bond, the rating is the first thing it considers, now there is CSRBB, it is a more timely indicator. This is the difference between the yield of a corporate bond and the yield of a risk-free government bond of similar maturity. It reflects the additional risk perceived by investors in holding a corporate bond compared to a government bond. CSRBB essentially means that if the market perception of credit risk changes, and credit spreads widen (meaning the difference between risky and risk-free yields increases), the value of the bank's holdings in the banking book could go down. This can negatively impact the bank's profitability and capital adequacy.

Figure 1. Components of Interest Rates.



Source: Credit Spread Risk in the Banking Book (Finalyse, 2022)

If one bond A has a higher margin than bond B, so it exists the extra risk margin, three possibilities here:

(a) Bond A has higher credit risk than Bond B

(b) Bond A has worse liquidity than Bond B

(c) Bond A has more unfavourable terms to investors than Bond B

A high credit spread means that the risk of the bond is relatively greater, and the income compensation is higher; in addition, it also reflects the results of market games. For example, a sudden jump or narrowing of the spread means changes in company operating conditions.

2.1 Model of CSRBB

The guidelines of EBA not clearly announce the methods of CSRBB assessment and monitoring. According to (Golin and Delhaise, 2013), organizations need to "monitor their exposure to CSRBB in terms of potential changes to both the economic value and net interest income" and "implement robust internal measurement systems (IMSs) that capture all components and sources of CSRBB which are relevant for the institution's business model."

EBA also wants institutions to capture CSRBB in both the short and long term, as well as to assess the impact of key modeling assumptions for the EVE, NII, and CSRBB of their banking book derivatives. Finally, it is claimed that institutions should create their own approaches and assumptions for evaluating the CSRBB.

In guidelines, CSRBB does not include financial instruments that are in an abnormal performance state, All assets, liabilities, derivatives and other off-balance sheet items (such as loan commitments) under the banking books should be evaluated, and any financial instrument should not be excluded from the management scope of CSRBB in advance according to the accounting treatment rules for financial instruments; Financial instruments may be excluded from management only if they lack sensitivity to credit spread risk; Under no circumstances should banks exclude financial instruments measured at fair value, some authors, such as (Duffie and Huang, 1996), (Hull, 1989) and (Fehle, 2003) also researched relative financial instruments, like swap spread and off-balance sheet products.

According to EBA guidelines, all credit risk premium and liquidity premium movements need to be assessed in specific dimensions. Like in the currency dimension, all relevant products can be classified into different currencies (i.e., EUR, CZK, USD, etc.). Also, can also be in the industry dimension, like real estate, financial institutions and airlines, etc.

In this paper, currency and sector are selected in the dimension standards. And the economic value change can be calculated by portfolio present value and market value.

$$\Delta EV = PV_{sen} - MV \tag{1}$$

PV_{sen} is present value consider the shock or make sensitive adjustments, MV is market value of portfolio.

When the adjustment discount cash flow got, we can use the adjustment discount cash flow to calculate the discount factor including the credit spread.

$$df_{cs} = \frac{CF_{adj}}{CF} \tag{2}$$

$$CF_{adj} = PV \cdot \frac{M}{P} \tag{3}$$

df_{cs} is the discount factor with credit spread, can be calculated by adjustment cash flow and cash flow. $\frac{M}{P}$ is the ratio in the same sector and currency, the portfolio market value divided by present value similar like the discount factor definition raised by (Hull, 2012) and (Tuckman, 2002), here we define.

$$df_{cs} = Exp\left(-R_{cs} \cdot \frac{days}{365}\right) \tag{4}$$

Here, df means discount factor; R_{cs} means the rate with credit spread; $days$ means the time of cash flows, like the bond coupon per half year, the days is 180, as for the second coupon, the days is 360, and so on.

$$R_{cs}^{s} = R_{cs} + r \tag{5}$$

Similar with the equation (4), if we know the rate with credit spread and shock, the sensitive discount factor can be got too,

$$df_{cs}^{s} = Exp\left(-R_{cs}^{s} \cdot \frac{days}{365}\right) \tag{6}$$

According to EBA guidelines, the EVE method needs to consider the shocking scene, so here R_{cs}^{s} means the rate with credit spread and shock, r is the shock we can set in the calculation.

$$PV_{sen} = PV \cdot df_{sen} \tag{7}$$

After all date we got, the EVE method can get the results in following:

$$CSRBB_{EVE} = \frac{\Delta EV}{T_1} \tag{8}$$

Legends：ΔEV is the change of economic value change, T_1 is the tier 1 capital of the bank.

3. Empirical Results

In this paper, the portfolio is considered in sectors and currency. Because there are too many items in the banking book and the confidentiality policy, only partial results can be shown in this part, in this paper, three kinds of sectors in calculations, USD financial institutions/sovereign, EUR corporations, and EUR Financial institutions/sovereign, all data are from Finastra and Bloomberg platform on Jan 12th, 2024.

Table 1: Sectors and Relative Value

SECTORS	MARKET VALUE	Present Value	M/P rate
USD FI/SOV	24,410,056	25,154,261	0.97
EUR CORP	8,256,171	8,793,246	0.94
EUR FI/SOV	1,825,559	1,797,738	1.02

Source: Finastra download and own calculation (2024)

From Table 1, market value and present value in sectors and currency can be obtained, and the market to present rate also.

Here one USD FI/SOV bond is used as an example to calculate the sensitive PV.

A USD bond is shown in supplement table 1, including the start and end, cash flow and notional amount, and each flow in each period. supplement table 2 shows one bond's cash flow in the whole duration, cause the bond pays coupons the half-year, the rate and days is shown in the table also.

In supplement table 2, The calculated results represented, including M/P rate according to equation (3), then calculated the cash flow by adjustment discount according to equations (2) and (3). The M/P is the market value to present value in one period of time, cause the bond has

five years until maturity and coupon per half year, there are 10 cash flows in supplement table 2. At maturity, there is one cash flow contains the principle and couple.

The discount factor including the credit spread is calculated by equation (4), then the rate includes the credit spread can be got. In our calculations, the shock is considered as 0.01%, then the rate with credit spread under shock can be decided. The bond present values are changed in each period, because the rate already contains the market change factors, it means the discount factors which we got is already consider the credit spread. Also, the discount factors got, the rate contains the credit spread can be got too.

The sensitive discount factor under shock can be calculated by (6) with the inverse operation. In our assumption, the shock is determined as 0.01%. So after doing all of these, the sensitive PV of one bond is got.

In the banking book, there won't be only one product, now consider there exist the EUR Corporate bond swap.

In supplement table 3 shows the swap calculations in banking book. Swap is the item need to consider its value and it also been affected by interest rates.

Same with the before calculation and use the formulations (3) to get the M/P ratio and calculate the cash flow and discount factor by (2) and (3).

Then the rate with credit spread and shock can be got by (4), (5) and (6). After all procedures the sensitive Present value can got.

According to EBA guidelines, the items effected by interest need to be consider in banking book. After calculated all products, the ΔEV can be got.

Table 2: Economic Value to Equity (in CZK)

Aggregate ΔEV	-547,833
Tier 1 Capital	1,265,250,000
Economic Value Change/Net Capita	-0.04%

Source: Own Calculation (2024)

From the Table 2, the results show the aggregate economic value is 547,833, consider the CNB requirement for bank in Czech Republic, the initial capital is USD 50 million, the economic value change to net capital is 0.04%.

4. Conclusion

In this paper investigates new capital requirements proposed by banking regulators to manage credit spread risk in banks' holdings (banking book). The paper highlights how changes in credit spreads, along with liquidity conditions, can significantly impact the value of a bank's assets.

Also explores the EBA's recommended model (EVE) for measuring this risk for individual banks. This model provides a step-by-step approach for calculations. It's important to note that credit spread movements are complex and influenced by various factors, such as investor risk tolerance and market liquidity. When credit spreads widen, it becomes more expensive for banks to borrow, potentially leading to losses on their liabilities. Ultimately, credit spread risk affects both sides of a bank's balance sheet (assets and liabilities), making the overall impact on the bank's capital health uncertain.

Acknowledgements

This paper was supported by the SGS Project VSB-TU Ostrava SP2024/045.

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Appendix:

Supplement Table 1: USD FI/SOV bond flows

TYPE	Start	End	Days	Rate	Spread	National	Date	Flows
USD FI/SOV	10/21/2020	4/21/2021	180	0.55	0	5,000,000.00	4/21/2021	13,750.00
USD FI/SOV	4/21/2021	10/21/2021	180	0.55	0	5,000,000.00	10/21/2021	13,750.00
USD FI/SOV	10/21/2021	4/21/2022	180	0.55	0	5,000,000.00	4/21/2022	13,750.00
USD FI/SOV	4/21/2022	10/21/2022	180	0.55	0	5,000,000.00	10/21/2022	13,750.00
USD FI/SOV	10/21/2022	4/21/2023	180	0.55	0	5,000,000.00	4/21/2023	13,750.00
USD FI/SOV	4/21/2023	10/21/2023	180	0.55	0	5,000,000.00	10/23/2023	13,750.00
USD FI/SOV	10/21/2023	4/21/2024	180	0.55	0	5,000,000.00	4/22/2024	13,750.00
USD FI/SOV	4/21/2024	10/21/2024	180	0.55	0	5,000,000.00	10/21/2024	13,750.00
USD FI/SOV	10/21/2024	4/21/2025	180	0.55	0	5,000,000.00	4/21/2025	13,750.00
USD FI/SOV	4/21/2025	10/21/2025	180	0.55	0	5,000,000.00	10/21/2025	13,750.00
USD FI/SOV				0	0		10/21/2025	5,000,000.00

Source: Finastar download

Supplement Table 2: Calculated Results of USD FI/SOV Bond

End days	Present Value	M/P rate	Cash flow by adj. discount	Discount factor incl. credit spread	Rate incl. credit spread	Rate incl. credit spread+0.01%	Sensitive discount factor	Sensitive PV
4/21/2021	0	0.97	-	-	-	-	-	-
10/21/2021	0	0.97	-	-	-	-	-	-
4/21/2022	0	0.97	-	-	-	-	-	-
10/21/2022	0	0.97	-	-	-	-	-	-
4/21/2023	0	0.97	-	-	-	-	-	-
10/23/2023	0	0.97	-	-	-	-	-	-
4/22/2024	13,544	0.97	13,143	0.96	16.32	16.33	0.96	13,143
10/21/2024	13,205	0.97	12,814	0.93	9.09	9.10	0.93	12,813
4/21/2025	12,831	0.97	12,451	0.91	7.79	7.80	0.91	12,450
10/21/2025	12,547	0.97	12,176	0.89	6.85	6.86	0.89	12,174
10/21/2025	4,562,599	0.97	4,427,611	0.89	6.85	6.86	0.89	4,426,825

Source: Own elaboration (2024)

Supplement Table 3: EUR Corporate Swap

Start	End	Present Value	M/P rate	Cash flow by adj. discount	Discount factor incl. credit spread	Rate incl. credit spread	Rate incl. credit spread +0.01 %	Sensitive discount factor	Sensitive PV
4/27/2022	6/6/2022		1.02	0	0.00	0.00	0.00	0.00	0
6/6/2022	12/5/2022		1.02	0	0.00	0.00	0.00	0.00	0
12/5/2022	6/5/2023		1.02	0	0.00	0.00	0.00	0.00	0
6/5/2023	12/5/2023		1.02	0	0.00	0.00	0.00	0.00	0
12/5/2023	6/5/2024	27802.58	1.02	28232.83	1.00	0.09	0.10	1.00	28231.71
6/5/2024	12/5/2024	23642.43	1.02	24008.3	0.98	1.86	1.87	0.98	24006.14
12/5/2024	6/5/2025	19417.12	1.02	19717.6	0.97	2.08	2.09	0.97	19714.85
6/5/2025	12/5/2025	17903.67	1.02	18180.73	0.96	2.11	2.12	0.96	18177.28
12/5/2025	6/5/2026	17828.15	1.02	18104.04	0.95	2.14	2.15	0.95	18099.7
6/5/2026	12/7/2026	17325.49	1.02	17593.6	0.94	2.13	2.14	0.94	17588.5
12/7/2026	6/7/2027	17426.59	1.02	17696.27	0.93	2.15	2.16	0.93	17690.25
6/7/2027	12/6/2027	17218.35	1.02	17484.81	0.92	2.16	2.17	0.92	17477.99
12/6/2027	6/5/2028	17484.52	1.02	17755.1	0.91	2.18	2.19	0.91	17747.29

Source: Own elaboration (2024)

Will the Future New Financial Policy and Adoption of "CBAM" by the EC be Successful in Terms of the Competitiveness of the EU Economy on Global World Markets?

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Abstract
Permanently increased energy prices in the EU compared to the situation before the war in Ukraine will potentially fatally damage the steel and automotive industries. The threat to EU competitiveness is related to the rising prices of raw materials and energy, which will reduce the EU's competitiveness in terms of global competition in connection with the adoption of the ECBM and the future monetary policies of the ECB and the EC, which M. Draghi promoted in the past. The EU's battle for lower global carbon emissions is far from over, as they are yet to take their toll on the EU in the form of rising unemployment, public debt, social unrest, and an increase in political polarization and extremism. Of the two mentioned problems, it does nothing to solve the competitiveness of EU countries and the reduction of CO_2 in the world.

Keywords: *CBAM, Draghi, EC, EU, Steel industry*

JEL Classification**:** *E60*, *F17, F62*

1. Introduction

The study aims to explain the existing problem of the EU in the international competition in steel production concerning the adopted CBAM (Carbon Border Adjustment Mechanism) and especially the inadequate future financial policy and competitiveness of the EU economy, which M. Draghi will try to solve. Because of the above, in the future, the EU will have to face the protectionism that reigns in some large countries of the world.

In the essay, I used methods of analysis to determine the sense or senselessness of both the new EC financial policies and the new CBAM directives. The reason may be that when US President Joe Biden introduced the revolutionary anti-inflation package (IRA), which laid the foundations for a massive investment wave in clean energy in the US, in response, the EU introduced many steps to reverse the US lead. These are mainly the Green Deal Industrial Plan (REPowerEU) or the Net Zero Industry Act. In total, additional investments of around €620 billion per year will be needed to meet the targets, with a further €92 billion needed to achieve the targets of the Net-Zero Industry Act in the period between 2023-2030, which like the American IRA package, aims to support the competitiveness of domestic industry and increase raw material security. We are not talking about the new NIS 2 directive (cyber security), which will continue to cause headaches for economic and non-economic entities due to high energy consumption and high penalties for non-compliance.

There are several reasons for the future incompetence of the EU countries, but I will mention only two reasons that we can say that the EU economy may be on the verge of collapse and will not be competitive on the world market, namely: the former financial policy of the ECB (under the leadership of M. Draghi) and CBAM. To understand what

CBAM brings, I suggest reading the following resources (Regulation (EU) 2023/956, (EC, 2023, Regulation (EU) 2023/956, EC:2023, EC: taxation, 2023, C(2023)5512, EC: Annex - C(2023)5512, Kurmayer, 2023, Kozina, 2023) to understand the operation of the CBAM system. The carbon tariff system in the EU will initially apply to imports of heavy industry, which is expected to have a higher risk of transferring emissions abroad: Cement, iron and steel, aluminum, fertilizers, and electricity. For now, importers will not have to pay for emissions from imported goods, this phase will start in 2026. One of the reasons is that the EU wants to prevent EU producers from moving to countries with lower environmental protection standards.

2. Is the EU Economy on the Verge of Collapse and Will it not be Competitive on the Global Market Due to the New Assumed Financial Policy of the EC?

Not only has the EU taken many different decisions, such as unlimited aid to Ukraine in its war with the Russian Federation, and various measures on climate change, but it is unable to solve the expensive energy that destroys the competitiveness of EU manufacturing companies on global markets. We understand the sanctions and several measures against the Russian Federation regarding the war in Ukraine, such as gas, oil, or petroleum products, but energy prices have increased abnormally in 2022, which is felt by all sectors of the EU economy.

Despite the sanctions, Russian oil and LNG are imported in large quantities, including important raw materials for the production of chips, electric batteries, etc. It is not my job to write about these things in the essay, so in the following I will focus on two topics, what will be the future financial policy of the European Commission from M. Draghi and environmental tariffs for steel production.

Energy, raw materials, steel, aluminum, and tires have become more expensive in the EU thanks to sanctions, and cheap competitive cars and electric cars can no longer be produced here. The French production of cheap cars and electric cars can only be saved by drastic new customs duties - EKO CLY CO_2.

China is famous for hitting back where it hurts. For example, in 2012 the EU wanted to impose tariffs on Chinese solar panels, but the Chinese threatened to retaliate against the European industry, and after the tariffs, and after the European production of solar panels. Now the situation is similar. Brussels, Berlin, and Washington are afraid to impose tariffs on Chinese cars and electric vehicles because China may retaliate by punishing Western concerns that have moved their production to China.

Or impose tariffs on lucrative imports of Western luxury foods, fashion fads, movies, music, and financial and insurance services. Or impose export duties on the export of Chinese consumer goods, electronics, and basic substances for the production of medicines, and rare minerals, to Europe and the US. Neither the US nor the EC want to risk such a customs war, because not only would Big Pharma, Google, Apple, and Banks come to the drum, but there would also be nothing to make weapons for Ukraine. The French car industry will have a problem and hundreds of thousands of jobs will be lost. All thanks to sanctions on Russian raw materials and energy!

The situation is not simple in Europe. Germany's decline in foreign trade with China in 2022 is particularly shocking. Compared to 2021, Germany increased its exports to China by only 3.1% to $107 billion in 2022, while China increased its exports to Germany by 33% to $191 billion over the same period. Germany, which until recently was one of the few countries in

the world with a positive balance of payments, fell into a negative balance in 2022. Thanks to sanctions on Russia and high prices, the EU's economy is already teetering on the edge of existence. The US is in a similar situation because in 2023 it has to import more than $120 billion worth of electronics, $120 billion worth of machinery and equipment, and $40 billion worth of toys and games. and between $20 billion and $40 billion must import goods from each of the following items: Textiles, plastics and rubber, iron, steel and other metals, furniture, and chemical products. In addition, the US chip giant Micron announced the construction of a new factory for state-of-the-art memory chips in China for $600 mil. (Global Times, 2023).

I keep saying that the euro is about to collapse. Why and where is the reason? In recent years, EU governments under the leadership of ECB Mario Draghi have bought unsecured government bonds worth 20 to 30 bil. € (Krall, 2023, Krall, online ,2023). These bonds are deposited in the central banks of each EU country. Germany will soon lose €600 billion, which no one will ever pay! The era of record cheap money from 2009 to 2022 caused record inflation, and central banks and governments were largely responsible for that situation, flooding the economy with near-zero interest rates and causing record national debts.

The government's purchase of uncovered government bonds violates the EU's Maastricht Treaty and is strictly prohibited, but Mario Draghi (Draghi, online, 2023) and his national assistants from individual EU member states devised a sophisticated plan to circumvent the ban. The governments of EU member states first sold their uncovered sovereign bonds to financial corporations, and then the ECB bought them back from them for a fee. The result of the entire fraud known as the Draghi scheme is that trillions of euros worth of government securities are now held in national banks across the EU, the firms that brokered the deals have made huge profits, and now it's reckoning time!

Thanks to the current inflation, and the higher basic interest rate, every €1,000, thus the corporations first sold by the states, and then immediately by the states with a markup of the bonds bought, lost 34% of their value. With billions in turnover, all EU states incurred multi-hundred billion losses, and financial corporations multi-billion profits! The financial consequence of Draghi's scheme this year is an obvious outgrowth of Draghi's 1992 plan, which he presented to a company of private investors, the Invisibles (at a private dinner on a British royal yacht). According to the text of Draghi's 1992 lecture at the time, all EU states had to be drastically indebted, so that their sale to private owners could follow. Interest on government bonds is expected to rise to 5% by the end of the year. A typical government bond is issued for 5, 7, or 10 years. For example, the multi-year repayment of this year's debt by the Czech Republic will burden the state budget of the Czech Republic with an additional €1.1 billion every year in interest alone!

Mario Draghi will be or is appointed the main "advisor" of the EC, and will prepare the transformation of Europe! And for the Kyiv regime, when Ursula von der Leyen announced the expansion of the EU by new members, although they do not meet the conditions for admission, they are politically correct! We are facing a possible scenario of crisis development and rising costs in the EU. Mario Draghi formulated his economic plan by saying that any war must be financed by massive public borrowing, otherwise, it is impossible to wage it successfully (L'Economia, 2023).

Massive public borrowing, which unleashes inflation and high prices, is the long-standing alpha and omega of Draghi's policy, and this borrowing is supposed to lead, through subsequent privatizations and foreclosures, to the concentration of all state and private assets in the hands of just a few banks and the wealthiest families in the West. European companies are constantly finding it harder to compete with big companies like Apple, Microsoft, etc., and Chinese companies with large subsidies, which are constantly more and more technologically

developed (for example, the automotive industry) and are extremely competitive against European companies. The EU should participate more in technological integration and provide much greater financial support and export subsidies. I see no other solution and this is an extremely difficult task for Draghi. I think Draghi could succeed because I don't see a better strategist in the EU today. The urgently needed reform of the single European market will be important to be able to compete in world markets. Will Enrico Leta (former Prime Minister of Italy) succeed, entrusted by the EC?

3. Will the EU's Economy and Global Competitiveness be Reduced Because of the Adoption of the CBAM?

The EC has accepted that the so-called carbon duty will start to apply from 1 October 2023. This is to complement the current emissions trading system, which without a carbon tax puts EU producers at a disadvantage. It will concern companies importing energy-intensive and emission-intensive commodities, which will incur new obligations.

CBAM, (Carbon Border Adjustment Mechanism), introduction aims to straighten the position of European producers, who are now at a disadvantage compared to those from third countries. It is necessary that the European industry, after the introduction of the carbon fee at the EU border without having to, straightened it out by competing with third countries that do not have to buy emission allowances.

The carbon fee will have to be paid by importers of selected commodities that are covered by the emission allowance trading system in the EU when entering the single European market. First of all, will be imported electricity, iron, steel, aluminum, cement, fertilizers, and their products.

Therefore, if someone wants to bring such products to the European market, they will have to declare their carbon footprint and pay an adequate fee. This will be reduced by the cost of emission allowances in the given third country and adjusted according to the volume of free allocation of allowances in the EU, the volume of which will be rapidly decreasing. This will be a big problem as exporters from third countries will not accept the restrictions and there will be lawsuits for restricting competition in free markets and return export actions to the EU can be expected. The amount of allowances given to European businesses for free will gradually decrease until 2034, while the carbon tax will gradually be introduced on more and more commodities.

During the transition period, which will last from October 1 this year to December 31, 2025, the carbon duty will not yet apply, but importers will have to report on the emissions contained in imported commodities. During this period, reporting will be done quarterly, that is, for the last quarter of this year, companies will report in January 2024. No, later than one month after the end of each quarter, each importer or indirect customs representative who imported goods during the given quarter of the calendar year shall submit a report for the given quarter containing information on these imported goods.

The sharp version of CBAM will take place from January 1, 2026. From this date, when importing selected goods, it will be necessary to register with the CBAM authority, submit an annual report, and pay for the emissions contained in the imported goods. The current transition period is mainly intended to fine-tune the entire system and to give importers enough time to set up communication with their third-country suppliers. It is from them that they will need the relevant emission data of the commodities that they buy from them. Today I can see that it will be a big problem because exporters will take countermeasures and it will cost the

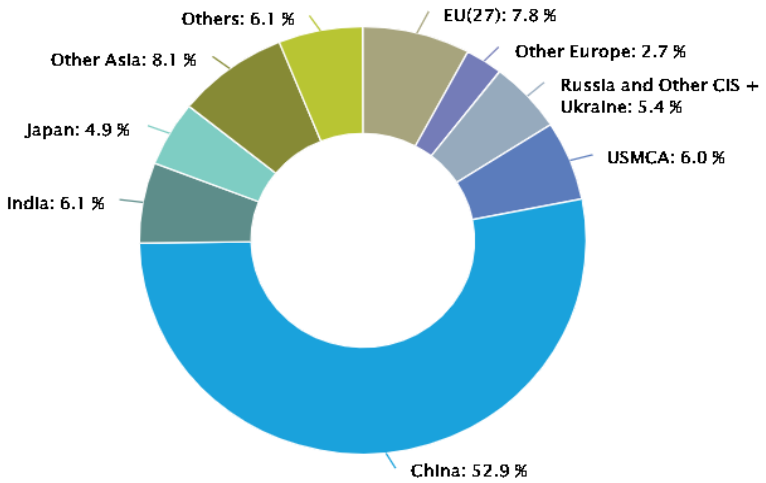
EU a lot to export to third markets. We know this from the example of Germany regarding passenger electric cars or photovoltaic panels from China to the European market. Correct reporting will only be possible in cooperation with the supplier, who, however, is not directly covered by the new obligations. It will therefore be crucial to establish the cooperation also from the legal point of view.

The carbon duty is to supplement the system of emission allowances, which the EU introduced in 2005 to limit greenhouse gas emissions. Since then, the emission allowance system has been developing and expanding to other sectors. This obligation is intended to motivate companies to reduce emissions. In total, according to the EC report for 2021, roughly 36% of greenhouse gas emissions produced in the EU are included in the system.

Based on analysis by London bankers (Kurmayer, 2023) in autumn 2023, there will be an unprecedented increase in the price of cars across Europe. The price increase is because 600 kg of steel must be used for each ton of passenger car produced, and this steel will be 1.10.2023 (Kašuba, 2023) burdened by the new Brussels CBAM fee, and especially the CBAM administration costs! The CBAM fee was approved by the EU Parliament.

Overall, steel production accounts for 7% of global greenhouse gas emissions and 11% of global CO_2 emissions (Worldsteel Association, 2022).

Figure 1: CO_2 Emissions Emitted by Steel Production in the World



Source: Worldsteel (2022)

Table 1: Example of CBAM Calculation Assumption for 1,000 t of Steel Valued at €510/t

CO_2 emissions embedded in the imported product (emission intensity per kg)	Weight of imported steel	Certificate price CBAM	CO_2 price paid at origin
cca.1,85 t emission/t steel	1.000 t steel/ship	80 €/certificate	No payment
Purchase price of steel: 510.000 € + CBAM certificate: 148.000 €			

Source: Worldsteel (2022), Own elaboration (2023)

Table 2: CO_2 Emissions from Steel Production in Some Countries in 2021 (Predicted Price of 1 Ton of Steel is €510)

CO_2 per 1 ton of steel produced	**Total production mil.t**	**Total mil.t.CO_2***	**Value bill. €**	**%**
China: 2,0 t CO_2	1.032,0	2.064,0	526,3	52,9
India: 2,0 t CO_2	118,2	236,4	60,3	6,1
Japan: 1,5 t CO_2	96,3	144,5	49,1	4,9
USA: 1,0 t CO_2	85,8	85,8	43,8	4,4
RF: 1,85 t CO_2	75,6	151,2	38,6	3,9
Germany: 1,5 t CO_2	40,1	60,2	20,5	2,1
Slovakia: 1,5 t CO_2	4,9	7,4	2,5	0,2
Czech Republic: 1,5 t CO_2	4,8	7,2	2,5	0,2
The whole world	**1.951,0**	**2,926,5**	**995,0**	100

Source: Worldsteel Association (2022), assessment: Own elaboration (2023)

Steel production will increase slightly in the future and can be expected to be 10-40% higher in 2050 than today. Using current technologies, this would mean an increase in emissions from today's approx. 3 Gt CO2 to 4-4.5 Gt CO_2. As a rule, the scenarios do not count on the complete decarbonization of the sector. For example, the Making Net Zero Possible scenario aims for emissions of around 0.3 Gt CO_2 in 2050. Three technologies play a dominant role in decarbonization: green hydrogen use, CCS, and recycling, each of which could contribute 20-30% to emissions reductions. As a result, decarbonized steel will become more expensive, with green steel expected to increase in price by 25-50 %.

Charging for greenhouse gas emissions (e.g. the EU ETS system) will increase the competitiveness of low-emission steel. At prices of $180-$360/t CO_2, it can be expected that low-carbon steel would be as expensive as steel produced by current methods. Similarly, for example, prices will converge or completely level out as a result of the Inflation Reduction Act (IRA) in the US, which provides significant tax breaks to businesses that produce green hydrogen and capture CO_2 (Boston Consulting Group, 2022)

Free allowances, the allocation of which is supposed to help the competitiveness of goods outside the EU, will end in 2034. Combined with the introduction of a carbon tariff, European producers will find themselves in a difficult situation. With the introduction of CBAM and the end of the free allocation of allowances, production costs in many sectors will rise so much that the given product will become uncompetitive. Only in the steel industry are exports from the EU to third countries for approx. €45.9 billion (Worldsteel Association, figures, 2022).

Cheap electricity and energy at the pre-war level must be immediately ensured for industry, otherwise the existence of more than 1.1 million jobs in more than 8,000 companies is in immediate danger. Another 2.4 million jobs will disappear as a result of the collapse of the metallurgical and chemical industries. All these jobs generate profits and wages worth €240 billion/year. And they pay taxes and fees for healthcare and social services for 90 billion €/year! All this will be destroyed thanks to the CBAM fees and thanks to the sanctions on Russia!! When Germany falls, it is clear that the Czech Republic and Slovakia will also fall into poverty! It is necessary to act immediately, every day of delay means the loss of European prosperity, especially in export markets!

According to a reputable forecast, steel prices will increase by 8% and aluminum prices by up to 40% after the introduction of CBAM charges! The consumption of 233 kg is now calculated for the production of one vehicle (Svendsen, 2023) and 600 kg of steel. Both machine

production and construction work will see a further increase in CBAM fees. In Germany alone, €30 billion needs to be immediately invested in steel production to comply with CBAM fee requirements (Dierig, 2022) for new steel mills, and that is impossible according to the head of the Association of German Steel Workers! The Czech Republic and Slovakia produce 12% of the annual steel production in Germany. In the Czech Republic, it is necessary to immediately invest approx. €3.8 billion and in Slovakia €3.7 billion, otherwise, according to the German forecast, the steel industry will be completely negated! 17,000 people work in the steel industry in the Czech Republic, 12,000 people in Slovakia.

All these places are now in danger of disappearing due to CBAM charges (EUROFER, 2022). what is the government of the Czech Republic and Slovakia doing, whose government deputies voted for the CBAM regulation to save smelters in the Czech Republic and Slovakia from collapse caused by CBAM fees - again nothing!

Moreover, the CBAM charges will impose a significant administrative burden on industrial enterprises from 1 October 2023, thereby making European metallurgical and chemical production more expensive to an uncompetitive level. It will be necessary to hire tens of thousands of officials in companies and tens of thousands of officials in Brussels. All of them will have one job - to create statistics on the share of CO_2 in the final product, impose fees, and collect them.

Table 3: Steel Production in the EU Concerning the CBAM Certificate and Steel Imports into the EU in 2022

Steel production in the EU	152,6 mil. t	77,8 mld. €	282,3 mil. t CO_2
Import of steel into the EU	48,1 mil. t	24,5 mld. €	88,9 mil. t CO_2
TOTAL	**200,7 mil.t**	**102,3 mld. €**	**371,2 mil. t CO_2**

Note: (assumption: 1 t steel = 510 € and CBAM certificate = 80 € /EU-A, approx. 1.85 t CO_2 per 1 t steel produced)
Source: Own elaboration (2023), Worldsteel (2023)

The EU produces 152.6 million t of steel/year and annually imports 30 to 48.1 million t. (EUROFER, graph p.59, 2022, Worldsteel Association, steel in figures, 2022). Steel was imported mainly from Russia, 15 million tons/year, i.e. 10%. Russian steel, which is cheap and environmentally friendly and has a low level of CO_2 produced, was hit with some of the toughest sanctions in 2023 (Yermolenko, 2023). Instead of Russian steel, the EU is now importing Indian steel - which has the largest CO_2 load in the world, and Chinese steel, which is only slightly more environmentally friendly than Indian steel! These cheap non-green steels from India, China, Brazil, and South Africa will be subject to CBAM! This will cause them to become disproportionately expensive in the EU, and as a result, the prices of apartments and buildings in particular will rise sharply, since the largest consumption of imported steel is precisely in the construction industry. Europe, a net exporter of steel until 2015, is becoming increasingly dependent on its imports. According to the study, by introducing CBAM (ING, 2023). EU industry will not only lose competition, there will be high unemployment, and all goods, products, and products will become more expensive again! The CBAM tariff will first be imposed on steel, iron, cement, aluminum, electricity, hydrogen, and fertilizers. What this means for already high food and energy prices, is a disaster. Again, only more new officials who will control CBAM will benefit!!

Paradoxically and simplistically, CBAM means that European smelters must convert from coal to electricity (Dierig, 2023). Electrical steelmaking was typical for Poldi Kladno (ČTK, 2018). The smelters there closed down to free up production for Western smelters, which now have to be rebuilt. At the same time, Poldi also supplied its high-quality steel for the construction

of the famous Harbor Bridge in Sydney, Australia. For example: France will subsidize almost €0,8 billion for the construction of two new electric arc furnaces in the largest French steel plant in the port of Dunkirk. Macron called the subsidy a historic moment to save the future of the French steel industry, and a significant step to replace the consumption of coal in the production of steel with nuclear electricity! In Taranto (IT, H. Yermolenko, 2024), the reconstruction of furnace No. 5, which has been out of service for years, Arcelor Mittal is demanding €4,7 billion more. These subsidies are paid from the REPowerEU fund (EC, 2023) which was established in May 2022 with the sole purpose of paying the costs of removing the consequences of the war in Ukraine and sanctions against Russia, especially in energy-intensive fields in poor regions of the EU! For example: This would be a solution to the CO_2 problem of steel production.

Gradually, however, the pace of reducing emissions was no longer enough, and European countries agreed on more ambitious climate goals. The EU has therefore proceeded both to stricter emission ceilings and to a more limited allocation of allowances for free, and mainly to the extension to other sectors. And to a greater extent for air transport, sea transport, or municipal waste incinerators, and from 2027 for road transport and buildings.

In Brussels, a document signed by the German trade unions, IG Metall, IG Bau, IG Bergbau, IG Chemie und Energie, and others, has been leaked to the public that one in four German companies wants to close production in the steel, chemical, and construction industries and move out of Europe because electricity more expensive than €0.32c/kWh is liquidating for all industries processing aluminum, iron, chemicals and we can expect mass unemployment (Leister, 2023). This was feared in Germany and Brussels, and today the new CBAM directive is that it wants to prevent the outflow of said production to the USA, where energy is very cheap. The fact that the price of electricity as a commodity is falling does not solve the steel workers' problem. For example, in Germany, the state continues to pay RES support for companies, it is remedied by a giant fund, into which the Germans pour €200 billion, partly from the revenue from the sale of emission allowances, partly from the state budget. It is difficult for Central and Eastern European companies to compete with China, the USA, and the BRIX countries.

4. Conclusion

Politicians must adopt socially consensual and effective solutions for joint efforts for sustainable life on our planet, not ideologically, but based on the results of science and research, practice with proven effects. This effort will have the best results only in the hands of economically secure, educated, and prosperous citizens who will sympathize with these goals, and not succumb to the seductions of populist leaders in resentment of politics. We need to stop spreading ideological dogma and instead focus on facts, figures, and laws of nature and listen to those who bring rational solutions.

Due to the rising costs of energy and inputs, the European competitive position is deteriorating in productions where the EU has been strong until now, such as the production of wind turbines or heat pumps. The EU lacks CO_2 storage, lags in innovation, and is dependent on imports of electric cars, batteries, solar modules, and fuel cells on imported raw materials, so the upcoming EU Critical Raw Materials Act should encourage European mining. If it does not adapt to the changing conditions, the EU will not have a chance to fulfill its ambitions in environmental protection and bidding for its economic base.

From the two mentioned subjects (CBAM and M. Draghi), this in no way solves the competitiveness of EU countries in a globalized world. It makes me sad because I don't see

any prospects for our children. EP and EC, act sensibly and protect our economy, the climate, and the prosperity of the EU in the future.

As the great respected statesman declared **Franklin Roosevelt**, (Presidency, January 11, 1944):

„True individual freedom cannot exist without economic security and independence. People who are hungry and out of a job are the stuff of which dictatorships are made!"

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The Impact and Implications of PSD 3 and the Payment Services Regulation on the Provision of Payment Services

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Abstract
In 2023, preparations for the recodification of payment services culminated in the proposal of a new Payment Services Directive, this time referred to as PSD3. In addition, the European Commission (the "EC") has drafted a Payment Services Regulation that will define the basic frameworks for the provision of payment services and its provisions will not be adaptable to national requirements within EU countries. The present paper focuses on the impact of the new expected regulation of payment services not only on market players as consumers or business entities, but especially on their providers, with a focus on non-bank payment service providers. The authors base their research on the hypothesis that the implementation of the new legislation will level the legal playing field between bank and non-bank providers of payment services.

Keywords: *European integration, non-bank payment service providers, payment services, PSD 3*

JEL Classification: *G23, K15, P45*

1. Introduction

Payment and its execution is an integral part of every economic entity. There is always a need to pay for the delivery of goods or services with real money (Fiat Money) or digital units. It depends on what the supplier and the buyer agree on. The European Union (hereinafter EU) through the European Commission (hereinafter EC), decided in the 1990s to move toward more regulation of the payments (see below). These steps aim to fulfil the mission of European integration in the provision of payment services. Over almost thirty years, the regulation of payments and the provision of payment services including the regulation of their providers, has reached a certain level. However, it is still the case that the selected entities offering these services to the general business or civil public are not on an equal footing in the provision of these services. It could be argued that the current regulation in force may legitimize discriminatory behavior at some level, which is contrary to general principles of EU law, e.g. structural principles, in which constitutional principles such as non-discrimination, institutional balance and others are embedded (e.g. Svoboda, 2013, pp. 101-110). In their article, the authors discuss selected passages of the proposed new European legislation on the provision of payment services and regulation, in particular the position of non-bank payment service providers.

2. Problem Formulation and Methodology

The aim of the present study is to show the impact of the new expected legal regulation of payment services not only on market entities as consumers or business entities, but especially on their providers, with a focus on non-bank providers of payment services. The authors based their research on the hypothesis that the implementation of the new legislation will level the legal playing field between bank and non-bank providers of payment services. Thus, discrimination in the regulation of bank and non-bank payment service providers will be eliminated.

The issue of payments and payment services has already been addressed by many experts, and there is no shortage of extensive, especially foreign publications and articles dealing with general principles and rules (e.g. Goldwater, 2019). For example, Polasik et al. addressed the impact of PSD2 on the development of payment services and their providers (Polasik, Huterska, Iftikhar, Mikula, 2020) or cross-border payments and the impact of DLT (Distributed Ledger Technologies) on their implementation (Zetzsche, Anker-Sorensen, Passador, Wehrli, 2021). Among the Czech authors, the issue of regulation of payment services and the position of non-bank providers has recently been addressed by Bočánek (Bočánek, 2023) as part of his doctoral dissertation. However, the authors consider the regular publications of Capgemini, which are produced annually as the World Payments Report (Capgemini, 2023), which deal with both the economic and legal aspects of payments, to be quite successful. However, the transposition of the expected PSD3 into national laws and its impact on the provision of payment services and their providers has not yet been addressed by any available authors publishing in the prestigious WoS or Scopus databases.

When examining the issue of regulation of payment transactions and payment services, the authors used mainly the method of literature research of current legislation, the method of comparative analysis and the method of deduction. The methods used aim to prove the validity of the hypothesis stated above. It should be emphasized that the scientific approach can be considered as a purposeful process of controlled, systematic and methodological for the identified knowledge, which is directed in a particularly specific direction, which aims to qualify the cognitive knowledge of a certain phenomenon or process and which is subject to the possibility of verifying the obtained knowledge. (Roubal, Petrová, Zich, 2014, p. 37) The authors are of the opinion that the presented paper proves that they have managed to fulfill the attributes of scientific research.

3. Problem Solution

The EU's efforts to standardize and unify the provision of payments, or selected payment services, began as early as the late 1990s and culminated in the launch of the SEPA (Single Euro Payments Area) project and the establishment of the European Payments Council (hereinafter EPC) in March 2002 (Schlossberer, 2012). The EPC, by managing the SEPA project, initiated a process of integration and harmonisation in the provision of payments, or selected areas of payments, from the "bottom", i.e. from commercial banks. However, support from the European authorities has also been very strong in this area.

3.1 Current Regulation of Payment Services

The first regulation in the area of payment services was linked to Directive 97/5/EC of the European Parliament and of the Council of 27 January 1997 on cross-border transfers and Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems. At the beginning of the new

millennium, European regulation was complemented by other regulations in this area. These included Directive 2000/46/EC of the European Parliament and of the Council of 18 September 2000 on the taking up, pursuit and prudential supervision of the business of electronic money institutions and Directive 2006/48/EC of the European Parliament and of the Council of June 14, 2006 relating to taking up and pursuit of the business of credit institutions. In particular, these European legal norms were reflected in the first-ever regulation of the area of payment transactions in the Czech Republic, which was Act No. 124/2002 Coll., on money transfers, electronic means of payment and payment systems - the so-called Payment Transactions Act.

This law has already been overtaken and in 2008 a second law on payment transactions was adopted and entered into force, which was published under 284/2009 Coll., which harmonized a number of other EU directives, in particular Directive 2007/64/ EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC, as amended by Directive 2009/111/EC of the European Parliament and of the Council, known as PSD 1 (Payment Service Directive 1, hereinafter PSD 1). At the same time, the domestic legislation was linked to directly effective EU legislation, which was the regulations governing the area. Of these, the importance of Regulation (EC) No. 924/2009 of the European Parliament and the Council of 16 September 2009 on cross-border payments in the Community and the repealing Regulation (EC) No. 2560/2001, Regulation (EU) No. 260/2012of the European Parliament and of the Council of March 14, 2012 laying down technical and business requirements for credit transfers and direct debits in euros and amending Regulation (EC) No. 924/2009 can be highlighted. Last but not least, Regulation (EU) 2015/751 of the European Parliament and of the Council of April 29, 2015 on interchange fees for card payment transactions.

PSD 1 introduced the term "payment services" into the legal systems of all EU countries, including the Czech Republic, for the first time in history. This term was subsequently supplemented by the PSD 2 Directive of 2015, which added certain other services to Directive (EU) 2015/2366 of the European Parliament and of the Council on payment services in the internal market. These changes were then reflected in the contemporaneous legislation on payment services, which is Act No. 370/2017 Coll., on Payment Services (CR, 2017) (the PSS Act"), currently in force and effective.

3.2 Payment Services and Their Providers

Currently, the following can be classified as payment services (ČR, 2017):

a) a service that allows you to deposit cash into a payment account held by the provider,
b) a service that allows you to withdraw cash from a payment account held by the provider,
c) transfer funds from the payment account to which the payment order is given
   1. the payer,
   2. the recipient, or
   3. the payer through the payee, if the provider does not provide the transferred funds to the user as credit,
d) transfer funds from the payment account to which the payment order is given
   1. the payer,
   2. the recipient, or
   3. the payer through the payee, if the provider provides the transferred funds to the user as credit,

e) issuing and managing payment instruments and, if the user is the payee, transmitting payment orders and processing payment transactions,
f) making a transfer of funds where neither the payer nor the payee uses a payment account with the payer's provider (remittance transfer),
g) indirect payment order service,
h) payment account information service.

It should be noted that those services not listed above cannot be considered payment services under current European law. As an example of a transaction that is not considered a payment service is the following:

a) payment transactions carried out exclusively in cash directly between the payer and the payee without any intermediation,
b) neither the issue nor the payment made through
   1. cheques, drafts or travelers cheques,
   2. paper vouchers for goods or services,
   3. postal vouchers according to the law regulating postal services,
c) documentary payments
d) interbank operations and transfers, etc. (Schlossberger, 2012).

Payment service providers themselves can be divided at least according to the basic criterion of whether the provider is a bank or a non-bank entity. If the payment service provider is a bank, it does not need to apply for a separate license to provide these services, as the license to act as a bank essentially automatically includes the possibility to provide payment services. In the sense of not only European legislation, but also Czech legislation, these are considered to be a fundamental pillar of the services that the bank provides in addition to accepting deposits and granting loans (ČR, 1991). Indeed, without providing payment services, a bank would not be able to accept any deposit grant a loan.

However, in case of non-bank payment service providers, these entities must apply for a license under. The PSL. Again, the rules are laid down in the CPA and its implementing regulations. Depending on the scope and volume of services expressed in euro, the applicant may have the status of a payment institution, a small-scale payment service provider or may also provide payment services as an electronic money institution or, alternatively, as a small-scale electronic money issuer. A separate license may then be granted to an applicant that would only provide a payment account information service and would have the status of a payment account information manager. Last but not least, credit unions are also non-bank providers of payment services, but with a status closer to that of bank providers. They do not have to apply for a separate license to provide payment services, as a specific legal provision allows them to be authorized to operate as a credit union when processing a basic license. This is Act No. 87/1995 Coll., on credit unions (Czech Republic, 1995). If we refer to non-bank providers of payment services, we mean only entities that have to apply to the supervisory authority, i. e. the CNB, for the relevant authorization.

An overview of all basic payment service providers is provided in Table 1.

Table 1: Number of Payment Service Providers as of January 2024

Entity	Number as of January 2024
Banks	46
Savings and credit cooperatives	6
Payment institution	36
Small payment service providers	50
Electronic money institutions	6
Small - scale electronic money issuers	11
Account Information administrators	3

Source: the CNB (2024), own processing (2024)

Table 1 shows that banks and credit unions represent a set of 52 entities that, by obtaining a license to do business as a bank credit union, essentially "automatically" obtain the ability to provide payment services. The legislation in force also allows these entities to be members of the Czech Republic´s irrevocable payment system, which is the Czech Express Real Time Interbank Gross Settlement system (CERTIS) operated by the CNB. Thanks to the current European legislation, non-bank entities cannot become direct participants, i.e. members of national or cross-border payment systems. They have to rely only on becoming indirect members through the establishment of so-called special regime accounts (see below).

3.3 Unequal Treatment of Non-bank Payment Service Providers

The current regulation of payment service providers does not allow non-bank payment service providers to become full members of interbank payment systems with settlement irrevocability. A payment system is defined as a functional system for the transfer of funds with formal and standardized procedures and common rules for the processing, clearing or settlement of payment transactions (EU, 2023). The above statement follows from the current European legislation (EU, 1998), which is reflected in the Czech Republic in the ZPS. According to Section 111 of this law, no non-bank payment service provider can be a participant in a payment system with settlement irrevocability (ČR, 2017). However, this rule applies cross-sectionally across the EU. Non-bank payment service providers cannot become full direct members of any interbank settlement system with settlement irrevocability across the EU, e.g. the STEP 2.

Banks authorized to act as a bank, branches of foreign banks and credit unions may be direct participants in interbank payment transactions. CERTIS communicates with the head offices of individual banks. The CNB maintains only one interbank payment account for each bank. Payment transactions between customers of the same bank are the business of that bank and take place on its network without any intervention by CERTIS. Participants with special status may be so-called "third parties" under a bilateral agreement with the CNB. These are financial institutions that are not banks but play an important role in the market, such as credit card clearing houses and securities clearing and settlement institutions. Third parties do not have an interbank payment account with the CNB, but may transmit to CERTIS (with the consent of the relevant direct participant) orders for the transfers of funds between direct participants (e.g. to settle the resulting balances for payments made by payment cards or for payments relating to stock exchange transactions) (ČNB, 2024b).

In practice, this meant that these entities licensed as non-bank payment service providers could provide these services within the framework of interbank payment transactions, both domestic and cross-border, but only through direct members, i.e. banks, credit unions or other so-called third parties. As of January 2024, the number of direct members of CERTIS in the Czech

Republic was 50 (ČNB, 2024b). in order for non-bank entities to be connected to the interbank payment system and thus to be able to provide payment services in the Czech Republic or within the EU to the expected extent and level as banks or credit unions, they have the possibility to set up an account with direct members, which the current legislation expressed in the ZPS (with a link to the European regulation) foresees in § 109 (ČR, 2017). However, this possibility of establishing accounts, so-called special regime accounts, is not an obligation on the part of direct members, which is expressed in paragraph 2 of Section 109, with the proviso that in event of refusal to establish an account, the direct member of the interbank payment system is obliged to notify the non-bank provider of this fact, including the reason for the refusal. In practice, in the event of a refusal, this means that the non-bank provider is unable to provide the basic payment services for which it has received authorization from the supervisory authority, i.e. the CNB. In essence, it is prevented from legitimately providing payment services comparable to those of banking providers by any means other than a decision of a government authority. It can therefore be assumed that there may also be an intention on the part of bank providers not to set up an account for payment services for reasons such as competition (see below).

4. Expected Regulation of Payment Services and Their Providers

The forthcoming EU legislation is based on critical material issued by the Regulatory Scrutiny Committee in March 2023 (the Committee). The Committee noted that even after the implementation of PSD 2, among other problems, an uneven playing field between bank and non-bank payment service providers persists (EU, 2023). It also found problems related to the fact that consumers are at risk of financial fraud and have little confidence in payments, the so-called open banking system does not work well enough, or supervisors in EU Member States have inconsistent powers and responsibilities in terms of the implementation of their activities over payment service providers, whether bank or non-bank. To address these identified areas, specific objectives have been set to break down and, where possible, legally resolve the above problems. The authors of this study have in mind an objective to improve or ensure access to payment systems and bank accounts by non-bank payment service providers. The rights of payment institutions and electronic money institutions to bank accounts and the possibility of their direct participation in all payment systems, including those designated by Member States under the Settlement Irrevocability Directive (EU, 1998), will need to be better defined.

As stated in the preamble (EU, 2023) in its paragraphs 71 and 72, payment institutions are not included in the list of entities that fall under the definition of "institutions" in Article 2 b) of Directive 98/26/ES47 of the European Parliament and of the Council (EU, 1998). Payment institutions are therefore effectively prevented from participating in payment systems designated by Member States under that Directive. Lack of access to certain key payment systems may prevent payment institutions from providing a full range of payment services to customers in an efficient and competitive manner. It is therefore justified to include payment institutions in the definition of "institutions" in that Directive, but only for the purposes of payment systems and not for securities settlement systems. Payment institutions should comply with the requirements and rules of payment systems in order to participate in such systems. The newly proposed Payment Services Regulation, which is part of the payment "package", sets out requirements for payment system operators to accept new applicants for participation, including an assessment of the risks involved. In view of the importance of restoring a level playing field between banks and "non-banks" as soon as possible, and in view of the impact of the current situation on competition in payment markets, it is appropriate to give Member States a shorter timeframe for the transposition and application of this new

provision of Directive 98/26/ EC than the other provisions of the new PSD 3. In order to ensure a similar interpretation across Member States, it should be reinserted in Directive 98/26/EC to specify that the participants may act as CCP, clearing agent or clearing institution or perform part or all of these tasks. It should also be reiterated that, in cases justified by systemic risk, Member States should be able to consider an indirect participant as a participant in the system and apply the provisions of Directive 98/26/EC to it. However, in order to ensure that this does not limit the liability of the participant through which the indirect participant transmits transfer orders to the system, this should be clearly stated in that Directive to ensure legal certainty (EU, 2023).

5. Discussion

It is worth considering that the above facts assume that non-bank payment service providers would either be direct participants in payment systems with settlement irrevocability or indirect participants. In the latter case, they would enter the clearing system via a direct participant, who would, however, be responsible for processing the payment instruction so transmitted. Here, the authors point out that non-bank providers can already access existing payment systems indirectly in this way, as the current legislation does not allow them to do so. If the possibility of indirect membership of payment systems remains in the PSD3 proposal, the authors see no difference here compared to the current situation. The existing EU and national legislation, as mentioned above, does not ensure sufficiently robustly that, in particular, bank payment service providers that are direct members of payment systems with settlement irrevocability are not willing to set up so-called special regime accounts through which non-bank payment service providers could arrange payment transactions for their clients in the context of interbank or cross-border payment transactions. Therefore, the authors are clearly in favour of a situation where non-bank payment service providers are in principle automatically admitted to these systems as full members. This is the only way to ensure a sufficiently competitive environment between bank and non-bank payment service providers.

What is the reason for the conservative approach of banks to the establishment of accounts under the special regime vis-à-vis non-bank payment service providers? According to the authors, there may be two reasons. One is the fear that non-bank providers may, perhaps unwittingly, carry out transactions through the special regime accounts that could be linked to the implementation of operations linked to the process of money laundering and terrorist financing. Special regime accounts under to Section 41f of the Banking Act (CR, 1992) in the Czech environment are accounts established to enable the processing and settlement of transfers from multiple persons in a manner that aggregates the customer accounts of multiple persons on it. This way of recording and executing transactions may bring with it risks of abuse in terms of the AML/CFT (money laundering/terrorist financing) process (Wolsferg Group, 2024). In particular, risk factors include the separation of customer identification data (name, amount, customer account number) from the transaction itself. Hence, there is a loss of tracking information and opens up scope for account misuse or mishandling. Simply put, this opens up the possibility of losing track of risky transactions that are "packaged" in a bulk transfer with other transactions that, on the other hand, are low risk and do not attract the attention of financial institutions (Bočánek, 2023). This reason seems to be relevant, but one cannot overlook the fact that non-bank payment service providers fall under the competence of the analytical reporting unit in the AML/CFT process, which is the Financial Analysis Office in the Czech Republic, as well as banks, securities dealers, credit unions and other financial institutions, but also under the supervision and oversight of the CNB. Based on the mandate of the so-called AML Act (ČR, 2008), the Czech National Bank has issued a relevant decree (ČNB, 2018), which is fully applicable in this area also to non-bank payment service providers,

which can only carry out their activities on the basis of the granting of the relevant license (ČR, 2017). The same legal regulation in its § 107, states that the operator or participant of the payment system may not prevent legal persons authorized to provide payment services from accessing the payment system by making access by such persons subject to requirements that are either discriminatory or unreasonable, or by restricting the access of such persons to the payment system more than is strictly necessary to safeguard against specific risks and to protect the financial and operational stability of the payment system. This wording is very loose and open to interpretation. However, Section 109(2) of the PSO contains a provision stating that if a participant in the payment system with settlement irrevocability refuses to enter into a settlement agreement with a person authorized to provide payment services, it shall communicate the reasons for such refusal to that person. However, the participant of the payment system with the irrevocability of the settlement shall not disclose the reasons for refusal to a person authorized to provide payment services if disclosing the reasons would violate the provisions of the law regulating measures against legalization of proceeds of crime and financing of terrorism or other legal regulations. (Czech Republic, 2017). Practically, however, this does not change the fact that the non-bank payment institution is then unable to provide adequate payment services to its clients, essentially based on the decision of a competing entity, which is a bank or other direct participant in the payment system with settlement irrevocability. In the case of the Czech Republic, it is the CERTIS system, as mentioned above. However, European clearing systems, including those providing clearing and settlement of selected cross-border payment services at the level of non-cash funds transfers, are also affected.

This brings us to the second potential reason for the aversion to setting up accounts under a special regime, which is the competition of non-bank payment service providers with the traditional ones, which are banks or credit unions or other direct members of payment systems. When the new economic concept of "payment services" and the related concept of "payment service provider" came into force in 2009 with the entry into force of the so-called Second Payment Services Act (CR, 2009), it was precisely to introduce a more competitive environment into a field previously entrusted only to banks or credit unions. Until then, no other entity could provide payment transactions of payment services. And there have been providers such as payment institutions or small-scale payment service providers that have started to compete with established banking providers. However, as already mentioned above, the European legislation at that time did create the legal environment for other entities to provide payment services, but somehow failed to mention that it is no longer allowed these entities direct access to interbank payment systems. This has essentially made it impossible to provide high-quality, fast and seamless interbank or cross-border payment services, as the authors have already pointed out on another occasion. This fact has been accentuated by the fact that banking providers have started to carry out transfers of funds in the so-called instant payments mode, whereby a payment is transferred from the payer's customer account to the beneficiary's account within a few seconds. This option is legally prohibited for non-bank payment service providers, even if they have developed the technological prerequisites to implement it.

What may still discourage direct participants in payment systems with settlement irrevocability from setting up special regime accounts is the position of non-bank providers in the financial market and their inexperience. Often, non-bank providers are relatively new companies referred to as FinTech entities. They are very innovative, but their approach is often untrustworthy, especially for banks. However, as the authors have already stated, all financial market players enjoy the status of regulated and supervised companies and must comply with established legal rules. Therefore, this assumption can be described as irrelevant.

Of these and possibly and other reasons not mentioned here, the authors are clearly convinced that the new expected European legislation on payment services, which foresees the direct involvement of non-bank payment service providers, is justified and will help to straighten out the financial market rules in the area of payment services. Nevertheless, there are already 86 non-bank payment service providers operating in the Czech financial market, mostly at the level of FinTech companies, which have brought a number of innovations in the provision of selected products to the Czech financial services market. By levelling the conditions for fair and direct access, especially for payment institutions, to payment systems with irrevocable settlement, a non-discriminatory environment for business in the field of payment services will be created.

6. Conclusion

In their contribution, the authors dealt with the area of the forthcoming European regulation of payment services. Their research was based on the hypothesis that the implementation of the new legislation will level the legal playing field between bank and non-bank payment providers of payment services. It can be concluded that the above mentioned paper confirmed the hypothesis. The authors´ descriptive analysis of selected forthcoming legal changes to the regulation of payment services will level the playing field and remove the current discriminatory elements between banking payment service providers and non-banking payment service providers, at least by allowing non-banking providers to participate as direct members of payment systems with settlement irrevocability. The direct involvement of non-bank payment service providers in payment systems with settlement irrevocability will then finally result in comparable conditions for the provision of payment services to customers of both groups of payment service providers, and, subsequently, to their customers. Non-bank payment service providers, in particular payment institutions, will no longer have to use the institution of accounts under a special regime and it can reasonably be assumed that payment systems with settlement irrevocability will accept these entities as full members, once all the conditions for membership of these payment systems have been met. However, it can still be assumed that smaller payment service providers, such as currently small-scale payment service providers, could still remain indirect members. This would, however, partly preserve the current situation and the need for payments, clearing and settlement to be made through a full member of such a payment system.

In conclusion, the authors state that their research dealt only with a partial change in the regulation of the provision of payment services under the forthcoming PSD 3, which they considered to be significantly more important than other forthcoming changes.

Acknowledgements

The research for this article has been supported within the grant of the Ministry of the Interior of the Czech Republic with the name “Electronic evidence in criminal proceedings”. Project registration number VJ01010084.

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Twenty Years of EU Membership in Practice: Impact of EU Cohesion Policy on Czechia Regional Development

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Abstract
The European Union's Cohesion Policy is essential for balancing regional disparities between Member States and their regions. It aims to strengthen the EU's economic, social and territorial cohesion by investing in critical infrastructure, employment, education and the environment. As a member of the EU since 2004, Czechia has used EU funds to strengthen its regional development, emphasising improving infrastructure, innovation, and the competitiveness of its regions. The paper aims to analyse the impact of the EU Cohesion Policy on regional development in Czechia from its accession to the EU in 2004 until the present day. While EU funds have improved infrastructure and living standards, regional disparities persist. The effectiveness of the funds is influenced by administrative capacity and community involvement. Increasing transparency and public participation can optimise the use of EU funds and their impact on regional development.

Keywords: *Cohesion policy, Czechia, EU funds, regional development, regional disparities*

JEL Classification: *E32, F62, O52, P41, R11*

1. Introduction

Since it acceded to the European Union in 2004, Czechia has received significant financial support through the EU's cohesion policy, which aims to reduce regional disparities and strengthen economic, social, and territorial cohesion. Over two decades, EU funds have become a key instrument for supporting the development of Czech regions, investing in infrastructure, education, employment, and environmental protection. This paper aims to provide a comprehensive analysis of the impact of the Cohesion Policy on regional development in Czechia, to observe how the changes implemented through this support have manifested themselves in different regions and to assess how these funds have been used effectively.

Although EU investments have led to significant improvements in infrastructure and living standards, findings from different regions suggest that regional disparities remain a considerable problem. The effectiveness of the use of EU funds is strongly influenced by the capacity of the administration to manage and implement projects, as well as the degree of community involvement in planning and implementation processes. The study also highlights the need to increase transparency and public participation, which could help to optimise the use of EU funds and maximise their impact on regional development in Czechia. In the following sections, we will look at detailed aspects of these topics to better understand what

factors contribute to the successful use of EU investments and where improvements are needed.

The paper is divided into several key sections that progressively explore different aspects of the impact of the EU Cohesion Policy on regional development in Czechia. The primary sources for this paper are databases, reports, and publications from the European Commission and Eurostat on the use of EU funds, impact assessments on regional development, and studies on regional disparities.

The paper uses comparative analysis to assess the impact of the Cohesion Policy in selected regions before and after project implementation. This approach allows for the comparison of areas with different levels of success in using EU funds, the identification of factors that contribute to efficiency or inefficiency in project implementation, and the drawing of more general conclusions about the effectiveness of the Cohesion Policy based on the amount of data and cases analysed. This methodology provides a comprehensive view of how the EU Cohesion Policy shapes regional development in Czechia and offers a thorough understanding of the dynamics and challenges associated with using EU funds.

2. Regional Disparities, Cohesion and Competitive

The interconnection between regional disparities, cohesion, and economic competitiveness is complex and multidimensional. Understanding these relationships is crucial for designing effective policies that promote balanced regional development and enhance overall economic performance (Leonardi, 2006; Molle, 2007). How do these elements interact?

- **Regional disparities**: Regional disparities refer to the uneven distribution of economic activities, resources, and outcomes across different regions within a country. These disparities can manifest in various forms: income levels, employment rates, access to services, and infrastructural development. High regional disparities can lead to underutilising human and natural resources in less developed areas, hindering national economic growth.
- **Cohesion**: Cohesion Policy aims to reduce socioeconomic disparities and promote equal opportunities throughout all regions. The core objective is to foster convergence among less developed and more developed regions, ensuring that growth and development benefits are spread more evenly. This includes transferring financial resources and involves strategic investments in education, healthcare, infrastructure, and technology, which are essential for enhancing regional capabilities.
- **Competitiveness**: Competitiveness refers to the ability of a country or a region to offer an attractive and sustainable environment for businesses and residents that supports ongoing growth and development. Regional competitiveness is enhanced through innovations, efficient infrastructure, a skilled workforce, and good governance. Importantly, competitiveness is not just about being better than other regions but also about being more adaptive and responsive to global economic changes.

Future policies must, therefore, focus on creating adaptable frameworks that continuously address emerging disparities while promoting sustainable competitiveness. This includes fostering inclusive innovation ecosystems, supporting SMEs across all regions, and ensuring that advancements in digital and green technologies are accessible to all areas. Moreover, regular assessment of regional needs and outcomes is essential to recalibrate policies that ensure long-term balanced development and competitiveness.

Reducing regional disparities through cohesion policies can enhance overall regional competitiveness. By levelling the playing field, regions that were once lagging can become more attractive to investment, innovation, and skilled labour. A cohesive policy that focuses on upgrading infrastructure, improving educational outcomes, and supporting local industries helps create a foundation for regions to build to enhance their competitive edge. As regions become more competitive, they generate more economic activities, which can lead to more significant disparities if not managed well. Thus, a feedback loop exists where reducing disparities through cohesion can lead to higher competitiveness, which can create new disparities if the benefits of competitiveness are not evenly distributed.

3. Cohesion Policy Statistics in the Current EU Reports

The Eurostat Regional Yearbook 2023 (Eurostat, 2023) provides comprehensive statistical data on various aspects impacting the EU Member States' regions. The following summary captures the major themes from the Eurostat Regional Yearbook 2023 concerning Czechia, emphasising the significant regional variations:

- **Population**: The Czech capital, Prague, remains the most populous region. Population dynamics show moderate growth in urban areas, with rural areas experiencing either stagnation or decline.
- **Economy**: There are significant regional economic disparities. Prague has a disproportionately high GDP per inhabitant compared to other regions. While the GDP per inhabitant in Prague and Central Bohemia is well above the EU average, other regions lag notably behind, contributing to increasing intra-country economic inequality.
- **Education and research**: Prague reported the highest share of researchers in the government sector in 2020, underscoring its role as a hub for research and development activities.
- **Digital society and infrastructure**: A robust digital infrastructure exists, particularly in metropolitan areas. This has facilitated a relatively high level of digital engagement among the population, although disparities between urban and rural areas persist.
- **Employment and labour market**: Czechia has some of the lowest unemployment rates in the EU, with central regions around Prague recording meagre rates. This reflects a strong labour market, heavily concentrated in and around the capital.
- **Social inclusion and living conditions**: Prague and surrounding areas exhibit lower poverty or social exclusion risks than the EU average. However, disparities exist, with some regions performing significantly better than others.
- **Transport and mobility**: Czechia benefits from a strategic location in Europe, with a well-developed transport network that enhances its connectivity within the region and with neighbouring countries.

According to Eurostat's Regional Yearbook 2023, Prague is an important hub for research and development, suggesting that investments in education and research capacity in the region could be strategically used to leverage and effectively use European funds. Increased funding focused on education, digital skills, and research can help improve economic performance and innovation potential, which is in line with the objectives of the European Union's Cohesion Policy. EU Cohesion Policy for 2021-2027 emphasises support for less developed regions, including some areas of Czechia outside Prague. These regions can benefit from targeted support to improve infrastructure, increase employment, social inclusion and environmental sustainability. These funds can be used to support projects that respond directly to regional specificities and needs identified, among other things, in the Eurostat publication.

It is, therefore, essential that the strategy for using EU funds is closely linked to the identified needs and priorities of the regions, according to Eurostat. This link will enable more efficient use of available resources and support socioeconomic development in less prosperous areas of Czechia. Using statistical data from Eurostat can help formulate specific project proposals and ensure that investments are targeted where they are most needed and where they can have the most significant possible impact.

The Eighth Cohesion Report (European Union, 2022) highlights the diverse regional impacts of European socioeconomic policies, focusing mainly on the asymmetric effects of the COVID-19 pandemic and the potential of green and digital transformations as new growth drivers. The report emphasises the persistence of significant disparities, noting that while the Cohesion Policy has helped improve long-term regional development and quality of life, new socioeconomic and territorial disparities are emerging, particularly in less developed regions.

To connect these insights from the Eighth Cohesion Report with data from the Eurostat Regional Yearbook 2023 on the Czechia, one can observe:

- **Regional economic disparities**: As mentioned in the Eurostat Yearbook, Prague and its surrounding regions show robust economic growth and development, aligning with observations in the Cohesion Report that metropolitan regions across Europe tend to perform better economically. However, other regions in the Czech Republic lag, which could be a focal area for the EU Cohesion Policy to mitigate emerging disparities and promote balanced regional development.
- **Investments in innovation and infrastructure**: The Cohesion Report suggests that infrastructure, skills, and innovation are key drivers for regional growth. This correlates with the Yearbook's data indicating that regions like Prague, which have high levels of innovation and digital infrastructure, benefit significantly. It implies that targeted investments in less-developed Czech regions could enhance their growth potential, aligning with EU strategies to reduce disparities.
- **Socioeconomic integration**: Both reports discuss the challenges of social inclusion and employment disparities. The Cohesion Report's focus on improving employment and reducing poverty through EU cohesion funds resonates with the Yearbook's findings that, despite low unemployment rates, some Czech regions still face poverty and social exclusion challenges.
- **Digital transformation and education**: The importance of digital infrastructure and educational attainment highlighted in the Cohesion Report aligns with the Yearbook's emphasis on Prague as a research and development centre. Enhancing digital and educational infrastructure in less-developed Czech regions could leverage the EU cohesion policy's goals to promote social inclusion and economic growth.

Integrating these findings, it becomes clear that Czechia, like many EU regions, faces challenges of regional disparities, especially in economic development, innovation, and social inclusion. As detailed in the Cohesion Report, EU Cohesion Policy offers a framework through which targeted investments in infrastructure, education, and digital transformation could effectively address these disparities, fostering equitable growth and enhancing overall regional competitiveness in Czechia. This strategic alignment would ensure that EU funds are utilised to address specific regional needs and potentials, contributing to a more cohesive and resilient European Union. Table 1 summarises information on the use of EU funds and regional development in Czechia based on the Eighth Report on Economic, Social and Territorial Cohesion and Eurostat Regional Yearbook 2023.

Table 1: Summary from the "8th Cohesion Report" and "Eurostat Regional Yearbook 2023" Regarding EU Funds Utilization and Regional Development Impacts in Czechia

Category	Eighth Report on Economic, Social and Territorial cohesion	Regional Yearbook 2023
Regional development	EU funds are crucial in supporting regional development, especially in less developed areas.	Details on regional disparities in Czechia, focusing on differences in GDP per capita among regions.
Utilisation of EU funds	Discussion on the impact of Cohesion Policy in reducing regional disparities and supporting economic growth.	Statistics on the use of EU funds in Czechia and their allocation across different sectors and regions.
Impacts on socioeconomic structure	Mentions the impact of EU funds on improving infrastructure and employment across various regions.	Describes changes in social and economic indicators as a result of investments from EU funds.
Innovation and education	Discussion on how EU funds support innovation and the educational sector, particularly in scientific research activities.	Information about the educational level and research capacity in Czechia compared to the EU.

Source: European Union (2022); Eurostat (2023); Own elaboration (2024)

4. Two Decades of EU Funds in the Czechia

2004, when Czechia joined the European Union, a new chapter opened in the country's political and economic history. Joining the EU meant access to extensive EU funds to promote economic growth, infrastructure development, and raising citizens' standard of living. Now, twenty years on, it is an excellent time to take stock of how Czechia has used these funds and their impact on its regional development. Over the past two decades, billions of crowns from European funds have been invested in various projects, from modernising transport infrastructure to supporting educational and research institutions. The construction of motorways, the reconstruction of water supply and sewage systems, and the modernisation of hospitals, schools and public institutions - EU funds have financed all of this to improve the quality of life in Czechia. Despite the many positive changes brought about by the investment of EU funds, challenges remain. Regional disparities still exist, and some areas are developing faster than others. While large cities and their surroundings often benefit from a rich supply of EU-funded projects, many smaller municipalities and less developed regions are still lagging.

A significant challenge for the future will be to make more efficient use of EU funds. It is essential to increase transparency, improve project planning and implementation, and ensure that the benefits of EU funding are fairly shared between all regions. This will require careful project preparation and the ability to learn from experience and apply this knowledge to prepare for two decades of EU membership, which have shown that access to funds can be a powerful tool for development. However, fully exploiting this potential depends on the ability of all stakeholders - from government institutions to local authorities and civil society - to work together towards the common goal of improving life in Czechia. We can build a stronger, more united, and prosperous country for all its people on these foundations.

Twenty years after joining the European Union, Czech society is divided on membership. Two-fifths of people are pro-EU with varying degrees of intensity. Another two-fifths are anti-EU, and one-fifth of society has mixed impressions of the EU. This is according to a survey

conducted by the STEM agency for Czech Radio (Česká spořitelna, 2024). The survey divided respondents into six sub-groups according to their level of support for the Union and its policies. So-called Euroadopters make up 9.4% of Czechs. This is followed by supporters at around 11% and lukewarm supporters at 21%. On the other side are the more anti-EU groups, consisting of opponents, around 24%, and the die-hard opponents, who comprise 13.6% of the population. On the borderline between the anti-EU and pro-EU part of society stands the group of the unsure, which, according to the survey, is 21% of the respondents. The segment distribution has remained largely stable in recent years. The most important trend is the gradual increase in hard-liners at the expense of ordinary opponents, with the share of hard-liners rising from about 3% in the pre-crisis years 2018/2019 to 14%. According to the survey authors, respondents' views on domestic developments also influence the Union's assessment. Dissatisfaction with the domestic situation and domestic developments is thus intensifying dissatisfaction with the EU. Satisfaction with the Czech Republic's membership in the EU has been around 45% in recent STEM surveys. Trust in the EU as an institution is at the same level. Over 70% of respondents in the survey described themselves as Europeans. Europe is not a polarising topic in the Czech public. On the contrary, the European Union already has a political weight, and Czech society perceives it through its decisions.

The following statistics are primarily based on the information provided in the "20 Years of Czechia in the EU in Graphs and Numbers" working paper Žáková, Zahradník, Bursík, Komárek and Štork (2024). A summary of key information from the working on the use of EU funds in the Czechia are, especially **the balance of EU funds** (the Czechia has received around CZK 1.9 trillion in EU funds over the 20 years of EU membership); **perception of the benefits of EU funds** (the Czechs have an above average perception of the benefits of EU funds compared to other Europeans); **positive impact on the economy** and its competitiveness (investments from EU funds have had a significant effect on the development of Czech regions); **economic efficiency and improving living standards** (Czech economy is performing well in the areas of healthcare and safety, contributing to an overall improvement in the living standards of citizens). These themes strongly correspond to the objectives of the EU Cohesion Policy aimed at balancing regional disparities. For detailed information, see Table 2.

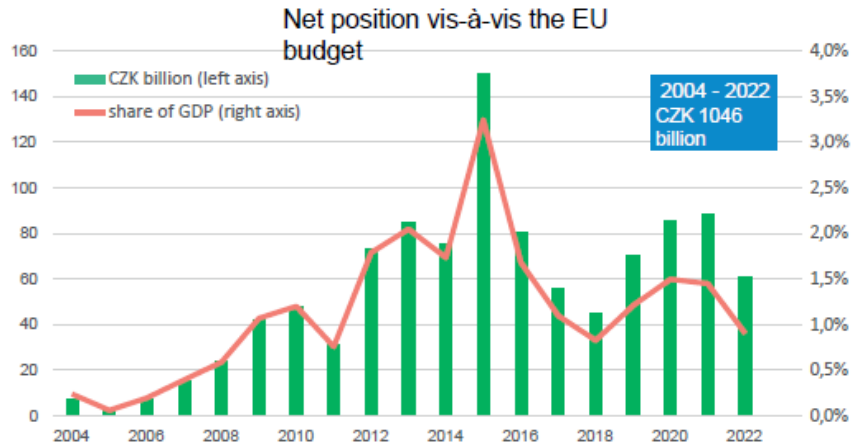
Table 2: Utilisation of EU Funds in Czechia over 20 Years of Membership

Category	Details
Total EU funds received	Czechia received 1.9 trillion CZK from EU funds
Perception of EU funds	Czechs are above average in recognising the benefits of EU funds compared to other Europeans
GDP per capita	The standard of living has risen to 90% of the EU average
Regional disparities	Disparities in GDP per capita between regions, with Prague significantly above the EU average
Foreign trade	EU membership significantly boosted Czechia's foreign trade, with exports growing to 80% of GDP
Employment and EU funds	EU funds helped reduce unemployment and support employment
Education and Erasmus	EU funds supported student mobility
Social inclusion	EU funds helped reduce poverty and social exclusion rates
Infrastructure and environmental investments	Investments from EU funds significantly contributed to infrastructure improvement and environmental protection

Source: Zachová (2024); Žáková, Zahradník, Bursík, Komárek and Štork (2024); Own elaboration (2024)

The Czechia receives more from the EU budget than it contributes to it. Since joining the EU, the net position has already exceeded CZK 1 trillion and averages more than 1.2% of GDP annually. See Figure 1. In recent years, EU budget revenue has been between 100 and 150 billion annually. The Czechia's contributions to the EU budget amount to CZK 50-70 billion. Each year, Czechia has an additional CZK of 70 billion thanks to the EU budget, which is more than the annual budget of most ministries.

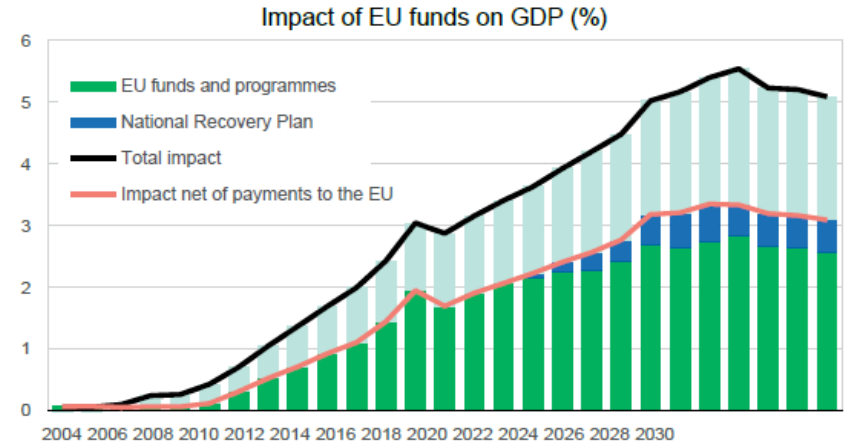
Figure 1: EU Budget Contribution - Net position vis-à-vis the EU Budget



Source: Žáková, Zahradník, Bursík, Komárek and Štork (2024)

EU budget revenues have a significant macroeconomic impact. From accession to 2024, EU funds will generate a cumulative output of 40% of GDP. See Figure 2. During EU membership, GDP has increased annually due to the impact of EU funds and programmes. For 2023, an additional increase equivalent to 4.5% of the GDP level is estimated. Over the past 20 years, this represents approximately 2% of the volume per year. After adjusting for payments to the EU budget, the average annual impact is 1.2% and 2.8% in 2023 alone. Given the implementation of investments and their long-term nature, the positive macroeconomic impacts will only become more pronounced over a longer time horizon.

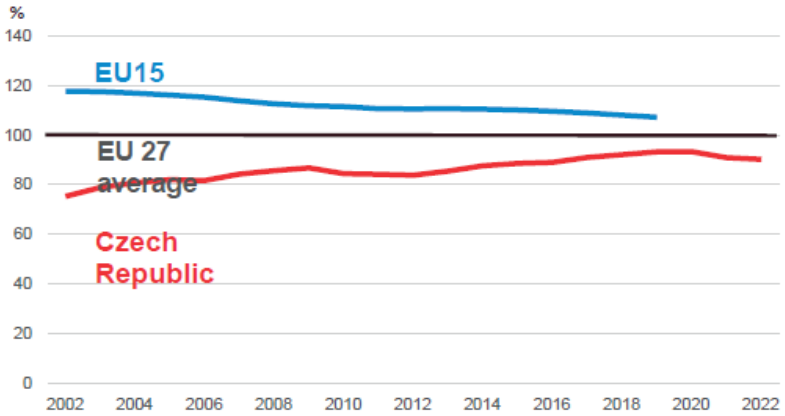
Figure 2: EU Budget Contribution - Impact of EU funds on GDP (%)



Source: Žáková, Zahradník, Bursík, Komárek and Štork (2024)

The standard of living in Czechia has risen to 90% of the EU average and has approached the level of Western Europe. The Czechia entered the EU with a GDP per capita at 80% of the EU average. Since then, it has overtaken Greece, Portugal, Spain, Slovenia, and Italy in terms of the standard of living measured in GDP per capita in purchasing power parity. See Figure 3.

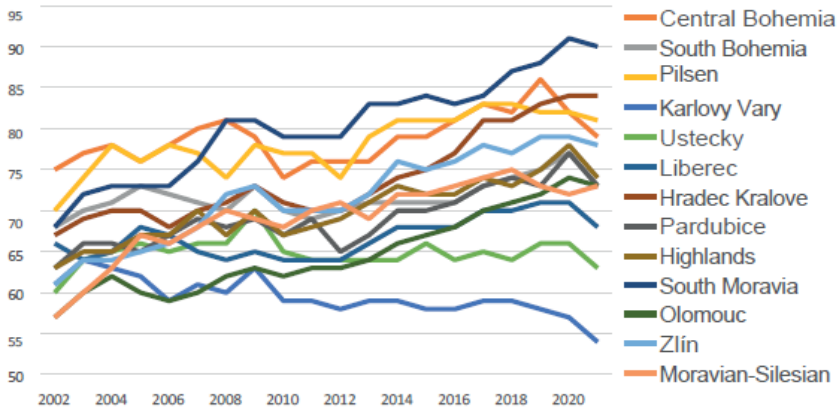
Figure 3: GDP per capita relative to EU27 (in PPP, %)



Source: Žáková, Zahradník, Bursík, Komárek and Štork (2024)

While Czechia is converging towards the EU average, some regions are moving further away. In the Karlovy Vary and Ústí nad Labem regions, the standard of living since EU accession has grown more slowly than in the rest of the country and relative to the average. The potential of EU funds has been much better used in the case of the Moravian-Silesian Region. The most oversized jumper in the Czech region is in the South Moravian Region. See Figure 4.

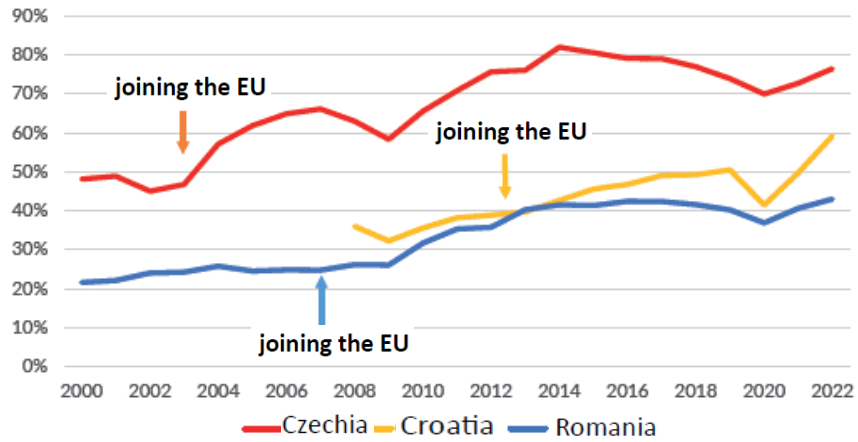
Figure 4: GDP per Capita in Relation to EU27 in the Czechia Regions (in PPP, %)



Source: Žáková, Zahradník, Bursík, Komárek and Štork (2024)

Accession to the EU was a significant boost for foreign trade in the Czech Republic and other countries that joined the EU later. See Figure 5. While exports of goods and services accounted for 45-50% of GDP before EU accession, they expanded to around 80% of GDP after EU accession. For example, a similar effect can be observed in Romania, which joined the EU in 2006, or Croatia (accession 2013).

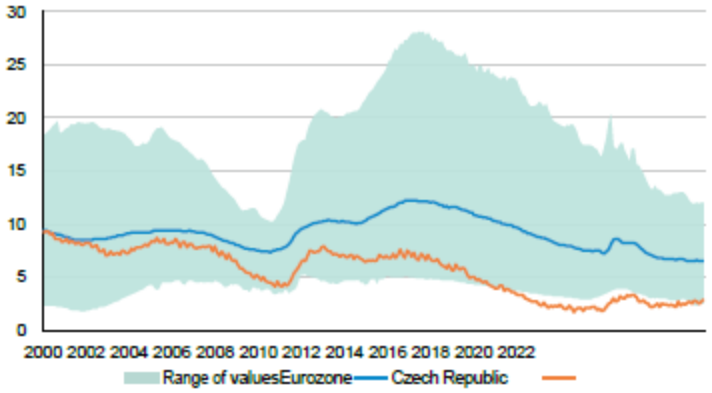
Figure 5: Share of Exports in GDP



Source: Žáková, Zahradník, Bursík, Komárek and Štork (2024)

The Czech Republic has had the lowest unemployment rate in the EU for a long time. See Figure 6. Since joining the EU, the unemployment rate has fallen from 6% to below 3%, and since 2016 it is been the lowest in the whole EU (Malta and Poland will approach the Czech Republic's level in 2023). While low unemployment contributes to the performance of the entire economy and saves public money on unemployment benefits, it is a drag on further growth. It puts upward pressure on wages, which - if stronger than labour productivity growth - weakens economic competitiveness.

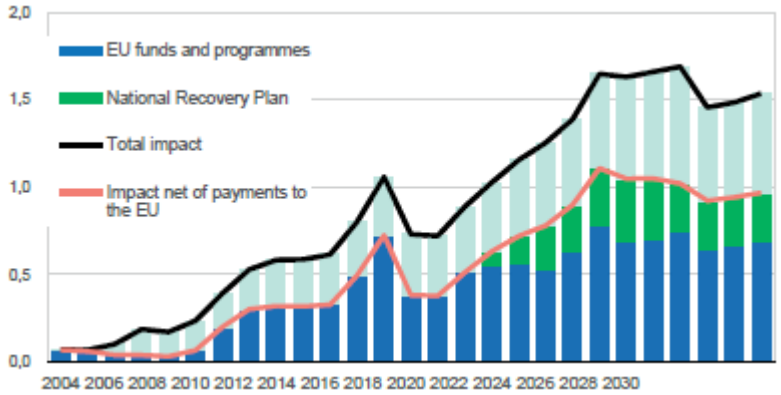
Figure 6: Unemployment Rate (%)



Source: Žáková, Zahradník, Bursík, Komárek and Štork (2024)

EU funds have made a significant contribution to higher employment. See Figure 7. During EU membership, EU funds and programmes have increased labour demand by an average of 0.6% of employment per year; net of payments to the EU budget, the average effect of the funds is 0.4%. This amounts to around 761,000 potential additional jobs between 2004 and 2024 (451,000 when adjusted for EU budget payments).

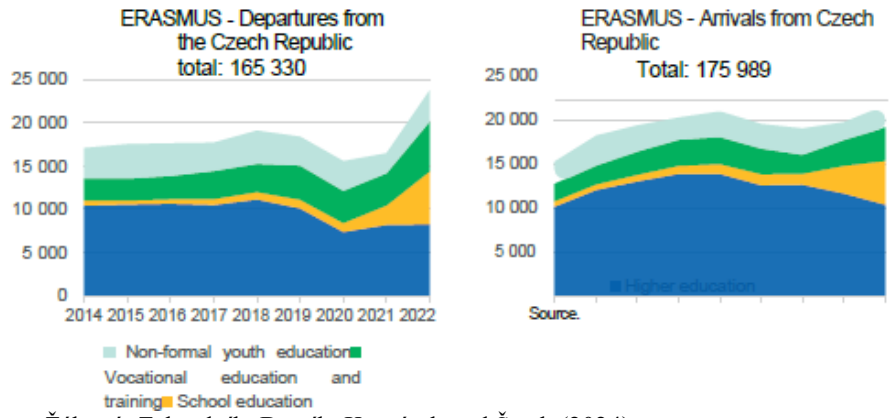
Figure 7: Impact of EU Funds on Employment (%)



Source: Žáková, Zahradník, Bursík, Komárek and Štork (2024)

Erasmus contributes to student mobility; interest in Erasmus is increasing in secondary schools but decreasing in universities. See Figure 8. Thanks to the Erasmus programme, 165,000 Czech students have studied or interned abroad under the 2014-2022 calls, while 176,000 people have visited the Czech Republic. The total number of participants has been growing in recent years only in the "school education" category.

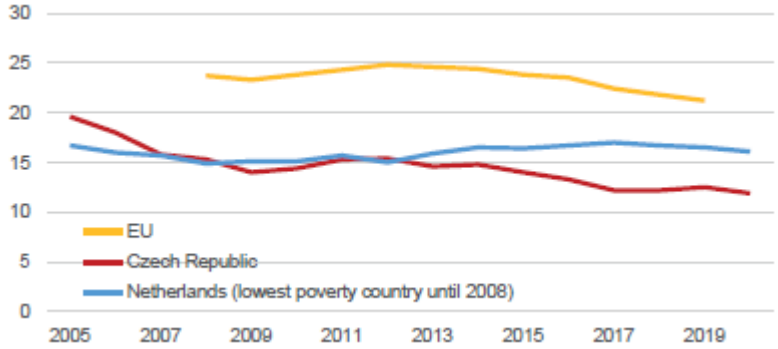
Figure 8: Education - Erasmus



Source: Žáková, Zahradník, Bursík, Komárek and Štork (2024)

After joining the EU, the Czech Republic gradually became the country with the lowest poverty rate. See Figure 9. The poverty rate has fallen from 20% to around 11% since EU accession, affecting around 750 000 people. EU funds have made a demonstrable contribution to this positive development through projects aimed at coordinating work in socially excluded localities, supporting social entrepreneurship (people with disabilities) and increasing the capacity of services and social work.

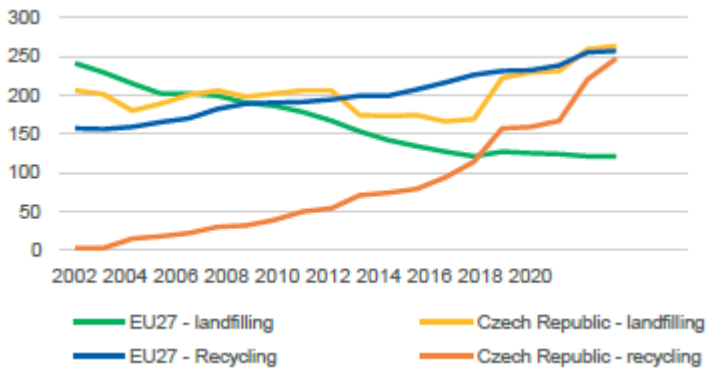
Figure 9: Percentage of People at Risk of Poverty (%)



Source: Žáková, Zahradník, Bursík, Komárek and Štork (2024)

Thanks to EU funds, we have learned to sort municipal waste and compost well, but our recycling rate is still below the EU average, and we are failing to reduce landfill. See Figure 10. EU funds have contributed to the increase in the material recovery rate of municipal waste and increased sorting. However, the recycling rate remains below the European average (49%) and has been stagnating since 2015. This is due to the overall increase in municipal impact (2nd highest in the EU in 2006-2021) and insufficient capacity to recycle sorted waste (Czechs sort a record 78% of PET bottles, but only 40% are recycled). This is why the share of municipal waste going to landfill has been increasing in recent years (48% in 2021, compared to the EU average of 18%), in contrast to EU trends.

Figure 10: Waste Management (kg per Capita)



Source: Žáková, Zahradník, Bursík, Komárek and Štork (2024)

The focus shifts to the specific impacts of EU funds in Czechia since its accession to the EU in 2004. Over the last two decades, these funds have been instrumental in a broad spectrum of development projects, ranging from upgrading transport infrastructure to bolstering educational and research institutions. Significant financial resources have been directed towards modernising highways, enhancing water supply and sewage systems, and refurbishing hospitals, schools, and public institutions. This investment has been aimed primarily at elevating the quality of life across the nation. Although these endeavours have significantly advanced Czechia's infrastructure and socioeconomic landscape, regional disparities persist. Areas around large cities, especially Prague, have seen more substantial benefits from these projects compared to more rural or economically lagging regions.

Addressing the remaining challenges, the chapter discusses the necessity of optimising the utilisation of EU funds. The disparity in development levels among different regions highlights the need for more tailored, strategic approaches to fund allocation and project implementation. The chapter argues for enhancing transparency and improving the administrative processes associated with these funds to ensure equitable development outcomes. It emphasises learning from past experiences and applying this knowledge to future initiatives to ensure that all regions, irrespective of their current socioeconomic status, can benefit from EU membership. By fostering a collaborative approach involving government bodies, local authorities, and civil society, Czechia can better leverage EU funds to reduce regional disparities, thereby paving the way for a more unified and prosperous future for all its citizens.

The "20 Years of Czechia in the EU in Graphs and Numbers" working paper provides comprehensive data that is highly relevant to the suggested future research directions. It offers a detailed analysis of the socioeconomic impacts of EU funds, highlighting advancements and ongoing challenges that can inform targeted studies. Here's how the paper aligns with the proposed future research areas:

- **Evaluating administrative efficiency in EU funds utilisation**: Insights into allocating and utilising EU funds across different sectors, such as infrastructure and environmental protection, highlight the importance of administrative efficiency.
- **Impact of community involvement on project outcomes**: Detailed analysis of community engagement, i.e. how community involvement in these projects correlates with the successful implementation and sustainability of funded initiatives, e.g. Melecký and Staníčková (2022).
- **Comparative studies with other EU regions**: With its comprehensive statistical review of Czechia's progress compared to other EU countries, contrast Czechia's use of EU funds and development outcomes with those of similar EU member states to identify best practices and improvement areas.

5. Conclusion

Over the past two decades, Czechia's integration into the European Union has been significantly bolstered by the strategic utilisation of EU funds to alleviate regional disparities and enhance socioeconomic conditions across its regions. As we reflect on twenty years of membership, while the infusion of EU funds has led to notable improvements in infrastructure, education, and living standards, the goal of achieving uniform regional development remains a work in progress. The persistent economic and social disparities between regions like Prague and outlying areas highlight the complex challenges of regional policy and the critical need for targeted interventions. Prague's rapid advancement underscores its role as a central hub for innovation and economic activity, further contrasting with slower-developing regions that have not capitalised on EU funds with the same efficacy.

EU funds have undoubtedly been a catalyst for growth. Still, the effectiveness of these funds varies greatly depending on regional administrative capabilities and the extent of local community involvement in the planning and execution of funded projects. This variability suggests that a one-size-fits-all approach is less effective than strategies tailored to each region's unique needs and potential. To optimise the impact of EU funds and ensure equitable development, Czechia must enhance transparency and foster greater public participation in the development process. Encouraging a more inclusive approach to project management and fund allocation could bridge the development gap between regions, ensuring that all Czech citizens benefit more uniformly from EU membership.

The alignment of regional development strategies with EU Cohesion Policy objectives remains pivotal. Strategic investments in infrastructure, innovation, and education are essential for sustaining growth and improving competitiveness across all regions. As Czechia continues to navigate its journey within the EU, the lessons learned from two decades of fund utilisation will be invaluable in shaping a more cohesive and resilient future for its regions. In conclusion, while significant achievements have marked the journey, the road ahead requires a concerted effort to address ongoing disparities through more effective and inclusive use of EU resources. The continued focus on regional development, supported by EU funds, will be crucial in realising the full potential of all Czech regions, fostering a balanced and sustainable growth trajectory for the nation.

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State Aid Temporary Framework in the European Union in the Light of the COVID-19 Pandemic

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Abstract
The purpose of the paper is to discuss selected aspects of State aid, which experienced significant changes in connection with the COVID-19 pandemic. The article focuses on a State Aid Temporary Framework, based on Article 107(3)(b) Treaty on the Functioning of the European Union (TFEU) to remedy a serious disturbance across the EU economy, which was adopted by the European Commission on 19 March 2020 to mitigate the negative effects of various restrictive measures aimed at the outbreak of COVID-19. The study aims to assess, based on the analysis of the impacts of the State Aid Temporary Framework on the area of public support in the EU internal market, whether the introduced measures were a suitable tool for solving the socioeconomic problems associated with the COVID-19 pandemic. Basic research methods include literature review, analysis, and comparison.

Keywords: *COVID-19, European Union, internal market, state aid*

JEL Classification: *H59, K20, L59*

1. Introduction

The coronavirus crisis has caused many devastating global consequences, not only in the entire European Union. The lockdown imposed by governments in many states to contain the Coronavirus pandemic caused penetrating restrictions on freedom of movement and has limited the possibility of carrying out most economic activities. Even if it was done for obvious and acceptable reasons, this had a significant impact at the macroeconomic level (Rosano, 2020). COVID-19 has caused variations in many key macroeconomic variables that affected economic activity (Hančlová, Chytilová, 2022). Among the plethora of measures that the European Union has resorted to, the European Union's state aid policy played a key role in mitigating the socioeconomic damage caused by the COVID-19 pandemic (Ferri, 2020). As stated by Kordoš (2016), the control of state aid is necessary to avoid the distortion of the single market, and at the same time, to ensure that subsidies that support the competitiveness of industries and companies are allowed. The European Union's system of state aid - a unique system in the world - provides a framework for supporting efforts to address market failures. After the elimination of all traditional trade barriers, physical, technical and fiscal barriers within the framework of the internal market process in the European Union, public support became the only interventionist and protectionist instrument on the domestic market (Ambrosiak, 2022).

The fundamental principles of state aid regulation remained consistent since the creation of the Treaty on the Establishment of the European Economic Community in 1957. The rules on state aid are included in Articles 107 to 109 of the Treaty on the Functioning of the European Union (TFEU). Article 107 paragraph 1 of the Statute of State Aid (EUR-Lex 2016) states: *"Any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between the Member States, be incompatible with the internal market".*

EU Legislation prohibits state aid as generally incompatible with internal market principles, except for a few exceptions. Articles 107(2) and (3) prohibit all state aid from being incompatible. It provides for a large amount of assistance that is completely or in part excluded from the scope of Article 107(1). Article 107 TFEU, paragraph 2, lists cases in which state assistance is automatically excluded from the above-mentioned general prohibition. Three types of assistance can be broadly defined as "social" assistance: assistance to restore damages caused by emergencies, and assistance to the economy of some areas of the Federal Republic of Germany affected by divisions (Mynarzová, 2022). The third paragraph of Article 107 TFEU sets out the types of State aid that may be considered compatible with the internal market: aid to promote the economic development of areas where the standard of living is extremely low and where there is serious underemployment; aid to promote the execution of an important project of common European interest or to remedy a serious disturbance in the economy of a member state; aid to facilitate the development of certain economic activities or of certain economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest; aid to promote culture and heritage conservation where such aid does not affect trading conditions and competition in the European Union to an extent contrary to the common interest, and such other categories of aid as may be determined by a decision of the Council on a proposal from the European Commission. Under these exceptions, aid that is automatically considered compatible with the internal market or can be considered compatible with it must be notified to the European Commission in advance. The exceptions provided for in EU law can be classified as *general exceptions* (Article 107(2) of the TFEU); *individual exceptions* (Article 107(3) of the TFEU); *block exceptions* (Article 651/2014); and *ad hoc exceptions* (Article 108(2) of the Third Subparagraph of the TFEU).

2. The COVID-19 Pandemic and the State Aid Temporary Framework

On 19 March 2020, the Commission adopted a temporary framework for COVID-19 based on Article 107(3)(b) of the TFEU to address serious disruptions in the EU economy (EUR-Lex 2020a) to mitigate the negative effects of various containment measures to combat COVID-19. As Rosano (2020) points out Art. 107 (3) (b) TFEU has been applied very few times. Things changed when in 2008 the economic crisis hit Europe. Considering the above-mentioned TFEU Article, the European Commission created a Temporary Framework for the application of state aid rules in a way that achieves maximum flexibility in resolving the crisis while maintaining a level playing field and avoiding undue restrictions on competition (EUR-Lex, 2009). Two objectives were pursued: to unblock bank lending and to make it possible for companies to make investments. In that Temporary Framework, the European Commission clarified that it would only consider State aid schemes not exceeding a cash grant of EUR 500,000 per undertaking that was not in difficulty on 1 July 2008 as compatible with the internal market (Mynarzová, Okręglicka, 2018). This experience provided a blueprint for the European Commission's response when the coronavirus became a widespread problem.

The Temporary State Aid Framework in the European Union, which was adopted on 19 March 2020, enables Member States to use the full flexibility envisaged in the State aid rules to support the economy in the context of the coronavirus outbreak. Member states have implemented a wide range of state aid measures, using different aid instruments, from credit-based instruments such as guarantees and subsidised loans to direct grants, recapitalisations, and other nonrepayable instruments. The temporary Framework was amended six times in the period between April 2020 and June 2022 as the crisis and the measures to address its economic impact developed. The first Temporary Framework was almost exclusively aimed at addressing the liquidity needs of companies affected by epidemics (e.g. guarantees and loans). On 3 April 2020, the Commission adopted a first amendment to provide aid to speed up research, testing and production of products related to COVID-19, to protect jobs and to further support the economy during the crisis (EUR-Lex, 2020b). A second amendment was adopted on 8 May 2020 to further facilitate access to capital and liquidity for businesses affected by the crisis (EUR-Lex, 2020c). This second amendment complements the types of measures already covered by the Temporary Framework and existing State aid rules by setting out criteria on which Member States can provide recapitalization and subordinated debt to companies in distress while protecting a level playing field across the EU. The third amendment was adopted on 29 June 2020 and extended the Temporary Framework to allow Member States to provide public support under the Temporary Framework to all micro and small enterprises, even if they were already in financial difficulties on 31 December 2019 (EUR-Lex, 2020d). The Commission has also adopted the conditions for recapitalisation measures under the Temporary Framework for those cases where private investors contribute to the capital increase of companies together with the State. In this amendment, the Commission clarified that the support should not be conditional on the relocation of the production activity or other activity of the beneficiary from another country within the European Economic Area to the territory of the Member State that provides the support, as such a condition would be particularly harmful to the internal market. On 13 October 2020, the Commission adopted the fourth amendment to the Temporary Framework (EUR-Lex, 2020e). The European Commission has decided to extend the scope of the temporary state aid framework adopted on 19 March 2020 to support the economy in the context of the coronavirus outbreak. All parts of the temporary framework were extended by six months until 30 June 2021, and the part allowing support for recapitalization was extended by three months until 30 September 2021. The amendment also introduced a new measure allowing Member States to support companies facing a decline in turnover during the eligible period by at least 30% compared to the same period in 2019 due to the outbreak of COVID-19. The support contributes to part of the beneficiaries' fixed costs that are not covered by their income. The fifth amendment, effective as of 28 January 2021, prolonged the Temporary Framework for an additional six months until December 2021 (EUR-Lex, 2020f). The Commission has also decided to expand the scope of the Temporary Framework by increasing the ceilings set out in it and by allowing the conversion of certain repayable instruments into direct grants until the end of next year. The last, sixth amendment adopted on 18 November 2021 extended the temporary framework by six months until June 2022 (EUR-Lex, 2020g). To further accelerate the recovery, the Commission also decided to introduce two new measures. Investment support measures to help Member States address the investment gap left by the crisis and solvency support measures to raise private funds and make them available for investment in SMEs, including start-ups, and small and medium-sized companies' capitalization. Investment support was valid until December 2022 and solvency support until December 2023.

3. Problem Formulation and Methodology

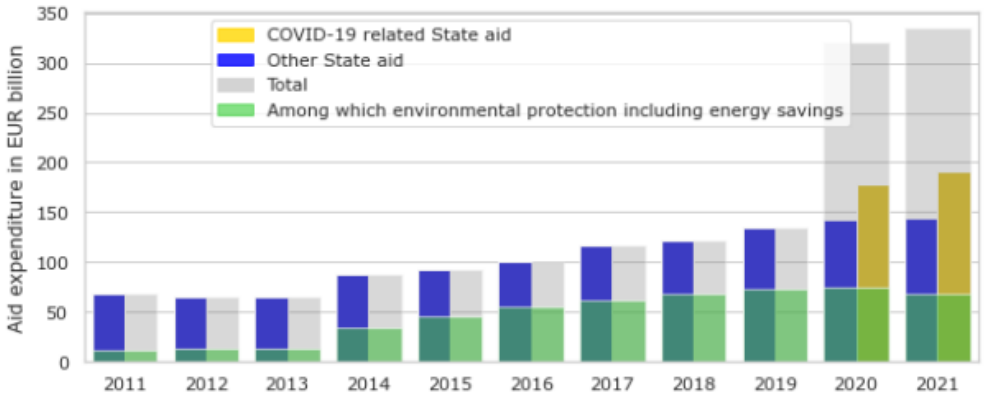
Many recent studies emphasized the importance of analysing state aid during the COVID-19 pandemic. The impact of support measures on the competitiveness of EU businesses and their likely consequences for the internal market is interwoven with the pivotal discussion on the application of the Temporary Framework for State Aid vis-à-vis the traditional European Union State Aid regime. On the one hand, the Temporary Framework – set up by the Commission on 20 March 2020 – aims to provide sufficient liquidity to companies that have run into difficulties as a result of the COVID-19 pandemic. On the other hand, the unprecedented relaxation of EU state aid rules may disrupt the functioning of the internal market and competition between companies (Agnolucci, 2022).

For the needs of the research, the author used some of the basic methods of scientific research to obtain the information necessary for comprehensive systematic processing of the issue. The author mainly used methods of qualitative but also quantitative research. The research methods used in this article are the study of literature, the analysis, and the comparison of the secondary data. Statistical data processed by the European Commission was used in the paper. To analyse the impact of the Temporary Framework measures, the period 2011-2020 was chosen. Unfortunately, more recent data were not available at the time the paper was being processed.

4. Problem Solution

Figure 1 shows the evolution of state aid expenditure in the EU-27 plus the United Kingdom (UK) in the period 2011-2020 in absolute terms. The overall trend over the last decade shows a steady increase in state aid spending since 2014, the year when the modernized General Block Exemption Regulation (GBER) entered into force (Mynarzová, 2022), with a huge increase in 2020 and 2021 due to the COVID-19 crisis.

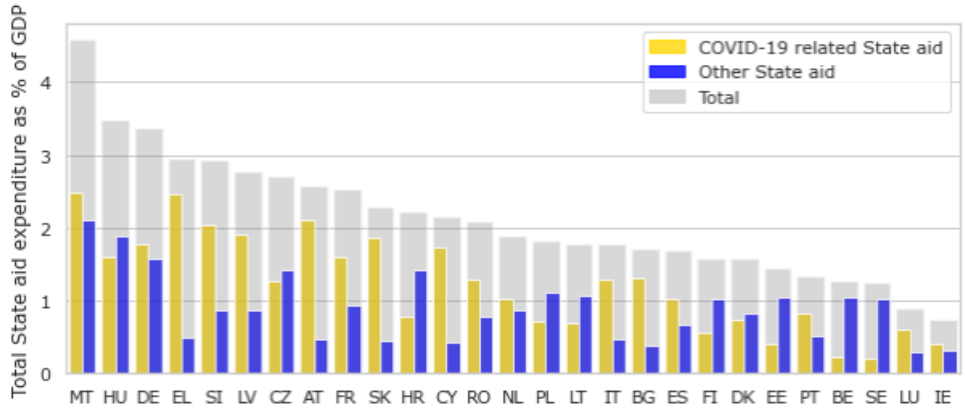
Figure 1: State Aid Expenditure in EU-27 Plus the United Kingdom from 2011 to 2020 (in EUR Billion, in Current Prices)



Source: European Commission (2023)

Regarding the massive support introduced during the COVID-19 epidemic, there are significant differences between EU Member States concerning the levels and changes in total expenditure from 2019 to 2022. Poland and Greece account for the largest share of COVID-19 state aid expenditures compared to GDP in 2020 – 3.8 per cent and 3.6 per cent. Ireland and Sweden spent the least in terms of relative expenditure (see Figure 2).

Figure 2: State Aid Expenditure by EU Member States – Comparison between COVID-19 and other State Aid Measures (as a Percentage of GDP in 2021)



Source: European Commission (2023)

Analysis of the proportion of COVID-19 aid expenditure in each Member State is shown to be about 80 per cent or more of the total State aid expenditure in Greece, Austria, Slovakia and Cyprus, followed by Bulgaria, Italy and Slovenia. In Belgium and Sweden, however, COVID-19-related expenditures account for less than 20 per cent of the total expenditure. Meanwhile, countries such as Germany, Czechoslovakia and Denmark have shown a more equitable distribution of state aid expenditures under COVID-19 and non-COVID-19 (European Commission, 2023).

EU-27 and the United Kingdom spent EUR 384.33 billion in 2020 on State aid to COVID-19 and other measures, equivalent to 2.43 per cent of GDP. Total expenditure on COVID-19 measures amounts to EUR 227,97 billion, accounting for about 59 per cent of total expenditure. The COVID-19 measures represent a minority of all active measures by 2020, but they have mobilized unprecedented support to ensure that viable companies affected by the COVID-19 pandemic can withstand the crisis.

5. Conclusion

During the COVID-19 unexpected pandemic crisis, to minimise socio-economic damages within the Member States, the European Commission has taken several steps to increase the flexibility of the support framework and include more diversified forms of aid. Implementing urgent measures, for the sectors that are mostly affected by the economic shock and unpredicted limitations pushed them to increase their resilience to be more stable for emergencies. To ensure the EU internal market is not fragmented and the level of playing field stays intact, as well as to avoid harmful subsidy races to the detriment of cohesion within the Union, the use of State Aid proved its necessity in various diversified forms of aid (Jafarli, 2023).

The COVID-19 pandemic has underscored the importance of having flexible yet robust frameworks for managing economic crises. An overview of the state aid rules related to the COVID-19 epidemic confirms the idea that the European Commission and Member States have learned from the financial crisis of 2008. The economic crisis has led to the development of significant expertise that allowed for rapid responses to massive economic shocks. A clear

legal framework and fast procedures were much needed for EU Member States to implement them use them to their full potential and save their economies.

Member States have channelled significant financial resources into the economy and the EU has eased relevant state aid rules designed to protect competition in the single market. State aid provided by Member States has consequently increased, in some cases sharply. The different extent to which the pandemic has affected EU member states and the occasionally significant differences in state support provided, both in terms of GDP and in absolute terms in 2020, have led to concerns that competition will be distorted, particularly in favour of Germany. However, as Rusche and Sutan state (2023) this is not confirmed by official data and statements of the EU, at least for 2020.

From an economic point of view, combining the existing relevant articles of the TFEU and the State Aid Temporary Framework made a lot of sense. The temporary revision of the rules of the game was not only a clear signal to society that the EU assumes its responsibility in times of crisis but was also a political response to the unprecedented challenges faced by member states in the context of the COVID-19 pandemic. Without public support, many companies would not have survived the coronavirus crisis because their liquidity and solvency reserves were insufficient to deal with such an extreme shock.

The Temporary Framework for State Aid allowed the European Commission to set horizontal rules for all Member States to protect equal playing grounds in the internal market and help Member States mitigate the effects of the epidemic. The temporary State Assistance Framework allows Member States of the EU to use the opportunities provided by the State Assistance Rules to support their economies and to respond effectively and proportionately to crises. The temporary framework can be seen as an urgent political response to avoid broader economic damage (European Parliament, 2021). The temporary framework introduced by the European Commission in response to the COVID-19 pandemic represents a significant change in the EU's state aid policy in response to the socio-economic impact.

Future research will focus on analyses of the impact of the temporary state aid framework to examine its consequences for the internal market and the level of competition, and cohesion within the EU internal market including its effects after the crisis period.

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Political Communication and Support for Refugees from Ukraine – Case of the Czech Republic

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Abstract
This paper focus on political communication as one of the factors influencing attitude towards refugees from Ukraine using the example of the Czech Republic. The goal of the paper is to show how the political communication in the Czech Republic approach to the support for Ukrainian refugees. Czech society has strongly supported their acceptance - unlike so called migration crisis in 2015. Level of the public support for refugees is influenced also by the way of the political communication. Need of more consistent connection with support for the long-term integration for Ukrainian refugees and low trust in state institutions weak the impacts of government communication. Parliamentary opposition unilaterally emphasize the potential negative impacts of the help to refugees. Ways of political communication related to the refugees reflect the fears present in the part of the Czech society connected with perception of the migration.

Keywords: *migration, political communication, public opinion, refugees, Ukraine*

JEL Classification: *F22, F51, M38, N40*

1. Introduction

One of the significant consequences of the full-scale Russian invasion of Ukraine is massive growth of refugee's number. According to data of United Nations High Commissioner for Refugees (UNHCR) is recorded more than 6,4 million refugees from Ukraine in February 2024 – most of them (6 millions) in Europe (UNHCR, 2024). Czech Republic has accepted hundred thousands Ukrainian refugees since beginning of the Russian aggression. In the present (at the end of January 2024) 381 400 refugees as a holder of the temporary protection are recorded in the Czech Republic (UNHCR, 2024). While during the so-called migration crisis the attitudes of Czech society towards applicants for international protection were strongly rejecting, the acceptance of Ukrainian refugees were supported by the clear majority of Czech citizens. After first "heroic" phase characterised by the wave of spontaneous solidarity the support for help to refugees from Ukraine has begun slightly decreased. Maintaining the public support for refugees is the challenge also for the political representation. Therefore the perception of the help to Ukrainians was becoming a topic for the political communication.

The goal of the paper is to show how the political communication in the Czech Republic approach to the support for Ukrainian refugees. Due the limited scope of the paper is not possible to present complex analysis of the political communication related to the refugees, therefore the article will focus on main features and topics typical for the communication of

politicians and other actors related to refugees from Ukraine. First part of the article will deal with theoretical aspects of political communication and its relation to perception of the migration, second part will analyze the Czech attitude towards migration in the historical context, and last part will introduce specifics of the political communication related to the support for Ukrainian refugees. The paper uses term "refugee" in accordance with the definition from United Nations Conventions Relating to the Status of Refugees.

2. Problem Formulation and Methodology

This paper deals with relation between support for Ukrainian refugees and political communication. The term political communication was originally used for government communication to public, now this concept has wider meaning analysing the role of communication in political life including also influence of media, public polls or political marketing (Křeček, 2013). How Lebedová (2013) with reference to Blumler and Gurevitch reminds, the political communication is possible to understand as the system of interactions between three main actors – politicians, media and public.

Blumler and Kavanagh (1999) distinguish three phases of the political communication. The first phase (1945-1960) was labelled as the „party-dominated communication system", characterised by the strong position of stabile political institutions and convictions. During the second phase beginning in the 1960s television became the dominant medium of political communication. Societal transformations connected with the growth of social mobility weakened traditional class ties and loyalty towards political parties. Character of party system has also changed – the era of so-called catch-all political parties has begun. The expansion of television has supported the transformation of political parties. Format of TV news has influenced the language of policy, it personalization, and planning of the political events with regard of TV broadcasting. Third age of political communication brought other new trends – emphasize on professionalization, increasing competitive pressures, growth anti-elite populism, diversifications of channels for political communication and new perceptions of policy (Blumler and Kavanagh, 1999). In the present, experts define fourth age of the political communication connected with extension of internet and social media. The expansion of social nets and web platforms had substantial impacts on working of media, and also led to the change of the communication of politicians. Gurevitch (2009) generally or Macková (2017) in the case of the Czech Republic analyse the influence of new media on the changes of the political communication.

Change of media environment and new tendencies of political communication have influenced also approach to the topic of migration and refugees. Various authors point out to politization of migration in Europe. So-called migration crisis in 2015 is possible to understand as the milestone in approach towards the migration on the European level. Kučerová (2020) analyzes the theoretical aspects of the migration crisis. The so-called migration crisis has revealed the differences in approaches to migration between Western and Eastern EU countries. Kučera (2002) reminds the historical aspects of the differences between the European West and East, not only in relation to migration. Schnaufer (2017) points out the Russia´s attempts undermine the trust in the democracy and in the EU by disinformation related to the migration. Medial presentation of migration and refugees has become an another specific topic for the scientific interest. Various authors (Zawadzka-Paluektau, 2023; Martikainen and Sakki, 2023) analyzed the semantic and visual presentations of refugees from Ukraine in comparison with perception of Syrian refugees. This paper will follow several aspects of mentioned research through the analysis of strategic documents and selected media reflections of political statements.

3. Attitudes of the Czech Society towards Migration in the Historical Context

During the so-called migration crisis in 2015, the topic of migration in the Czech Republic became strongly politicized with a significantly negative connotation. Prokop (2021) suggests that negative perceptions of migrants within Czech society may be influenced also by the exploitation of migration-related issues by populist politicians. This approach has supported the social acceptance for anti-immigrant policies as a new aspect of attitudes towards migration. Political entities opposing immigration often exhibit strong criticism of the EU while demonstrating varying degrees of support for Russian policies. Migration became the prominent topic in the campaign leading up to both the 2018 presidential elections and, to some extent, the 2021 parliamentary elections.

Negative attitudes towards migrations present in the Czech society is possible to interpret as a consequence of the national homogenization after World War II. Czech Republic could follow the tradition of the Czechoslovak asylum policy, but its heritage also contains contradictory features. After World War I the new Czechoslovak republic accepted around 25 000 Russian a 6 000 Ukrainian refugees. In the early stages, direct political support was provided by the Russian Relief Action under the patronage of president Tomas Garrigue Masaryk, which was operated by the Ministry of Foreign Affairs. Within the framework of this action, 5,500 Russian refugees were supported, with a preference for students, farmers, and representatives of the intelligentsia (Brandes, 2019). In the 1930s, private committees, established along political or confessional lines, took care of refugees from Germany, receiving only limited state support. (Čapková and Frankl, 2008). The state did not provide financial support to organizations caring for refugees from Germany, unlike the funding of the Russian emigration. After 1948, the asylum policy was constrained due to the country aligning with the Soviet bloc. Communist Czechoslovakia provided refuge for over 12,000 Greeks who fled their country during civil war. The Communist leadership urged local officials to understand the political significance of the "Greek Action" and influence public opinion accordingly (National Archive).

After 1989, the Czech Republic began to build its asylum policy on new foundations, which were closely linked to the European integration. Czech Republic has also begun to become a target country for international protection applicants, but their numbers did not reach the levels of the First Republic era by 2022. The Russian aggression in Ukraine represents a historical milestone in this regard as well. The arrival of hundreds of thousands of war refugees can be considered the greatest challenge to migration policy in modern Czech history.

4. Support of Ukrainian Refugees as a Topic for the Political Communication

Russian aggression has changed the character of Ukrainian migration in Europe. After invasion of Russia the migration from Ukraine significantly has changed its character. Mostly economic migrants prevailing in previous periods were replaced by war refugees. Another new tendency of the Ukrainian migration is high share of women and children (OECD, 2022) Andrews et (2023) reminds new gender structure of migration from Ukraine.

On 4 March 2022, the Council of the EU enacted for the first time ever, the Temporary Protection Directive (TPD), for refugee from Ukraine in the EU. Member States are bound by this Directive and cannot offer a lower set of rights than determine by this legal framework to the beneficiaries of temporary protection. Refugees with temporary protection received a residence permit (or equivalent) for the entire duration of the protection (which can last from

one year to three years). The set of rights guaranteed by the Directive involves access to the labour market and housing, medical assistance, and access to education for children (OECD, 2022).

In the case of the Czech Republic, the Ministry of Interior firstly prepared Program of help to refugees from Ukraine, which provided housing and basic material support. Regions in cooperation with the Ministry of the Interior have opened assistance centers for refugees from Ukraine. (Government of the Czech Republic, Information related to to Russia's invasion of Ukraine, 2022). Local authorities, non-profit organizations, and the public have all played significant roles in supporting refugees. Legal framework for the help to Ukrainian refugees represent so called Lex Ukraine and its novelization, which enable to receive temporary protection and relating financial and other support. Assistance to refugees involves rights to work, access to education, housing provisions, inclusion in the public health insurance system, financial aid, free language courses for job seekers, vocational training, job placement assistance, counseling services, and childcare support (OECD 2022).

Opinion polls of the Centre of empirical researches (Středisko empirických výzkumů – STEM) have confirmed significant level of public support for refugees from Ukraine – according to 70 % of respondents is right to accept of these asylum seekers. Concurrently 70 % respondents agreed with statement, that consequence of the accepting of refugees will be weakening of social security for Czech citizens. Nearly half of respondents (47 %) consider war refugees as threat for Czech society. According to STEM the relation of Czech public to the Russian invasion in Ukraine is connected primarily with anti-Russians attitudes (STEM, 2022). Prevailing rejection of Russian aggressive policy in the Czech Republic is connected with historical experience, which enable more easily identify with defending victim. Current surveys (as of February 2024) confirm a declining public support for accepting Ukrainian refugees. Nevertheless, over 50% of respondents still express approval for its continuation (see Table 1).

Table 1: Do You Think It's Right That the Czech Republic Continues to Allow the Stay of Ukrainian Refugees? (%)

	June 2023	September 2023	January 2024
Definitely yes	21	18	20
Rather yes	35	33	33
Rather no	28	30	26
Definitely no	17	20	20

Source: STEM (2024)

Despite this continuing mild support for assisting refugees, a majority of respondents prefer a swift end to the war, even at the cost of Ukrainian territorial losses (STEM, 2024).

In April 2022 Czech government introduced their Strategic Priorities for the Management of Refugee Wave Associated with Invasion of Ukraine by the Russian Federation. This document defined three phases of coping with the situation caused by the war. First stage, which was named Fight for safety, included provision of basic life needs for refugees. This humanitarian first period was marked as successful thanks to the commitment of authorities and non-profit organizations and solidarity help of public. The second phase should focus on creating of condition for adaptation of war refugees. Measures in this stage should involve support aiming

to decrease of language barrier, area of education, housing and health care. The goal of third long-term phase is integration of refugees who will want to stay in the Czech Republic and guarantee of return for those Ukrainians who will want to go back. depend on development of war. How document reminds, the course of this phase will depend on development of war.

Government defined thirteen specifications of strategic priorities for management of refugee wave. The communication was stated as last of them, whereas it was characterized as key part of strategy. Document distinguish three target groups for communication: public, Ukrainian refugees and the Member States of the EU (and another foreign partners). In case of informing focused on public the government document declared the establishing of national coordinator and coordinator for strategic communication. According to the strategy, quality and timely communication should prevent to spreading of misinformation and the emergence of potential problems related to internal security. Strategic document is a little more specific in a case of communication focused on refugees from Ukraine. Document reminds already existing government websites, but there is also emphasized the importance of informing on regional and local level. Strategy suggests to support consulting activities and projects of Centres for support of foreigners integrations, municipalities, non-profit organizations or schools. Document in last part dealing with communication briefly mentions the necessity of strategic external communication focused on the European Union and "wider abroad" with the goal to introducing the Czech Republic as one of the main target countries for Ukrainian refugees (Government of the Czech Republic, Strategic Priorities for the Management of Refugee Wave Associated with Invasion of Ukraine by the Russian Federation, 2022). Strategy didn't mention explicitly need of communication with providers of social services for refugees (non-profit organizations, social workers etc.).

Several representatives of NGO and academic experts point out that strategic governance related to Ukrainian refugees is failing. Jelínková and Tollarová (2022) as members of the Expert Group for Ukraine established at the Faculty of Social Sciences at Charles University reminded extraordinary help to Ukrainian refugees provided by Czech society, including state administration and self-government. Mentioned authors in their policy brief from November 2022 also highlighted quick acceptance of government strategy document related to management of support for refugees from Ukraine. While the first humanitarian phase of help to refugees was managed successfully, second (adaptation) and third (long-term) phases were carried out only to a limited extent or not at all, according to the authors. They criticised the lack of strategic objectives and missing mechanism to monitor the fulfilment of tasks. The main problem is supposedly the absence of clear vision supporting the integration of refugees and insufficiently clarified responsibility on national regional and local levels. Authors admitted that government made significant progress in communication (for example quality section in websites of key ministries), but they point out remaining tendency to withhold information on strategic considerations or methodology.

Aforementioned critical reflection mentioned the role of official communication as factor influencing support for refugees. Also OECD (2022b) emphasized the importance of strategic communication introducing long-term strategy for the integration of Ukrainian refugees. Document of OECD mentioned information platforms in chosen European countries which combine focusing on refugees and public. Czech authorities also established special websites providing relevant information for refugees – also in Ukrainian language. Web portal www.nasiukrajinci.cz has became the main communication platform created primarily as signpost of information, which offering individual ministries.

Statements by certain politicians significantly influence the public space, aiming to reframe the debate on refugees as a factor threatens the interests of Czech citizens. In March 2022, the

leader of the strongest opposition party Andrej Babiš, in his regular Facebook program, urged the government not to prioritize refugees over care of Czech citizens (idnes.cz, 21.3. 2022). The Prime Minister Petr Fiala criticized his statement as an attempt to "turn Czech society against refugees." (idnes.cz, Seznam.cz 25.3. 2022). Andrej Babiš repeated his critical evaluation of government support for refugees in following month (Novinky.cz, 16.4.). In spring 2022, minor issues with Romani refugees from Transcarpathian Ukraine became a pretext for escalating the debate on the existing refugee policy (idnes, 11.5). Opposition communication began to be dominated by criticism of the government's policies, emphasizing the alleged preference for refugees at the expense of Czech citizens and questioning the government's competence. In some cases, this criticism was also associated with downplaying the war situation in Ukraine (idnes 31.5. 2022, irozhlas 14.12. 2023).

In response to concerns about decreasing support for refugees, both non-profit organizations and government institutions have created various communication strategies. Company Kontra in the cooperation with the Consortium of Non-Governmental Organizations Working with Migrant suggested communication strategy focusing on support the integration of refugees from Ukraine in Czech Republic. Strategy consider “the confrontation politization of topic” as one of the main threat for integration of Ukrainian refugees. According to authors of strategy the economic problems, social inequality and information war could lead to the weakening of public support for refugees in the Czech Republic. The proposed communication strategy aimed to highlight the key role of non-profit organizations as the primary actor in the communication campaign, ensuring its apolitical nature. The involvement of non-profit organizations was intended to ensure that the campaign would be acceptable even to voters of opposition parties. The key topic of the proposed communication strategy is the support for the integration of refugees, interpreted as a benefit to Czech society.(Komunikační strategie na podporu integraci ukrajinských uprchlíků v ČR). As a result of the proposal, among other things, there was the creation of a website providing an overview of essential information and arguments in support of integration, including specific stories of Ukrainian refugees (začítspolečně.cz) In the fall of 2022, the Ministry of the Interior launched its own communication campaign with the goal of presenting facts supported by information related to current events. According to media reports, the draft communication strategy recommends not prominently mentioning non-profit organizations, which are allegedly perceived negatively by a portion of the public. The document suggests presenting assistance to refugees as a result of collaboration among all relevant stakeholders. In 2023, the Ministry of the Interior launched an information campaign, including websites aimed at debunking disinformation related not only to the war in Ukraine but also its impacts (nenaletet.cz).

In both cases, the information portals aim to demonstrate that support for Ukrainian refugees does not economically burden Czech society. In this regard, political communication supporting the acceptance of refugees reflects the framing of the issue introduced by opposition criticism. Emphasizing the positive economic aspects of supporting refugees (especially in the area of the labour market) reflects concerns within a part of society associated with perceptions of migration. Compared to 2015, government communication tries to frame the presence of refugees as a benefit for the Czech Republic as well. The impact of information campaigns is difficult to evaluate. It can be assumed that direct statements from politicians and their media interpretations significantly influence public opinion more than official communication campaigns. Current public opinion surveys confirm the stable support for accepting Ukrainian refugees. According to data from the STEM agency in January 2024, 53% of respondents agree with providing help to refugees, compared to 56% in June 2023 and 51% in September 2023 (STEM, 2024). These results also indicate that Czech society is divided on the issue of supporting refugees from Ukraine. Public opinion relating to Ukrainian refugees will influence

by the success of their long-term integration as well as by the ability of political representation to achieve basic agreement in communication regarding support for refugees and Ukraine itself.

5. Conclusion

The ongoing solidarity with Ukrainian refugees during the Russian aggression demonstrates a commitment to helping within various political and international contexts. Clearly understandable story of aggressor and victim as a cause of current refugee crisis, specific sociodemographic structure of migrants fleeing before war, their cultural affinity and adaptability, and the presence of numerous expatriate communities, are significant factors contributing to supportive attitudes towards Ukrainian refugees in the Czech Republic. Their acceptance is depicted as an act of solidarity and an expression of political and international alignment.

Public opinion surveys, nevertheless, indicate a decline in public support for refugees. Since the spring of 2022, there has been more frequent opposition criticism of the government's refugee policy, primarily emphasizing its social and economic dimensions. Level of the public support for refugees is influenced also by the way of the political communication. Need of more consistent connection with support for the long-term integration for Ukrainian refugees and low trust in state institutions weak the impacts of government communication. Parliamentary opposition unilaterally emphasize the potential negative impacts of the help to refugees. Ways of political communication related to the refugees reflect the fears present in the part of the Czech society connected with perception of the migration. This approach is manifested in the political communication mainly by emphasizing the economic benefit of the integration of refugees.

Acknowledgements

This research was financially supported by the Ministry of Education, Youth and Sports Czech Republic within the Institutional Support for Long-term Development of a Research Organization in 2024.

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Attacks on the European Green Deal: A Snapshot of the Czech Disinformation Scene in Action

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Abstract
The 2019-2024 Political Guidelines of the European Commission set out six strategic goals and the first of them is the famous European Green Deal (EGD). The EU drive for sustainability and competitiveness is projected in the EGD and the EU extensively communicates about it. However, enthusiasm for the EGD is not universally shared, instead, a large number of objections continue to arise. Unfortunately, along with rational and solid arguments and discussions, disinformation initiatives consistently engage in campaigns designed to discredit the EGD, and upset the entire concept of modern European integration. It is instructive to engage in a content analysis of popular Czech disinformation websites to analyse WHAT regarding the EGD they target and/or manipulate and WHICH European values they attack. The generated data points toward the Achilles' heel of the EGD and, once verified by more extensive longitudinal studies, could indicate how the EU should readjust its strategies, in particular concerning climate and digitalization.

Keywords: *Disinformation, European Green Deal, Sustainability*

JEL Classification: *F63, L21, M14, O20, Q01*

1. Introduction

In 2015, the United Nations issued a resolution called Transforming our world: the 2030 Agenda for Sustainable Development ("UN Agenda 2030"), which declares 17 Sustainable Development Goals ("SDGs") and 169 associated targets (MacGregor Pelikánová and MacGregor, 2020). The EU actively supported UN Agenda 2030 and has consistently endorsed it vigorously (MacGregor Pelikánová and Sani, 2023). Consequently, the current EU Commission, under the presidency of Ursula von der Leyen, set six matching ambitions for 2019-24, advancing all SDGs, with the very first of these six ambitions being the famous European Green Deal ("EGD"). Sustainability, in particular the EGD, can be effectively and efficiently materialized only with the support of all stakeholders, i.e. communicating about EGD to society-at-large is critical (MacGregor Pelikánová and Hála, 2021). The importance of such communication increases in crises (Carroll, 2021; MacGregor Pelikánová, 2021). The COVID-19 pandemic, the War in Ukraine, high inflation, etc. having heavily impacted global society, including the EU (Cowling and Dvouletý, 2023; MacGregor Pelikánová et al., 2021) and led to greater cost consciousness and suspicion about (allegedly) responsible behaviour and its costs (Hála et al., 2023; Kathayat, 2022; Turečková and Nevima, 2020).

At the EU level, it is basically up to the Commission to achieve coherence between industrial, environmental, climate and energy policies, to support the creation of an optimal business environment for sustainable growth, job creation and innovation based on shared engagement

(Hála et al., 2023; Melecký and Staníčková, 2022), and to communicate about it clearly and convincingly. Corporate social responsibility ("CSR") needs to be boosted, because without the support of pro-CSR businesses and well-informed Europeans, the EU will not achieve the transformation of the EU economy into a circular and value-based economy advancing SDGs (Jakubelskas and Skvarciany, 2023; Ma and Xue, 2023; Van Tulder and Van Mil, 2023). Concerns about greenwashing aka CSR waste (de Freitas Netto et al., 2020), and misplaced or uncoordinated social responsibility endeavours (Kasturi Rangan et al., 2015) should be avoided, and Environmental, Social and Governance ("ESG"), i.e. corporate policies about semi-tangible plans on sustainability and CSR satisfying the demands of external stakeholders (Balcerzak et al., 2023), should dominate. All stakeholders should help sustainability and create shared values ("CSV") (MacGregor Pelikánová and Hála, 2021; MacGregor Pelikánová et al., 2024). Shareholder activism (Goranova and Ryan, 2014), investor's ESG preferences and customers "green" choices should influence the managerial discretion (Aragon-Correa et al., 2004; Hutzschenreuter and Kleindienst, 2013), reduce managerial opportunism (Duong et al., 2021) and steer businesses towards CSR and CSV (MacGregor Pelikánová et al., 2024), especially if EU policy and the legal framework demands it (MacGregor Pelikánová and Sani, 2023). From this perspective, the concepts and models of Milton Friedman and R. Edward Freeman are not that remote (Hühn, 2023) and the expansion of corporate accountability is induced (Dillard and Vinnari, 2019). The evil is corporate social irresponsibility (Mocciaro Li Destri et al., 2022) because it destroys social and business values (Ma and Xue, 2023).

The EU has to establish a framework to support sustainability, CSR and CV, and to communicate it. The EU must provide high quality, accessible and reader friendly information which will inspire and induce the general support of the EGD. The EU selected, as the e-platform for its own Internet domain, commission.europe.eu with Website (European Commission, 2024). Experts and laypersons from the EU discuss the EGD via their own Internet domains. Some of them through democratic discussions with solid data, while others seek to attract the public to sources of information online which intend to manipulate and intentionally misinform, i.e. providing "information that is false and deliberately created to harm a person, social group, organization, or a country" (Wardle and Deerkhshan (2017: 20).

Disinformation is often perceived as organized efforts by political actors to disseminate false information (Guess & Lyons, 2020). It encompasses a broad range of sources and tactics - highly partisan media outlets, foreign governments, trolls, bots, fake news websites, politicians, conspiracy theorists and theories, and mainstream media (Tucker et al., 2018). Essential to understanding disinformation are the motives behind it, which involve sowing division, spreading doubt and confusion, and influencing elections (Tenove, 2020), destroying trust in the news media (Newman et al., 2022) and respect for public institutions (Bennet and Livingston, 2018), etc. The hallmark is acquiescence, not belief (O'Shaughnessy, 2020). Primary incentives to spread disinformation are political and financial (Rao, 2022). Anti-democratic or hate-based initiatives are common (Li et al., 2021). Popular themes for articles are those with divisive value. For that reason, attractive ones include those related to averting the impact of climate change. Since their objective measurements and impact assessments are challenging, it is easy to attract attention and controversy. Consequently, disinformation regarding climate change has quickly become one of the most serious thematic areas for society (Green et. al, 2021; Turečková et al., 2023). There is insufficient research on climate change disinformation dissemination and the involvement of various stakeholders, making the prevention of public confusion a rather ominous task (Fou, 2020; Hassan et al., 2022).

Central Europe, particularly the Czech Republic, holds significant relevance in the contemporary study of disinformation and propaganda due to its strategic location along the historical border of the former Soviet Bloc. This region has been volatile, with widespread

discussions about the Russian Federation's efforts to reestablish its sphere of influence, reminiscent of Soviet-era times. Furthermore, the Czech Republic presents an intriguing case for examining disinformation initiatives, as the demographic composition of the country amplifies the influence of less technologically proficient citizens in elections. Approximately one in five citizens belong to the 65+ age group ("Age Structure," n.d.), further complicating the landscape. Lastly, the Czech Republic exhibits concerning international trends in the form of growing disillusionment with democracy and a heightened belief in disinformation (Bennet and Livingston, 2018). Trust in the news media stands at 34% (Štětka, 2022), while trust in disinformation arguably exceeds this level. The rabid Czech disinformation scene reaches over half of the Czech population, with nearly half of those unable to judge when they are consuming disinformation (NFNZ, 2024). Disreputable Czech-based websites provide a steady stream of hostile disinformation or conspiratorial themes and have referred to the EGD. It is difficult to exaggerate the impact that the emergence of a globally active, locally pertinent environment of aggressive computational propaganda has had, and is having, on trust in democratic societies (Wooley and Howard, 2019), including in the Czech Republic.

Motivations for spreading disinformation about the EGD on Czech websites can only be speculated about, but it is feasible after this introduction (1.) to move to a problem formulation and a methodological framework (2.) identify pro-sustainability values, EGD parameters, Czech disinformation websites and content analysis. This should lead to a problem solution (3.) visualized by the juxtaposition of comparative tables, i.e. to check selected Czech disinformation Websites, arguably the worst and most popular, and see WHAT regarding the EGD they target and/or manipulate and WHICH critical European values they attack. This will allow the moving on to fresh suggestions and pioneering propositions in this arena.

2. Problem Formulation and Methodology

What is the Achilles´ heel of the EU related to the EGD? WHAT, regarding the EGD, is targeted and/or manipulated and WHICH critical European values are attacked by popular Czech disinformation websites? A content analysis of Czech disinformation websites can offer interesting suggestions. In order to obtain them, four steps need to be completed: (i) identify European pro-sustainability values and selected values for this study; (ii) identify the key parameters of the European Green Deal; (iii) select a sample of websites; (iv) set the criteria to perform a Delphi-manual content analysis with Likert scale scoring. Once these four steps are completed, the resulting data is to be juxtaposed and critically discussed.

2.1 Identification of European Pro-sustainability Values – Necessary for the EGD

The EU is founded on the values of respect for human dignity, freedom, democracy, equality, the rule of law and respect for human rights (Art. 2 TEU). Further, the EU shall work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment (Art. 3.3 TEU). As stated above, the EU endorses the UN endeavours including SDGs. Consequently, sustainable development in the EU means adherence to the SDGs, CSR and CSV as well as European values. Therefore, the EGD entails public law collective responsibility (sustainability) and private law individual responsibility (CSR), ideally its higher collaborative version (CSV), and combines it with European values. Table 1 demonstrates this synergy and reveals values critical for European integration and sustainability, i.e. the EGD needs to be built upon them, and needs to be understood as advancing them.

Table 1: European Pro-sustainability Values - Indispensable for EGD

Foundation	Description	Key Words
European Values (TEU)	respect for human dignity, freedom, democracy, equality, the rule of law and respect for human rights (Deontological – moral imperative)	RESPECT RULE OF LAW
Four justifications for CSR	Moral obligation = companies have to be right citizens and "do the right thing" (Deontological – moral imperative)	RESPECT
	Sustainability = companies have the duty to operate in ways that secure long-term performance (Consequentialism – utilitarian imperative)	NO WASTE
	License to operate = companies have the duty to communicate and pragmatically reflect stakeholders (Social contract - order imperative)	COMMUNICATION
	Reputation = companies have the duty to satisfy expectations of external audience (Social contract – order imperative)	CONSCIOUSNESS
Three Ways to CSV = Sustainability as responsibility making economic and social win-win = CSV aka creating economic value by creating societal value	Reconceiving products and markets aka turning social in economic = Figuring what is good, explain it and be consistent and trustworthy (Deontological)	CREATIVITY HONESTY
	Redefining productivity in the value chain = turning challenge/threat into opportunity aka courage to be transparent, honest and open-minded (consequentialism)	NO WASTE TRANSPARENCY
	Building supportive industry clusters- from shared words (communication) to shared acts (collaboration) (Social contract)	RESPECT COLLABORATION

Source: Authors's own elaboration based on Porter and Kramer (2006 et 2011) and MacGregor Pelikánová and Sani (2023).

2.2 Identification of Key European Green Deal Parameters

The EGD - striving to be the first climate-neutral continent is the top priority of the current European Commission projected in a package of measures, such as the Fit for 55 package (55% net emissions cut by 2030), the European climate law (climate neutrality by 2050), biodiversity strategy for 2030, etc. The EGD is built upon the conviction that climate change and environmental degradation are an existential threat to Europe and the world, which can be perceived as an opportunity to make Europe better, greener and stronger. The EGD was brought to overcome challenges, and to transform the EU into a modern, resource-efficient and competitive economy, ensuring: (i) no net emissions of greenhouse gases by 2050, (ii) economic growth decoupled from resource use and (iii) no person left behind, see Table 2.

Table 2: Goals/Targets and Initiatives of the European Green Deal

Goals/Targets	Values	Initiatives
No net emissions of greenhouse gases by 2050.	No EMISSION RESPECT	Fit for 55; European Climate Law; EU Biodiversity 2030; Farm to Fork; European Industrial Strategy; Circular Economy Action Plan; Batteries and wasted batteries; A just transition; Clean affordable and secure energy; EU chemical strategy; Forest strategy
Economic growth decoupled from resource use and	ECONOMIC GROWTH NO WASTE	
No person left behind	INTEGRATION INCLUSION	

Source: Authors's own elaboration based on European Commission (2024) and Consilium (2024).

2.3 Identification and Description of Selected Czech Disinformation Websites

Although, there is not any complete official list ranking Czech Disinformation Websites, there are a number of initiatives identifying and monitoring website disinformation in the Czech language targeting the Czech population. These initiatives entail endeavours presented via, nelez.cz, nfnz.cz, CZNic, globsec.org and konspiratori.sk. Namely, nelez.cz focuses on three characteristics critical for the trustworthiness of a website: (i) transparency of media, (ii) an honest disposition with data and sources and (iii) professional work with information and, based on them, compiling a list of such disinformation Websites without ranking them (Nelez, 2024) Nadační fond nezávislé žurnalistiky compiles, based on its own criteria, such a list as well (NFNZ, 2024). The Czech Domain Registry (CZ.NIC) famously identified eight domains from the TLD.cz (TLD) (aeronet.cz, protiproud.cz, ceskobezcenzury.cz, voxpopuliblog.cz, prvnizpravy.cz, czechpress.cz, exanpro.cz and skrytapravda.cz) and six domains from other TLDs (sputniknews.com cz24.news, nwoo.org, slovanskenebe.com, svobodnenoviny.eu and zvedavec.org) in February of 2022, and blocked them at the outset of the invasion of the Ukraine, thereby creating its own list of Czech domains with disinformation websites (Munzar, 2023). Globsec uses its methodology to even rank disinformation Websites (Globsec, 2024). Similarly, Konspiratori has a panel of experts which uses five criteria and the same scale 0-10 to rank untrustworthy Websites (10 is the worst, i.e. the website is not trustworthy at all), see (Konspiratori, 2024). Finally, similar web (Similarweb, 2024) and the Global Disinformation Index ("GDI") provide their own rankings, marking the worst as #1 and then moving further. Consequently, eight websites appearing on these lists with the highest monthly visits and rankings were placed in Table 3, below, and serve as a sufficiently representative sample of Czech disinformation websites with the potential to misinform about EGD.

Table 3: Overview of Czech Disinformation Websites

Czech Disinformation Websites	Monthly visits	Included on Nelez.cz + nfnz.cz + CZNic Blocked	Globsec.org 0-10	Konspiratori.sk 0-10	Similarweb "News & Media Publishers" + GDI
https://www.parlamentnilisty.cz/	4-7 million	Yes/No/ No	6-9	-	#13
https://www.ac24.cz/	1 million	Yes/Yes/No	6-9	9.1	#41
https://protiproud.info/	600-700 thousand	Yes/Yes/Yes	9.8	9.5	#56
https://www.novarepublika.cz/	500-600 thousand	Yes/Yes/No	6-9	-	#48
https://pravyprostor.net/	500-600 thousand	Yes/Yes/No	6-9	8.9	#73
https://zvedavec.news/	200-300 thousand	Yes/Yes/Yes	9.8	8.4	TBA
https://www.czechfreepress.cz/	60-70 thousand	No/Yes//Yes	-	8.6	#263
https://ceskezpravy.eu/	20-30 thousand	Yes/No//No	-	-	#638

Source: Authors's own elaboration based on nelez.cz, nfnz.cz, CZNic, globsec.org, konspiratori.sk and similar.web (2024)

Parlamentnilisty.cz has existed since 2008, and over four million people visit it monthly. This makes it the largest and most attractive Czech disinformation site. It was added to the Minister of the Interior's list of disinformation sites in 2020. AC24.cz was launched in 2011, is operated by Ondřej Geršl and mostly translates and republishes content from other similar sites or takes content out of context. Protiproud.info is operated by Ondřej Hájek, a spokesperson for former

president Vaclav Klaus, and spreads various conspiracy theories related to themes such as 'new world order' and Covid-19 as an attempt at a 'big reset' and is recognized by the Ministry of the Interior as a Disinformation Site. Novarepublika.cz is operated by Ivan David, a Member of the European Parliament for the far-right Czech political party SPD and is watched by the Ministry of the Interior, it tends to follow the Moscow line closely, and often uses exclusively Russian sources in its articles. Pravyprostor.net is owned and operated by Karel spreads conspiracy theories and contributes to creating conspiracy narratives (Šefčíková & Tkáčová, 2023). Zvedavec.news was created in 1999 by a Czechoslovakian emigrant in Canada, Vladimír Stwora, and is a disinformation and anti-systematic Website with a pro-Russian propaganda orientation and denying the holocaust etc. Czechfreepress.cz is an anti-systematic Website and its content is often re-taken by another conspiratory Website – ceskezpravy.eu.

2.4 Methodology for the Content Analysis of Disinformation Websites

The holistic assessment by a content analysis of these eight Czech Websites, which emerged by the intersection of various lists and indexes, see Table 3, was done by a panel focusing on concepts and values critical for the EGD, which were identified by sustainability, CSR and CSV demands and justifications, see Table 1, and EGD parameters, see Table 2. The panel employed the Delphi-manual approach and Likert style scale scoring and coding system to assess these concepts and values on each of these eight Websites. This social responsibility scoring methodology to explore websites and assess each specific criterion while using an evaluation scale is based on previous research, but considering the particularities of the given sample, instead of a 5-point scale (from 0 to 4) used previously for report analysis (Hąbek, 2017) a 3-point scale was used. Subsequently, a professional panel consisting of three experts (two males and one female - RKM, DR, LM), each with a solid background in law and economics and experienced in giving assessments in the field of CSR and CSV based on Internet resources, explored, extracted and analysed data from these eight websites while focusing on the set concepts and values, and scored the information while using the three-level Likert scale (Allen and Seaman, 2007). The grading was 0 if these values and concepts were not targeted and manipulated, 1 if they were targeted and manipulated in a general manner and 2 if they were targeted and manipulated in a developed and sophisticated manner, see Table 4.

Table 4: Methodology Overview Table – six Concepts and Values and their Assessment

Intensity of Disinformation on Websites	Respect	No waste	Transparency (honesty)	No emission	Economic growth	Inclusion (for all)
0	These concepts and values in the context of EGD are either not mentioned or they are mentioned in a neutral manner					
1	These concepts and values in the context of EGD are mentioned in a pejorative and/or manipulative manner without going in depth.					
2	These concepts and values in the context of EGD are specifically targeted and manipulated while arguments and data are twisted.					

Source: Authors's own elaboration based on prior literature (Hąbek, 2017)

The panel focused on the specific and actionable nature of the information (Van Tulder et al., 2016), followed an open-minded and co-operative approach (Van Tulder and Keen, 2018) and progressed with an advanced content analysis (Kuckartz, 2014), emphasizing quantitative aspects (MacGregor Pelikánová et al., 2024) and the direct and indirect causality (Heckman 2005). The panel engaged in contextual reading with synonym recognition and homonym rejection, i.e. they intentionally entirely disregarded automatic word scanning, which has an inherent inclination to misleading results. Their scoring of such information met the panel

member's expectations, and possible heuristic shortcomings were overcome after mitigating scoring discrepancies in the first and second rounds (MacGregor Pelikánová et al., 2021).

3. Problem Solution

The assessment of disinformation on the preselected six concepts and values of the EGD by the preselected eight Czech Disinformation Websites brings pioneering and relevant data.

Table 5: Disinformation About Concepts and Values of the EGD on Czech Websites

Czech Disinformation Websites	Respect	No waste	Transparency (Honesty)	No emission	Econ. growth	Inclusion (for all)
https://www.parlamentnilisty.cz/	2	2	1	1	2	2
https://www.ac24.cz/	2	2	1	1	2	2
https://protiproud.info/	0	0	0	0	0	0
https://www.novarepublika.cz/	1	1	0	0	1	0
https://pravyprostor.net/	2	1	1	0	2	2
https://zvedavec.news/	0	0	0	0	0	0
https://www.czechfreepress.cz/	2	1	0	0	0	2
https://ceskezpravy.eu/	2	0	0	1	0	2

Source: Authors's own elaboration based on the performed assessment (2024)

Parlamentnilisty.cz extensively discusses EGD and labels as hypocritical, anti-environmental, manipulative, anti-social, contra-productive and falsely and unfairly re-distributing assets. The EGD is presented as a nonsense instrument to parasite on and take advantage of the Czech Republic. Ac24.cz attacks the nature of the EGD, and presents it as a disaster, and this even for the environment. Green-peace representatives and economists are interviewed and they advance the idea that EGD is a fanatical instrument to destroy the entire Euro-Atlantic civilization. Protiproud.info does not engage extensively with EGD. Novarepublika.cz presents a set of articles which describe EGD in detail and correctly points to various problematic issues, i.e. the criticism is strong, but only slightly dis-informative. Pravyprostor.net does not hesitate to label EGD as the biggest at looting and plundering. Zvedavec.news informs briefly about real EGD issues and criticism, and does not extensively twist the information, just highlights and slightly magnifies agricultural protests. Czechfreepress.cz follows a similar trend as Pravyprostor.net, and presents EGD as an unfair instrument with the wrong ideas, and concepts as could be observed in communism, i.e. EGD is dangerous for the Czech Republic. Ceskezpravy.eu goes to an extreme by advancing the idea that EGD is redundant and that both the planet and growing population cannot be saved, and so the governments are arranging for the reduction of the population by 50% by releasing new viruses (HIV, SARS, Covid, etc.). It does not engage with aspects of EGD, but it goes straight to the organized elimination of one half of the population and basically approves it.

The analysis and assessment of eight Czech disinformation Websites regarding EDG leads to five propositions. Firstly, EGD is a topic for the majority, but not all of them (protiproud.info, zvedavec.news), i.e. EGD is POPULAR but not omnipresent. Secondly, the common denominator of attacks on the EGD is that it is wrongly conceived and contra-productive (ac24.cz, novarepublika.cz), i.e. EGD is ILL-CONCEIVED. Thirdly, EGD is (allegedly) an anti-integration instrument which is oriented against certain EU member states and certain Europeans (parlamentnilisty.cz, ac24.cz, pravyprostor.netczechfreepress.cz), i.e. EGD is about stealing from certain states and certain Europeans (pravyprostor.net), i.e. EGD discriminates and is NOT FOR ALL. Fourthly, EGD is presented as the imposed end of our civilization

(ac24.cz, ceskezpravy.eu), i.e. EGD is a suicide COMMAND. Fifthly, often EGD is discussed along with communistic and despotic strategies, i.e. EGD is NOT DEMOCRATIC.

4. Conclusion

Based on the performed analysis, for the majority of Czech Disinformation Websites, EGD is a POPULAR topic, but their level of interest and coverage regarding EGD varies. However, once they engage with EGD, it is then presented as an ILL-CONCEIVED, DISCRIMINATORY AND NOT DEMOCRATIC COMMAND, i.e. the EGD is often seen as undemocratically imposed nonsense which unfairly and discriminatorily hurts Czechs. Regarding the analysis assessing six concepts and values, the EGD is presented as violating the European value of RESPECT and INCLUSION and partially as well of NO WASTE, but not so much the TRANSPARENCY and HONESTY. EGD parameters are partially discussed and sometimes even in an acceptable, not misinformative manner, especially if it is about the issue of reducing emissions, i.e. even the Czech disinformation websites (at least tacitly) admit that the EGD is geared to reduce emissions. This admission does not extend to two other EGD parameters, i.e. the EGD potential for economic growth is rejected and the idea "no person left behind" is attacked. The Czech disinformation websites closely tie European integration to the EGD and do not hesitate to, based on their criticism of EGD, make radical judgments about the EU. This suggests that the Achilles´ heel of both EGD and European integration is the feeling of disrespect and discrimination followed by the perception of waste and redundancy, while transparency and honesty is not questioned. In sum, the Czech disinformation scene presents EU as DISRESPECTULLY ELITIST. Further longitudinal studies from more jurisdictions and entailing more websites are needed. However, even based on the performed analysis, it can be suggested that European integration and the EGD need to be better explained while highlighting their democratic (respect, legitimacy, no discrimination) features, e.g. that the EGD was repeatedly approved by the European Parliament, populated by directly elected representatives, that it passes the scrutiny for fairness and no discrimination, and that the Court of Justice of the EU, along with the Constitutional courts of EU member states, can check it in the light of the rule of law. Perhaps the biggest source of disinformation attacks is the insufficiently reader-friendly information given by the EU about EGD. Communication is key for the multi-stakeholder model and, without it, sustainability, CSR and CSV are chimeras.

Acknowledgements

This paper is a result of endeavours supported by the University of New York in Prague.

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How Does the European Union Perceive Resilience of the Region?

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Abstract
This research paper examines the perception of resilience by the European Union (EU) in the context of economic stability and crises. The main objectives are to explore the definition of regional economic resilience, to identify the factors that influence regional economic resilience, and to analyse the concept of resilience within the EU. Based on the analysis of existing literature and data, it is found that the economic resilience of regions is multifactorial and depends on many variables, including economic diversification, institutional capacity, policies, and infrastructure. In the EU context, resilience is an important element to achieve sustainable economic development and stability. The findings of this research paper contribute to a deeper understanding of the concept of resilience and its relevance for European integration and economic policy. The findings are also the starting point for further study of the economic resilience of the regions of the Czech Republic.

Keywords: *economic resilience, European union, regional development*

JEL Classification: *O18, O52, P48*

1. Introduction

Since the 2008 financial crisis, many new challenges and questions have emerged regarding the ability of economies to respond to external economic shocks and to recover from their negative effects. The rise of asymmetric threats such as global terrorism and hybrid threats, together with the financial crisis, the recent health crisis caused by the COVID-19 pandemic and the energy crisis caused by Russia's aggression against Ukraine, have brought the issue of state resilience to the forefront. Resilience here includes not only the resilience of the state as a whole, but also the resilience of society, the economy, regions, communities, the economic sector, the banking sector, the manufacturing sector, etc. Resilience is also becoming an increasingly relevant topic in the field of regional development and economic geography. Therefore, the concept of resilience, which was originally applied in the natural sciences, is gradually making its way into the field of regional development and economic geography. The issue of economic resilience is already a challenge in terminological terms. There are no exact Czech equivalents of the English term resilience, so the term is being simplified to include meanings such as resilience, flexibility, and adaptability. Resilience encompasses resilience to events, flexible response, and adaptability. However, it is important to stress that resilience goes beyond economics and is a broader concept. From the above, it is clear that the study of the issue is very complex and a simple solution that is easily transferable across regions cannot be expected. Just as the views differ on the definition of resilience itself, so do the ways in which it is measured and evaluated and the resulting strategies for strengthening the resilience of regional economies. Measuring and assessing regional development disparities is the study

of the functioning of complex social objects (regions) whose development takes place under different socioeconomic conditions, time, and space, resulting in a number of problems. However, this is why it is appropriate to address the issue of measuring the resilience and flexibility of economies in order to identify the most important factors that can contribute to the stability of regional economies.

To define and adopt an effective development plan for a given region, all aspects of regional disparities and factors affecting the region's competitiveness must be identified and properly assessed. Strengthening regional resilience is based on a highly complex process that is not limited to a small number of key factors. Resilience is multifactorial, so it is important not only the presence of individual factors, but also their combination, which creates a favourable local environment.

2. Understanding Economic Resilience

In general, economic resilience refers to the ability of a system, community or society to withstand and recover from economic shocks and disruptions. This includes the ability to adapt and adjust in order to maintain an acceptable level of functioning and structure. Such shocks and disruptions can come in various forms, such as economic crises, natural disasters, pandemics, or cyberattacks. The concept of economic resilience has gained significant attention in recent years due to the increasing frequency and severity of these shocks. As a philosophical view, economic resilience raises important questions about the nature of systems and their ability to navigate and overcome adversity. What factors contribute to economic resilience? How can communities and societies build and strengthen their economic resilience?

Due to its specificities, resilience has become a key topic across scientific disciplines and policy debate. The importance of resilience is increasing, especially due to the global pandemic crisis, but there is a lack of a widely accepted approach to its analysis and study. A theory of regional economic resilience does not yet exist, and it is equally difficult to quantify this resilience. Although a universal method of measuring resilience is lacking, it is key to understanding how systems, such as regions and cities, adapt to external challenges and sustain development. It is important to understand how external factors, including policy decisions and government actions, affect economies while ensuring that local economies should be influenced primarily by local people and not central governments (Martin and Sunley, 2020). As world economies face a range of significant challenges, from recessions to health crises, resilience is becoming a key concept for analysing the responses of different economic systems. To understand the impact of these events on economic development, it is important to study resilience concepts (Martin and Sunley, 2015). The importance of economic diversification in regions to achieve prosperity is also emphasised, as is the need for macroeconomic and microeconomic policies that promote resilience, as Briguglio et al. (2009) point out. The importance of resilience in policy is growing, with support from institutions, including the EU.

2.1 Defining Resilience

In today's relatively unstable global economy, various regional economies face many shocks and challenges. While some are recovering quickly and returning to normal, others are suffering long-term consequences. In this context, the key question becomes: What makes some economies more resilient than others? The term "resilience" is derived from a Latin expression that means "to jump back". Historically, it has been defined, as reported in the Encyclopaedia Britannica in 1824, as the ability of a body or system to return to its original

state after a sudden disruption (Klein et al., 2003). Staníčková (2018) expands on this understanding, emphasising that in the context of a regional economy, it is the ability to recover quickly from exogenous shocks and maintain its stability. The European Union (EU) has long incorporated the concept of resilience into its policies. Initially, the concept was linked to economic growth and development, and in the 1990s to security issues. More recently, the EU has redefined its approach to resilience, focusing on internal problems and challenges without neglecting external threats, as Meszaros and Ţoca (2020) point out. The concepts of resilience and adaptation are key in the analysis. Adaptation reflects visible changes, while resilience refers to deeper adaptation processes. Resilience in the economic context refers to the ability of an economy to recover from a shock and maintain its growth. Diversified economies, as reported by Feyrer et al. (2007), are better able to withstand shocks. Simmie and Martin (2010) point out that resilience also includes stable and changing institutions that support economic growth.

3. Exploring the Foundations of Economic Resilience

Economic resilience is not solely dep2endent on economic factors, but also on social, institutional, and environmental factors. These interdependent factors contribute to the overall resilience of a community or society, as they can either support or hinder its ability to withstand and recover from economic disturbances. *What are the interdependent factors that contribute to economic resilience?*

Regional resilience is a dynamic concept that speaks to a region's ability to cope with and adapt to external shocks. In current research, regional resilience emerges as a key component of sustainable regional economic development. It is a multidimensional concept that focusses on a region's ability to adapt to external challenges and shocks. Despite the limited research resources in this area, there are several key factors that influence regional resilience.

Historical and current economic growth, according to Christopherson et al. (2010), regions with solid historical and current economic growth are usually better prepared to cope with shocks. Geographic location and climate, according to Feyrer et al. (2007), regions with optimal climate and proximity to major metropolitan areas tend to recover more quickly from economic shocks. Firm ownership structure, Kolko and Neumark (2010) highlight that regions with a preponderance of local firms may be more vulnerable to economic shocks. Creative and adaptive capabilities. These two key capabilities, as Palekienea et al. (2015) point out, are crucial for regional resilience. While creative capabilities relate to a region's economic potential, adaptive capabilities reflect how effectively a region can adapt to shocks. Global pressures. In the context of globalisation, regions face constant pressures such as competition, technological developments, and rapid changes in the global business environment. According to Hudson (2009), these global pressures can cause a weakening of regional resilience. Economic and social structure. Martin (2012) emphasises that dynamic growth, economic structure, specialisation, human capital, innovation, and institutional arrangements are key components of regional resilience. Similarly, Foster (2006) highlights the importance of economic capacity, social democratic capacity, and community capacity. Macroeconomic stability: Koutský et al. (2012) show that indicators of macroeconomic stability such as GDP, inflation and employment are critical indicators of regional resilience.

A research and innovation ecosystem, high levels of investment in R&D, the existence of higher education and research institutions, and the capacity to innovate can increase the resilience of a region (Ekosgen, 2009; Mancini et al., 2012). Sociodemographic aspects. Important indicators of social resilience are the educational attainment of the population, social capital, quality of life, and health of the population (FAO, 2016; Gianmoena, 2018;

Stanicková, 2018). Environmental and natural aspects. The current literature highlights the importance of considering environmental and natural aspects in the context of regional resilience. This includes both natural resources and how regions address environmental challenges such as climate change (Giacometti and Teräs, 2019; Graziano, 2013; Psycharis, 2014). Digital transformation, in the digital age, there is a growing emphasis on digital infrastructure, skills, and services. Regions with a higher degree of digitalisation may be better prepared to face future economic shocks and challenges (European Commission, 2020b). For greater clarity, a table of key factors affecting the resilience of the region has been created, see Table 1.

Table 1: Overview of Factors Affecting the Economic Resilience of Regions

Key factors affecting the economic resilience of regions	Historical and current economic growth,
	Global pressures
	Geographical location and climate,
	Creative and adaptive capacity
	Ownership structure of firms,
	Digital transformation, Environmental and natural aspects
	Economic and social structure,
	Economic capacities, Social democratic and community capacities
	Dynamic growth, economic structure, specialisation, human capital, innovation and institutional arrangements
	Research and innovation ecosystem, high level of investment in R&D, existence of higher education and research institutions and capacity to innovate
	Socio-demographic aspects - education of the population, social capital, quality of life and health of the population

Source: Own elaboration (2024)

The economic resilience of a region is a complex concept that is constantly evolving. To fully understand what makes some regions more resilient than others, it is necessary to look deeper into the above factors and examine how they interrelate. Regional resilience is the result of a combination of factors that range from economic and social to environmental and technological. Understanding these factors and designing policies that strengthen the resilience and adaptability of regions to future challenges is essential for effective regional development strategies.

4. Resilience in the EU Context

The European Union (EU) faces constant challenges, including economic instability, political conflict, migration, climate change, and many others. The ability of the EU to overcome these challenges and recover from crises is crucial to maintaining stability and prosperity in the region. This chapter focusses on the concept of resilience in the EU context and analyses the measures and policies that have been adopted to strengthen its capacity to withstand crises.

Resilience refers to the ability of an individual, community, or system to adapt and recover from various challenges and crises. In the EU context, resilience includes the ability to respond to economic, political, environmental and security threats through flexible policies, institutional mechanisms, and social networks (European Union Institute for Security Studies, 2017).

Resilience in EU policy strategies: The EU has included the concept of resilience in its policy strategies, such as the European Security Strategy and the Strategy for External and Security Policy (European Commission, 2016).

4.1. Steps to Strengthen EU Resilience

Economic and monetary union (EMU) policy: reforms to EMU, such as strengthening the banking union and creating a European stabilisation mechanism, aim to strengthen the euro area's resilience to financial crises and economic shocks (European Commission, 2015).

Security and defence policy: the EU is seeking to strengthen its security and defence capabilities through better coordination of Member States' military forces and the creation of common defence capabilities. This includes joint military missions, information sharing and strengthening the ability to respond to new threats such as cyber-attacks and hybrid threats (European Union, 2016).

Promoting innovation and research: Investing in research, innovation, and digital transformation is key to strengthening the competitiveness and resilience of the European economy. The EU supports science, technology, and innovation projects through programmes such as Horizon Europe, which promotes collaboration between research institutions and businesses across the EU (European Commission, 2021).

A common migration policy: the EU is working to develop an effective and humane migration policy that improves the EU's ability to respond to migration crises while respecting the human rights and dignity of migrants. This includes better coordination between Member States, strengthening border controls, and promoting the integration of migrants into society (European Commission, 2015b).

Resilience has become a key concept in EU political and strategic debates and is essential to maintain stability and prosperity in the region. Strengthening EU resilience requires a comprehensive approach that encompasses political, economic, security, and social measures at all levels of the EU. Applying the concept of resilience in EU strategies and policies contributes to strengthening the EU's capacity to face future challenges and crises.

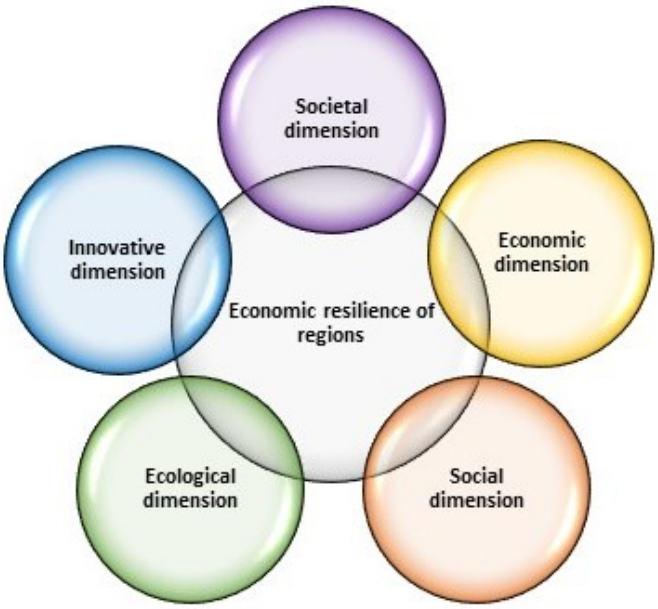
5. Conclusion

As mentioned above, the emergence and increased intensity of asymmetric threats in the 21st century have the greatest impact on regional resilience. At the beginning of the research, the world was exposed to an exogenous shock in the form of the COVID-19 pandemic. Subsequently, Europe was hit by a security threat due to the war in Ukraine, as a consequence of which it was necessary to consider the potential inclusion of a "security" dimension of resilience as a significant factor for regional resilience. The Ukraine crisis, as the war conflict triggered by the Russian Federation is called, has demonstrated the importance of the security factor, which has implications for the further economic development of regions and their current and future resilience. The war in Ukraine is also linked to the deepening of the energy crisis, which has thus acquired an additional dimension, and this fact and these developments also have an impact on the environmental dimension of resilience, where it is becoming more important and more relevant, not least thanks to the European Commission's Green Deal initiative to tackle this crisis. Therefore, the events of the last three years have demonstrated the multifactorial nature of regional economic resilience and its impact on widening or reducing disparities between regions. The multifactorial nature of regional economic resilience, influenced by recent crises, has prompted the European Union to reevaluate and

strategically adapt its policies to enhance regional resilience. This adaptation is seen in the EU's focus on integrating resilience across various dimensions, including economic stability during crises.

It was an unexpected shock, in the form of the COVID-19 pandemic crisis, that led the European Union to implement a new strategy to strengthen and build the resilience of the EU as a whole, as well as its member states, in its policies. The Czech Republic as an EU member state and its regions are therefore facing new challenges in the form of strengthening resilience to green and digital transformation, which has become a top priority for the recovery and building of resilience in the EU and is closely linked to the EU cohesion policy and its support instruments. Based on the resilience dimensions identified that were part of the previous literature search, five dimensions were identified that are inspired by the resilience dimensions compiled by the European Commission in the area of building resilience in the European Union. In its Communication to the European Parliament and the Council, the European Commission presented its Strategic Outlook - Mapping the way to a more resilient Europe, where it presented its four-dimensional analysis of resilience, which are: the social dimension, the geopolitical dimension, the environmental dimension and the digital dimension (European Commission, 2020). The five identified dimensions of resilience in the own research include the societal, economic, social, environmental, and innovation dimensions, see Figure 1.

Figure 1: The Five Identified Dimensions of Resilience



Source: Own elaboration (2024)

The inclusion of the concept of resilience in the policies and strategies of the European Union leads to its inclusion at lower regional levels, such as cohesion regions and regions, or lower regional units in the Czech Republic. Within the framework of the European Regional Policy,

the Czech Republic is thus developing strategies from this position, with the aim of supporting regional development in the Czech Republic with an impact on the subregional units and their inhabitants. An example of this is the Smart Cities concept, which serves to improve the lives of residents. It is an approach to smarter management of cities, municipalities, regions, and life in them through the introduction of modern technologies.

As Ostárková said (2022) the is a new trend when the resilience is integrated into all European Union policies. Another example of such a strategy is the National Research and Innovation Strategy for Intelligent Specialisation of the Czech Republic 2021-2027, which focusses on support for knowledge-orientated and applied research and innovation and directs support to selected priority areas that have a high potential to create a long-term competitive advantage of the Czech Republic based on knowledge exploitation and innovation. The identification and development of these promising areas, i.e., "smart specialisation", builds on the strengths of the Czech Republic and individual regions. However, the strategy is not created only by the state; in contrast, there are strategies for each region of the Czech Republic, an example being the Strategy for the Development of the Smart Region of the Moravian-Silesian Region, through which projects are implemented in the field of smart transport, ICT infrastructure, health care, civil service and energy. Its aim is to build a high capacity and high-capacity data network public Wi-Fi network, which will be the basis for the development of electronic services of the regional corporation. Another example at the level of the Moravian-Silesian Region is the Regional Innovation Strategy of the Moravian-Silesian Region 2021-2027. It builds on and develops the horizontal themes of the MSK Development Strategy and the Strategic Development Plan of the City of Ostrava for the period 2017-2023 (FAJNOVA) and defines the areas that are necessary to meet the definition of "smart specialisation", among other things, identifies the areas of strategic specialisation of the MSK, presents the direction in the field of international cooperation, and describes the monitoring and evaluation system of implemented activities. The above-mentioned strategies have a unified line at the national, regional, and local level (the example of the City of Ostrava), which is the European Union's goal of digital transformation, with the aim of promoting competitiveness and reducing disparities. As a result, regional policy and its instruments affect not only the competitiveness of a given region but mainly its inhabitants as the main entity that shapes the region. To what extent and in what way do the instruments supporting regional development affect the level of regional resilience and flexibility of the Czech Republic? This fundamental research question, addressing the effectiveness of regional development support instruments in fostering regional resilience, particularly in times of economic shocks, calls for in-depth investigation to ensure that regional policy instruments indeed support the reduction of regional disparities and, as a consequence, bolster the region's ability to face exogenous shocks.

The above raises a fundamental research question in relation to regional economic resilience, namely to what extent and in what way do regional development support instruments affect the level of regional resilience and flexibility of the Czech Republic, i.e. whether regional policy instruments really help to support the reduction of regional disparities and, as a consequence, to support the region's ability to face exogenous shocks. Looking ahead, further research should examine how recent economic crises have influenced the development of EU policies on regional economic resilience. Key components of these policies and their efficacy in mitigating the effects of such crises across diverse economic landscapes within the EU need to be explored. Moreover, evaluating the effectiveness of EU resilience measures in enhancing the resilience of its member states during economic shocks could provide valuable insights for future resilience-building efforts.

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Bridging the Gap: Can a new Approach to the Measurement of European Integration Be Found? Application and Validation on EU Presidency

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Abstract

Today's European Union has been constantly evolving since its creation in the 1950s, and it was necessary to start mapping and measuring the integration results achieved, as well as identifying the limits that weaken the integration process, slow it down or the challenges that need to be overcome in the integration process. By mapping and measuring the European integration process, it is possible to discover how individual countries are integrated, what their views are on current European policies, or what their views are on the future of the European Union and thus the future direction of the European integration process. Using content analysis, scaling techniques, frequency analysis, cluster analysis in software IBM SPSS 28, the aim of the paper is to provide a comprehensive view of the current European integration process in the countries holding the EU Council presidencies between July 2020 and June 2023. The aim of the paper is also to determine the compatibility of the analysed countries with the current European Commission's policy guidelines.

Keywords: *cluster analysis, European Commission, European Union, EU presidency, Presidency Trio*

JEL Classification: *B15, F02, F15, O52, O57*

1. Introduction

The European integration process, as we know it today in the form of the European Union, began to develop after the Second World War, when Europe was coping with the devastating effects of war, and no one wanted to face war again. With the development of the European integration process and the involvement of other countries, it became necessary to measure and map the European integration process comprehensively and assess and analyse the involvement of sub-European countries in the European integration process. Linked to the mapping and measurement of integration tendencies is the concept of the actual state of integration. Knowledge of the integration of the Member States and the EU as a whole helps to understand better the state of European integration, how individual countries are integrated, how they are developing, what their views on current European policies are, or what challenges the European Union has to face. Knowing the degree of integration is crucial for the European Commission to set European priorities or propose measures to strengthen European integration and improve the quality of EU citizens or, more precisely, European support. Knowledge of the current state of EU integration is essential in assessing the success of policies and measures aimed at promoting European integration. It is also a tool for improving the efficiency and

functioning of the European Union. In addition to the integration results achieved, it was and is necessary to identify the limits that weaken and slow down the European integration process and the challenges that need to be overcome in the context of integration. EU integration helps Europe in international politics and allows it to promote its interests and values at the international level.

The current European integration process in the form of the European Union can be measured using indicators and composite indices on a sectoral or comprehensive basis. However, most approaches to mapping and measuring the achievements of the European integration process are old and do not consider the views of Europeans. EU integration should be examined at the national level and reflect the opinions of Europeans. This paper seeks to propose an effective way of measuring and mapping the European integration process that combines top-down and bottom-up approaches.

2. Data and Methodology

The paper is based on qualitative and quantitative methods. The qualitative methods used are primarily literature search and content analysis of documents. The literature search serves as a basis for understanding current aspects of European policies, approaches to measuring economic integration and indicators used to assess integration. The content analysis of the documents of the EU Presidency programmes serves to identify the attitudes of EU Member States towards current European policies. The data source for the opinions of the population of the countries analysed are Eurobarometers (opinion polls). Quantitative methods such as scaling techniques are used for data analysis, univariate analysis (frequency analysis) for validation of the data base and multivariate analysis (cluster analysis) for classification of countries into clusters. The outlined analysis procedure is performed using IBM SPSS 28 statistical software.

In order to scale using scaling techniques, in particular the scoring method and the traffic light method, it is necessary to construct a scale that reflects the attitudes of the Member States and the views of their populations on current European policies resulting from the European Commission's policy guidelines 2019-2024, see Table 1. Scales are a common tool in European integration research, used for example by Haralampiev and Eftimova (2020), Vidačak and Milošić (2020), Vandecasteele, Bossuyt, and Orbie (2015), Cross (2013), Thomson et al. (2012), Warntjen, 2007, and Thomson and Stokman (2006).

Table 1: Values and Scaling of the Intensity of Links to the EU

Values of the attitudes and opinions of Member States and their populations		
Most positive links, least controversial places	Unified opinions	**3**
Medium positive links, medium controversial sites	Consistent requirements	**2**
Slightly positive links, frequent disputes	Similar opinions	**1**
No attachment or neutral attachment (information not available)	Neutral linkage (cannot be determined)	**0**

Source: Own elaboration (2024)

After identifying the attitudes of the Member States and the opinions of their populations on current European policies using scaling techniques and then controlling the data base using frequency analysis in IBM SPSS28, the attitudes of the Member States and then the opinions of their populations are first classified using agglomerative hierarchical cluster analysis. The results of the cluster analysis are visualised in dendrograms. The use of cluster analysis in both cases is based on the assumption that within clusters there are EU Member States that are as similar as possible in terms of their views and in different clusters there are EU Member States that are different in terms of their views. The cluster analysis is performed in both cases using Ward's method as the clustering procedure and the Manhattan similarity (distance) measure.

According to Ruff (2014), it is possible to use agglomerative hierarchical clustering analysis to cluster ordinal data. The Manhattan distance was chosen as a measure of distance (similarity), which has greater predictive power for multidimensional dataset and categorical data. Manhattan distance is commonly applied together with Ward's clustering procedure. Manhattan distance is used to calculate the absolute difference between the distance coordinates of pairs of objects. The Manhattan distance between two points can be calculated as follows (1):

$$d\left(x_i, x_j\right) = \sum_{r=1}^{v} \left| x_{li} - x_{lj} \right| \quad (1)$$

where xli is the value of the i-th element on the l-th element, xlj is the value of the j-th element on the i-th element, and v is the number of variables (Putri et al., 2023).

According to Strauss and Maltitz (2017), the combination of Ward's method and the Manhattan distance is common and gives better results than Ward's method with squared Euclidean distances.

3. Results & Discussion

EU countries hold the Presidency of the Council of the EU. They can present their national interests at the supranational-European level and participate in developing the European agenda. Setting political priorities for the work of the Council of the European Union is the youngest EU function. As part of the presidency, Member States draw up their presidency programmes, in which they express their views on current European policies and can promote their priorities. Presidency programmes include priorities and sub-topics that are part of the political agenda. The setting of priorities and themes reflects current issues, not only on the European scene, and seeks to respond to the challenges that must be addressed in a given time.

Since 2007, the Member States have formed a “Trio Presidency”, a concept where three successive Presidencies work closely together to produce an 18-month EU Council programme, which is drawn up before the first country in the Trio takes over the Presidency. It is often referred to as outdated during the presidency, but it provides an initial view of the sub-areas of European policy that the trio countries will address. The Presidency sub-programmes, drawn up just before the EU Council Presidency, are more up-to-date. The paper analyses the views of the trio DE-PT-SI trio and the triof of FR-CZ-SE. The measurement of integration is a starting step for the creation of a custom composite index measuring EU integration and the study of the potentials and limits of the current and future form of the European integration process or the European Union.

Measuring EU national integration builds on the approaches of the previous European Commission under the leadership of Jean-Claude Juncker, which outlined possible forms of the European Union in 2025 in the White Paper on the Future of Europe. The five scenarios presented in the White Paper on the Future of Europe - Reflections and Scenarios for the EU27 in 2025 contain several insights into possible forms of the EU in 2025, depending on what decisions Member States collectively take. The five scenarios range from the status quo to a change of focus and priorities to a partial or collective leap forward. Scenarios presenting a top-down approach have many common elements and are not mutually exclusive. (Pekarčíková, 2022).

By contrast, under Ursula von den Leyen, the current Commission is taking the opposite approach, more oriented towards Europeans (Staníčková, 2022). At the Future of Europe Conference, the citizens of the EU Member States could express their views on European policies and the shape of the European integration process and make suggestions for change.

European integration trends need to be viewed comprehensively, considering the first approach mentioned above, i.e. top-down, and the second approach discussed above, i.e. bottom-up.

For the assessment of EU integration, 5 priority areas consisting of 39 priority themes were set at the European level and based on a content analysis of the European Commission's policy guidelines 2019-2024, see Table 2. The opinions of the analysed Member States (Germany, Portugal, Slovenia, France, Czech Republic, Sweden) were then sought on these priority themes using a content analysis of the presidency programmes of these countries and scaling techniques. These are the countries that held their presidencies between July 2020 and June 2023.

Table 2: EU's Priority Areas and Themes

EU – Priority areas	EU – Priority themes
P1 (Digital transformation)	P1A (Strengthening digital sovereignty)
	P1B (Data access and protection)
	P1C (Development of innovative technologies)
	P1D (Modernisation of infrastructure)
	P1E (Digital Goals Delivery Plan 2030)
	P1F (Building a functioning digital market)
	P1G (European electronic identity)
P2 (Green Transformation)	P2A (Leader in the fight against climate change)
	P2B (Reducing emissions and using resources more efficiently in all sectors of the economy)
	P2C (Green transformation)
	P2D (The goal of climate neutrality by 2050)
	P2E (Implementing the UN 2030 Sustainable Development Goals)
	P2F ("Fit for 55" package - reducing emissions)
	P2G (Carbon offset mechanism at the borders)
P3 (Social Economy)	P3A (Implementing the social rights pillar)
	P3B (Protecting workers' rights in the digital economy)
	P3C (Ensuring equal opportunities for all)
	P3D (Minimum wage framework, increased wage transparency)
	P3E (More resilient and stronger EU economy)
	P3F (Free movement through the proper functioning of the Schengen area)
	P3G (Single market and rules-based trade)
	P3H (Supporting national reform and investment programmes and stimulating private investment)
	P3I (An ambitious and more resilient European industrial policy)
	P3J (Single currency, financial stability and a fair financial market)
	P3K (Protection against unfair competition from abroad)
	P3L (Measures in the area of taxation)
	P3M (Strategic autonomy)
P4 (Freedom, Security in Europe, Strengthening Democracy and Protecting the European Way of Life)	P4A (Respect for the rule of law)
	P4B (EU response to terrorism, hybrid threats)
	P4C (Elimination of demographic changes)
	P4D (Respecting fundamental rights and combating discrimination)
	P4E (Fighting racism and equal opportunities for all)
	P4F Comprehensive reform of the EU migration and asylum system)
P5 (The EU as a global player)	P5A (Promoting and reforming a rules-based multilateral global order)
	P5B (Close cooperation with strategic partners, primarily the USA)
	P5C (Cooperation with Eastern and Southern Neighbourhood partners)
	P5D (Promoting a dynamic partnership with Africa)
	P5E (Improving defence capabilities for a stronger Europe as part of a stronger transatlantic alliance)
	P5F (Striving for a strong WTO)

Source: Own elaboration (2024)

Subsequently, Standard Eurobarometer 93-98, the Special Eurobarometer on Digital Transformation and Agenda and Eurobarometer on the Future of Europe were used to collect the views of the population of the countries analysed on current European priority issues, using the same scale and scaling techniques as for the Member States analysed. At the level of the population, opinions were only surveyed on the European priority areas, as it was not possible

to obtain the views of the population on all 39 priority topics. In order to be able to compare the views of Member States and their populations, averages of the priority themes in the sub-priority areas were produced.

The analysis using scaling techniques at the population level showed that the populations of the countries analysed perceive European policy differently than at the national level, as can be seen in Table 3, where the populations of the Member States are marked with *. The most divergent views between national and resident levels are visible in France. This view corresponds to a bottom-up approach that should be more integrated into European policymaking. The current European Commission held a Conference on the Future of Europe, where Europeans could express their views. However, it is questionable how much of this was a bottom-up approach when the questions in the discussions and the platform were set by the institutions of the European Union.

Table 3: Values and Scaling of Countries and Their Citizens DE-PT-SI and FR-CZ-SE to EU

EU – Priority areas	Values of the attitudes and opinions of Member States and their populations											
	DE	DE*	PT	PT*	SI	SI*	FR	FR*	CZ	CZ*	SE	SE*
P1 (Digital transformation)	3	2	3	2	3	3	3	2	2	2	2	2
P2 (Green transformation)	3	3	2	1	3	2	3	2	2	2	2	3
P3 (Social Economy)	2	2	3	2	2	3	2	2	2	2	2	2
P4 (Freedom, Security in Europe, Strengthening Democracy and Protecting the European Way of Life)	3	2	2	2	3	2	3	1	3	2	3	3
P5 (EU as a global player)	2	2	2	2	2	2	2	0	3	2	2	2

Source: Own elaboration (2024)

The content analysis and scaling techniques of the Standard Eurobarometer 93-98, the Special Eurobarometer on Digital Transformation and Agenda and the Eurobarometer on the Future of Europe showed that the countries of the previous DE-PT-SI presidency trio and the current FR-CZ-SE trio have both convergent and divergent views on the perception of European priority areas, both from these countries and from the citizens of these countries. Thus, there are divergent views or attitudes on the perception of the European integration process at the national and population level, and nowhere are there consistent views on the European priority areas. National views on current European policy are more 'pro-European' than at the population level, the only exception being Sweden, whose population favours a European green transformation. Germany, the EU's strongest economy in the long term, is not in the best shape in terms of economic prospects. It is just as well that its citizens consider the social economy a priority. Based on the analysis, the national level in Slovenia and also in Portugal has a more positive approach to Green Transformation. As far as the Czech Republic is concerned, at the national level, according to the analysis, European policy is perceived more positively in the European priority areas of Freedom, Security in Europe, Strengthening Democracy and Protecting the European Way of Life and EU as a global player.

So far, only the views of the analysed countries and their citizens have been presented. Still, the analysed countries and their citizens can be categorised into homogeneous and heterogeneous groups using cluster analysis in IBM SPSS 28, see Methodology. Firstly, clustering with selected methods according to the countries analysed. The vertical axis represents the analysed countries (DE, PT, SI, FR, CZ, SE), while the horizontal axis represents the information lost in each process phase. Based on this procedure, only three clusters were created at national level. In each cluster, there are countries of the trio that are close in their attitudes towards the perception of European politics or the perception of sub-European issues.

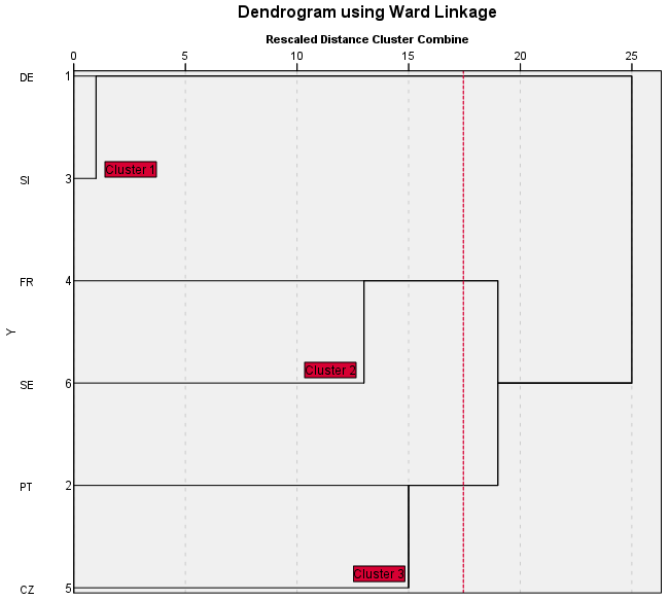
In *Cluster* 1 are Germany and Slovenia, see Figure 3.1, which are the countries of the former presidency trio. Germany is one of the six founding countries, while Slovenia only joined the EU in 2004. It might seem that they would have different views on European politics. Still, the opposite is accurate, and they agree on key issues on the current European political agenda, but this does not mean that they agree on all aspects of European politics. Frequent disputes, according to them, are on issues such as the development of innovative technologies, free movement through the proper functioning of the Schengen area or striving for a strong WTO and a level playing field while ensuring the Union's ability to respond to unfair practices and lack of reciprocity. According to Germany and Slovenia, the most positive links, or the least contentious in number, are found in the priority areas of Digital Transformation and Green Transformation.

France and Sweden are in *Cluster 2*, see Figure 1. These EU countries are geographically located in different parts of the European Union. Both countries express the most positive links from the Digital Transformation priority area to the Strengthening Digital Sovereignty and European Electronic Identity priority themes. Regarding the Green Transformation area, they find the least controversial topics, such as Maintaining EU global leadership in the fight against climate change, reducing emissions and Using resources more efficiently in all economic sectors. The least contentious areas are in the European priority theme of Striving for a strong WTO and a level playing field while ensuring the Union's ability to respond to unfair practices and lack of reciprocity. This approach or perception of this priority theme may be due to the current situation in Eastern Europe, the war in Ukraine. Conversely, the same demands are made on topics such as an ambitious European industrial policy and the strengthening of the single currency, which fall under the European priority area of the Social Economy. In addition, these are countries that use the euro as legal tender. France sees the same requirements as Sweden in the priority theme of Paying attention and efforts to pressing social issues related to demographic countries. The Presidency trio FR-CZ-SE was generally more focused on the issue of coping with demographic change, whether it is education, enabling young people to secure better opportunities or more support for Erasmus+. However, Cluster 2 also includes the more diverse approaches of France and Sweden to European policy. These include. Strengthening, deepening and reinvigorating the single market, promoting rules-based trade, France sees this as a priority topic with frequent points of contention. In contrast, Sweden sees it as the least contentious. Regarding Supporting national reform and investment programmes and stimulating private investment, France has a medium positive view, but Sweden has a slightly optimistic view.

In *Cluster 3* are Portugal and the Czech Republic, representatives of the two analysed Presidential Trios. Their views on the current European political agenda are the most diverse of the three clusters. These countries have been in the European Union for different periods, and their geographical locations lend themselves to varying perceptions of the integration process. However, they are united in their positions on Preserving the EU's global leadership in the fight against climate change, on the overall approach to Green Transformation and Strengthening the foundations of the Union's economy to make it more resilient and stable. Other factors may influence the motives for strengthening the competitiveness of the European economy. Portugal held the Presidency of the Council of the EU from 1 January to 30 June 2021, when the European economy was dealing with the impact of the COVID-19 pandemic. At that time, the NextGeneration EU plan was approved to support economic recovery. 806.9 billion euros were earmarked to meet this ambitious plan's needs to help the EU emerge stronger from the pandemic and create an EU that works for the benefit of all its citizens. The Czech Republic held the presidency from 1 July to 31 December 2022, when the EU had to deal with the effects of Russian aggression in Ukraine, primarily high energy prices, rising

inflation in some Member States and a wave of migration that mainly affected countries in the eastern part of the EU. Unsurprisingly, the Czech Republic saw the priority theme of striving for a strong WTO and a level playing field while ensuring the Union's ability to respond to unfair practices and lack of reciprocity as the least controversial place and Portugal as a frequent dispute point.

Figure 1: Consensus Dendrogram of the Two Presidency Trios (DE-PT-SI and FR-CZ-SE) for the Reference Period 1 July 2020-30 June 2023



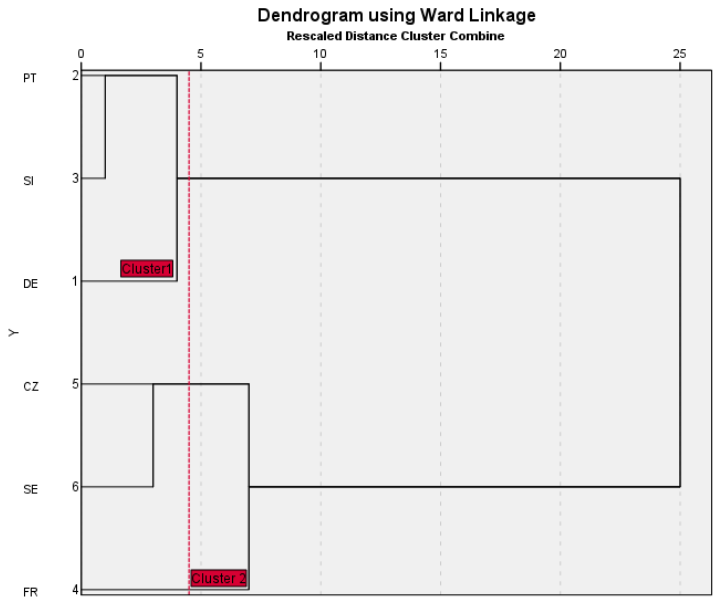
Source: Own calculations and processing in IBM SPSS Statistics 28 (2024)

Czech Republic and Portugal have the same demands on priority topics, such as working on a comprehensive reform of the Union's migration and asylum system, reducing dependence on the supply of goods or strengthening the opening of strategic autonomy and resilience. But their reasons for this are different. In the case of Portugal, it was more about reducing dependence on health supplies at the time of the global COVID-19 pandemic, and the current motive is driven by the desire to reduce dependence on Russian energy resources and fuel. Portugal and the Czech Republic have united opinions on respect for the rule of law, one of the elementary European principles. Hungary and Poland have a problem with respect for the rule of law and democratic principles, so this issue must be on the European political agenda. Portugal and the Czech Republic take very different approaches to the issues of the single currency, financial stability, taxation, and money laundering. Primarily because Portugal is in the euro area, whereas the Czech Republic is not and does not currently meet the Maastricht criteria, and entry into the euro area is not in sight. Next year, the Czech Republic is expected to meet one Maastricht criterion, the public deficit criterion. The FR-CZ-SE Presidency Trio has been more concerned with the issue of combating demographic change, so the Czech Republic is adopting the same requirements, and Portugal is assuming a position of only neutral linkage.

The analysis must consider the citizens' views of the EU Member States to have an objective view of the European integration process. It is useful and desirable to know the opinions of the people of the EU for its legitimacy. If citizens feel involved in current political events and their views are taken into account, this positively impacts their confidence in the political system.

Knowing people's views can help politicians better understand what is important to EU citizens and relevant to Europeans and can lead to better policy decisions that meet the needs and interests of Europeans themselves. It is also worth noting that when the views of Europeans are presented and discussed in public, this can help to reveal interests and improve the quality of decision-making. Overall, awareness of EU citizens' views on current European policies impacts the legitimacy, relevance, participation and transparency of the EU political process. However, their views need to be taken critically and contextually. Based on Eurobarometer data and multi-criteria decision-making, there may have been a clustering of views of DE-PT-SI and FR-CZ-SE countries towards current EU policies. The clustering was done using Ward's method, and the distance was chosen as the Manhattan distance, as in the clustering of country opinions. Two clusters were formed, see Figure 2.

Figure 2: Consensus Dendrogram of Citizens of the Two Presidency Trios (DE-PT-SI and FR-CZ-SE) for the Reference Period 1 July 2020-30 June 2023



Source: Own calculations and processing in IBM SPSS Statistics 28 (2024)

Cluster 1 includes Portugal, Slovenia and Germany. In terms of the opinions of the citizens of these countries on the priority areas set at the level of the European Union, the citizens of these countries agree on the priority areas of Freedom, Security in Europe, Strengthening Democracy and Protecting the European Way of Life, and the EU, as a global player, accepts the consistent requirements in these areas. Slovenians are the only ones who see Digital Transformation and Social Economy as the areas with the least controversial places, while Germans and Portuguese see medium controversial sites.

Cluster 2 includes France, the Czech Republic and Sweden. For this trio, there was a more comprehensive range of views on the five European priority areas. Swedes are the most pro-European in this cluster, followed by the Czechs, and the French are the most Eurosceptic. These countries see the least controversial places in the Digital Transformation and Social Economy priority areas. The Swedes adopt a united position on Green Transformation, while the Czechs and the French have only Consistent requirements. In the European priority areas of Freedom, Security in Europe, Strengthening Democracy and Protecting the European Way of Life, the Swedes find the least controversial places, the Czechs medium controversial sites

and the French frequent disputes. While the EU as a global player is an area that has recently begun to gain importance, Swedes and Czechs see only medium positive links and the French neutral ties.

4. Conclusion

The European integration process as we know it today has been shaped since the 1950s when six European countries established the European Coal and Steel Community. Since then, the number of Member States involved has increased and decreased to the current EU-27. Gradually, countries from different parts of Europe with other characteristics, problems, and challenges have become members of the EU. The integration process has thus had to be adapted to respond flexibly to the challenges of the time and the needs of the Member States. The European integration process can do this only if the degree of integrability of the EU Member States is known. The paper dealt with the design of a methodological basis for measuring the integrability of the European integration process using scaling techniques and statistical multivariate analysis. Then, the results were commented on and visualised in Scoreboard heat-maps, dendrograms, and scatter plots according to the sequence of the mentioned methods. Integration was measured in the countries of the EU presidency trio of Germany-Portugal-Slovenia and the trio of France-Czech Republic-Sweden.

The EU integration of the sub-analysed countries was carried out based on Member States' views on 39 priority areas representing the European strategic policy agenda of the current European Commission. The countries formed three clusters based on scaling techniques, the traffic light method, the numbering method, and cluster analysis. Within a cluster, some countries have similar perceptions of the European integration process and different perspectives in different clusters. In terms of population levels, two clusters were formed.

The approach of the paper to measuring the EU's integration, i.e. the actual state of the European integration process, respects and combines top-down and bottom-up approaches. It is more than desirable to know the views of Europeans for the current and future shape of the European integration process. From the analysis of the EU integration of selected Member States carried out, it became clear that there are differences of opinion at the national level and the views of Europeans on the current European political agenda. The opinions of the analysed Member states are more "pro-European", and the population's views are more realistic. The exception among the countries analysed is Sweden, where citizens have a more positive perception of the current European political agenda, see Table 2.5.

The European integration process and its forms are evolving, and Europe must face and respond to different challenges and limits. This is evident from the analysed presidential trios DE-PT-SI and FR-CZ-SE results. The DE-PT-SI presidential trio had to primarily respond to and address the global pandemic COVID-19, including proposals on possible forms of European economic recovery. The FR-CZ-SE trio was still grappling with the impact of the worldwide pandemic, and the six countries are adopting unified positions on the issue. The FR-CZ-EU presidency trio had to face the impact of the war in Ukraine, which resulted in an energy crisis. The dependence on the supply of goods, or Russian energy and fuels, has grown in importance. Migration and asylum policy was already an important issue under the DE-PT-SI presidency. Still, the war in Ukraine has made it more important again, and countries primarily from Central and Eastern Europe are having to face up to the migratory wave. An analysis of the two presidencies between 1 July 2020 and 30 June 2023 confirms that the European Union has been and is being formed in crisis.

This raises the question of how the European Union will evolve. The approach to the future of the European Union has often been reduced to 'more or less Europe', which is misleading and

over-simplistic. The future form should be a synthesis of top-down and bottom-up principles. The top-down approach is associated with retrograde planning, where there is an overarching plan. In the case of the EU, the future of the European Union would be directed based on national views alone, without considering the opinions of Europeans. The bottom-up principle is associated with the so-called convergent approach. The current European Commission is applying this approach, led by Ursula von der Leyen for 2019-2024, which seeks to engage more with EU citizens and actively seeks their views on current aspects of the European integration process. In that case, the future of the European Union would be shaped more by the views of Europeans than is currently the case. At the suggestion of the French President, the platform Conference on the Future of Europe (CoFoE) was launched to allow Europeans to express their opinions on the shape and perception of the European Union's sub-policies. The results of the CFE should contribute to the debate on the further development of European integration. Conference on the future of Europe, through a series of discussions, allowed Europeans to share their thoughts and views on the functioning of the EU and directly influence the shaping of its future. The CoFoE was concluded in May 2022 with the submission of 49 proposals to the European institutions. The European Commission has incorporated four initiatives stemming from the CoFoE into its work programme for 2023. It is also reported that the European Commission has already acted on 95% of the CoFoE actions that fall within its competence and are in line with the Treaties. Following on from the CoFoE, European Citizens' Panel Discussions are currently underway, which also aim to seek the views of Europeans on current European policies.

The previous European Commission applied the top-down approach under Jean Claude-Junker in 2014-2019. On the anniversary of the Treaties of Rome in 2017, the European Commission presented a White Paper on the future of Europe, outlining five possible scenarios (Continuing with business as usual, Single Market only; States wanting to do more; Doing less but more effectively; Doing much more together) that the European Union could be inspired by or evolve towards. The result should not be a selection of one given scenario but a combination of approaches to sub-aspects of European policy combining elements from the five scenarios outlined. In this way, the future would be shaped at the national level, with the condition that all 27 Member States participate in the future shape.

European elections will be held soon and a new or old European Commission should be formed in the autumn. What direction will the European Union take? Will it tend to differentiate Europe according to the scenarios set out in the White Paper on Europe, or will it seek to involve Europeans more in shaping the future of the European Union?

The next phase of research will focus on EU integration and in particular on the degree of integration of EU Member States and possible scenarios for the future development of the European Union. The motivation will be to design a custom composite integration index combining both top-down and bottom-up approaches, responding to the current challenges, needs and limits of a European Union with all 27 Member States.

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On the Nature of the Causes of the Economic Crisis from the Perspective of the Covid-19 Pandemic and Its Impact on European Integration

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Abstract
The Covid-19 pandemic has undoubtedly triggered a global recession, the size of which, according to economists, was only surpassed by both world wars and the Great Depression. The occurrence of the global pandemic has caused lasting socioeconomic damage, contributing to a decline in economic activity and profitability. The purpose of the article is to retrospectively review the basic definitions of economic crisis, as well as its types. The article presents the socio-economic crisis caused by the coronavirus pandemic. In the area of key findings, it should be noted that the large-scale fiscal packages and the loosened monetary policy have undoubtedly avoided a deep economic recession, but the costs of this aid will certainly be felt in the coming years, if not decades. The article was written based on economic literature, current articles and other academic sources, mainly in electronic form, specializing in macroeconomics, economic crises and also fiscal and monetary policy.

Keywords: *economic crisis, causes, types, COVID-19 pandemic, European integration*

JEL Classification: *B30, E62, H12*

1. Introduction

The crisis caused by the SARS-Cov-2 virus pandemic has led to substantial changes in the functioning of the economy, both at the national and global level. Nearly three and a half million people lost their lives as a direct consequence of a pandemic, and another one hundred and sixty-eight million were infected. Apart from the threat to health and life, the pandemic brought with it serious social and economic complications in most of the world economies. Nevertheless, its indirect effect is the loss of livelihood by millions of people who have lost their jobs as a result of the pandemic, and the next millions live in uncertainty about their future. Within only one year, the pandemic had a significant impact on global supply chains, financial markets and the current lifestyle.

The purpose of the article is to retrospectively review the basic definitions of economic crisis, as well as its types. The article presents the socio-economic crisis caused by the coronavirus pandemic. The tools of legal and financial analysis and the method of deduction were used. The starting point in the consideration is the assumption of the need to use fiscal and monetary instruments in situations of crisis and economic downturn, but at the same time the need to critically evaluate them from different points of view.

2. Problem Formulation and Methodology

The study provides a typological assessment of the economic crisis caused by the Covid-19 pandemic. The typology of crises occurring in the economy depends primarily on the adopted criteria allowing to determine the causes of the occurrence of a given type of crisis. Consequently, several types of business collapses can be distinguished, which can be divided into two main groups, i.e.: collapses in the real sphere: economic crisis, agrarian crisis, industrial crisis, foreign trade crisis, and collapses in the financial sphere: currency crisis, banking crisis, debt crisis, stock market crisis.

The study uses a qualitative research methodology. Its main elements are a critical analysis of legislative acts, a review of the economic literature, and a process of deduction. Conclusions are drawn based on existing crisis theory studies and an analysis of relevant laws and their preliminary effects.

3. Definition of Economic Crisis

Presently, the economic crisis is defined as periods of regular economic downturn in which domestic production is well below its potential (Vlados et al., 2018). A crisis may affect various branches of the economy and may have a diverse range of occurrence: from a regional crisis to a crisis on a global scale (Somarriba Arechavala et al., 2015). Due to the deepening globalization of world markets and the multitude of financial and institutional connections, crises affecting most national economies are becoming more and more frequent. Examples include the crisis of the so-called "Asian tigers" of 1997, or the last financial crisis of 2008 (Hadziahmetovic et al., 2018).

The economic crisis has accompanied mankind since time immemorial. In the past, economic downturn was most often caused by external factors such as crop failures, natural disasters, pandemics or warfare (Podsiadło, 2016). Along with civilization development, successive industrial and technological revolutions and the expansion of thought in the field of economics, exogenous factors began to give way to endogenous factors. Natural impulses have been replaced by market factors such as production volume, supply, demand and trade balance. A revolution in the current of economic views came in the eighteenth century with the publication of the work entitled *Research on the nature and causes of the wealth of nations* by Adam Smith. It is the thought of capitalism and market economies that are inextricably linked with the phenomenon of the business cycle, and hence with economic crises. The same determinants that define the dynamism of capitalist markets - the desire to maximize profits or increase insensitivity to risk, also become the factors that create the foundation for a recession and, as a consequence, a crisis (Roubini and Mihm, 2010).

The crisis is considered mainly as a phenomenon creating qualitative factors that permanently change the rules of the economy (Van Hal, 2015). Its effects are dynamic, fundamental, and therefore often irreversible. The issue of the economic crisis is of a multidisciplinary nature, as its occurrence implies social, economic and political consequences. In economic literature, the phenomenon of crisis is presented as an accumulation of dysfunctionalities, irregularities and neglect, the disclosure of which ends an era, creating the impression that there is no return to the pre-crisis situation. Consequently, along with the identification of the sources of the economic downturn, adequate institutional and regulatory methods are sought to shape a new post-crisis balance.

4. The Causes of the Economic Crisis

Over the centuries, the research has been carried out on the nature of crises, but to this day, the causes of their emergence have not been unequivocally identified (see table 1). The reason for such a state is not only the complexity of the analysed phenomenon, but also the multitude of theorists who put forward various theses about the sources and implications of the crisis in the economy. The analyses of the causality of crises intensified with the crisis in the United States in the 1930s. For the first time, the classical theory of self-regulation of the market failed to meet the expected assumptions. The opinion revolution was initiated by John Maynard Keynes.

Table 1: The Causes of Economic Crises According to Selected Representatives of Economic Thought

Representative	***Causes of the crisis***
Mercantilism	The changes in the real product are influenced by changes in the amount of money
Physiocrats	State regulation of trade is an obstacle to economic growth
Classicists	State interventions
T. Malthus	Insufficient consumption
J. S. Mill	Excessive supply due to credit constraints as a result of pessimistic expectations
K. Marks	Technological cycle, the crisis of disproportionality, the long-term decline in the rate of return
M. Kalecki	The policy of balancing the budget under pressure from "industry leaders" during the boom period
A. Marshall	Excessive credit expansion during the boom period
J. M. Keynes	Insufficient aggregate demand (demand shock)
Monetarists	Monetary disruption (too large increase in money supply)
Neoclassicists	Unexpected, too restrictive monetary policy
The school of the real business cycle	Supply shocks (mainly technological) through investments; slowing productivity growth
The New Keynesian School	Supply and demand shocks; recessions are deepened by price and wage rigidity and risk aversion
Austrian school	State intervention for economic recovery through excessive credit expansion

Source: Piech (2002), pp. 107-108.

From the 18th century onwards, the prevailing belief was that crises were caused mainly by government interventions. Market economy supporters, advocating economic liberalism, believed that the market should be left to itself. Adam Smith's theory about the operation of the so-called "invisible hand" suggested that the market itself creates predictable economic systems, such as supply and demand, because people are relatively predictable in their behaviour. Therefore, according to the classics, the role of the state in economic life should be kept to a minimum in order to allow the market the free movement of goods and capital, thereby self-regulating (Del Hierro Carillo, 2018).

In the years 1926-1936, mankind experienced a crisis with which it had not been exposed so far. The event was called the "Great Depression" because, in addition to the scale it had achieved, it also exposed the inadequacy of the existing market mechanisms, which had been considered reliable for about two hundred years. Adam Smith's theory lost some relevance with the emergence of strategic monopolies in the markets who could not only control the supply of their products on the market, but also create demand for them. Unmonopolized areas of the American economy, in an attempt to prevent losses, began to increase the production of goods, which led to a crisis of overproduction, which resulted in falling prices in the economy (Cortes et al., 2022).

The Great Depression revised the views of liberal economic policy, thus allowing the state to increase its share in economic life. The main theorist of this trend, John Maynard Keynes, saw the causes of the crisis in insufficient aggregate demand, caused by the instability of investment expenditure. He opted for limiting unemployment by the state at the expense of inflation so that the market could function more effectively. It should be noted that the intervention of the state, in this case by the United States, did not end the cycles and the related crises. Since the end of the Second World War, cyclical fluctuations of the economies have continued to be observed, but in a modernized form. Thus, the classical theory of business cycles was subject to further research, as it became somewhat anachronistic in relation to the progressing economic development (Konzelmann et al., 2022).

Along with globalization and the growing importance of transnational flows, the value of the real sphere is replaced by the financial sphere, which exerts a significant influence on it. Like an unlimited flow of capital, it implies the risk of an inflow of speculative capital, creating a channel of "contagion" between an economy struggling with financial problems and a "healthy" economy. According to the theory of the American economist Hyman Minsky, such channels are conducive to the creation of speculative bubbles on financial markets, which are currently considered to be the main causes of recession and crisis in the market economy, not only local, but above all global (Konings and Adkins, 2022). An obvious example is the 2008 financial crisis, when the bursting of the US housing market bubble led to the worst global economic downturn after the Great Depression. Therefore, research on the nature of business cycles is currently presented as a prelude to the subject of contemporary fluctuations in the economic situation, as the current economic cycles are more and more often the result of turmoil in the financial sphere.

5. The Socio-economic Crisis Caused by the Covid-19 Pandemic – Hindsight Interpretation

The Covid-19 pandemic caused by infection with the SARS-CoV-2 virus has spread to all continents since December 2019 and has infected tens of millions of people. Moreover, the pandemic has led to a severe global downturn, leaving hundreds of thousands of people suffering from diminished prospects and disrupted livelihoods. The Covid-19 pandemic represents the worst economic shock the global economy has not experienced in decades. This is mainly due to the fact that most countries have implemented various types of preventive measures to limit the spread of the Covid-19 virus and reduce the burden on health care systems. These necessary constraints had a negative effect on consumption, investment, production and labour supply. In turn, restrictions on the international flow of goods and capital have shaken local financial markets and global supply chains (Altig et al., 2020).

Empirical evidence from China, the country from which the Covid-19 pandemic spread, suggests that drastic measures to prevent the spread of the virus have been successful in limiting the increase in new cases and also in reducing the number of deaths. However, efforts

to protect human beings have led to unprecedented losses to economies in the short term. Many state decision-makers faced a choice between a complete *lockdown* limiting economic activity, and minimal restrictions that, at the cost of human health or life, allow the economy to function. Although preventive measures have not been introduced to affect the economy, the decision to implement them and the consequences of these decisions have a decisive impact on economic activity (Dep et al., 2020).

A global pandemic negatively affected both the demand and supply sides of the economy. The supply side was hit hardest by the wide spread of infection, which had a direct impact on the decline in supply and labour productivity. On the other hand, restrictions in international and national mobility, social distance and closing economic activity have disrupted the supply chain of services and goods. The demand side was shaken by the income disturbance and the sharp rise in unemployment. It was the result of a high degree of morbidity and deaths as well as limited consumption and investment expenditure in the scale of the entire economy (Borio, 2020).

Despite the extraordinary intervention measures taken by global fiscal and monetary decision-makers, according to a World Bank study, the world economy only in 2020 contracted 5.2% of the world gross product. Moreover, the pandemic was projected to leave indelible scars of declining human capital and damage to the global supply chain. On the one hand, restrictions to protect public health have had a significant economic, environmental and health impact. On the other hand, the restrictions, especially in the initial stage of the pandemic, contributed to the strengthening of the health care system in the studied countries as well as the decrease in the emission of pollutants into the atmosphere (Aktar et al., 2021).

The economic impact of the pandemic was substantial. It contributed to the outbreak of the global crisis, which resulted in millions of deaths and a sharp increase in unemployment in most economies of the world. Therefore, the Covid-19 pandemic was not only a health crisis, but also a socio-economic crisis that was having a negative impact on global development. The basic indicator illustrating the impact of the pandemic on the global economy is the gross domestic product indicator. As a result of the pandemic and the resulting economic restrictions, the growth of the indicator in 2020 recorded negative values. According to the data of the International Monetary Fund, in 2021 and 2022 this indicator was negative for both developed and developing economies (Auer, 2022).

The negative impact of the pandemic on real GDP growth was initially observed only in China, but as the number of infections spreading around the globe increases, the negative trend was also observed in other countries in Asia, Europe, the Americas, Africa and Australia (Abbass, 2022). A significant part of the decline in GDP was due to the direct effects of lower global demand and increasing uncertainty in financial markets. The largest world economies, including the United States, India, Brazil and European Union countries, recorded negative values of real GDP growth in the first quarters of 2020, respectively: -31.4%, -8.9%, -6.5% and -15%. Interestingly, China was one of the few countries affected by the coronavirus pandemic in 2020 to achieve a positive increase in the rate and it will be around 1.9%. According to economists, this is the result of the immediate reaction of the Chinese Communist Party authorities and the multi-billion-dollar support of the Chinese central bank for the improvement of the economic situation and employment (Fedayev et al., 2022).

The impact of the pandemic on employment varied both in terms of economies and the degree to which the country is affected by the pandemic. It is clear that unemployment was higher in those economies most severely affected by the pandemic. A collapse in demand deprived an enterprise of the sources of revenue necessary to cover production costs and/or maintain the workforce. Emerging markets and developing economies were particularly exposed to the risk

of high unemployment, as their situation was strongly correlated with the condition of highly developed economies. An example is India, where over 10 million infections were recorded by December 2020 alone (Jaipuria et al., 2021). Moreover, official data from India on unemployment do not include people who joined the agricultural sector as a result of unemployment due to the pandemic (Victor et al., 2021). While such people are officially considered employed, the loss of wages and purchasing power can constitute hidden unemployment (Goyal et al., 2021).

The global recession triggered by the pandemic was expected to be reflected in declines in many indicators of global activity. While service activities have been relatively resilient during previous recessions, high frequency indicators show that the current recession has led to a sudden halt in large parts of the service sector, reflecting both a regulated and voluntary reduction in human interaction, with the risk of infection (Laborde et al., 2021). The field of services most affected by the pandemic on a global scale was air transport as well as catering and hotel services. For example, despite the recovery that took place after May 2020, the tourism-related turnover in September only reached about 72% of the value in February (Rajput et al., 2021). The strongest declines occurred in the Mediterranean countries, in particular in Spain, Greece, Italy and France, where losses can reach up to 3% of individual countries' GDP. The aviation industry, on the other hand, has experienced a decline of almost 90% since the pandemic began (Anh Vo et al., 2022).

The effects of the pandemic were also visible in international trade (Gruszczynski, 2020). The volume of global trade in goods in May 2020 decreased by 17.7% compared to the same period in 2019. The decline in the first months of 2020 was recorded in most economies of the world, the largest of which in the United States, Japan and the European Union. Although the decline in trade during the Covid-19 pandemic was similar in scale to the global financial crisis of 2008-2009, its context differs significantly. The decline in gross domestic product was much more pronounced during the current recession, while the decline in trade was more moderate. Therefore, the volume of world trade in goods was expected to decline only twice as much as world gross domestic product (Jean, 2020). High declines in imports and exports stem from the nature of the pandemic and the anti-crisis policy (Sharma et al., 2020).

The beginning of the pandemic also brought about rapid changes in the oil market (Kilian, 2022). The large-scale measures taken to slow the spread of the pandemic resulted in an unprecedented decline in oil demand implying a sharp increase in oil resources. This had a direct impact on the sharpest one-month decline in oil prices in history. According to the *West Texas Intermediate* Index, one of the top three benchmarks for oil and gasoline prices, the price of a barrel of oil fell below $ 15 in April 2020. This was an 80% decrease compared to the same period in 2019. The fall in prices in the oil market in March coincided with the tension between the OPEC countries and the Russian Federation. As a result of the prolonged deadlock on the contract for the extraction of raw material, its stocks increased significantly, reducing prices (Jefferson, 2020). After the April consensus confirming the reduction in oil production, oil prices began to increase, but by the end of December 2020 their level did not return to the level before the beginning of the pandemic.

Another sector that was heavily affected in the initial phase of the Covid-19 recession was the global financial market (Su et al., 2022). As the number of new infections reported worldwide increased, investment optimism began to decline. Fearing a sharp increase in losses, investors began to sell off their assets massively. In the United States, the Dow Jones Industrial Average recorded one of the largest decreases and increases in the history of measurement over one month, reflecting the volatility and instability of the financial sector. The European, Asian and South American indices were similar (Chowdhury et al., 2022).

Research on the impact of the pandemic on the financial market carried out for the euro area has clearly shown a direct relationship between the pandemic and risk fluctuations in the financial markets (Bora and Basistha, 2021). The study showed that in addition to influencing economic growth and household inflation expectations, Covid-19 had a significant impact on European financial markets in the first months of the pandemic. The negative impact was particularly evident in the change in profitability of long-term bonds. The pandemic also had an indirect impact on financial markets (Pham et al., 2021). Stock market fluctuations were closely correlated with the economic support plans announced by individual fiscal and monetary jurisdictions. Mobility restriction measures, stimulus packages and the loosening of monetary policy played a significant role.

The Covid-19 pandemic also posed a threat in the area of public finances (Agrawal and Bütikofer, 2021). In many economies, public debt in 2020 and next years exceeded the current standards due to tensions in the functioning of the market and disruptions in the flow of international capital. Anti-crisis measures forced decision-makers to increase public expenditure mainly on the healthcare system, fiscal packages aimed at stimulating enterprises, households and individuals, or tax loosening. These actions contributed to an increase in the debt of the public sector around the world and an increase in the budget deficit in individual countries.

IMF forecasts were assumed stabilization of public debt in the years 2021-2023 in most economies, except the United States and China (Global, 2020). Contrary to developed countries, emerging and developing countries should expect significant fiscal challenges as their debt service to tax income ratio is projected to increase. As a result of the pandemic, national decision-makers faced major compromises between short-term support and medium-term threats to macro-financial stability.

The current situation of economies continues to pose a threat to public finances, which may be manifested by:

- increasing financial needs at the government level resulting from higher expenditure needs and income shortage,
- an increase in public expenditure and a reduction in currency reserves, which may lead to doubts as to the government's ability to service the growing debt,
- increased financial needs from local governments and state entities,
- realization of implicit and explicit contingent liabilities, such as calls for government guarantees, potential liquidity leakage causing dislocations in the domestic bond market.

Actions taken by government decision-makers to limit the increase in infections have led to unprecedented losses on a micro- and macroeconomic scale. The spread of the SARS-CoV-2 virus had social implications, such as restrictions on movement, mass deaths, loss of jobs and sources of income, as well as economic implications: an unprecedented increase in public debt, shrinking economies, disrupting global supply chains or multi-billion losses in the manufacturing and service sector.

6. Conclusion

The Covid-19 pandemic has undoubtedly triggered a global recession, the size of which, according to economists, was only surpassed by both world wars and the Great Depression. The response to the crisis in many economies was immediate and also in many cases effective enough. Countries began to adjust their economic policies to minimize the death rate of the pandemic as much as possible. In addition to thorough reforms in the health care system, fiscal

and monetary decision makers provided a range of economic stimulus to mitigate the economic effects of recession and crisis. The large-scale fiscal packages and the loosened monetary policy have undoubtedly avoided a deep economic recession, but the costs of this aid will certainly be felt in the coming years, if not decades. Currently, the socio-economic situation seems to be returning to the pre-pandemic state, nevertheless the observed new mutations of the Covid-19 virus effectively reduce euphoria on the markets and require careful monitoring of further developments at the local and global level. On August 9, 2023, the World Health Organization (WHO) issued an announcement related to a new COVID-19 variant that is spreading rapidly and widely. It has been named Eris and officially designated EG.5.1. With this in mind, as well as the difficult geopolitical situation caused by the war in Ukraine and the escalating conflict in the Middle East, it should be stated that although global economic activity has returned to its growth path, it seems unlikely that it will return to normal operation in the near future.

Acknowledgements

The publication presents the results of the Project no. 026/EFA/2023/POT financed from the subsidy granted to the Krakow University of Economics.

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The Impact of the Macroeconomic Environment on the Existence of Zombie Firms in European Countries

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Abstract
Zombie firms are those that cannot cover the cost of debt from their profits over an extended period and have little hope of recovery but avoid failure through external support. We expand on the previous studies by using cross-country firm-level and macro data to explore the effect of the institutional environment and firm taxation (tested as an implicit tax rate) on the probability of a firm becoming a zombie firm in European Countries. The emergence of zombie firms is influenced only by the implicit tax rate; the type of taxation system does not matter here. In the connection between zombification and the GM indicators, we find a disparity in their effects. The quality of the institutional environment does not always have an adverse impact on the zombification of firms. We propose a series of legislative changes to address this issue holistically.

Keywords: *corporate finance, European Countries, institutional environment, logistic regression, taxation in EU, zombie firm*

JEL Classification: *C33, G30, H25*

1. Introduction

The concept of zombie companies has garnered global attention, referring to financially unsustainable yet persisting firms sustained by low-interest rates, lenient lending, and government interventions. (Hoshi, 2006; Banerjee and Hofmann, 2018; Tan et al., 2016) The growth of these companies, which increased from 1-2% to 12% in world economies from the 1980s to 2016 (Banerjee and Hofmann, 2018), is evident in research and media. This increasing prevalence emphasizes the need to comprehend zombie companies' dynamics and economic impact for formulating effective policy measures and promoting sustainable economic growth.

The literature on zombie firms is extensive, and authors have already defined these firms in addition to the cause of their emergence and their impacts on the economy. However, there needs to be more literature identifying the effects of the institutional environment and taxation on the emergence of zombie firms. Here, we expand on the previous studies by using cross-country firm-level and macro data to explore the effect of the institutional environment and firm taxation (tested as an implicit tax rate) on the probability of a firm becoming a zombie firm. Observing the behavior of zombie firms from the perspective of the institutional environment is very important because the institutional environment is the cornerstone of the economy; it directly affects banks and the tax system, which have immediate effects on the emergence of zombie firms. Engaging with the impact of taxation and the tax system is also pivotal. The influence of the state on the emergence of zombie firms remains unclear, but it

exerts an influence nonetheless. In this research, we use an expansive and thoroughly assembled dataset consisting of 47 European countries with a rich array of data spanning 5,365,740 firms from 2011–2020. We use the model to assess the impact of crises and various firm factors and consider implicit tax rates and institutional indicators. Additionally, GM indices are incorporated to enhance the depth and analytical value of the dataset.

The external support may come from the government, which financially supports certain firms, or it may be closely linked to banks' efforts to hide nonperforming loans or long-term low-interest rates. The impact of the banking system from the perspective of zombie firms was studied by Mkhaiber and Werner (2021) and Aristei and Gallo (2017). The effect of the bank-company relationship on zombie firm emergence has been confirmed by Dwenger et al. (2020) and Belaid et al. (2017). The literature on this topic is currently limited. However, there is often a tendency for the influence of the state to be masked through banks, which encourages the irresponsible behavior of banks and zombie lending. The consequences of the emergence of zombie firms are general stagnation, reduced output, slowed inflation, and resource scarcity for efficient firms. Consequently, the market can become so distorted that healthy firms become infected and become zombie firms, or banks and governments increase costs for healthy firms (for example, through tax increases) to compensate for the losses of zombie firms, which are thus advantaged. (Chang et al., 2021)

The paper's contribution lies in its revelation of the negative effect of the implicit tax rate on firm zombification. This finding is reinforced by the fact that states behave homogeneously among themselves in terms of tax competition, and it does not matter whether a firm is in a high-tax country or a tax haven. The emergence of zombie firms is influenced only by the implicit tax rate; the type of taxation system does not matter here. In the connection between zombification and the GM indicators, we find a disparity in their effects. The quality of the institutional environment does not always have an adverse impact on the zombification of firms. Still, it can be a catalyst that increases the probability of firm zombification.

The paper is structured as follows. Section 2 presents a literature review and hypotheses based on previous research and our research. The literature review consists of zombie firm characteristics and the identification and influence of the institutional environment. Section 2 concludes with our hypothesis and theoretical background. Section 3 describes the data collection method, data alternations, and methods used for analysis. Section 4 presents the empirical results of our study. Section 5 presents a robustness check of the results from Section 4. Section 6 concludes the paper.

2. Literature review

Zombie firms are those that cannot cover the cost of debt from their profits over an extended period and have little hope of recovery but avoid failure through external support. Three primary subjects are causing or allowing the emergence of zombie firms that is described in chapter 2.1. The factors influence the emergence of zombie firms are presented in chapter 2.2.

2.1 Zombie Firm Characteristics

The persistence of zombie firms raises essential questions about the underlying causes and mechanisms that enable their survival. One significant factor behind the creation of zombie firms lies in the state's actions. In the state's case, zombie firms are created through subsidies, financial or resource support, taxes, and loose regulations. The government can also directly or indirectly influence banks and demand support for insolvent firms. Another way the state can support zombie firms is by assigning projects and contracts to them. (Tan et al., 2016)

Furthermore, banks play a pivotal role in the emergence of zombie firms. The emergence of a bank-induced zombie firm is closely related to banks' efforts to hide problematic and nonperforming loans. (Caballero et al., 2008; Chang et al., 2021; Hoshi, 2006) Banks can defer repayments or reduce debt. New, cheaper loans can be provided to firms despite their inability to repay them or give loans to repay previous loans. The emergence of zombie firms also facilitates the long-term maintenance of interest rates at very low levels. (Banerjee and Hofmann, 2018)

Last, companies themselves bear responsibility for their zombification. When firms fail to innovate and reduce the quality of their production, management forms a long-term strategy, and the company needs more financial and risk management. Such firm deficiencies may contribute to the zombification of the firm or directly cause it.

Moving seamlessly from the causes of zombie firms, we now focus on identifying these entities within the economic landscape. Using the correct form of identification is essential to ensure that the results are not biased. Authors use different types of identification concerning the subject of research. The appendix provides a simplified illustration of some of the most commonly used zombie firm identifications.

The types of identification for zombie firms can be classified based on whether they focus on one or multiple countries. When authors examine a single country, they use more detailed identifications. The most well-known models in this area are the CHK and CHK-FN criteria. Caballero et al. (2008) used the CHK criterion to analyze Japanese banks' practices and their impact on zombie firms. Fukuda and Nakamura (2011) later improved this criterion to the CHK-FN criterion to address its shortcomings. Schivardi et al. (2017) used Altman's Z score for risk assessment. Chang et al. (2021) explored the Chinese market using the CHK-NF criterion, considering factors beyond financial metrics.

In contrast, identifications covering multiple countries often rely on the interest coverage rate (ICR) as a standard indicator. As the size of the dataset increases, the difficulty of data acquisition and the accuracy of zombie identification increase. McGowan et al. (2018) introduced an age requirement to distinguish startups from zombies. Banerjee and Hofmann (2018) added Tobin's Q for listed firms. In a later study, they combined the two identification methods, modifying the ICR criteria. Acharya et al. (2019, 2021) focused on the European debt crisis and the impact of zombie firms on inflation, using financial leverage as an additional criterion. Finally, Storz et al. (2017) included negative ROA and net investment criteria in the Eurozone crisis context to identify nonprofitable and noninvesting firms.

2.2 Theoretical Background

The institutional environment is the cornerstone of the state and the economy, which means that the environment strongly influences the economy, its structure, development, and the future. Therefore, the institutional environment can be an important indicator to infer the current structural state of the economy and predict its growth in the long run. Fiscal policy is part of the institutional environment and plays a crucial role in shaping tax policy and the value of taxation. The government dictates the amount of taxes, on whom the tax will be imposed, or under what conditions a rebate can be applied to the tax.

Corporate income taxes, which companies must pay on their gross profits for a given period, are heavily debated in the literature. It is argued that reducing this tax promotes economic growth (Arnold et al., 2011; Lee and Gordon, 2005; Martens and Ravn, 2013); however, some studies show the opposite and come up with negative or mixed results (Widmalm, 2001; Gale et al., 2015). An exciting claim comes from Gechert and Heimberger (2022), who reveals that

reporting results that tax cuts promote economic growth is biased and that the probability of reporting a positive effect on growth can be up to three times greater than that of a negative impact. When this bias is removed, he finds that the average impact of a corporate tax change does not have a statistically significant effect on economic growth.

Based on economic intuition, the tax costs are not expected to be sufficiently interpretable to describe the impact of taxation on firm zombification, as taxation is closely tied to firm earnings. Therefore, the effect of an implicit tax rate that considers both taxation and firm earnings will be tested. Taxation can be expected to behave similarly to interest rates. Low interest rates allow zombie firms to emerge based on cheap credit. It can be expected that similarly, low tax costs will not burden firms too much and will allow even inefficient firms to continue operating. Hence, we propose the first hypothesis:

H1: Growth in the implicit tax rate harms the emergence of zombie firms.

Corporate taxes are also used in international competition. Capital flexibility is high, and firms can move their business abroad. On this basis, governments are incentivized to reduce corporate taxes to attract entrepreneurs to their country. A good example is the EU, where significant corporate tax cuts are visible. (Heimberger, 2021).

Each country has a different institutional environment and its systems tailored to its economy or government plan; this is evident in the behavior of banks. The literature suggests that banks' behavior is affected not only by the country's institutional environment as a whole but also by individual regions, which may have differently tailored institutions, firms, or firms with different focuses. Banks adapt to the regional environment and behave differently from banks in other regions, which implies that the various systems have heterogeneous relationships with each other, representing the basis for our second hypothesis (Aristei and Gallo, 2017; Fan et al., 2012; Matemilola et al., 2019; Mkhaiber and Werner, 2021). Based on the above information, it can be hypothesized that:

H2: The effects of individual tax systems on the probability of zombie formation are heterogeneous.

The institutional environment is the foundation of the economy and society; its quality and structure determine the state and growth of the economy. A good-quality institutional environment reduces uncertainty in the market and the country in general, allowing subjects to plan strategically for the long term. Lower values of the corruption index also enable market participants to think ahead. Firms in countries with a low corruption index prefer long-term debt and have less tendency and initiative to reduce taxes by debt; financing is less expensive for firms when a country enforces its insolvency law well. A good state of the institutional environment also increases the economy's total output. According to economic intuition, the probability of zombification decreases with increasing institutional quality, which is the basis of Hypothesis 3:

H3: An increase in the quality of the institutional environment will lower the probability of zombie firm emergence.

3. Data and Methodology

The empirical research is conducted on an unbalanced dataset that includes firm, macroeconomic, and institutional observations. The observations are for 47 European countries with an annual frequency of 2011–2020. The firm data are obtained from Orbis, a commercial database provided by the electronic publishing firm Bureau Van Dijk. In total, observations for 1,491,227 firms are downloaded. The study is conducted only on nonfinancial

firms. For this reason, all banking firms and insurance companies were removed from the dataset. The Orbis database provides information for both consolidated and unconsolidated units. Consolidated units are removed to avoid double counting. Institutional and macroeconomic data are obtained from the World Bank on a yearly basis.

In terms of company size, the dataset contains medium, large, and very large companies. Small firms are omitted altogether because they behave differently than large firms, so it is preferable to remove them or form 2 different datasets for testing accuracy. Firm size was measured using the Orbis database, which categorizes firms as follows: small firms having total assets less than $2.8 million, medium-sized firms having total assets equal to or greater than $2.8 million, large firms equal to or greater than $28 million, and very large firms, which are all firms with assets equal to or greater than $280 million.

Some variables must be cleaned (processed) and transformed before analysis. Based on the histograms, outliers are removed from the variables to achieve or at least partially close to the normality of the data. If needed, 1% clipping is performed, either from one or both sides of the histogram. Other methods, such as logarithmization, are avoided because they are not appropriate for all variables, and many observations are lost through this method, which reduces or makes the results impossible to interpret. Additionally, negative values for the debt and sales variables are removed because they are considered erroneous observations. An index of GDP growth is created for GDP. For the transformed data, refer to Appendix, which provides the variables as they were entered into the model.

Table 1: Variable Definition

Variable	**Variable type**	**Definitions, transformations**
Zombie probability	Dependent variable	Value 0 and 1
Return on assets	Firm	EBIT/Total assets
Liquidity	Firm	(Current assets - inventories)/Current liabilities
Asset turnover	Firm	Sales/Assets
GDP Growth Index	Macroeconomic	Index (2015 = 100)
Implicit tax rate	Institutional	Taxation/EBITDA
Domestic credit to the private sector	Institutional	% of GDP
Tax Competition	Institutional	Point Scale (0-100)
Level of democracy	Institutional GM	Point scale (-2.5 to 2.5)
Political Stability	Institutional GM	Point Scale (-2.5 to 2.5)
Government Effectiveness	Institutional GM	Point Scale (-2.5 to 2.5)
Regulatory Quality	Institutional GM	Point Scale (-2.5 to 2.5)
Legal Order	Institutional GM	Point Scale (-2.5 to 2.5)
Control of Corruption	Institutional GM	Point Scale (-2.5 to 2.5)

Source: author's calculations (2024)

The variable definition Table 1 provides a descriptive overview of all the variables included in the analysis. The dependent variable is the probability of a firm being a zombie, which takes the values 0 when the firm is not identified as a zombie and 1 when it is a zombie firm. The identification of zombie firms is decided based on our summary of the most often used identifications available in Appendix. Our dataset is quite large and contains many countries; therefore, ICR is used for identification, where any firm with ICR less than one is categorized as a zombie firm. The ICR varies among authors, and they experiment with other values. However, the ICR limit of 1 for zombification is the most commonly used variant; hence, we use this value in our analysis. We find 537,674 companies with at least one or more characteristics indicating that they can be considered zombie firms.

For a general description of the firm's impact on its zombification, four variables are used from a microeconomic point of view. Variables are selected based on previous research. Companies' susceptibility to becoming zombies is strongly linked to their ability to sustain themselves, meaning their ability to generate profit. The relevance of profitability applies not only to zombie firms but also to healthy firms whose profitability is affected by the presence of zombie firms. From this point of view, firms' profitability is also discussed by Banerjee and Hofmann (2018, 2020) and McGowan et al. (2018). In our study, a firm's profitability is explained and measured by ROA and asset turnover. ROA represents the firm's efficiency, as it describes its ability to generate profits using its assets. Asset turnover describes a firm's performance and success based on its ability to generate revenue from its assets. The greater these indicators are, the healthier the firm can be assumed to be. Liquidity is also added to profitability and describes a firm's ability and swiftness to cover its liabilities.

From a macroeconomic point of view, we use GDP adjusted to the GDP growth base index. The GDP index allows for a better observation of GDP growth and makes the variables in the model more readable and interpretable. Countries differ significantly in GDP, so the variable must be adjusted. The year 2015 is chosen as the reference period because of its stability. In 2015, the effects of the financial crisis were not so pronounced, and the boom in 2016 has not yet happened; therefore, 2015 is the most appropriate study year in terms of GDP. This variable is based on Banerjee and Hofmann (2018, 2020), who studied zombie firms from the point of view of economic cycles or crises. In terms of the institutional environment, two groups of indicators are used. Standalone and GM indicators. In the standalone indicators, an implicit tax rate shows the impact of firms' tax costs compared to their profitability. A higher implicit tax rate means that firms face a more significant tax burden and that government regulations reduce their returns. The second indicator is domestic credit to the private sector (%GDP). This indicator measures the total amount of credit extended to the private sector of the domestic economy as a percentage of GDP. The indicator demonstrates the overall indebtedness of the private sector and its access to credit. Higher values imply more outstanding indebtedness and easier access to credit, and vice versa. The third variable is tax competition, which, on a scale of 0-100, indicates firms' interest in doing business in a given country concerning taxation.

Another group of institutional indicators is the GM indices, which describe the state of a country's public administration. The quality of the institutional environment is a pretty broad concept, and a wide range of factors can be included. For this reason, the issue can be viewed from a very narrow and a broad (general) perspective. In this case, the World Bank seeks to determine ways of measuring the institutional environment that does not go to extremes and can measure our average awareness of the issue. Based on this idea, the World Bank has created the "Governance Matters" project, which publishes an aggregate index of GM (Governance Matters) and is divided into six dimensions describing the state of governance.

We use panel data analysis to identify the probability of a zombie firm occurring, where the model is a logistic regression with fixed effects. The fixed effects are chosen based on the assumption that each firm behaves specifically. This assumption is tested with the Hausman test. All analyses are performed based on the following model.

$$p_{i,t} = P\left(zombie_{i,t} = 1 \middle| macro_{c,t}^{m}, firms_{i,t}^{f}, imptax_{i,t}^{x}, inst_{c,t}^{s}, \theta_t\right) = F\gamma(\sum_{m=1}^{M} \beta_m \, macro_{c,t}^{m} + \sum_{f=1}^{F} \beta_f \, firms_{i,t}^{f} + \sum_{x=1}^{X} \beta_x \, inst_{i,t}^{x} + \sum_{q=1}^{Q} \beta_q \, inst2_{c,t}^{q} + \sum_{s=1}^{S} \beta_s \, gm_{c,t}^{s} + \mu_i + \theta_t + \varepsilon_{i,t}) \quad (1)$$

The dependent variable $p_{i,t}$ represents the probability that firm "i" at time "t" is a zombie. The parameter "β" represents the coefficient estimates for the independent explanatory variables. The first group is "macro", which means the macroeconomic data for country "c" at time "t". In this group, only the GDP variable can be found. The second group of indicators is "firms", which represents micro data for firm "i" at time "t". This group consists of ROA, liquidity, and asset turnover. The third group is "inst", which contains the values of the implicit tax rate for individual firm "i" at time "t". The fourth group is "inst2", which includes the values of domestic credit and tax competition for country "c" at time "t". The last group is "gm", which represents GM indices indicating the quality of the institutional environment of country "c" at time "t". In addition, the logistic regression includes the time variable θ, which removes the model instability created by the business cycle, and the fixed effect μ, which describes the heterogeneity of each firm. Finally, we add the error term (standard error) ε to the equation.

4. Results

In the light of literature review we test the probability of zombie emergence based on macro and micro variables (see Table 2) and continue with GM index variables in Table 3.

Table 2: Probability of Zombie Emergence – Macro- and Micro Variables

	(1)	(2)	(3)	(4)
GDP Growth Index	**-0.006**	**0.028*****	**0.095*****	**0.102*****
	(-0.008)	(-0.007)	(-0.012)	(-0.011)
ROA	**-0.041*****	**-0.039*****	**-0.038*****	**-0.039*****
	(-0.001)	(0.000)	(-0.001)	(-0.002)
Liquidity	**-0.003*****	**-0.003*****	**-0.003*****	**-0.002*****
	(0.000)	(0.000)	(0.000)	(0.000)
Asset turnover	**-0.077*****	**-0.085*****	**-0.097*****	**-0.086*****
	(-0.003)	(-0.001)	(-0.002)	(-0.004)
Implicit tax rate	**-0.078*****			**-0.081*****
	(-0.003)			(-0.004)
Domestic credit		**0.001*****		**0.001*****
		(0.000)		(0.000)
Tax Competition			**-0.001*****	**0.000****
			(0.000)	(0.000)
Time variables	Yes	Yes	Yes	Yes
Format	Margins	Margins	Margins	Margins
Observations	1,610,322	2,156,373	1,052,960	777,129
Number of firms	228,040	291,736	207,308	157,169
R-squared	0.301	0.258	0.239	0.283

Source: author's calculations (2024)

Note: Values of standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 2 shows the results of the first model consisting of macro and micro variables, to which institutional variables are then added. All variables are significant. The GDP index starts to increase in value and significance; its sign becomes positive. Thus, the economic intuition and procyclicality of institutions can be confirmed. Zombie firms are created in good times and discovered in bad times. As expected, in Model (4), the micro values representing the good health of a firm (ROA, liquidity and asset turnover) have predominantly negative values. Therefore, with an increase in these variables, the probability of a firm becoming a zombie decreases. The findings confirm the validity of the economic intuition.

The institutional variables in Model (4) are significant at levels between 5% and 1%. The implicit tax rate variable consists of the firm's tax cost divided by EBITDA. This implies that the two parts of the equation for the implicit tax rate should move almost proportionally as the tax cost depends on EBITDA. A change in this balance may suggest the influence of an external factor. For example, if EBITDA increases with no change in taxation, the firm is receiving external cash assistance. Similarly, if tax costs are reduced without reducing the firm's EBITDA, it means that the firm is being artificially allowed to reduce its tax costs, or the firm is reducing its costs with new debt but generating no added profit, which is a direct example of a zombie firm. The functionality of the described calculation of the implicit tax rate with links to economic intuition is confirmed by the coefficient in Model (4), which is negative; this means that the greater the firm's implicit tax rate is, the lower the probability of zombie firm emergence. It is also important to mention that the variable reaches significant values and is at a similar level of influence as, for example, the GDP index or asset turnover. Based on this finding, we confirm our first hypothesis, which states that an increase in the implicit tax rate will reduce the probability of a zombie firm.

This finding is strongly associated with another newly added variable, Tax Competition. In Model (4), tax competition reaches zero. A zero value indicates that it does not matter in which country the firm is situated. In terms of tax competition, it is irrelevant whether it is located in a high-tax country or a tax haven; the effect on zombification is negligible in this respect and adds to the influence of the implicit tax rate variable, which is thus the main driver in terms of taxation. If the coefficient is equal to zero, the heterogeneity disappears, and it can be argued that there is homogeneity in the firm-state relationship in terms of taxation and that the effect of tax competition on zombification is insignificant. For instance, in one country, a firm can be taxed by 20% and be a zombie firm, while in another country, a firm can be taxed by 10% and not become a zombie firm. Based on this finding, we reject the second hypothesis that, in terms of the probability of zombie firms occurring, tax systems behave heterogeneously.

In Table 3, the last group of GM index variables is added. In this regression, the procedure has been changed, and the variables are only entered into the model semi separately and not in bulk; this is because the individual indices are highly correlated with each other, and their bulk insertion into the model would reduce its interpretability, and the results could be considered irrelevant.

Table 3: Probability of Zombie Emergence – GM Index Variables

	(1)	(2)	(3)	(4)	(5)	(6)
Level of Democracy	**0.003**					
	-0.016					
Political Stability		**0.030*****				
		-0.006				
Government Effectiveness			**0.081*****			
			-0.007			
Regulatory Quality				**-0.038*****		
				-0.009		
Legal Order					**-0.041*****	
					-0.012	
Control of Corruption						**-0.107*****
						-0.009
Time variables	Yes	Yes	Yes	Yes	Yes	Yes
Format	Margins	Margins	Margins	Margins	Margins	Margins
Observations	777.129	777.129	777.129	777.129	777.129	777.129
Number of firms	157,169	157,169	157,169	157,169	157,169	157,169
R-squared	0.283	0.283	0.283	0.283	0.283	0.283

Source: author's calculations (2024)
Note: Values of standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Based on Hypothesis 3, we assumed that all indices would have negative coefficients, thus reducing the probability of firm zombification. However, Table 3 shows results that contradict this hypothesis.

The level of democracy is completely insignificant. (see Table 3, variable level of democracy in Column (1)). We assume that this is due to the variables that make up the index; it contains information on, for example, freedom of speech, trust in parliament, and human rights. Such information alone does not have much effect on zombification; hence, the index is not significant. However, it can be assumed that if an overall model were constructed, the level of democracy would reach significant negative values and would probably reach high significance. Democracy is the basis for all other GM indices. At the level of democracy, politicians are elected who then decides what the institutions will look like and what their purpose and rules will be; this means that it is the basis for the other GM indices and will increase in value in conjunction with them. We estimate a negative sign based on the variable being the most highly correlated with GM indices that reach negative values. (Table 3, variable regulatory quality, Column (4); variable legal order, Column (5); variable control of corruption, Column (6))

The variable political stability and the absence of violence reach positive values; we believe this is because the index represents security and stability in the country, or in other words, a sense of uncertainty about the future. Firms that cannot plan for the future will usually not take on long-term debt. However, if the environment is stable and firms can strategize for the long term, they will take on more debt. Therefore, when the stability of a country increases, so does the debt burden, which may lead to a greater probability of zombification.

Interestingly, in the case of this GM model, government effectiveness has a positive effect with a relatively high and significant value, which is an unexpected finding. Before explaining the results, we describe the government effectiveness index more deeply. The index incorporates information on the availability of basic needs such as health, education, water, electricity, infrastructure quality, bureaucracy, administration, and budgets. This finding implies that the greater the value of government effectiveness is, the greater the availability of higher human welfare and the greater the efficiency of institutions in the form of low bureaucracy and quality administration. The more efficient these elements are in a country, the easier and faster it is for firms to access external support, thereby increasing their chances of becoming a zombie company.

The regulatory quality and the legal order indices are almost identical because they are very similar; they contain information on law enforcement, private property, quality of regulation, unfair competitive practices, etc. Unfair competition enforcement, debt collection, and market regulation have a negative effect on the emergence of zombie firms; hence, both indices have negative results. (Table 3, variable regulatory quality, Column (4); variable legal order, Column (5))

The most influential indicator is control of corruption, which is defensible because zombie firms often emerge from "friendly" aid rooted in systemic cracks and corrupt behavior. The greater the value of anticorruption is, the lower the emergence of zombie firms. (Table 3, variable control of corruption, Column (6))

Based on these mixed results, we reject Hypothesis 3 and argue that the probability of zombie firms may not only decrease but may also increase as the quality of the institutional environment rises.

5. Robustness Check

The critical point is how the value of indebtedness impacts firms based on their size. We tested it in Table 4. A second robustness check is performed for individual regions of Europe to test the likelihood of zombie emergence in the different areas.

5.1 Firm Size

The data are subjected to a robustness check to determine their behavior in different environments. The second model is tested on the size of the company. The companies are divided according to the abovementioned indicator of the Orbis database into medium, large, and very large firms.

Table 4: Probability of Zombie Emergence – Size of the Company

	Medium firms	Large firms	Very large firms
	(1)	(2)	(3)
GDP Growth Index	**0.120*** **	**0.120*** **	**0.023**
	(0.013)	(0.029)	(0.056)
ROA	**-0.045*** **	**-0.042*** **	**-0.028** **
	(0.001)	(0.002)	(0.012)
Liquidity	**-0.002*** **	**-0.002*** **	**-0.002**
	(0.000)	(0.000)	(0.001)
Asset turnover	**-0.102*** **	**-0.096*** **	**-0.057** **
	(0.004)	(0.007)	(0.026)
Implicit tax rate	**-0.084*** **	**-0.076*** **	**-0.039** **
	(0.003)	(0.005)	(0.018)
Domestic credit	**0.001*** **	**0.001*** **	**0.001**
	(0.000)	(0.000)	(0.001)
Tax Competition	**0.000**	**-0.002*** **	**-0.002** **
	(0.000)	(0.001)	(0.001)
Time variables	Yes	Yes	Yes
Format	Margins	Margins	Margins
Observations	681,537	113,495	14,313
Number of firms	141,622	24,363	3,031
R-squared	0.293	0.270	0.251

Source: author's calculations (2024)
Note: Values of standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4 shows that Models (1) and (2) maintain similar signs and values as in the basic model, and the change is only visible in the variable of tax competition. This change is nonsignificant in the first model and may be because firms have different opportunities to exploit a country's tax system because of their size. Smaller firms may not have the resources to adjust their business based on differences in taxation across countries and may shift parts of their business abroad. However, for large firms, adapting and relocating is not burdensome, and it is advantageous for them to customize their activities according to tax competitiveness. This reasoning is suggested by the rising value of tax competitiveness with the increasing size of the firm.

The main changes are visible in Model (3), where we can find several distinctions. The index GDP is nonsignificant with a relatively low estimated value; the reason for this is that some firms are so large that GDP does not influence them, and they are, in fact, the firms that are moving the GDP. Another nonsignificant variable for very large firms is liquidity. Here, we explain the nonsignificance because these firms have easier access to financing and, therefore, do not need to hold as much liquidity as smaller firms. The nonsignificant domestic credit can be related to previous explanations of liquidity and GDP, where firms have diverse access to financing and form a large part of overall domestic credit.

The firm's debt increases with the firm's size. The larger the firm is, the greater the effect of indebtedness. One possible explanation may be that large firms not only have better access to financing and greater bargaining power in terms of loans but can also endure high debt and

losses for longer, allowing them to postpone restructuring or exit the market. In contrast, when faced with similar problems, medium-sized firms will be under more pressure to restructure or exit. This behavior is confirmed by the correlation between the firm's debt and total assets, representing the firm's size. This correlation is negative for medium and large firms, while for very large firms, it reaches positive values. This outcome may explain the insignificant value of liquidity for very large firms; their negotiation power and access to debt lower the influence of their liquidity.

In general, the zombification of firms depends on the firm's size. In his dataset, Chang et al. (2017), in which he divides firms into small/micro, medium, and large, states that the probability of zombification of a firm decreases with firm size, with small firms having a percentage of zombification of 28.23%, medium 18.04%, and large 9.55%, respectively. Similarly, McGowan et al. (2018), who tests SMEs (medium and small firms) based on her dataset, argues that the smaller the firm is, the more likely it is to become a zombie. Our dataset differs significantly from both, but we obtain similar results when analyzing it. After correlating firm size proxied by total assets with the zombie variable, we find that the correlation for large and very large firms is negative in this case; it is positive for medium-sized firms, but one can assume that if we included small firms, as McGowan does, we would obtain similar results.

5.2 Regions of Europe

Europe is divided into northern, southern, western, and eastern Europe. The model does not include all countries in the base dataset. The choice of countries is based on creating units of countries with similar economic backgrounds and sufficient amounts of data.

Table 5a: Probability of Zombie Emergence – Individual Regions of Europe

	North Europe	West Europe	South Europe	East Europe
	(1)	(2)	(3)	(4)
GDP Growth Index	**-0.100**	**-0.008**	**0.273****	**0.641***
	(0.366)	(0.013)	-0.135	(0.387)
ROA	**-0.033*****	**-0.019*****	**-0.025****	**-0.052*****
	(0.008)	(0.005)	(0.013)	(0.006)
Liquidity	**-0.001**	**-0.002*****	**-0.001***	**-0.003*****
	(0.000)	(0.001)	(0.000)	(0.001)
Asset turnover	**-0.046*****	**-0.046*****	**-0.047****	**-0.079*****
	(0.012)	(0.012)	(0.023)	(0.012)
Implicit tax rate	**-0.106*****	**-0.046*****	**-0.043****	**-0.078*****
	(0.025)	(0.012)	(0.021)	(0.014)
Domestic credit	**0.000**	**-0.001*****	**-0.003***	**-0.001**
	(0.001)	(0.000)	(0.002)	(0.001)
Tax Competition	**0.000**	**0.000**	**-0.004****	**0.003**
	(0.003)	(0.000)	(0.002)	(0.003)

Source: author's calculations (2024)

Table 5b: Probability of Zombie Emergence – Individual Regions of Europe

Time variables	Yes	Yes	Yes	Yes
Format	Margins	Margins	Margins	Margins
Observation	62,853	230,494	438,587	39,337
Number of firms	13,074	49,302	85,678	8,043
R-squared	0.337	0.258	0.302	0.388

Source: author's calculations (2024)
Note: Values of standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Most variables maintain similar significance and estimation values as in the baseline model. However, there are a few nonsignificant estimates. These differences may be attributed to insufficient observations, which were significantly lower than those in the original model. This observation is self-evident in Table 5 in Columns (1) and (4), where the observations are reduced the most, and variables such as GDP, domestic credit, and tax competition lose entirely their significance. This observation also applies to liquidity in Table 5 in Column (1).

A clear difference is found in the case of the GDP index, where only two variables are significant. The GDP index has an important and highly positive estimate in Table 5 in Models (3) and (4), which differs from the baseline model. This difference can be explained by the fact that Southern European countries tend to be significantly more indebted to an economic expansion and are subsequently unable to meet their obligations in a crisis. The tendency toward over indebtedness is underlined by the fact that Southern European countries are among the most indebted countries in Europe. Eastern countries are not yet as developed as Western countries, and their economies might be strongly procyclical, which makes them more vulnerable to GDP volatility.

There has also been a significant change in tax competition, which has reached positive significant values in Southern Europe, while this variable is not important in other regions. The positive estimate of tax competition for the southern region could be explained by the fact that southern countries have a relatively low level of tax competition, which means high taxes and strict tax legislation; they are heavily indebted, and their investments are among the lowest in Europe. Increasing tax competition could theoretically reduce the number of zombie firms, as more investment would come into the country to boost the economy. However, in the case of southern countries, the acquired freedom and easing of legislation would only lead to a worsening of zombie firm occurrence. The strictness of tax systems or the value of taxation is underlined by the low value of the implicit tax rate estimate compared to other regions. Based on the low value of the implicit tax rate, it can be assumed that the value of taxation is already high enough that an increase in the implicit tax rate no longer has as significant an effect on zombification as it does in other regions.

The state of domestic credit is grounded on a similar basis not only in Southern Europe but also in the case of Western Europe, where other highly indebted countries occur but not as badly off as Italy, Greece, or Portugal, which is depicted in the lower value of domestic credit estimates. In Table 5 in Models (2) and (3), domestic credit reaches negative values. One would argue that the results do not follow economic intuition because debt increases should not lower the probability of zombie firms' emergence. In this case, the economic theory still holds; it is muddled by high indebtedness. These two regions are already so indebted that if we lent them more money, we would relieve them from actual debt and increase their ICR. However, such an effect would only be temporary and, in the long term, would result in an even further increase in the number of zombie firms, as zombie lending would occur.

6. Conclusion

In this work, we empirically investigate the effects of the implicit tax rate and institutional environment on the formation of zombie firms. We find that the implicit tax rate negatively influences the emergence of zombie firms and that this influence is further strengthened by homogeneity, which occurs among taxation systems in terms of firm zombification. Furthermore, we explore the impact of certain parts of the institutional environment, which reveals the diverse influences of institutional quality on the occurrence of zombie firms. Generally, we can conclude that the government plays a prominent role in zombie firm creation and that there are reasons why the government is willing to support or create zombie firms. Still, if it is pragmatic and market-oriented enough, it will leave emotions and protectionism aside and try to prevent or eliminate them.

In response to these findings, we propose a series of legislative changes to address this issue holistically. These five recommendations encompass the implementation of a minimum tax requirement for large corporations to discourage excessive debt and reduce the risk of zombification. We introduce a low capitalization rule that limits excessive tax cuts and curbs excessive leverage in financing based on a ratio where interest expense is measured against the firm's capital base. We support strengthening and enforcing the obligation to publish firm documentation in a public register, imposing stricter penalties for noncompliance to remove problematic firms. Then, we propose creating a ratio-based limit on the amount of debt relative to firm sales to prevent inefficient firms from further leveraging their tax burden. This approach is similar to the second proposal but based on sales. Finally, we encourage states to act as mentors and supporters rather than bailout providers, promoting responsible risk management and encouraging firms to restructure or merge as needed. These combined measures offer a comprehensive approach to addressing the issue of zombie firms and could foster a more resilient economic environment.

Existing research has not focused mainly on the impact of taxation and the institutional environment on the likelihood of zombie firm occurrence. Hence, using the implicit tax rate, institutional indicators, and GM indices, we analyze their impact on firm zombification and extend the literature with these findings. Most of the incentives forming zombie firms come from the institutional environment; therefore, our analysis identifies the extent to which each indicator influences these firms and the strength of that influence.

The present work presents discoveries, but additional research is needed to build upon them. For future extensions of the issues dealing with the impact of the institutional environment and taxation on the probability of zombie firm emergence, it may be worthwhile to go into more detail and focus on the different types of taxes and their impact on the emergence of zombie firms. It might also be beneficial to add to the model variables related to interest and loans to look at the effect of interest on tax costs. Finally, it would be possible to modify the actual dataset. There are countries with different numbers of firms in the dataset and, hence, different numbers of observations. It would be interesting to perform a sample adjustment on the data by stratifying it or using a weighted analysis method, which would not change the dataset but would add different weights to each country. Finally, it would be interesting to examine the actual proposals for changes in state regulations and the calculation of their country-specific parameters.

Acknowledgements

This paper was created within the project Internal Grant Schemes of Mendel University in Brno. Project registration number IGA-PEF-TP-23-018.

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Appendix

Table 6: Identification Types

Studies focused on one country		
Author	**Country**	**Identification**
Caballero et al. (2008)	Japan	CHK criterion = compared to hypothetical benchmark rate attained by the best borrowers with the rate of the tested firm
Fukuda and Nakamura (2011)	Japan	CHK-FN = adds EBIT to the benchmark, which must be lower than the hypothetical interest rate
Schivardi et al. (2017)	Italy	Altman´s Z-score
Chang (2021)	China	Differentiation from the rest of the firms (consumption, processes, pollution)
		Operating losses for 3 or more years
Studies focused on more countries		
Author	**Country**	**Identification**
McGowan et al. (2018)	9 OECD countries	ICR < for 3 years + firms aged 10 years or more
Banerjee and Hofmann (2018)	14 advanced economies	ICR < for 3 years + firms aged 10 years or more
		Tobin´s Q < industry median
Banerjee and Hofmann (2022)	14 advanced economies	ICR < 1 for 2 years + Tobin´s Q < industry median
Acharya et al. (2019)	Europe	ICR is below hypothetical value + firm rating is BB or lower + bank syndicate remains the same
Acharya et al. (2021)	12 European countries	ICR < median + leverage > median + ICR is lower than hypothetical value
Storz et al. (2017)	7 Eurozone countries	Negative return on assets + net investment is negative + ability to repay debt less than 5 % for 2 years

Table 7: Descriptive Statistics

Variables	Number of observations	Mean	Standard deviation	Min	Mdn	Max
Zombie probability	14,912 270	0.11	0.32	0	0	1
GDP growth index	14 751 440	1.08	0.78	0	0.99	2.65
ROA	7 625 812	4.89	10.73	-37.07	2.43	56.61
Liquidity	9 091 528	3.09	6.83	0	1.07	60.51
Asset turnover	5 370 128	0.97	1.06	0	0.68	5.89
Indebtedness	9 953 401	0.58	0.35	0	0.61	2.06
Implicit tax rate	4 931 517	0.12	0.28	-2.42	0.12	2.3
Domestic credit to private sector	14 780 741	97.39	35.24	21.78	94.09	255.31
Tax competition	9 096 388	60.27	10.52	40.13	62.45	100
Level of democracy	14 896 110	1.01	0.71	-1.66	1.24	1.74
Political Stability	14 896 110	0.47	0.59	-2.02	0.5	1.69
Government effectiveness	14 895 960	1.13	0.68	-1.19	1.39	2.23
Regulatory quality	14 895 960	1.15	0.68	-1.32	1.24	2.05
Legal order	14 896 005	1.11	0.83	-1.11	1.43	2.12
Control of corruption	14 895 960	1.09	0.96	-1.18	1.47	2.4

Digitization of Public Administration: Visegrad Four Countries

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Abstract
The article deals with the digitization of public administrations of the Visegrad Four countries – the Czech Republic, Hungary, Poland and Slovakia in European union. The main focus of this article is the financial and tax administrations of the mentioned countries. The aim of the article is to examine the level of e-government in the Visegrad Four countries. The aim of the article is achieved through a literature search, public databases of the given countries, and with the help of the Digital Economy Index (DESI) and the E-Government Development Index (EGDI). The countries of the Visegrad Four are at a similar level in terms of digitization, but in comparison with other European Union countries they achieve rather below average results. The countries of the Visegrad Four are recommended to deepen the existing cooperation within the framework of other European Union countries and to strive more intensively for the use of information and communication technologies in the framework of communication between tax subjects and public administration. These states should positively communicate the benefits of e-government and also improve digital knowledge and skills of citizens. Furthermore, they should try to develop new technologies that facilitate electronic communication.

Keywords: *digitization; e-government; European integration, financial administration; public administration; Visegrad four countries*

JEL Classification: *K34; O38; P35*

1. Introduction

According to Sabani, Thai and Hossain (2023), eGovernment is defined as the application of information and communication technologies that lead to greater efficiency of public services. It can be more effective communication between the state and tax entities, or the provision of public services through information and communication technologies. Financial administration can also be part of eGovernment (Blechová and Sobotovičová, 2022). However, the countries of the European Union differ in the level of digitization (Lacová and Šuplata, 2022).

Within the digitalization of financial administration, 3 core tasks can be distinguished. These are the development and provision of public services, economic and social support of interested entities and the implementation of management control within individual departments. All these tasks should be developed both at the national and international level (Sobotovičová and Blechová, 2021). The advantages of electronic communication are efficiency, speed, low financial costs, automatic control and calculation or availability outside the working hours of financial administration. The electronic form of tax returns is more suitable for legal entities compared to natural persons, but with regard to the size of the company (Sobotovičová and Blechová, 2021).

According to Ihnatišinová (2021), it is advisable to invest in information and communication technologies, especially in the automation of processes within the electronic communication of financial administration and tax entities. Furthermore, it is appropriate to modernize the functioning of financial administrations and reduce the administrative burden, both for financial officers and for taxpayers, with regard to information technology. Joshi and Islam (2018) looked at the development of e-government in developing countries and found, for example, that trust in these technologies is important for stakeholders. According to Androniceanu and Georgescu (2021), there are several main principles and principles by means of which electronic communication takes place between subjects of financial administration. This is to ensure transparency; access to information for all without distinction; efficiency; reasonableness and related data protection of subjects; availability. E-government can be considered as one of the possible sources for rampant corruption in the country (Linhartová and Tvrdíková, 2018).

The introduction of the article contains an overview of research in the field of e-government. The next part is focused on the methodology of the article. Other chapters are devoted to the Visegrad Four countries and their level of e-government. The results are summarized in the conclusion.

2. Problem Formulation and Methodology

The article uses basic methods, primarily analysis and comparison. The analyzed data is based on the financial administrations of the analyzed countries, or from various databases such as Eurostat. Two indices are used to assess the level of digital services of states, namely the Digital Economy and Society Index (DESI) and the Electronic Government Development Index (EGDI).

The Digital Economy and Society Index (DESI) tracks the level of European Union countries in terms of digital technologies. The main areas of this indicator include human capital, connectivity, integration of digital technologies and digital public services. The e-Government Development Index (EGDI) looks at the level of e-Government in the countries of the United Nations. It is an indicator that consists of three areas, namely the provision of online e-government services, telecommunication connectivity dealing with the quality and availability of the Internet, and human capacity dealing with literacy and education. Its values range from 0 to 1, while: 0.75 – 1 means very high values; 0.5 - 0.7499 means high values; 0.25 – 0.499 means medium values; 0 – 0.2499 indicates low values (Kabbar and Dell, 2012).

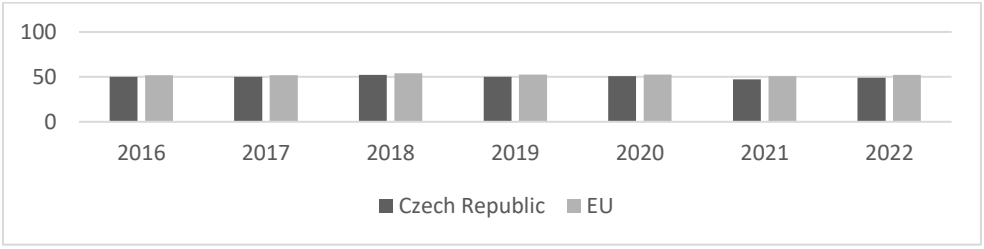
3. Problem Solution

This section deals with the analysis of the 4 countries of the Visegrad Four.

3.1 Czech Republic

According to the digital economy index in 2022, the Czech Republic ranked 19th with 49.1 points, see Figure 1. The Czech Republic ranks on the average around 18th place within that index. In terms of points obtained, the Czech Republic ranks rather among average to below average countries. In the area of human capital, the Czech Republic ranks with the average of the European Union, on the other hand, in other areas such as connectivity and the integration of digital technologies, the Czech Republic is below average. The problematic part is the use of technology by businesses and also the lack of experts in information and communication technologies.

Figure 1: Index DESI in Czech Republic



Source: European Commission (2023a)

According to the area of digital public service in 2022, the Czech Republic ranked 17th with 64.5 points (the average of the European Union is 67.3 points). The share of users of digital public administration was around 76% in 2022 (the average of the European Union is 65%). The point score (0-100) within the pre-filled forms is 41 points (the European Union average is 64 points). The digital services area scores 75 for citizens (European Union average is 75) and 81 for businesses (European Union average is 82). In this area as well, the Czech Republic ranks rather among the below-average countries, but in 2022, compared to previous years, there was an improvement and it came closer to the average European Commision, 2023a. The citizens of the Czech Republic have been slightly above the European Union average in their use of the Internet for the use of e-government services since 2017 (Eurostat, 2023)

Based on the EGDI index the Czech Republic ranked 45th (out of 193 countries) in 2022 with 0.8088 points, which is slightly below the average of European countries (in 2008, it ranked 25th). As of 2020, it ranks among the countries with very high values.

In the area of e-government services, it reaches a value of 0.6693 in 2022 (in 2008 it was 0.6455), i.e. high values (European average is 0.7699). In the area of e-participation, which is focused on the use of public administration websites, their social networks, or making public data and documents available, the Czech Republic achieved a value of 0.6023 (United Nations, 2023).

In the Czech Republic, the first form of digitization of financial administration took place after 2000 with the launch of the tax portal. Thanks to this portal and the adoption of the law on electronic signatures, electronic filing for financial administration became possible (Sobotovičová and Blechová, 2021). However, the first stage of digitization was already started in 1999, with the establishment of the State Information Policy. The possibility of submitting electronic tax returns for some taxes or other documents started in 2003 Špaček, Csóto and Urs (2020).

The Ministry of the Interior is responsible for the digitization of public administration in the Czech Republic. The year 2008 was considered an important milestone in this area, when the CzechPoint contact points were introduced, which can be used, for example, to obtain authorized statements, etc. Subsequently, tax boxes used for online communication were introduced in 2009 and in 2012, basic registers used for storing data on entities (for example, a register of persons) were introduced. In 2018, the Citizen portal was introduced, within which it is possible to manage data that is publicly available on subjects, for example in the mentioned basic registers.

In 2020, the Act on the Right to a Digital Service was adopted, which concerns the right of individuals to the provision of electronic services by state administration bodies. Apart from the provision of electronic services, this law also includes the acceptance of other digital

actions. In 2021, the online financial office MY TAX was introduced, which is used to settle all tax obligations electronically. Logging into this system is possible via e-identity (electronic ID card, My ID service or bank identity) and also via a data box (Blechová and Sobotovičová, 2022).

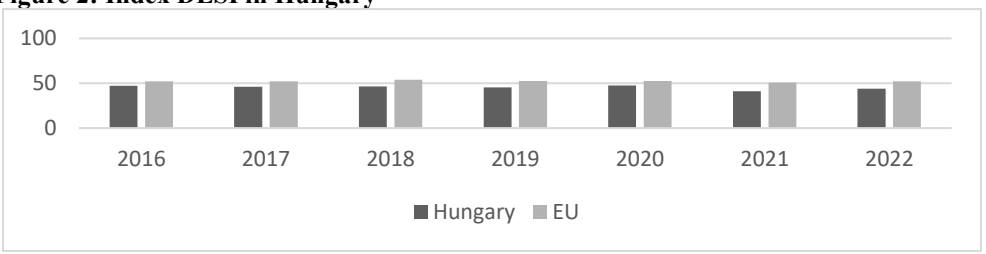
In the Czech Republic, it is mandatory to submit a tax return electronically for all entities that own the aforementioned data box or are required to have their financial statements verified by an auditor. In addition to sending the tax return via the data box or the MY TAX portal, it is possible to prepare a tax return through the electronic filing office for the financial administration (EPO). In 2023, a data box was established for all business persons as well as non-profit legal entities (MVČR, 2022). In the Czech Republic, it is planned to be able to use digital public administration services on the basis of a compiled catalog of services from 2025.

In 2021, approx. 593,000 tax returns were submitted electronically, which is an increase of approx. 3,049% compared to 2010 (at the same time, the total number of tax returns submitted increased by approx. 19%). For the year 2022, 593,268 tax returns have been submitted electronically so far, which is almost 18% more than for 2021. Most often, tax returns are submitted through the data box, but it can be assumed that the share will grow through the online financial office MY TAXES, because for 40,085 returns were submitted in 2021 and 103,276 for 2022 so far.

3.2 Hungary

According to the digital economy index in 2022, Hungary is ranked 22nd with 49.1 points (the European Union average is 52.3 points), see Figure 2. According to the average values, Hungary ranks among the below-average countries. In the area of human capital, Hungary also ranks below the European Union average, as well as in other areas such as connectivity and integration of digital technologies. A problem area in Hungary is the low number of experts in information and communication technologies, as well as the low share of technology use in businesses.

Figure 2: Index DESI in Hungary



Source: European Commission (2023b)

According to the area of digital public service in 2022, Hungary was ranked 21st. with 64.5 points (the European Union average is 67.3 points). The share of digital public administration users was around 81% in 2022 (the European Union average is 65%). The point score (0-100) within the pre-filled forms is 60 points (the European Union average is 64 points). The area of digital services for citizens scores 64 (European Union average is 75) and for businesses 74 (European Union average is 82) (European Commision, 2023b)

The citizens of Hungary are at the level of the European Union average when it comes to using the Internet to use e-government services, and since 2017 this trend has been growing for a long time above the level of the European Union (Eurostat, 2023)

In 2022, Hungary ranked 51st (out of 193 countries) with 0.7827 points, which is slightly below the European average. Throughout the monitored period, it is a country with high values, although this value is increasing, Hungary is falling in the ranking of countries (in 2008 it was ranked 30th). In the area of e-government services, it reaches a value of 0.7465 in 2022 (in 2008 it was 0.6171), i.e. high values (European average is 0.7699). In the field of e-participation, which is focused on the use of public administration websites, their social networks, or making public data and documents available, Hungary achieved a value of 0.7827 (United Nations, 2023).

The process of digitization of financial administration in Hungary include general form filling framework program; online cash register; electronic road traffic control system; tax authority audit reporting; e-personal income tax; online form application; online invoice system; online form application.

The General Form Filling Framework Program contains various types of forms and was introduced in 2009. The Online Cash Register was introduced in 2014 and is used for automatic electronic recording of cash payments. Tax authority Audit Reporting was introduced in 2016 and makes it possible to standardize audits. E-Personal Income Tax was introduced in 2017 Polish citizens are below the European Union average when it comes to using the Internet to use e-government services (Eurostat, 2023) and enables the preparation and drafting of electronic tax returns. The Online Form Application was introduced by the tax authority in 2019 for the electronic control of tax entities Kertész (2022). According to Kosponti (2023), in 2022, 81.5% of users used electronic contact with public authorities (in 2006 it was 32.2% and in 2016 it was 59.8%). Furthermore, in 2022, a total of 80.9% of users used information that is published on the websites of public authorities (in 2006 it was 26% and in 2016 it was 56.4%).

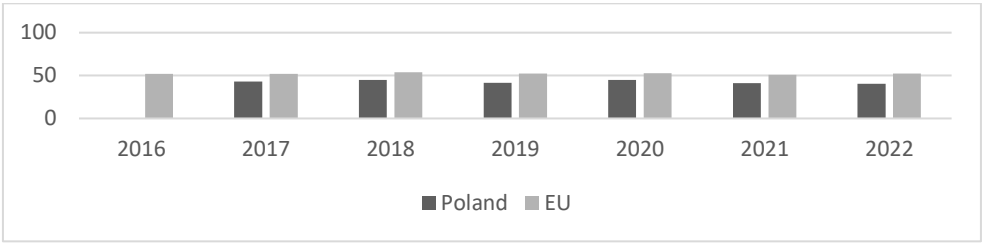
The digitization of Hungarian public administration is improving compared to previous years, and according to Bojtor and Boszó (2020), the digitization of public administration will deepen in the coming years. As in other countries, the directive on electronic signatures was introduced in Hungary in 2001. In Hungary, a portal dedicated to eGovernment was launched as early as 2003. After 2010, the Government Windows project was introduced in which they were available in one place customer services that enabled, for example, the sending of different forms to different institutions at the same time (CzechPoint in the Czech Republic). Furthermore, in 2016, identity cards with an electronic chip were introduced, which enable, for example, logging into e-government services. Through Client Gate, which was founded in 2005, it is possible to communicate with the state, for example, by submitting tax returns, registration, awarding public contracts or health and social insurance issues. In 2018, the e-Administration Act came into effect, according to which public administration bodies provide electronic services - natural persons can use services both physically and electronically, while legal entities can usually only do so electronically via digital email Špaček, Csóto and Urs (2020).

3.3 Poland

According to the digital economy index in 2022, Poland is ranked 24th with 40.5 points (the European Union average is 52.3 points), see Figure 3. According to the average values, Poland ranks among the below-average countries. In the area of human capital, Poland also ranks below the European Union average, as well as in other areas such as connectivity and integration of digital technologies. In these areas, Poland should focus on the number and level of people with digital competences, as well as the use of technologies such as artificial intelligence in businesses. According to the area of digital public service in 2022, Poland is ranked 22nd with 55.8 points (the European Union average is 67.3). The share of digital public

administration users was around 55% in 2022 (the European Union average is 65%). The point score (0-100) within the pre-filled forms is 74 (European Union average is 64). The area of digital services for citizens scores 57 (European Union average is 75) and for businesses 70 (European Union average is 82) (European Comisions, 2023c)

Figure 3: Index DESI in Poland



Source: European Commission (2023c)

In 2022, Poland was ranked 34th (out of 193) with 0.8437 points (very high value), which is slightly above the average of European countries (as of 2018) and compared to 2008, it is a deterioration of 1 place. It is a country with high values throughout the observed period and very high values from 2020. In the area of e-government services, it reaches a value of 0.7929 in 2022 (in 2008 it was 0.5385), i.e. high values (European average is 0.7699). In the area of e-participation, which is focused on the use of public administration websites, their social networks, or making public data and documents available, Slovakia achieved a value of 0.8437 (United Nations, 2023).

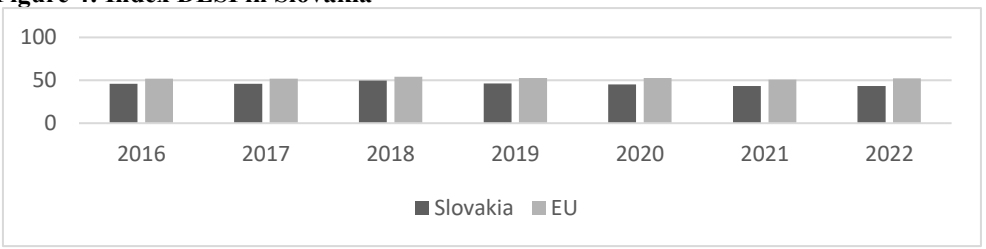
The beginning of the electronation of public administration dates back to 2003 with the establishment of bodies dealing with the design, creation and operation of systems dealing with information and communication technologies. One of the plans for the digitalization process was described in a document called the Action Plan for the Development of Electronic Public Administration. This document for the years 2005-2006 contained an evaluation of e-government activities as well as an overview of digitization projects implemented by the Government of Poland. Between 2006 and 2008, an electronic platform of government services was implemented, which still functions today in a more modern form. It is an information system that serves as access to digital public administration services. This platform enables communication between the public administration and other tax entities. Among the other services that this platform enables is, for example, an application for a European health insurance card or an application for the issuance of an identity card. To use electronic services, log in via a so-called trusted profile, which has already been used by approx. 17 million inhabitants, or a bank identity (Ziemba and Papaj , 2012; Gajowniczek (2017).

In 2018, the mObywatel application was introduced, which enables a mobile version of documents (for example, a citizenship or student card) in the form of digital services. Using this application, it is possible to make payments for public services. About 10 million citizens use this application. In 2019, the E-PIT tax service was introduced, which represents pre-filled income tax forms. In 2021, an electronic invoice system was introduced, which is used for issuing invoices (from 2024, this system will be mandatory). From the same year, citizens can request the establishment of an e-delivery box, which replaces the paper form of communication between the public administration and other entities. According to Statista (2023), in 2022, citizens used electronic public administration services most often for obtaining information (29.3%), downloading public forms (29.1%) and filing tax returns (28.9%).

3.4 Slovakia

According to the digital economy index in 2022, Slovakia ranked 23rd with 43.4 points, see Figure 4. Within that index, Slovakia is on average around 21st place. From the point of view of the points obtained, it ranks rather among the below-average states. In the area of human capital, Slovakia also ranks below the European Union average, as well as in other areas such as connectivity and integration of digital technologies. In Slovakia, over 50% of businesses report a problem with employees regarding their poor digital skills. The problematic part is also the inappropriate level of technology used by companies. According to the area of digital public service in 2022, Slovakia ranked 24th with 52 points (the average of the European Union is 67.3 points). The share of users of digital public administration in 2022 was around 62% (the average of the European Union is 65%). The point score (0-100) within the pre-filled forms is 45 points (the European Union average is 64 points). The area of digital services for citizens scores 65 (European Union average is 75) and for businesses 75 (European Union average is 82). Even in this area, these are average values (European commissions, 2023d).

Figure 4: Index DESI in Slovakia



Source: European Commission (2023d)

The citizens of Slovakia are at the level of the European Union average when it comes to using the Internet to use e-government services (Eurostat, 2023)

In Slovakia, digitization began in 2002. In that year, electronic communication based on electronic documents, signatures and seals, as well as the security of electronic documents, was legislated (this law was then updated in 2016). In 2002, a public administration web portal was created to provide information on services provided by the state. In 2013, a register of financial statements was introduced, in which the financial statements of business companies and selected entities were published Blahušiaková, Mateášová and Meluchová (2022). In the same year, the establishment of electronic mailboxes for communication between the state and entities was enacted, as well as integrated service points (similar to CzechPoint in the Czech Republic). In 2013, electronic identification cards began to be issued, which is an ID card with an electronic chip and electronic mailboxes were also introduced for communication between the financial administration and tax entities. In 2014, an electronic payment system began to be used to pay administrative or other fees. The number of established electronic mailboxes is constantly increasing. In 2014, mandatory electronic communication between the financial administration and selected taxpayers (for example, an entity that is obliged to pay VAT in Slovakia) was introduced. A call center was introduced, the scope of which was, among other things, technical support in the case of electronic communication between the financial administration and taxpayers. An online chat was also introduced based on the "Live Agent" application, within which communication takes place between the financial administration and not only taxpayers Ihnatišinová (2020).

In 2022, Slovakia was ranked 47th (out of 193 countries) with 0.8008 points (a very high value), which is slightly below the average of European countries and compared to 2008, it is

a deterioration of 9 places. Throughout the observed period, it is a country with high values. In the area of e-government services, it reaches a value of 0.7260 in 2022 (in 2008 it was 0.475), i.e. high values (European average is 0.7699). In the area of e-participation, which is focused on the use of public administration websites, their social networks, or making public data and documents available, Slovakia achieved a value of 0.4659 (United Nations, 2023).

In 2021, there was an increase of 50.9% tax questions on financial management compared to 2016, and at the same time the share of communication through digital means increased. In order to reduce the pressure on the created call center, a chatbot named TAXANA was created in 2018 for communication with the public, which works on the principle of automatic electronic responses. In 2019, an electronic record of sales called eKasa Ihnatišinová (2020) was also introduced. From 2022, two-way communication between the tax authority and tax subjects was introduced (until then, only electronic communication from tax subjects to tax authorities was possible) see Blahušiaková, Mateášová and Meluchová (2022). According to research by Gombár et al (2022), there should be a growth in the application of information and communication technologies within the framework of tax administration. In 2021, approximately 460,000 tax returns were filed electronically, which is an increase of approximately 5,800% compared to 2012 (at the same time, there was a decrease in the total number of tax returns filed by approximately 1%). The graph shows an increase in the share of electronic forms of filed tax returns, especially since 2018, which was influenced by the above-mentioned areas.

4. Conclusion

Currently, digitalization is considered one of the most significant influences that shape various aspects. One of these aspects is precisely public, i.e. financial administration. The problem, however, is that some states are not ready for deepening digitization, or there are significant differences between them. The reason is, for example, economic or cultural differences or the specifications of individual policies. The submitted paper deals with e-government research in the Visegrad Four countries. The countries of the Visegrad Group (Czech Republic, Slovakia, Poland and Hungary) are similar in the area of digitization. They use comparable technologies, and their level is also similar. Compared to other European Union countries, they achieve rather below average results. Although these countries have made progress in this area in the years under review, the progress is slow. It is recommended that these states start cooperating more intensively in this area and exchange their knowledge. The biggest obstacles and challenges of these countries include insufficient technological infrastructure, security and data protection, complex and outdated legislation, insufficient funding or insufficient digital literacy of citizens. States should deal with the gradual and effective modernization of digital infrastructure, including investments in the modernization of IT infrastructure, including high-speed Internet and cloud services. They should actively develop and improve their digital services to further increase digital literacy, including Investing in programs to increase digital literacy. At the same time, they should promote innovation in the field of digital technologies and strengthen cooperation between the public and private sectors in the development and implementation of digital technologies. In 2021, the European Union, which includes these states, presented a document called the 2030 Policy Program "Path to the Digital Decade", on the basis of which goals in the digital field are set. These goals include 80% having basic digital skills, every populated area covered by a 5G network, at least 75% of businesses using cloud services, and all key public administration services being available online for citizens, etc. To achieve these goals, the states should would focus more on deepening the current level of digitization of public administration and also increase the competence and digital capabilities of its citizens.

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European Competitiveness Strategy: Approaches and Challenges in Trade and Competitiveness Beyond 2030

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Abstract
This paper examines the European Union's competitive strategies and innovations, focusing on new directions beyond 2030. The EU has consistently endeavoured to enhance its competitiveness through internal market integration, innovations in clean technologies, and digitalisation, emphasising efforts to reduce barriers and increase efficiency within the single market. Amidst emerging global economic challenges and geopolitical shifts, the EU is prompted to strengthen its strategic autonomy and open trade further. This paper also discusses how the EU plans to utilise its regulatory and investment tools to support competitiveness in key industrial sectors, such as digital technologies and sustainable energy, and how it seeks to increase access to private capital and investments, crucial for financing innovations and green transitions. It analyses recommendations for optimising trade and investment policies to face future challenges better and enhance the EU's global influence.

Keywords: *Competitiveness, European Union, strategy, sustainability, trade*

JEL Classification: *E02, F02, O52, O53, P51*

1. Introduction

In today's global economy, the European Union faces challenges that require robust responses in competitiveness, trade, and sustainable development. This paper analyses and interprets EU strategies to enhance competitiveness and trade efficiency beyond 2030. Amid rising geopolitical tensions and economic barriers, it is crucial to understand how the EU strives to strengthen its economy while responding to environmental and technological changes. The objectives of the paper are to explore key EU strategy for enhancing competitiveness and trade efficiency; to assess the impacts of the strategy on the long-term sustainability and economic growth of the EU; to provide recommendations for improving future strategy based on the findings and trends observed. The structure of the paper contains a theoretical framework (overview of existing EU strategies and policies), methodology (description of the analytical and comparison methods), analysis and discussion (examination of implemented strategies and their effectiveness, and comparison with global standards and evaluation of impacts), conclusions (summary of key findings and policy recommendations). The paper employs descriptive and analytical methods to evaluate available data and literature from official EU documents, academic articles, and relevant reports. Descriptive analysis will be used to present current strategies and policies. A comparative analysis approach will focus on comparing these strategies with global trends and standards, which will allow the identification of areas where the EU excels and areas that require further improvement. The results will serve as the basis

for formulating recommendations to strengthen the EU's competitiveness and economic efficiency in an international context.

2. Theoretical Framework of Competitiveness and Trade Issue

Measuring and evaluating competitiveness have been at the forefront of economic interest in the last few years. Competitiveness is one of the most used words. Despite this expression's high frequency of usage, hardly anybody can precisely explain the correct meaning of the word competitiveness. The definition of competitiveness is a problematic issue because of the lack of a mainstream view of this term. Competitiveness is a fundamental criterion for evaluating the economic performance of an area (country/region) and reflects the success in wider (international/interregional) comparison. The concept of competitiveness is understood at different levels - microeconomic, macroeconomic, and regional, but there are differences between these approaches (Garelli, 2002; Krugman, 1994).

Competitiveness is a monitored characteristic of national economies, which increasingly appears when evaluating their prosperity, welfare,e and living standards. The need for a theoretical definition of competitiveness at the macroeconomic level emerged with the globalisation process in the world economy because of increased competition between countries. Even though the growth competitiveness of the territory belongs to the main priorities of countries' economic policies, there is no standardised definition or understanding of national competitiveness. The concept of competitiveness in the European Union (EU) is specific in that it includes elements of European integration beyond purely economic parameters. The concept of competitiveness has quickly spread to the regional level. In the global economy, regions are increasingly becoming the drivers of the economy. Generally, one of the most striking features of regional economies is the presence of clusters or geographic concentrations of linked industries (Porter, 2003). Within governmental circles, interest has grown into regional foundations of national competitiveness. New forms of regionally-based policy interventions have been developed to help improve the competitiveness of every region and major city and, hence, the national economy. Regions play an increasingly important role in the economic development of states.

Competitiveness evaluation is no less complex than the concept's definition and understanding. Creating a competitiveness evaluation system in terms of the EU is incredibly complicated by the heterogeneity of countries and regions and by its approach to the original concept of competitiveness. There is a space for alternative approaches because of the lack of mainstream view of competitiveness evaluation. Competitiveness evaluation in terms of differences between countries and regions should be measured through complex economic, social, and environmental criteria that can identify imbalanced areas that cause main disparities. Quantitative and qualitative development at the national level, especially at the regional level, increases socio-economic attraction and creates new opportunities for overcoming inequalities and improving the territory's competitiveness.

External competitiveness is paramount for a nation's success in international trade. It reflects a country's capacity to efficiently produce goods and services that meet global market demands. This involves maintaining high levels of productivity, innovation, and quality standards. A robust external competitiveness enables countries to offer competitive prices and attract customers worldwide, contributing to trade expansion and economic growth. Moreover, it influences trade balance and policy decisions as governments strive to enhance competitiveness through strategic investments and participation in trade agreements. Cultivating external competitiveness is essential for countries to thrive in the increasingly competitive global marketplace.

The link between competitiveness and trade is fundamentally rooted in how economies produce, exchange, and consume goods and services domestically and internationally. Competitiveness essentially refers to an economy's capacity to provide economic goods and services in a manner that is profitable in the global market while simultaneously maintaining or increasing the real income of its citizens. This relationship is pivotal for understanding the dynamics of international trade, economic growth, and sustainable development. Table 1 summarises the theoretical connections between competitiveness and trade, highlighting how different aspects influence trade dynamics.

Table 1: Theoretical Connections Between Competitiveness and Trade

Aspect of Competitiveness	Connection to Trade
Productivity and Efficiency	Enhances the ability to produce goods and services at competitive prices, quality, and speed, directly influencing trade by making products more attractive on the international market. Enhances market responsiveness and adaptability.
Innovation and Market Entry	Drives the development of new products and services, opening new markets and expanding existing ones. Innovation leads to higher value-added products, increasing profitability and market share in global trade.
Quality Standards and Branding	Ensures compliance with international quality standards, crucial for gaining and maintaining access to tightly regulated markets. High standards improve international branding and consumer trust, thereby expanding trade opportunities.
Economic Policies and Trade Agreements	Robust economic policies and involvement in trade agreements enhance trade by stabilising the economic environment, protecting investments, and reducing trade barriers. These policies foster both domestic and foreign investment.
Human Capital Development	Focuses on creating a skilled workforce that can innovate and operate efficiently in a global market. A well-trained workforce is crucial for maintaining competitiveness and enhancing the capacity to engage in complex, high-value international trade.
Market Size and Domestic Demand	Larger domestic markets provide economies of scale and testing grounds for innovation, reducing costs and fostering the initial growth necessary for international expansion. Strong domestic demand drives the economy's international trade agenda.

Source: Own elaboration (2024)

Table 1 presents a detailed exploration of the multifaceted connection between competitiveness and trade, elucidating pivotal factors like productivity, innovation, quality standards, economic policies, human capital development, and market size. These elements collectively shape a nation's capacity to excel in the global marketplace, exerting profound

influences on its trade dynamics. Serving as a fundamental blueprint, the table aids in formulating robust economic strategies aimed at bolstering international competitiveness. Additionally, it leverages insights from esteemed authors in the field, such as Michael Porter, Richard Rumelt, Gary Hamel, W. Chan Kim and Renée Mauborgne, Clayton Christensen, and John Kay. Their seminal contributions enrich our comprehension of business dynamics and competitiveness within the global arena.

The authors referenced for creating Table 1 offer invaluable perspectives on various facets of international business and competitiveness. Michael Porter's seminal works, "Competitive Strategy: Techniques for Analysing Industries and Competitors" (1998a) and "Competitive Advantage: Creating and Sustaining Superior Performance" (1998b), establish foundational concepts like Porter's Five Forces model and competitive advantage. Richard Rumelt's "Good Strategy Bad Strategy: The Difference and Why It Matters" (2011) delineates effective strategies from ineffective ones through real-world illustrations. Gary Hamel's "Leading the Revolution" (2002) underscores the imperative of innovation in transcending traditional business paradigms. Similarly, W. Chan Kim and Renée Mauborgne's "Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant" (2015) advocates for innovative approaches to avoid competitive environments. Clayton Christensen's "The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail" (2001) offers insights into why successful firms falter in the face of emerging technologies and suggest strategies to mitigate risks. Lastly, John Kay's "Foundations of Corporate Success" (2003) delves into the fundamental factors underpinning business success, emphasising the significance of long-term strategic thinking in achieving sustainable competitiveness on the global stage.

3. EU Competitiveness in the Context of the Single Market

Competitiveness refers to the ability of a company, region, or country to produce goods and services that meet the quality standards of the local and global markets while maintaining or increasing the income of its people. At its core, competitiveness is about value creation and efficiency, ensuring that an entity can sustainably preserve or improve its position in the market relative to its competitors.

The European integration process is guided by striving for two different objectives: to foster economic competitiveness and reduce regional disparities. The economy may be competitive, but the country will face significant difficulties if society and the environment suffer too much. The same problem would happen vice versa when the economy is too weak. Therefore, governments, in the long run, cannot focus alone on the economic competitiveness of their country. Instead, they need an integrated approach to govern the country and to contribute to competitiveness from a broader perspective (Staníčková, 2012; Melecký, 2022).

The topic of EU competitiveness within the context of the EU Single Market is broad and complex, involving multiple economic, social, and policy dimensions. This relationship is pivotal because the Single Market is designed to be a space where goods, services, capital, and labour can move freely among the EU member states, thus increasing efficiency, stimulating trade, enhancing productivity, and fostering economic growth across the region.

Key Aspects of EU Competitiveness and the Single Market

1. **Economic Integration**: The EU Single Market integrates member states' economies, allowing businesses to operate on a larger scale. This integration boosts competitiveness by providing access to a broader consumer base and facilitating the efficient allocation of resources.

2. **Regulation and Standards**: The EU-wide regulations and standards help level the playing field and enhance competitiveness by ensuring that all players meet minimum quality and safety standards. This prevents a "race to the bottom" where countries or companies compete by lowering standards.
3. **Innovation and Technology**: The Single Market promotes innovation through increased competitive pressure and larger potential markets for new products. It also supports collaborative research and development projects across member states, funded through mechanisms like Horizon Europe.
4. **Free Movement**: One of the cornerstones of the Single Market is the free movement of goods, services, capital, and people. This mobility allows for an optimal distribution of labour and capital, matching skills and investment with opportunities, thus boosting productivity and competitiveness.
5. **Economic Cohesion**: Through EU funds, the EU aims to reduce regional disparities in income and opportunity, enhancing overall competitiveness. Well-coordinated policies ensure that less developed regions are not left behind.

Challenges to Competitiveness in the Single Market

1. **Divergent National Regulations**: Despite efforts at harmonisation, significant differences in national regulations can still exist, complicating the business environment and reducing the overall efficiency of the Single Market.
2. **Non-Tariff Barriers**: Non-tariff barriers such as differing national standards or administrative procedures can still impede the free flow of goods and services, limiting the effectiveness of the Single Market in boosting competitiveness.
3. **Economic Asymmetries**: Economic and social asymmetries between EU member states can lead to competitive imbalances, where richer countries benefit more from the Single Market than poorer ones.
4. **External Economic Shocks**: Global economic uncertainties and external shocks can disproportionately affect the EU, challenging the competitiveness of its economy. How well the EU responds to such shocks can test its economic resilience.

The EU's competitiveness is intricately linked to the functioning and deepening of the Single Market. The continuous evolution of policies to promote integration, innovation, and inclusivity is essential for sustaining the EU's competitive edge in the changing global economy.

4. EU Competitiveness Strategy Beyond 2030: Trade Context

The current orientation of the European Commission is focused on envisioning the future of the EU's competitiveness as it celebrated the 30th anniversary of the Single Market in the last year, i.e. 2023. This strategic vision emphasises the integral role of the Single Market in boosting the EU's economic vitality and global standing. It highlights how the Single Market has historically served as the engine of economic prosperity and innovation within the EU, underpinning the economic and social fabric of the Union. The European Commission details the achievements of the Single Market in enhancing the free movement of goods, services, capital, and labour, which have collectively contributed to significant increases in the EU's GDP.

The document outlines a proactive strategy for the EU to enhance its long-term competitiveness in the context of current global challenges, including geopolitical tensions, technological disruptions, and environmental concerns. It stresses the EU's need to adapt its economic and regulatory frameworks to remain competitive in an increasingly digital and

green economy. The strategy emphasises reinforcing the digital single market, boosting digital infrastructure, and fostering a supportive environment for digital innovations. Additionally, it discusses the importance of transitioning to a greener economy through sustainable practices and technologies that align with the European Green Deal's objectives.

The European Commission also addresses the need for structural reforms to strengthen the EU's economic resilience and adaptability. It proposes enhancing the regulatory environment to better support businesses, particularly SMEs, in navigating market challenges and capitalising on new opportunities. The strategy underscores the significance of continuous investment in human and physical capital to ensure sustained growth and competitiveness. Furthermore, it calls for a collaborative approach among EU member states to harmonise policies and share best practices, ensuring that the Single Market continues to be a cornerstone of EU competitiveness and a catalyst for economic integration and prosperity beyond 2030.

The European Commission provides an in-depth analysis and strategic framework to enhance the European Union's long-term competitiveness. It identifies the critical need for the EU to adapt to an evolving global landscape characterised by technological advancements, shifting geopolitical dynamics, and pressing environmental challenges. The document emphasises the importance of strengthening the EU's economic foundations through innovation, digital transformation, and sustainable practices to maintain and enhance its position in the global economy.

Central to the strategy outlined is the focus on bolstering the internal market while promoting open and fair trade externally. It highlights the EU's commitment to deepening the Single Market, enhancing economic integration, and removing barriers that hinder cross-border trade and investment within the EU. The strategy advocates for significant investment in digital infrastructure and skills development to foster a more connected and technologically advanced European economy. This includes support for high-tech sectors like artificial intelligence, biotechnology, and clean energy, which are pivotal for future growth and competitiveness.

Furthermore, the European Commission underscores the need for a resilient economic framework to withstand and adapt to external shocks and stresses. It calls for robust policies that support economic stability, including fiscal sustainability and labour market reforms. The strategy also emphasises the importance of social inclusion and cohesion, advocating for measures that ensure all regions and communities within the EU benefit from economic growth and technological progress. By aligning economic policies with social goals, the EU aims to enhance its competitiveness and ensure that this competitiveness is sustainable and inclusive, supporting a prosperous future for all its citizens.

For several reasons, the strategic approach outlined in the EU's long-term competitiveness plan is paramount for EU trade. This strategy aims to enhance the EU's global trade position, improve the internal market's efficiency, and ensure that the EU remains a competitive and influential player in the international arena. Table 2 encapsulates the importance of the EU's long-term competitiveness strategy for EU trade, highlighting how each strategic area supports and enhances trade activities.

Table 2: Importance of the EU's Long-Term Competitiveness Strategy for EU Trade

Strategic Area	Importance for EU Trade
Strengthening the Single Market	Facilitates intra-EU trade by reducing barriers and simplifying regulations, making the EU an attractive destination for foreign investments.
Access to Capital and Investment	Enables innovation and business expansion, supporting cross-border activities and economic interconnectivity within the EU.
Promoting Research and Innovation	Maintains the EU's competitive edge globally and drives the development and diversification of products, enhancing trade capacities.
Sustainable and Digital Transitions	Ensures long-term sustainability and prepares the EU for future digital trade needs, enhancing resilience and competitiveness in global markets.
Education and Skills Development	Develops a skilled workforce that can adapt to and meet the demands of modern industries, crucial for maintaining productivity and competitiveness.
Trade and Open Strategic Autonomy	Balances openness in trade with strategic autonomy, reducing dependencies and strengthening the EU's negotiating position in international trade.

Source: European Commission (2023); Own elaboration (2024)

Table 2 highlights how interconnected and essential each strategic area is in enhancing the EU's trade capabilities, ensuring it remains a robust and competitive force in the global economy. In line with such challenges, the European Union must shift from reactive crisis management to proactive long-term planning to enhance its international competitiveness. This transition is significant in recent crises such as the COVID-19 pandemic and geopolitical tensions that have underscored the need for resilience and adaptability in the EU's economic strategy. The document outlines the EU's focus on integrating competitiveness into its policy framework across all sectors, emphasising the importance of a coordinated approach to ensure that the EU's economy is recovering and poised for future growth and stability.

The strategy elaborates on various drivers identified as key to bolstering the EU's competitiveness, including the deepening of the Single Market, promoting innovation through increased investment in research and development, and enhancing digital and energy infrastructures (Houbrechts, Druta, and Ledure, 2023). These drivers are supported by developing a robust regulatory environment that facilitates business operations and encourages investment. Furthermore, the strategy highlights the need for sustainable economic growth that aligns with the EU's environmental goals, illustrating how competitiveness and sustainability are increasingly intertwined in policy considerations.

The European Commission suggests specific actions and reforms at the EU and member state levels to implement this long-term vision. It calls for improved governance structures to enable more effective policy coordination and faster implementation of reforms. The strategy also recognises the critical role of education and workforce development in sustaining economic competitiveness, advocating for policies that enhance skills and adapt the labour market to the

needs of a dynamic and innovative economy. The European Commission sets a roadmap for the EU to advance its economic agenda, ensuring that competitiveness remains at the heart of its policy-making process to meet current and future challenges.

Long-term competitiveness of the EU: looking beyond 2030 highlights various pivotal points aimed at boosting the competitiveness of the European Union as it looks towards the future beyond 2030 through nine strategic areas, see Figure 1.

Figure 1: Boosting Competitiveness Beyond 2030

Source: European Commission (2023)

1. **Functioning Single Market**: The strategy emphasises the importance of fully harnessing the potential of the Single Market by reducing barriers and ensuring seamless cross-border operations for goods, services, capital, and labour. This includes uniformly enforcing EU rules and regulations across all member states to avoid market fragmentation and inefficiencies.
2. **Access to Private Capital and Investment**: Recognising the critical role of finance in competitiveness, the EU aims to deepen the Capital Markets Union and complete the Banking Union to facilitate more accessible access to diverse financing options for businesses across member states, thus fostering a more integrated financial market.
3. **Public Investment and Infrastructure**: There is a strong focus on upgrading infrastructure to support competitiveness. This includes modernising transport, digital, and energy networks to enhance the efficiency and sustainability of economic activities across the EU.
4. **Research and Innovation**: The EU plans to significantly increase investment in research and innovation, focusing on strategic areas like digital technologies, clean energy, and biotechnology. This also involves creating synergies between public and private sectors to drive technological advancements and economic growth.

5. **Energy Transition and Efficiency**: The strategy includes accelerating the shift towards renewable energy sources, improving energy efficiency, and ensuring the resilience of energy supply to enhance sustainability and reduce dependency on external energy sources.
6. **Circularity and the Circular Economy**: The EU aims to promote a more circular economy by reducing waste, increasing resource efficiency, and transitioning to sustainable consumption and production patterns. This involves setting stringent eco-design requirements and fostering recycling and reuse across the value chain.
7. **Digitalisation**: Enhancing the digital infrastructure and capabilities of the EU economy is crucial. The strategy calls for broad adoption of digital technologies across all sectors, support for digital innovation, and ensuring that digital transitions benefit businesses and consumers.
8. **Education and Skills Development**: The EU recognises the need to continuously upgrade the skills of its workforce to meet future job market demands. This involves adapting education systems, promoting lifelong learning, and aligning training programs with market needs to ensure a skilled and adaptable workforce.
9. **Trade and Open Strategic Autonomy**: The strategy aims to strengthen the EU's global trading position by promoting open and fair trade, diversifying supply chains, and enhancing the EU's capacity to act independently in strategic economic sectors. This includes fostering relationships with key global partners and advancing a rule-based international trading system.

These nine strategic points collectively aim to create a robust framework that addresses current challenges and anticipates future economic shifts, ensuring the EU remains globally competitive and well-positioned for the decades ahead (Houbrechts, Druta, and Ledure, 2023). Table 3 summarises the Key Performance Indicators (KPIs) for the nine strategic areas outlined in the EU's long-term competitiveness strategy. The KPIs are designed to measure the effectiveness and progress in implementing the EU's strategic goals. The KPIs are the leading performance metrics that the EU will monitor and strive to improve as part of its strategy to boost competitiveness. The KPIs provide concrete targets that help track the success of initiatives and guide future policy adjustments to ensure the EU's economic, digital, and environmental goals are met.

In future research on EU competitiveness, it is essential to address several key challenges that affect the economic, political and social context of the Union. One of the main areas of investigation should be digitalisation and innovation, which bring new opportunities and challenges for European businesses and the economy. This research should explore strategies to support the digital transformation of industry and services to improve digital infrastructure while addressing issues related to cyber security and regulation of the digital environment. It should also explore the challenges of the climate crisis and sustainability, including investment in clean energy, renewables, and green technologies, to ensure the EU's competitiveness in global efforts to combat climate change and sustainable development.

Another key theme for future research is to explore the impact of globalisation and international trade relations on EU competitiveness. This research should analyse the EU's current trade policies, strategies to strengthen European businesses' international competitiveness, and the opportunities and challenges associated with trade relations with major global partners. At the same time, examining social and labour market challenges, including demographic change, labour migration, and the need for new skills in a changed economic environment, is essential. Ensuring inclusive growth and social justice through education, retraining and promoting flexible working patterns are key to strengthening EU competitiveness and maintaining social cohesion within the Union.

Table 3: KPIs for Monitoring the EU's Long-Term Competitiveness Strategy

Area	Key Performance Indicator (KPI)	Target	Latest Available Data
1. Functioning Single Market	Integration in the Single Market (trade vs GDP)	Increase to reflect enhanced integration	23.5% for goods, 6.75% for services (2021)
	Conformity deficit	Reduce to 0.5%	1.3% (2021)
2. Access to Private Capital and Investment	Net private investment as a share of GDP	Increase	3.2% (2021)
	Venture capital investment	Increase	0.48% (2021)
3. Public Investment and Infrastructure	Public investment as share of GDP	Increase	3.2% (2022)
4. Research and Innovation	R&D intensity % GDP	>3% beyond 2030	2.26% (2021)
	Number of patent applications	Increase	67,713 (2021)
5. Energy Transition and Efficiency	Share of energy from renewable sources	45% by 2030	21.77% (2021)
	Electricity prices for non-household consumers	Reduce and stabilise	EUR 0.1604 per kWh (1st Semester 2022)
6. Circularity and the Circular Economy	Circular material use rate	Double by 2030 compared to 2020	11.7% (2021)
7. Digitalisation	Digital intensity of Union SMEs	90% by 2030	69% (2022)
	Digital technologies adoption by companies	75% by 2030	AI 7.9%, Big data 14.2%, Cloud services 41% (2021)
8. Education and Skills Development	Adult participation in education and training every year	60% by 2030	37% (2016)
	Adult employment rate	78% by 2030	73% (2021)
	ICT specialists (female and male)	20 million by 2030	8.5 million, 19.1% women (2021)
9. Trade and Open Strategic Autonomy	Trade with the rest of the world (as a share of GDP)	Increase	21.5% (2021)

Source: European Commission (2023); Own elaboration (2024)

5. Conclusion

Based on the findings and trends observed in the "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Long-term Competitiveness of the EU: Looking Beyond 2030," several recommendations can be made for improving future strategies: (1) Investment in Innovation and Digitalisation: Prioritise investment in innovation and digitalisation to foster

competitiveness in key sectors. This includes increasing funding for research and development, supporting digital skills development, and promoting adopting emerging technologies such as artificial intelligence and blockchain. (2) Promotion of Sustainable Growth: Emphasise the importance of sustainability in economic growth by integrating environmental and social objectives into EU policies. This involves setting ambitious targets for reducing carbon emissions, promoting circular economy practices, and supporting the transition to renewable energy sources. (3) Enhancement of Education and Skills Development: Strengthen education and skills development initiatives to ensure a highly skilled workforce capable of driving innovation and competitiveness. This includes investing in lifelong learning programs, promoting STEM (science, technology, engineering, and mathematics) education, and fostering collaboration between academia and industry. (4) Facilitation of International Trade and Cooperation: Foster international trade agreements and cooperation initiatives to expand market access for EU businesses and promote a level playing field in global trade. This includes advocating for fair trade practices, reducing trade barriers, and enhancing diplomatic relations with key trading partners. (5) Support for SMEs and Entrepreneurship: Provide targeted support for small and medium-sized enterprises (SMEs) and entrepreneurs to stimulate innovation and job creation. This involves simplifying regulatory frameworks, increasing financing and venture capital access, and promoting entrepreneurship education and mentoring programs. (6) Investment in Infrastructure and Connectivity: Prioritise investment in modern infrastructure and digital connectivity to improve the EU's competitiveness and facilitate economic growth. This includes upgrading transport networks, expanding broadband coverage, and promoting digitalisation in public services. (7) Promotion of Regional Development and Cohesion: Address regional disparities within the EU by promoting inclusive growth and fostering regional development and cohesion. This involves implementing targeted investment strategies in less developed regions, supporting local entrepreneurship and innovation ecosystems, and promoting cross-border cooperation initiatives. By implementing these recommendations, the EU can strengthen its long-term competitiveness and position itself as a global leader in innovation, sustainability, and economic growth beyond 2030. These strategies should be integrated into the EU's policy framework and supported by adequate funding and regulatory measures to ensure effective implementation.

Considering the EU's Competitiveness Strategy Beyond 2030, and the change from crisis management to long-term vision, it's essential to complement the recommendations with a focus on strategic resilience and adaptability. Firstly, fostering a culture of resilience within the EU institutions and member states is crucial. This involves developing mechanisms for anticipating and responding to future crises, whether economic, environmental, or geopolitical. Investing in robust crisis management frameworks, including early warning systems and contingency plans, can enhance the EU's ability to navigate uncertainties and maintain its competitive edge in adversity.

Secondly, aligning long-term vision with short-term actions is essential for effective strategy implementation. While setting ambitious goals for 2030 and beyond, it's equally important to identify concrete steps that can be taken in the short term to advance competitiveness. This includes prioritising policy coherence and coordination across different policy areas, streamlining decision-making processes, and fostering public-private partnerships for innovation and investment. By bridging the gap between long-term aspirations and immediate actions, the EU can ensure its competitiveness strategy remains agile, responsive, and impactful in the ever-evolving global landscape.

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Performance of EU Member States in the Farm to Fork Goals

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Abstract
Green Deal Strategy targets for agriculture are defined in the Farm to Fork and Biodiversity Strategies: pesticides reduction; nutrient losses and fertilizers reduction; enlargement of area under organic farming; antimicrobials reduction; landscape features for diversity; internet in rural areas. The aim of the paper is to assess the performance of EU Member States in those goals. MS are grouped according to 6 indicators by hierarchical cluster analysis (Ward's method with Canberra distance) into 3 groups. Pesticides reduction can be reached by the MS in cluster 3 where the sales of it is already the lowest. Similarly, the fertilizers reduction could be achieved here, as the use of nitrogen and phosphorus is the lowest. There is also the highest share of the land under organic agriculture already. The biodiversity investments and internet coverage are the highest in cluster 1. However, the real attainability of goals is debatable.

Keywords: *Cluster Analysis, EU Member States, Farm to Fork Strategy, Ward's method*

JEL Classification: *Q28, C38, Q57*

1. Introduction

The European Commission (EC) has introduced a strategy aiming on better environment and climate-neutral continent by 2050 – Green Deal (COM(2019)640 – EC(2019)). The targets for agriculture are defined in the Farm to Fork (F2F) and Biodiversity Strategy (BS):

1. Reduce by 50% the overall use and risk of chemical pesticides and reduce use by 50% of more hazardous pesticides by 2030.
2. Achieve at least 25% of the EU's agricultural land under organic farming and a significant increase in organic aquaculture by 2030.
3. Reduce sales of antimicrobials for farmed animals and in aquaculture by 50% by 2030
4. Reduce nutrient losses by at least 50% while ensuring no deterioration in soil fertility; this will reduce use of fertilisers by at least 20 % by 2030.
5. Bring back at least 10% of agricultural area under high diversity landscape features by 2030.
6. Achieve 100% access to fast broadband internet in rural areas by 2025.

The purpose of F2F is to make food systems fair, healthy and environmentally friendly. The BS aims to build our societies' resilience to future threats such as the impacts of climate change, food insecurity, and disease outbreaks. Food system should be sustainable, have a neutral or positive environmental impact, help to mitigate climate change and adapt to its

impacts, reverse the loss of biodiversity, ensure food security, nutrition and public health. (EC, 2024). "The green deal, a strategy programme by the European Commission, intends to "green" the EU activities and re-orient policies and laws for the years to come, in areas such as climate and energy, agriculture and fisheries, products and services, and trade and foreign policy, the most important announcement being the adoption of an EU climate law which will ensure EU climate neutrality by 2050." (Krämer, 2020).

The achievement of the goals is controversial, because it can be done only with large costs for agricultural producers and can affect the functioning and viability of agricultural sector. The impacts on the situation of European Union's farms can be various and is a subject of many studies – see e.g. comparison of those studies in Šimpachová Pechrová and Šimpach (2022). Similarly, as Stoicea et al. (2022), they also found out that "the implementation of the Farm to Fork strategy will lead to a significant decrease in agricultural production in the EU and an increase in food prices". According to Wesseler (2022) the F2F strategy "negatively affects aggregate consumer surplus and – depending on the assumption made – a net increase or decrease in producer surplus, thereby inducing an overall net welfare loss", but also can bring environmental benefits.

Our current analysis focuses on the question whether the aims of the strategies are to be achieved on the EU level. In this regard also some studies have been elaborated. Heyl et al. (2023) assessed the extent to which the measures proposed by the Farm to Fork Strategy, i.e., digital precision fertilization and sustainable agricultural practices, contribute to the nutrient reduction objective of the Farm to Fork Strategy in Germany and found that there are some shortcomings.

The study of Stoicea et al. (2022) analysed the usage of fertilizers and plant protection substances in Romania, Germany, France, Poland, Hungary and the United Kingdom (European countries cultivating cereals, technical plants and oleaginous plants) in the period 2010–2019. Practical solutions to manage carbon in the agricultural sector (minimal or zero tillage, carbon sequestration in soils, biogas and biomethane production, growing perennial crops and agroforestry) seeks the research of Bumbiere et al. (2022).

Analysis of Vistarte et al. (2023) of Latvian Common Agricultural Policy Strategic Plan shows that its objectives that are associated with European Union policies, such as the National Energy and Climate Plan, European Green Deal, and Farm to Fork strategy, are more likely to succeed than objectives not connected to these or similar policies.

2. Problem Formulation and Methodology

Each EU Member State has different type and magnitude of the agriculture. Hence, some MS are closer to the fulfilment of the goals of F2F and BS strategies than the others. Grouping countries according to whether they are similar in how far they are in meeting the goals can help formulate concrete steps to meet the goals of the Strategy at EU level. The creators of the common agricultural policy will get an idea of how far individual groups of countries are in meeting the goals and will be able to formulate procedures for achieving the goals. It is more efficient to work with groups of states than with each member state separately. Therefore, we used hierarchical cluster analysis to create 3 similar groups of MS.

2.1 Data

The data were downloaded from Eurostat. The first aim is to reduce the pesticides. The data about usage of pesticides are available only for each type of pesticides separately and there are many missing values. Therefore, the data about *Sales of pesticides by type of pesticide [tai02]*

were utilized. We expect that sold pesticides are all used. Second target wants the increase of the area under organic farming, so *Organic crop area by agricultural production methods and crops [org_cropar]* table was obtained.

The data for the third aim of decrease of antimicrobials sales were not available at Eurostat, so we could not include it in the analysis. Usage of fertilizers as the fourth target was represented by *Consumption of inorganic fertilizers [aei_fm_usefert]* – nitrogen and phosphorus. To assess the biodiversity target, the proxy had to be used. Particularly we chose the expenses on the protection of biodiversity and landscapes that are available in table *Environmental protection investments of general government by environmental protection activity [env_ac_epigg1]*. Finally, the coverage by the Broadband internet had to be also adjusted, because the data from Eurostat were not distinguished for the rural areas. Therefore, we took the overall percentage for the whole state. According to different definitions the Broadband shall have certain speed (at least 1, 3 or 10 Mbps), so we took the data about coverage by the internet with speed more than 100 Mbps from table *Broadband internet coverage by speed [isoc_cbs]*.

The states were selected according to the data availability. All data were available for Belgium Bulgaria, Czechia, Germany, Estonia, Ireland, Croatia, Latvia, Lithuania, Luxembourg, Hungary, the Netherlands, Portugal, Romania, Slovakia and Sweden. Similarly, some data were available for year 2022 already (sales of pesticides and internet coverage), but mostly year 2021 was used. Environmental protection investments to biodiversity were available only for year 2020 the latest.

2.2 Cluster Analysis

The aim of the clustering methods is to group the objects (e. g. MS in our case) according to their similarity in certain variables (indicators of F2F and BS strategies). Clustering techniques can be divided into two categories: non-hierarchical and hierarchical. Hierarchical clustering has the advantage that it does not require the specification of the number of clusters as it can be specified later after the clustering process is completed. The visualisation of this process is done in so-called dendrogram which displays a general similarity structure of the data. "The lower in the dendrogram two observations are merged, the more similar they are." (Cabezas, Izbicki and Stern, 2023). The number of clusters is determined by cutting a dendrogram at a given height.

There are various linkage methods defining how the points are merged and various ways how to calculate distances between objects. The overview of the clustering methods can be found e.g. in Everitt et al. (2011).

We choose hierarchical agglomerative approach where the clustering procedure is forming hierarchical groups of mutually exclusive subsets, each of which has members that are maximally similar with respect to the chosen indicators. "Given n sets, this procedure permits their reduction to $n - 1$ mutually exclusive sets by considering the union of all possible $n(n - 1)/2$ pairs and selecting a union having a maximal value for the functional relation, or objective function, that reflects the criterion chosen by the investigator." (Ward, 1963). This process repeats until only one group remains.

Particularly we choose Ward's method (minimum sum of squares method) that merges the clusters with minimal within-cluster sum of squared deviations from objects to centroids. This method tends to create same-size spherical clusters, but it is sensitive to outliers (Everitt et al.,2011).

The distance between objects was calculated by Canberra approach as for example in Šimpach and Pechrová (2016). Canberra metric a_{jk} is a dissimilarity coefficient defined in interval

$a_{jk} = \langle 0;1 \rangle$, where $a_{jk} = 0.0$ means maximum similarity when objects *j* and *k* are identical. "Each term in the sum is scaled between 0.0 and 1.0 equalizing the contribution of each attribute to overall similarity" (Romesburg, 2004). Multiplier $1/n$ averages the *n* proportions (1):

$$a_{jk} = \frac{1}{n} \sum_{i=1}^{n} \frac{\left| X_{ij} - X_{ik} \right|}{\left(X_{ij} + X_{ik} \right)}, \tag{1}$$

where X_{ij}, X_{ik} are real values of particular variable *i* for objects *j* or *k*. The data had to be normalized, because they were measured in different units and magnitude. We used Z-transformation (2) as recommended by Löster (2017).

$$Z = \frac{X - \mu}{\sigma}, \tag{2}$$

where X is real value of particular variable, μ is arithmetic mean and σ is standard deviation of all values of the variable. Z is transformed (normalized) variable.

The dendrogram was visualized and cut in height that 3 groups of MS were created. The characteristics of each group were then described using basic statistical methods. The calculations were done in Stata 15.1 software.

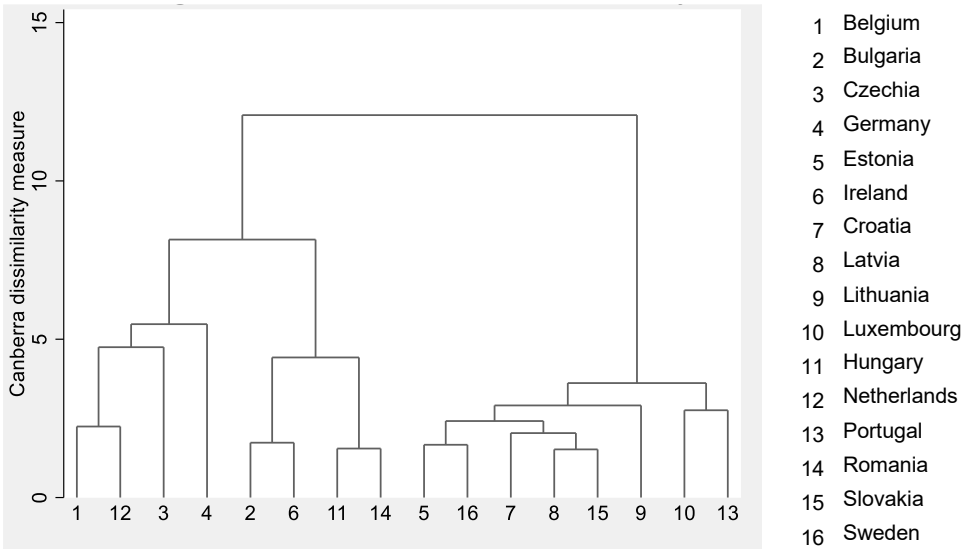
3. Problem Solution

The aim of the paper is to assess the performance of EU MS in the F2F and BS goals. The highest sale of pesticides and usage nitrogen fertilizer in absolute terms was in Germany. The highest usage of phosphorus fertilizer was in Romania. However, when we recalculated those indicators on 1 hectare of utilized agricultural area (UAA), the highest sale of pesticides per ha was in Belgium, the highest usage of nitrogen fertilizer was in the Netherlands and of phosphorus in Ireland. Therefore, those 3 states are the furthest from the fulfilment of the set goals. On the other hand, the lowest sale of pesticides and usage of nitrogen and phosphorus fertilizers in absolute terms was in Luxembourg. When recalculated per ha of UAA, the lowest sale of pesticides was in Romania, and usage of nitrogen in Portugal and of phosphorus in Luxembourg.

The highest environmental protection investments of general government to biodiversity had the Netherlands in absolute and relative terms. The highest share of land under organic farming (full or in transition) was in Estonia, Sweden and Portugal. The highest coverage by broadband internet was in the Netherlands, Belgium and Hungary. No state was the best in all indicators, but the Netherlands and Portugal fulfilled the most of them.

Consequently, the states were put into the groups according to their similarity in these indicators. The normalization of the variables was done (we deduct arithmetic mean from the value of the variable and divided it by standard deviation) because each indicator is in different units. Hierarchical cluster analysis approach is displayed at dendrogram in Figure 1. The most similar were Hungary and Romania, and Latvia and Slovakia, because they were merged together at the lowest. The dendrogram was cut at the height of 7 in order to create 3 groups.

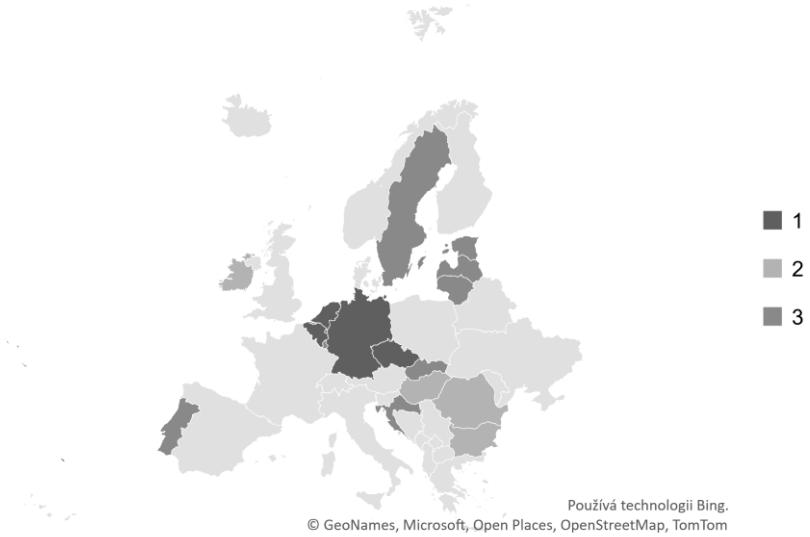
Figure 1: Dendrogram for Cluster Analysis (Ward´s linkage, Canberra Distance)



Source: Own elaboration (2024)

First group includes Belgium, Czech Republic, Germany, and the Netherlands. Second group contains Hungary, Romania, Bulgaria and Ireland. From Figure 2 is visible that MS in both groups are geographically close to each other (with exception of Ireland). To the third group belongs the rest of the analysed countries: Estonia, Lithuania, Latvia, Croatia, Portugal, Luxembourg, Slovakia, and Sweden. From dendogram in Figure 1 can be seen that there is a subgroup of Luxembourg and Portugal and that also Lithuania is merged to other MS later.

Figure 2: Member States of the European Union Clustered According to the Targets of Farm to Fork and Biodiversity Strategies



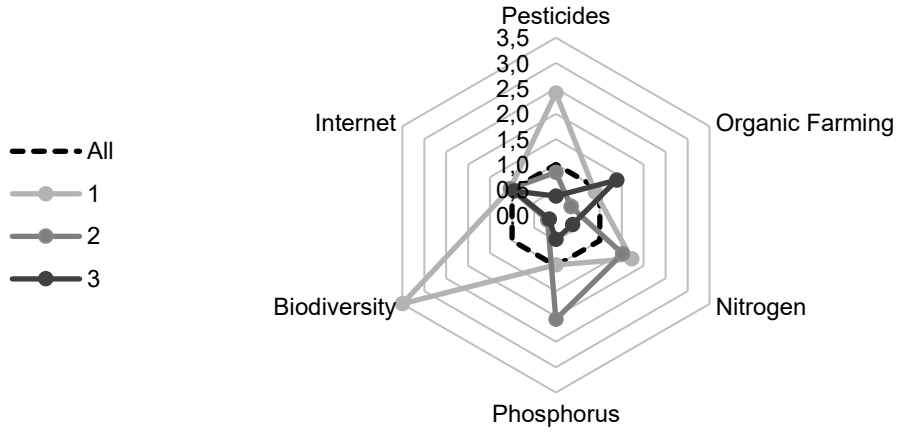
Source: Own elaboration (2024)

Consequently, the clusters were described by arithmetic mean of each indicator. The results are displayed in Table 1 in Appendix. Then the mean for all MS was calculated and the clusters were compared to it. The mean was considered as the base (1, or 100%) and the deviations from the mean were calculated and displayed in spider graph in Figure 3. This graph has advantage that it clearly shows which cluster of Member States is above or below average in which indicator.

The sales of the pesticides and usage of the nitrogen which is the highest from all groups is the most significant for the first cluster. On the other hand, the investments into the biodiversity measures are the largest, because in Germany and the Netherlands invested over 200 mil. euro in year 2020. Belgium invested over 100 mil. euro and the Czech Republic almost 100 mil. euro. Therefore, the difference compared to other countries is huge. The coverage by broadband internet is high thanks to the Netherlands and Belgium.

MS in the second cluster have average values in all indicators with exception of phosphorus usage – there is the highest usage from all; especially thanks to Romania. MS in the third group use the pesticides and both fertilizers the least. However, they invest the least to the biodiversity measures. And the coverage by the broadband internet is also the lowest. Only the share of the land under organic farming was the highest in this cluster; especially thanks to Estonia and Sweden.

Figure 3: Spider Graph of the Member States in Clusters 1, 2, 3 – Comparison to the Mean of all Member States (= 1)



Source: Own elaboration (2024)

The targets of minimization of usage of pesticides, nitrogen and phosphorus are the most probable to be achieved in the third cluster, where the average usage in tons is the lowest. Also, there is the highest share of utilized agricultural land under organic farming in those countries. Nevertheless, the share is only 14% which is still far from desired 25%. There must be further steps taken. As found out by Righi and Viganò (2023) "it is necessary to increase professionalisation and improve the current organization of agricultural enterprises in order to improve their efficiency, market competitiveness and profitability". It is also necessary to improve the qualification, skills and knowledge to achieve more sustainable agrifood system.

Regarding the nitrogen usage reduction (by at least 20% by 2030), also the impact on the agricultural production must be considered. For example, Šimpach and Šimpachová Pechrová

(2022) found out that, when linear function is used, the decrease of fertilization by 20% will cause decrease of yields of selected crops by 10%.

The investments to biodiversity were the highest in the first group. Sanchéz-Fernandéz et al. (2018) found "clear overall associations between conservation investments and biodiversity variables", but some countries received more / less investment than would be expected based on their biodiversity values. Hence, the distribution of support for F2F and BS Strategies targets is also important. As noted by Pechrová (2014), the subsidies can help to increase the operating surplus of the agricultural sector and profitability of agricultural holdings through increasing profitability of commodities. On the other hand, this can lead to the increased reliance of beneficiaries on external financial support.

Nevertheless, the targets of both Strategies are very ambitious, and their achievement is difficult, costly, and controversial due to the impacts on farmers, consumers and agricultural and food sector. According to Wesseler (2022) policy makers have implicitly concluded that the additional net benefits of the F2F strategy outweigh the losses in consumer surplus, but this cannot happen without further technological and institutional changes, such as supporting the application of modern biotechnology by reducing regulatory hurdles. There might also be certain adjustments in the goals in the future. We cannot therefore clearly conclude about whether the EU (and its MS) will or will not achieve the goals.

4. Conclusion

The aim of the paper was to assess the performance of EU MS in the 6 Farm to Fork and Biodiversity Strategies targets for sustainable development of agricultural sector as part of the Green Deal. Data about the indicators for those goals were obtained from Eurostat and normalized by Z transformation. Then we used hierarchical cluster analysis – Ward's method with Canberra distance to create 3 clusters of the 16 MS.

First cluster (Belgium, Czech Republic, Germany, and the Netherlands) is characterized by the highest sales of pesticides, usage of nitrogen, but also the biggest investments in the biodiversity measures and coverage by the broadband internet. We can therefore recommend focusing on the pesticides and fertilizers reduction as a strategy of fulfilment of the goals of the Strategies.

For the second group of MS (Hungary, Romania, Bulgaria and Ireland) is typical the highest usage of phosphorus and average values in other indicators. Share of land under organic farming is very low here and far from the target, so this cluster shall focus on this topic.

In the third cluster, the MS (Estonia, Lithuania, Latvia, Croatia, Portugal, Luxembourg, Slovakia, and Sweden) with the lowest values in all indicators prevail. Only the share of land under organic or conversion to organic farming is the highest of all MS here. These states are on the good way for achieving the goals of the Strategies, but they should increase the biodiversity investments to improve their performance in this area.

First target of pesticides reduction was close to be reached by the MS in cluster 3 where the sales of it were already the lowest. Similarly, the fourth aim of fertilizers reduction was the easiest to be achieved here, as the use of nitrogen and phosphorus was the lowest here. The share of the land under organic agriculture was the largest here, so the second target was the best achievable here. On the other hand, the biodiversity investments and broadband internet coverage was the highest in cluster 1. However, the real attainability of individual goals by specific countries is debatable.

Nevertheless, we must keep in mind that the targets of the Strategies are very ambitious, and their achievement is difficult, costly, and controversial due to the impacts on farmers, consumers and agricultural and food sector. Hence, the target values might be adjusted during the implementation of particular steps towards the goals. Therefore, our future research will aim on the monitoring of the development of the F2F and BS Strategies goals and their fulfilment by particular MS.

Acknowledgements

The paper was supported by long-term institutional support of research activities by the Faculty of Informatics and Statistics of Prague University of Economics and Business.

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Appendix

Table 1: Statistical Description of the Clusters of Member States

	Pesticides Sales (tones)	Land under Organic Farming (%)	Nitrogen Usage (tones)	Phosphorus Usage (tones)	Biodiversity Investments (mil. euro)
All	7 021 374	10.28	281 312	28 228	45.38
Cluster 1	16 900 000	9.23	484 858	27 776	158.80
Cluster 2	5 908 911	3.49	427 291	58 041	8.70
Cluster 3	2 649 555	14.00	106 550	13 548	7.03

Source: Own elaboration (2024)

Analysis of the Application of the Common European Policy in the Sustainable Tourism

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Abstract
The article deals with the topic of analysis of the application of common European policy in the field of sustainable tourism. The development of mass tourism, which has been dominant in Europe since the 1990s, is becoming unsustainable in the light of the current threats associated with climate change and over tourism in some destinations. The aim of this article is to analyse how and if selected tourism destinations are implementing the factor of sustainability in their respective policies and how much those policies are in accordance with general policy of EU. The data for achieving the goal will be obtained through a detailed analysis of secondary data and using the method of personal interviewing in online form with representatives of tourist destinations. The result will be a set of recommendations for more effective implementation of tourism sustainability policy in practice.

Keywords: *Common European Policy, destination management, sustainable tourism, tourist destination.*

JEL Classification: *Z32, Z38, Q56*

1. Introduction

In the first half of the 20th century, the tourism industry continued to grow thanks to the mass production of buses and cars and especially coastal tourism began to gain importance and, after World War II, the Mediterranean coast quickly grew in popularity. Also, improvements in air transport especially charter flights had a positive impact as well as progress in labour legislation and a growth in social welfare.

Later in the 1970s, the tourism sector suffered a recession mainly due to the energy crisis, leading to lower costs and prices. That's when mass tourism emerged. Travelling went from being something only for an exclusive group to become a leisure activity within the reach of many. Virtually every economic growth is accompanied by a phase of internationalization, and tourism was no exception, In the following decades, there was a progressive internationalisation of hotel companies, travel agencies and airlines. New products and new leisure activities were also offered, revolving around sports and health, among others.

After ensuring security after World War II, society's income increased, free time "management" became noticeable, and the consumer did not define himself as only a local/regional element but became a conscious citizen of Europe/ world, exploring (also touristically) subsequent locations, etc. Over time, the needs continued to develop and are now related not only to free time and pleasure but also to greater ecological awareness.

Currently, the tourism sector is considered one of the great economic engines in many countries, forming part of the international political agenda. In recent years, with low-cost flights and the existence of alternative accommodations such as AIRBNB, it is much easier for tourists to afford to travel, and they can design their itinerary and experiences to their liking. On the one hand, this is an indisputable advantage, on the other hand, in the case of tourist-attractive factors, which simplify travel, can lead to uncontrollable and uncontrolled development of the destination and its tourism, which can bring a number of negative impacts on the environment, local people and culture.

Therefore, the goal of key tourism representatives must be the challenge of how to provide solutions by developing a tourism awareness that is respectful with the environment and the local way of living of its inhabitants. And not only through theoretically established policies, but above all through their application in practice.

Torres-Delgado (2012) has mentioned that In the last two decades sustainability has emerged as a force in the tourism industry, offering new directions and values for public policy, and inducing the creation of the concept of sustainable tourism. There have been a number of institutional initiatives in this respect, and they have shaped a framework for both theoretic and applied development and have helped extend the paradigm of sustainability as a general feature of contemporary tourism. The institutional initiatives arising from development and tourism policies have had a decisive role in the creation and acceptance of the concept of sustainable tourism (Torres-Delgado & Saarinen, 2014).

Institutional policies and initiatives have advanced gradually from an initial acceptance of sustainability in tourism associated almost exclusively with the conservation of the environment, to a more global concept which takes the balance between society, the environment and economy into account. It can be seen in this evolution that the concept of sustainable tourism has acquired sufficient weight to progress from being a tangential issue in a diverse range of papers, to generating its own documents.

There is increasing pressure for Destination Management Organisations (DMOs) to be seen incorporating sustainability in their policies, arguably because it is a competitive factor for tourist destinations and because there is a need to plan and manage properly future tourism and its associated impacts (McLoughlin & Hanrahan, 2019). In doing so they are expected to collect sustainability data in the form of indicators and to find ways to use this data for critical policy information (Torres-Delgado & Saarinen, 2014).

Tourist destinations are increasingly coming across multiple social, economic, cultural, and environmental challenges corroborated with a great urgency for sustainable development. In this context, the European Commission has launched in 2013 a unitary system of indicators for sustainable management of tourism destinations, called The European Tourism Indicators System (ETIS).

More specifically, ETIS was configured initially with a total of 27 core indicators and 40 additional (optional) indicators. The purpose of this paper is to present the difficulties and challenges encountered in the application of ETIS, having as a case study, the county of Braşov, located almost entirely in the Romanian Carpathians. In this regard, a testing technique has been designed through an innovative Group Decision Support System (GDSS) that is applied to our destination. The results show that the selection of ETIS indicators is a flexible process that must be adequate with the particularities of each destination taking into account both the needs of the stakeholders, the information that is useful to them, and the existence and periodicity of the data available. Also, in some cases, when the available indicators are

insufficient, additional indicators have to be introduced, and they must be subsequently adapted to the needs and specifics of the destination.

1.1 Sustainable TourismPpolicy in Europe

For decades, European tourist destinations have developed without having any major problems in capitalizing on the available natural and cultural resources. Throughout this period, the hospitality industry was perceived as not generating pollution and significant changes in the quality and stability of the natural environment.

A change in the perception of tourism and its impact on the environment and local people's culture came in the 1990s, when the World Tourism Organization (WTO) officially began to address the idea of sustainable tourism.

This organization has been active in the effort to develop and implement indicators which help in the sustainable development of tourism at different destinations. The reflection of sustainability issues is seen at all scales. The program has been most successful in its efforts to aid managers of tourism destinations to anticipate and prevent damage to their product. With this aim in 1995-96 a manual for indicator development was prepared based on initial pilot tests in Canada, US, Mexico, Netherlands and Argentina (WTO, 2004).

And because Tourism is now one of the global engines of development. Every year, more people are in motion than ever before in history, the European Union, respectively, had to start dealing with the issue of sustainable tourism. Its governing bodies.

In the mid-1990s, the Commission's Green Paper on the role of the Union in the field of tourism stressed that one of the Union's objectives in the field of tourism was to contribute to sustainable development. The Philoxenia programme proposed measures to develop quality European tourism by promoting sustainability. For example, it provided for the establishment of environmentally friendly management systems and a European Tourism and Environment Award (DOCE, 1995).

The European Agenda 21 for Tourism the Agenda for a Competitive and Sustainable European Tourism stresses the need to develop a more competitive and environmentally friendly European tourism industry. This means sustainable tourism, a quality that differentiates it from other emerging destinations (EC, 2023)

1.1.1 The Transition of EU Tourism

The EU's tourism ecosystem is highly diverse and complex, covering globalised and interconnected value chains. It comprises businesses in several sectors, including food and beverage services, online information and services providers (e.g., tourist offices or digital platforms), travel agents and tour operators, accommodation suppliers, destination managing organisations, attractions and passenger transport (such as airlines and airports, trains, busses and boats).

Despite the notable disparities between EU countries, tourism represents an important part of the EU's overall economy. In 2019, it represented nearly 10% of the EU GDP and accounted for around 23 million jobs in the Union (EC, 2019).

As the tourism ecosystem was hit hardest by the COVID-19 pandemic it took some time to start the transition from classic tourism to the sustainable one. This effort was supported by the European Commission when the transition pathway for tourism was published. The report

identifies 27 areas of measures for the green and digital transition and for improving the resilience of EU tourism (EC, 2019).

In 2022 the Council of the European Union adopted the European agenda for tourism 2030. The agenda is based on the Commission's transition pathway for tourism and includes a multi-annual work plan with actions to be taken by the EU countries, the Commission and tourism stakeholders.

To achieve the objectives that are listed in the above-mentioned documents, actions promoting tourism may be grouped under the following four priorities:

1. Stimulate competitiveness in the European tourism sector;
2. Promote the development of sustainable, responsible and high-quality tourism;
3. Consolidate the image and profile of Europe as a collection of sustainable and high-quality destinations;
4. Maximise the potential of EU financial policies and instruments for developing tourism (EC,20202).

If we are concerned with the development of sustainable, responsible and high-quality tourism, the promotion of such tourism is understood as the sector's competitiveness is closely linked to its sustainability, as the quality of tourist destinations is strongly influenced by their natural and cultural environment and their integration into a local community (EC,20202).

The sustainability of tourism covers a number of aspects: the responsible use of natural resources, taking account of the environmental impact of activities (production of waste, pressure on water, land and biodiversity, etc.), the use of 'clean' energy, protection of the heritage and preservation of the natural and cultural integrity of destinations, the quality and sustainability of jobs created, local economic fallout or customer care. These principles are largely reflected in tourism strategies introduced at national and regional level, although they find insufficient expression in specific actions (EC,20202).

At EU level, the Commission has introduced a number of tools to facilitate sound environmental management for businesses, such as the EU Eco-label or the Community eco-management and audit scheme. However, the response from tourism businesses across Europe to concerns about sustainability has varied widely. The Commission has also made available to Member States documents facilitating the implementation of European environmental legislation, in terms of both individual projects and strategic planning (EC, 2023).

Via the Tourism Advisory Committee the Commission facilitates exchanges of EU country representatives on tourism and, in particular, on the provision of services for tourists. At the EU level, there is close contact with other EU bodies such as the Council of the EU, the European Parliament, the Economic and Social Committee and the Committee of Regions (EC, 2023).

The Commission works with international organisations on the sustainability and balanced development of tourism globally. Thus, the Commission strengthened its cooperation with the World Tourism Organization (UNWTO), the Organisation for Economic Co-operation and Development (OECD) and the Council of Europe (CoE) (EC, 2023).

Greening European tourism is considered as a part of the broader objective to develop a more sustainable and responsible ecosystem, taking in account that this process must involving all players at multi-level governance: industry, destinations, national, regional and local authorities, but also the consumer – the tourist.

According to the UN World Travel Organisation, sustainable tourism development "takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities".

By stepping up the greening of the EU tourism ecosystem, industry and destinations would not only contribute to CO^2 reduction and a better-protected environment but would also benefit from reduced costs and reinforced competitiveness. Responsible tourists would benefit from an improved travel experience while contributing to the well-being of host communities (EC, 2023).

2. Problem Formulation and Methodology

Despite the facts mentioned in the introduction, there are indicators and tools for the development of sustainable tourism Warner (2020) points out that tourism developers are dissatisfied with the European and national policies under which they must work locally. Sustainability aspects within these policies are difficult to achieve as coordination is poor, communication lacking and there is a high uncertainty as to what the goals for the local level even are so they see problems in identification of which policies´ sustainability indicators to follow (Warner, 2020).

The fundamental problem of the development of sustainable tourism seems to be the fact that, from the theoretical point of view, high-quality materials have been processed, but their application in practice remains a more complex issue. This is despite the fact that a unified policy, specific instruments and coordination of the implementation of the principles of sustainable tourism are absolutely crucial. If any of the above principles are violated, destinations that meet the basic requirements for the development of sustainable tourism, or land beyond the minimum requirements, may lose part of their competitive advantage. This may be due to the fact that sustainable tourism works on different principles than mass tourism. How 2 major tourist destinations in the European Union approach the concept of sustainable tourism. What tools do they use to eliminate unwanted over tourism? How do they perceive the potential economic risks of a more intensive application of sustainable tourism, which is likely to lead to a temporary reduction in the economic benefits of tourism?

2.1 Methodology

Answers to the above problem statement were obtained through interviews with local authorities' experts in tourism. The semi-structured interview was carried out on-line by e-mail interviewing, some of the answers were subsequently specified by an on-line interview. For the purposes of the analysis, two European destinations were chosen, which have been dealing with the phenomenon of mass tourism (see Table 1 Statistics Sheet Barcelona and Table 2 Statistics Sheet Venice) for a long time and are facing accompanying signs of long-term unsustainable tourism, including manifestations of turismo phobia. For the purposes of the analysis, representatives of destination management – Venezia and Barcelona – were addressed. Before the presentation of the results of the interview, the basic statistics of both destinations will be briefly presented, such as the number of visitors, the number of accommodation capacities, the intensity of tourism.

2.1.1 Barcelona

The main tourist centre of Catalonia and Spain. Visitors are attracted by the pleasant climate, rich history and a number of monuments by the renowned architect Antonio Gaudí.

Table 1: Statistics Sheet Barcelona

Barcelona	**2018**	**2019**	**2022**	**2023**
Number of visitors (overnight stays)	9,1	9,6	12,4	**12,7**
Number of inhabitants	1,62	1,62	1,65	1,64
Intensity of tourism	5,6	5,92	7,51	**7,74**
Number of accommodation fac. Legal (thousands)	148	149,5	149,8	149,9
Number of accommodation fac. Ilegal (thousands) approx.	9,5	10	9,6	9,1

Source: Statistia (2024); Own Elaboration (2024)

We can see that the number of visitors is increasing, the intensity of tourism the ratio between the number of visitors and the number of inhabitants is high, and in the irritation index, Barcelona is in the Antagonism level. This stage is characterized by tourists being blamed by the locals for all evil.

2.1.2 Venice

A city in the north of Italy. Visitors are attracted by the pleasant climate, rich culture, historical monuments and unique reputations of the city built on canals.

The year-on-year increase in visitors is significant in 2022 and 2023. While the tourism intensity index was highest in 2019, subjectively the impact on local residents must have been worse in 2023, when there was an increase of a full 2 percentage points, see Table 2: Statistics Sheet Venice.

Table 2: Statistics Sheet Venice

Venezia	**2018**	**2019**	**2022**	**2023**
Number of visitors	4,8	**5,5**	3,8	5,1
Number of inhabitants (thousands)	635	636	639	641
Intensity of tourism	7,55	8,64	5,9	**7,9**
Number of accommodation fac. Legal (thousands)	429	431	392	401
Number of accommodation fac. Ilegal (thousands) aprox.	10,2	10,3	9,3	10,6

Source: Statistia (2024); Own Elaboration (2024)

2.2 Interview

The following questions have been asked to the tourism authorities in Barcelona and Venice, the answers to which are retrospectively authorized and slightly abbreviated.

Does your destination have a sustainable tourism development plan and what sub-goals do you consider to be crucial?

Barcelona: The strategy includes a work plan with 16 goals and 48 actions to be carried out in the 2023- 2025 to promoting sustainable tourism as a complex system that brings together visitors, the resident population and the region using an integrative approach. The document focuses on three Sustainable Development Goals (SDGs) - Environmental sustainability (5 goals) - Economic sustainability (7 goals) - Socio-cultural sustainability (4 goals). I cannot judge which objective is the most important because it is important to meet them in parallel, but cooperation between the public and private sectors is absolutely essential for achieving them.

Venice: In our destination the elaboration of the Action Plan was supported by the local Destination Management Organisation (DMO) that was set up in Venice in 2016, in charge of the strategic management of the Venice territory and of the implementation of the Destination Management Plan. In general, the main aim of this action plan is to obtain data on the movement of tourists in Venice and on the basis of this data to take specific measures that will lead to greater protection of the environment and the interests of local residents, but at the same time will not reduce the economic benefits of tourism for Venice. Our plan is to run the campaign of the City of Venice promotes slow and sustainable tourism, encouraging travellers to go beyond the usual tourist sights, stumble upon unique experiences and see Venice with new eyes.

Before the outbreak of the COVID-19 pandemic, you were one of the destinations that announced a shift away from mass tourism towards sustainable tourism, how did you manage to fulfil this intention?

Barcelona: Yes, our city has been struggling with the phenomenon of over tourism for a long time, and there have also been phenomena that pointed to turismo phobia. The situation improved during the COVID period, when Barcelona and the whole of Spain were more or less closed to foreign visitors. During this period, tourism service providers became convinced that it was not possible without tourists, after all, their economic losses were considerable, but on the other hand, they showed little interest in returning to the usual tracks. As a result, their willingness to contribute to the SDGs has increased significantly. Between 2022 and 2023, there was the smallest year-on-year growth in the number of tourists, but at the same time the total income from tourism increased, which is certainly positive.

Venice: Venice lives on tourism, which brings economic benefits — some 65% of the jobs in Venice are linked to tourism — but is also the primary cause of the city's problems like the increase in the cost of living, but also by overcrowded conditions; the closure of public services in education and healthcare due to a diminishing population; the closure of local food and clothing stores, often transformed into tourism boutiques; and the conversion of resident accommodation into 'sharing economy' units (Airbnb or similar). So the shift from massive tourism to sustainable tourism is a necessary but not the only condition for vibrant tourism in the coming years.

Online accommodation platforms lead to an increase in the number of overnight stays of tourists in the destination and an uncontrolled increase in tourism, how does your destination approach the issue of online accommodation platforms?

Barcelona: For many reasons – a complete ban. For example, leakage of financial resources, depopulation of centres, resolution of complaints of local residents.

Venice: it is possible to list accommodation on the Airbnb platform, but it is necessary to meet strict criteria that are controlled by the authorities of the town hall.

What other tools are you considering to curb mass tourism?

Barcelona: We have banned the provision of AIRBNB services in and around the historic centre of Barcelona. We limit the number of beds in collective accommodation facilities. It is forbidden to build any accommodation facilities in the city centre and we did not agree with the expansion of Barcelona el PRAT airport, we introduced a tax for visitors from cruise ships, an increase in the accommodation tax for all accommodation categories. The goal is not to eradicate tourism, but to balance it with local people, the environment and economic benefits.

Venice: As a crucial problem we see the presence of one day tourists so the first step is relieving the lagoon of large cruise ships. Implementing the entrance fee on day trippers, that have already been postponed many times but the 2024 will be the first year of paying this fee and limitations of tour groups to no more than 25 persons.

3. Problem Solution

Based on the results of the conducted research, basic recommendations for the implementation of a unified sustainable tourism policy can be defined. These recommendations can be divided into two basic areas.

Recommendations for the European Commission

- More consistently control the implementation and compliance of the common sustainable travel policy.
- To divide tourism destinations in the European Union based on key criteria such as tourism destination saturation, amount of waste, consumption of rare resources such as water into 3 basic categories, i.e., destinations that show signs of over tourism destinations, destinations that show primary signs of over tourism destinations and to destinations that currently do not have a problem with over tourism.
- Supervise those destinations in individual categories implement appropriate measures in tourism destination management to minimize the impacts of unsustainable tourism development, so that fair market competition is not disrupted, and that none of the destinations gains a competitive advantage by not following the rules.

Recommendations for management of tourism destinations

- Listen to local residents and actively solve problems associated with over tourism.
- Possible tools to reduce the effects of over tourism should be introduced after consultation with the professional public and with regard to the balance of economic effects and sustainable tourism.
- As part of marketing communication, appeal more to the necessity of introducing the principles of sustainable tourism.
- Educate visitors to travel more responsibly.

4. Conclusion

The transition from mass tourism to sustainable tourism is not a simple matter. Barcelona and Venice have long been considered to be destinations for a long time. Tables 1 and 2. However, both tourist destinations are aware, and even more so after the covid phase, that in addition to

the negative impacts of mass tourism, the economic benefits of tourism are indispensable in the long term.

The managements of selected tourist destinations are located at different points on the starting line of this transformation. While Barcelona has clearly set a total of 16 goals, including key indicators for evaluating them, and has taken some measures to meet them and is now monitoring their effectiveness, Venice is currently in a data collection period that will begin in full in 2024 with the introduction of a one-day admission fee and an app that will monitor the use of accommodation facilities and introduce any significant measures from 2025 onwards. The current measures are aimed only at limiting the number of one-day tourists, or spreading them throughout the year. From the point of view of the authors of the article, it is debatable whether the introduction of one-off fees without additional measures will lead to a reduction in the influx of one-day tourists in the case of such an exceptional destination as Venice. Normal text of the paper, Times New Roman 10pt, Block-aligned. Again, first paragraph is without indentation.

The fact that sustainable travel has been steering the European tourism policy for the past years is noticeable, the reason is that it is led by increasing demand and expectations by the travellers and the host communities alike. While the COVID-19 crisis had paralysed travel in the past years, it has been also a unique opportunity to reset, shift the cultural mindset and emerge more resilient.

Implementing the principles of sustainable tourism is always a difficult and, according to the authors of the article, to a certain extent a political decision, because the protection of the environment and the better quality of life of the local inhabitants of tourist destinations will be redeemed, at least in the short term, by a reduction in the economic benefits that flow from tourism. Long-term benefits from the adoption and implementation of the principles of sustainable tourism should be guaranteed by adherence to a unified European sustainable tourism policy. This policy should provide clear and sufficiently concise rules for tourist destinations in the perspective of sustainable tourism and make it binding for all EU countries within a certain timeframe. The reason for their binding nature is compliance with the rules of fair competition.

The limitations of the research conducted can be seen in the relatively small number of destinations that were compared. It would be interesting to include, for example, destinations in northern Europe in further research, where the perception of sustainable development, environmental protection and the local cultural environment is generally much more sensitive.

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Dynamics of the Development of the Quaternary Sector in EU

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Abstract
The expanded sectoral structure, which adds the quaternary sector to the primary, secondary and tertiary sectors, provides a more factual view of economic changes in countries and regions and allows for a more comprehensive analysis of trends in economic activity and individual sectors. The aim of this paper is, against the background of a comparative analysis, to determine the development of the quaternary sector in the 27 EU countries over the period 1995-2021. The quaternary sector and its share in the sectoral structure of the economy is reflected in current approaches to promoting, in particular, qualitative, endogenous and responsible-sustainable development and is associated with the concept of Society 4.0. The activities included in the quaternary sector are an important source of competitiveness and have implications in today's so accentuated applications of the institutional guidelines of regional development to the practical management and support of the territory.

Keywords: *analysis, development, EU countries, extended sectoral structure, quaternary sector*

JEL Classification: *E23, L00, O14, R11*

1. Introduction

The origins of the division of economic sectors, as they are now generally perceived by economic science, are to be found in the works of the first mercantilists and physiocrats, although references to the division of economic activities and people into certain groups according to similar characteristics are already known from ancient China or ancient Greece. In modern history, it was Sir William Petty (1691) and later Francois Quesnay (1758) who first described the specific links and effects of changes in the economy on different economic sectors. Although a number of eminent economists and schools of economics have subsequently defined, categorised and classified specific sectors of the economy, a general classification into three main sectors has emerged: primary, secondary and tertiary. The significant growth of the tertiary sector's share of GDP and employment towards the end of the 20th century in a number of countries has led some economists to discuss and argue about the need to move a purposefully defined and specifically identified group of services out of the traditionally conceived service sector into a new sector and thus differentiate the so far one-sided perception of services in order to analyse their development and impact on the overall economy of a country in more detail. A new sector - the quaternary sector - has thus been defined from the tertiary sector. It includes a specific group of "knowledge" services,

which by its nature refers to all areas of intellectual activities and in a way defines the knowledge economy (Turečková, 2014).

The knowledge economy with a significant share of knowledge services is currently also associated with the term Society 4.0, which represents a modern and cultural society that is naturally subject to the significant influence of technology and digitalization, which demonstrably affect most areas of human life (Turečková et al., 2023 or Schindlerová, 2021) and should contribute to sustainability and value sharing (MacGregor Pelikánová and Sani, 2023). From this point of view, the term Society 4.0 can be associated with economic activities bordering on the quaternary sector. This sector contains the services related to the generation and sharing of information, education and scientific research are typical of the quaternary sector and include the whole area of development and use of technology, whether it is information, communication, manufacturing, computing, environmental or biotechnology (see also Balaram, 2023). This main group is complemented by advisory and consultancy services, financial services and activities relating to health care and medical research. The growth in the share of the quaternary sector is dependent on a highly skilled and educated workforce and the ability of the economy to use this human capital effectively within the relevant framework and also in times of crisis (Hála et al., 2023), which is why this sector is developing mainly in developed countries. At the same time, it is important to bear in mind that the development of the quaternary sector, especially technologies such as artificial intelligence, automate certain job tasks and consequently reduce the number of jobs needed. This is already and will continue to be one of the reasons for the possible decline in the number of jobs, particularly in the primary and secondary sectors (Burger and Hovančíková, 2021). Given the potential of the quaternary sector to further deepen the growth and development assumptions of individual economies, it should be the general effort of government and political authorities to further develop and support these knowledge-based activities.

The aim of this paper is to determine, against the background of a comparative analysis, the development of the quaternary sector in the 27 EU countries over the period 1995-2021, preceded by a self-determination of the extended sectoral structure based on output data in sectors (according to NACE classification) measured as Gross Value Added taken from Eurostat. This paper involves an initial analysis of the dynamics of the quaternary sector over the last 27 years, which will be extended ex post with additional parameters with the intention, for example, of identifying the significance of the relationship between the size of the quaternary sector and the competitiveness of individual economies. The intention of the analysis is also to identify possible interesting moments related to the geopolitical location of the EU countries, which could be further developed. Finally, let us add here that the issue of the quaternary sector is surprisingly not elaborated in more detail. This explains the absence of a greater number of citations on the given topic.

2. Problem Formulation and Methodology

Information on the quaternary sector, its size and percentage, is not directly available within the databases, as is the case for the traditional individual sectors. For this reason, it is necessary to subdivide the individual industries into these sectors. The division of the main industries into individual sectors was already specified in earlier studies (for example Turečková, 2014 and Turečková and Martinát, 2015), and therefore this text will also be based on this in the determination of the individual sectors. The input sectoral composition of economic activities is based on the NACE rev. 2 (European Commission, 2008) division, which is combined with the actual nature of the individual sectors, i.e. groups A and B form the primary sector; activities C-F belong to the secondary sector; services included in groups G, H, I, L, O, R-U

form the tertiary sector and finally economic activities included in categories J, K, M, N, P and Q are classified as the quaternary sector.

The data for the calculation of the extended sectoral structure were taken from the Eurostat database (National accounts aggregates by industry), where relevant values for the maximum available period (1995-2021; 27 years) with annual frequency, current member countries (27 countries) in Gross Value Added (GVA) in current prices (million euro) and in ex ante defined 21 main NACE sectors (A-U) were filtered. By sub-summing the GVA of each sector, a monetary value was determined for the primary, secondary, tertiary and quaternary sectors and then the percentage of the four sectors in the total output of the country was determined for all countries and the selected period (see also Appendix). It should be added here that the graphs in the empirical part also show values for the EU as a whole; however, these are not the cumulated values of the averages for the individual countries, but as a percentage of the quaternary sector in the total output (GVA) of the whole EU. The expanded sectoral structure and the percentage of each sector (100% in total) does not tell us anything about their monetary value (e.g. the quaternary sector of Bulgaria was approximately €18776 million in 2021 and its share of the total structure was 30%, while for the Czech Republic, it was €63781 million and the quaternary sector share was 29%; see Figure 3)

The research results presented in the following chapter are intended to answer three basic questions: (1) what have been the sources of growth of the quaternary sector in terms of constraints on the remaining sectors; (2) what are the dynamics of change in the quaternary sector in recent years across countries compared to the EU as a whole; and (3) are economically richer countries more involved in quaternary sector activities? In the context of the commentaries on the individual analyses, an attempt will also be made to highlight the specific position of the Czech Republic in the parameters compared.

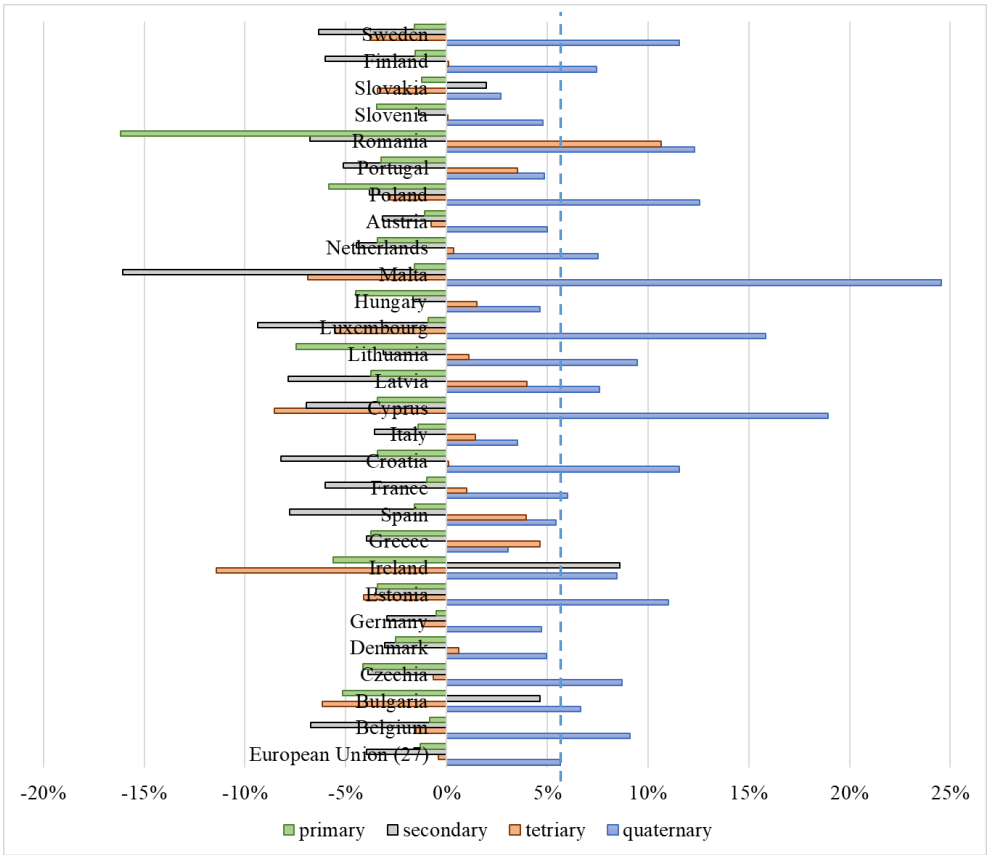
The analytical part of this paper is based on standard descriptive comparative analysis without using any quantitative methods. The purpose is rather to point out in general terms the changes in the sectoral structure of the EU economies and to outline the appropriate implications of the knowledge about the quaternary sector for selected concepts to support the development of modern economies.

3. Problem Solution

It is only natural that the quaternary sector has grown stronger in EU countries over the 27 years under review. The quaternary sector in the 27 EU countries comprised 28.27% of economic activities in 1995, while in 2021 it was 33.94%. During these 27 years, the representation of the quaternary sector in the sectoral structure of the overall EU economy increased by 5.67%. However, it is interesting to know at the expense of which sectors this has happened and how large these changes have been. Figure 1 shows the overall percentage change in sector representation that has taken place between 1995 and 2021. The graph is complemented by a line showing the percentage change in the quaternary sector in the EU as a whole. At a glance, it can be seen that primary sector representation has decreased in all countries. Exceptionally, the industrial sector, i.e. the secondary sector, has strengthened (Slovakia, Ireland, Bulgaria), and more often the tertiary sector, which includes standard services (in 14 cases). The quaternary sector has thus strengthened in most countries, mostly at the expense of the primary and secondary sectors (most noticeably in Romania), and in 13 countries at the expense of the tertiary sector (e.g. Cyprus or Malta). The largest growth in knowledge services, which we therefore include in the fourth sector, was recorded in Malta (from 21% to 46%), Cyprus (23% to 41%) and Luxembourg (from 40% to 56%). The quaternary sector in the EU has overall strengthened by 6% over the 27 years, the least in

Slovakia (only 2.7%) and Greece (3%). From a geopolitical perspective, only three causalities can be identified: above-average growth of knowledge services in (1) the Baltic and (2) Scandinavian countries and (3) the Mediterranean island countries (Cyprus and Malta); other similarities in the development of the quaternary sector based on geographical location are not evident.

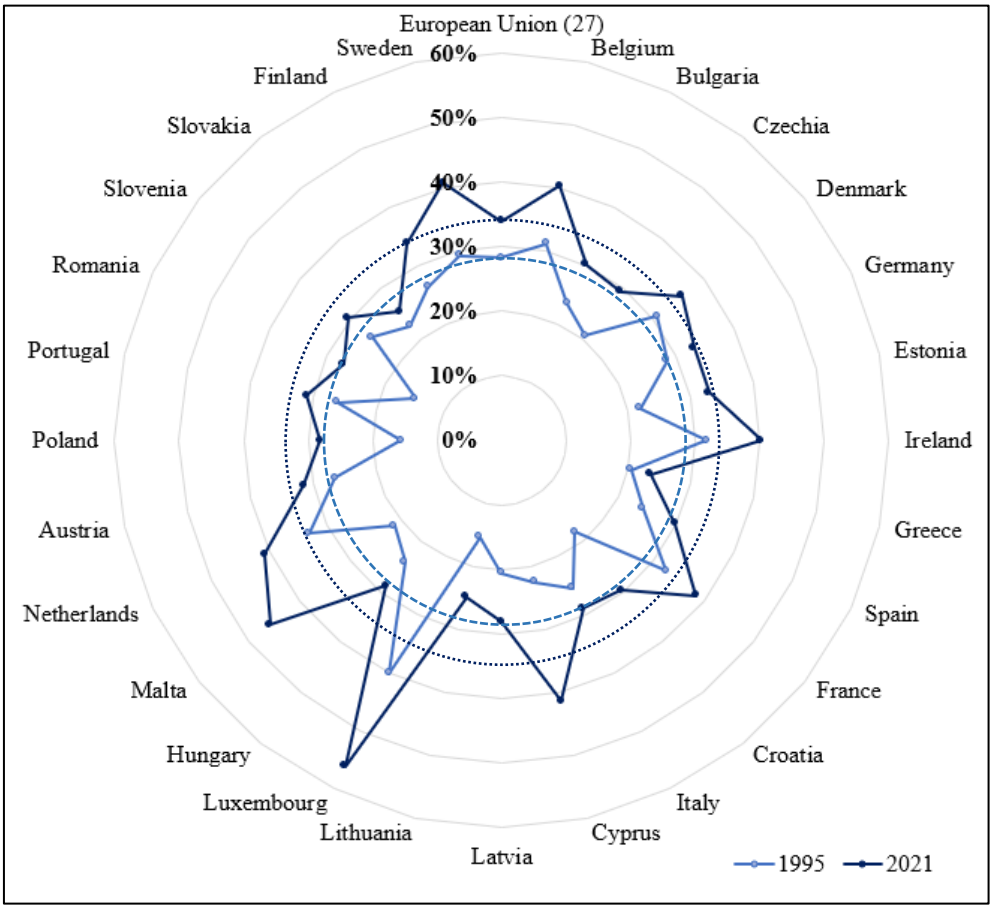
Figure 1: Total Change in Economic Sectors of 27 EU Countries (in %; 1995 - 2021)



Source: Own elaboration (2024)
Note: the percentage change of the quaternary sector in the EU countries as a total is shown by the auxiliary line

A different perspective on the development of the quaternary sector in EU countries is shown in Figure 2, which shows its size as a percentage of the total structure for 1995 and 2021. Here it is already evident that, with exceptions (Malta, Cyprus), a higher share of the quaternary sector is found in those countries that were members of the EU before its massive enlargement in 2004 (Luxembourg, Sweden, Belgium, Ireland, France, etc.). At the same time, it can be seen that the Southern, Central European and Baltic countries (excluding Estonia) are still below the EU percentage threshold and thus have the potential for further growth. Slovakia, Lithuania, Latvia and Greece had a significantly low share of knowledge services in all economic sectors in 2021, not even reaching 28%, which was the quaternary sector representation for the EU in 1995.

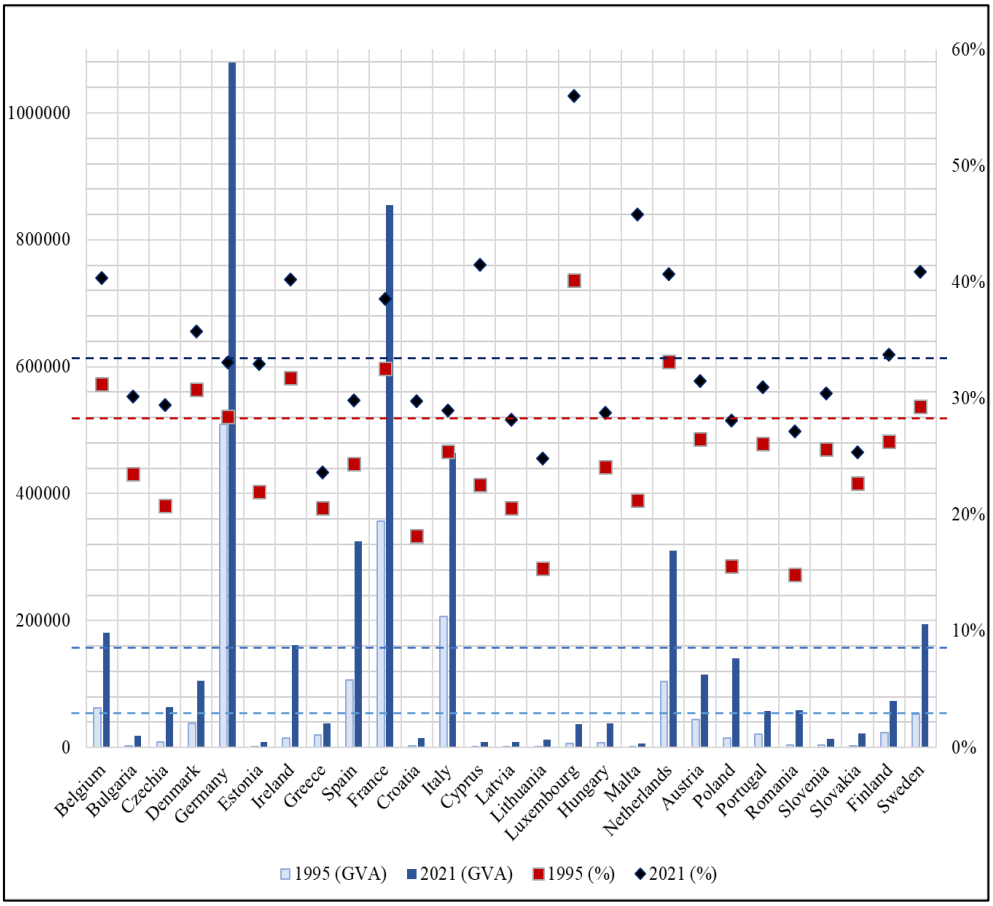
Figure 2: Quaternary Sector in EU Countries in 1995 and 2021 (in %)



Source: Own elaboration (2024)
Note: the percentage share of the quaternary sector of the EU countries in 1995 and 2021 are shown by the auxiliary circle

The last results presented relate to the representation of the relationship between the percentage of the quaternary sector and its actual value expressed in millions of EUR (share of GVA). The purpose is to point out that the monetary value of knowledge services itself is not directly related to the percentage of the quaternary sector, i.e. the concentration of the industries in the different sectors is related to the setting of economic priorities in the field of economic activities and the real situation referring to the needs of the economic agents themselves. The graph in Figure 3 illustrates the last fact we want to highlight, namely that the smaller (in terms of population and total economic output) advanced economies (Belgium, Luxembourg, Denmark, Ireland or Finland) have a higher dynamism in engaging in the development of knowledge services than the richest European countries such as Germany, France or Italy.

Figure 3: Quaternary Sector in EU Countries in GVA (in million EUR) and on the Total GVA (in %) (1995 and 2021)



Source: Own elaboration (2024)
Note: the percentage share of the quaternary sector of the EU countries in 1995 and 2021 are shown by the auxiliary lines

4. Conclusion

The quaternary sector comprises economic activities associated with generating new knowledge and includes information and communication technologies, science research, development, education, consultancy and other intellectual skills-based services. The paper presented here analysed the general trends of changes in the quaternary sector across the 27 EU countries over the period 1995 to 2021. All countries have seen an increase in economic activities related to knowledge services, with the highest increases in Malta and Cyprus. Most often, the percentage growth of the quaternary sector has been at the expense of a weakening of the primary and secondary sectors, with activities in industries and sectors including agriculture, mineral extraction and mining not achieving the same growth dynamics as 'progressive' services directly related to intellectual activity and the generation of knowledge and innovation. The quaternary sector has long had a significant presence in the smaller advanced economies of the original EU Member States, such as Belgium, Denmark, the

Netherlands, Ireland, Finland and Sweden, while Southern European and former Eastern Bloc countries are increasingly focusing on traditional industries and sectors.

The issue will be further elaborated in the sense of searching for causality between the quaternary sector and competitiveness against the background of panel regression and a deeper analysis of trends in the development of the sector across EU countries (see Miron et at., 2019). Here we can refer to the findings of the above research (what macroeconomic factors are key for the development of the knowledge services sector?), or what are the impacts of supporting the development of the quaternary sector on the socio-economic structure of a given country? At the regional level, it is suggested to confirm the causality between the size of the quaternary sector and the degree of "learning region" in the sense of referring to this theory of sustainable regional development. The quaternary sector is closely linked to innovation, knowledge and qualitative endogenous economic growth, thus identifying it as a key driver of long-term economic prosperity. Therefore, understanding the dynamics of the quaternary sector is important both for economic policymakers in terms of creating an enabling environment and innovation ecosystem, and for strategic planning at the corporate level, which needs to reflect changes in consumer preferences in the context of the emergence of Society 4.0.

Acknowledgements

This paper was supported by the project SGS/xx/2024 “The theory of learning regions in application to the Czech Republic”.

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Appendix

Percentage share of the quaternary sector in the total GVA of each economy in the period 1995 – 2021 (based on data from Eurostat).

Table 1: Percentage share of the quaternary sector in the total GVA of each economy in the period 1995 – 2021

GEO/TIME	European Union (27)	Belgium	Bulgaria	Czechia	Denmark	Germany	Estonia	Ireland	Greece	Spain	France	Croatia	Italy	Cyprus
1995	28%	31%	24%	21%	31%	28%	22%	32%	21%	24%	33%	18%	25%	23%
1996	29%	32%	23%	20%	31%	29%	22%	31%	21%	25%	33%	20%	26%	24%
1997	29%	32%	20%	20%	31%	30%	21%	31%	22%	25%	33%	20%	27%	25%
1998	29%	33%	24%	21%	32%	30%	21%	30%	23%	25%	33%	21%	27%	26%
1999	30%	34%	18%	21%	32%	31%	24%	31%	23%	25%	34%	23%	27%	28%
2000	30%	34%	19%	21%	32%	31%	23%	31%	22%	25%	34%	23%	28%	27%
2001	30%	34%	20%	21%	32%	31%	22%	31%	23%	26%	34%	24%	28%	29%
2002	31%	34%	21%	21%	33%	32%	23%	30%	24%	26%	34%	25%	28%	29%
2003	31%	34%	20%	22%	33%	32%	23%	32%	23%	26%	34%	25%	29%	28%
2004	31%	35%	21%	22%	33%	32%	23%	34%	25%	26%	35%	25%	29%	28%
2005	31%	35%	22%	23%	34%	32%	24%	36%	25%	26%	35%	26%	29%	28%
2006	31%	35%	20%	22%	33%	32%	24%	36%	26%	26%	35%	26%	29%	29%
2007	31%	35%	22%	23%	34%	31%	24%	37%	26%	27%	35%	27%	29%	29%
2008	31%	35%	23%	24%	35%	31%	27%	39%	26%	28%	35%	28%	29%	29%
2009	32%	37%	23%	25%	38%	32%	28%	42%	27%	29%	36%	29%	29%	31%
2010	32%	37%	27%	25%	37%	32%	28%	44%	25%	28%	37%	29%	29%	32%
2011	32%	37%	26%	25%	36%	31%	26%	42%	24%	28%	37%	29%	29%	33%
2012	32%	38%	26%	25%	36%	32%	26%	42%	23%	28%	37%	29%	29%	33%
2013	33%	38%	25%	26%	36%	32%	26%	41%	23%	28%	37%	29%	29%	36%
2014	33%	39%	26%	25%	36%	32%	26%	42%	23%	28%	37%	29%	29%	38%
2015	33%	39%	26%	25%	37%	32%	27%	35%	23%	28%	37%	28%	29%	38%
2016	33%	39%	27%	25%	37%	32%	28%	35%	23%	28%	37%	29%	29%	38%
2017	33%	40%	26%	26%	36%	32%	28%	37%	24%	28%	37%	29%	29%	37%
2018	33%	40%	28%	27%	36%	33%	29%	38%	23%	29%	38%	29%	29%	36%
2019	33%	40%	28%	27%	36%	33%	30%	40%	24%	29%	37%	28%	28%	36%
2020	34%	41%	31%	29%	36%	33%	33%	41%	25%	31%	39%	30%	30%	42%
2021	34%	40%	30%	29%	36%	33%	33%	40%	24%	30%	39%	30%	29%	41%
change	**6%**	**9%**	**7%**	**9%**	**5%**	**5%**	**11%**	**8%**	**3%**	**5%**	**6%**	**12%**	**4%**	**19%**

GEO/TIME	Latvia	Lithuania	Luxembourg	Hungary	Malta	Netherlands	Austria	Poland	Portugal	Romania	Slovenia	Slovakia	Finland	Sweden
1995	21%	15%	40%	24%	21%	33%	26%	16%	26%	15%	26%	23%	26%	29%
1996	19%	16%	42%	25%	23%	34%	27%	16%	26%	13%	26%	23%	27%	31%
1997	19%	17%	43%	24%	23%	34%	27%	18%	26%	13%	24%	23%	26%	32%
1998	21%	18%	42%	24%	24%	35%	27%	19%	26%	15%	25%	22%	26%	32%
1999	22%	20%	46%	24%	24%	36%	27%	19%	27%	17%	26%	22%	26%	33%
2000	23%	20%	47%	25%	25%	36%	27%	23%	27%	18%	26%	21%	26%	33%
2001	24%	20%	46%	25%	27%	37%	27%	24%	28%	17%	27%	20%	27%	34%
2002	23%	20%	46%	26%	26%	37%	28%	24%	29%	17%	27%	23%	27%	34%
2003	23%	19%	46%	28%	27%	38%	28%	24%	29%	15%	27%	22%	27%	35%
2004	22%	19%	48%	27%	30%	38%	28%	24%	30%	15%	27%	21%	28%	36%
2005	23%	19%	50%	27%	32%	38%	28%	24%	30%	15%	27%	21%	28%	36%
2006	22%	19%	53%	28%	34%	37%	28%	24%	31%	15%	28%	21%	28%	35%
2007	22%	20%	54%	27%	34%	37%	28%	24%	31%	16%	27%	21%	28%	35%
2008	25%	20%	54%	27%	32%	38%	29%	25%	32%	18%	28%	21%	29%	36%
2009	24%	23%	56%	28%	35%	41%	29%	25%	31%	17%	29%	24%	31%	38%
2010	24%	21%	56%	28%	36%	41%	29%	24%	31%	21%	30%	24%	31%	37%
2011	23%	20%	54%	27%	37%	41%	29%	24%	30%	20%	30%	23%	31%	38%
2012	23%	19%	56%	28%	38%	42%	29%	24%	29%	20%	30%	24%	32%	38%
2013	24%	19%	55%	27%	38%	42%	29%	25%	28%	24%	29%	24%	32%	39%
2014	24%	19%	55%	27%	38%	42%	30%	26%	28%	25%	29%	24%	33%	39%
2015	25%	20%	56%	26%	39%	42%	30%	25%	28%	24%	29%	26%	33%	40%
2016	26%	21%	55%	27%	43%	42%	30%	25%	28%	24%	28%	26%	33%	40%
2017	25%	21%	56%	28%	43%	41%	30%	26%	28%	25%	28%	26%	32%	39%
2018	26%	22%	56%	27%	43%	41%	30%	27%	29%	25%	28%	26%	33%	40%
2019	26%	23%	55%	28%	45%	41%	31%	27%	29%	27%	28%	25%	33%	40%
2020	27%	24%	56%	28%	47%	41%	31%	28%	31%	28%	29%	26%	33%	41%
2021	28%	25%	56%	29%	46%	41%	31%	28%	31%	27%	30%	25%	34%	41%
change	**8%**	**9%**	**16%**	**5%**	**25%**	**8%**	**5%**	**13%**	**5%**	**12%**	**5%**	**3%**	**7%**	**12%**

Source: Eurostat, 2023

Research on the FDI Efficiency of Energy Companies in China Based on DEA Method

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Abstract
With its unique strategic position, energy influences the vitality of the international economy, the stability of world politics, and the environment in which the world lives. The global energy incremental consumption center has shifted from developed countries to countries in the Asia-Pacific region. China has gained a dominant position in the world's energy transformation pattern with its energy consumption advantage. In the past 13 years, energy projects have been the most important industries for China's foreign direct investment (FDI) and construction, with oil and gas investment being the largest. This study aims to develop an evaluation framework using data envelopment analysis (DEA) to guide the selection of different companies of China according to investment efficiencies. Data of 11 Chinese energy companies in 3 years were examined using DEA to determine the efficiencies. The results indicate that SINOCHEM and HUAXIN are the most efficient companies while the top 3 biggest oil companies are much lower in FDI.

Keywords: *DEA method, energy company, EU investment, evaluation, FDI efficiency*

JEL Classification: *F21, F60, C67*

1. Introduction

With the sustained and rapid development of China's economy, energy consumption has risen year by year. In 2020, energy consumption was 4.36 billion tons of standard coal, but the energy self-sufficiency rate dropped from 96.1% in 2000 to 79.3% in 2020. In 2021, the dependence on foreign oil was as high as 72%, and the dependence on natural gas was 39.9%. With the pressure of industry, consumption upgrading and environmental protection, the proportion of coal in the energy structure will reduce, the consumption of clean energy such as oil and natural gas will continue to increase, and its increased energy will mainly rely on imports.

From 2005 to the first half of 2021, Chinese enterprises had a total of 2,495 projects with a single project economy of more than 100 million U.S. dollars, including 1,213 direct investment projects and 1,282 construction contracts; the total economic output exceeded US$1.65 trillion, of which direct investment US$961.2 billion and construction contracts of US$691.6 billion (International Energy Agency, 2019), (International Energy Agency, 2020), (International Energy Agency, 2021).

Investments by Chinese energy companies in the EU have continued to grow in recent years, soaring from almost zero in the mid-2000s to a record €20 billion in 2015. In the energy sector,

investments are targeting fossil fuel assets and renewable energy projects, as well as power infrastructure and utility assets that are being privatized (Conrad et al. 2017).

2. Methodology

The method of data envelopment analysis (DEA) was first proposed by the operations researchers Charnes, Cooper and Rhodes (Dulá et al. 2009), (Wang. 2017). Unlike the other traditional absolute evaluation method, DEA is a relative efficiency evaluation method commonly using "input and output". It needs to be compared with the reference object, otherwise it is impossible to judge whether it is effective. A production system with multiple inputs and multiple outputs is called the decision unit (DMU).

DEA mainly uses the linear programming method to determine the maximum output or minimum input level of each decision unit under the same conditions, that is, the current production front, and then compare the actual input/output level of each DMU with the production frontier. The distance is used to evaluate the efficiency of each DMU. If the distance is farther, the conclusion that the decision unit is less effective can be obtained. If the actual input/output level of the decision unit is just the frontier level, then the decision unit is valid.

Charnes et al. (1978) formulated a linear programming (LP) model, named CCR, to evaluate the efficiency of a set of similar DMUs with multiple inputs and multiple outputs. Then, Banker et al. (1984) proposed a model, named BCC, which is an extension version of the CCR model from CRS to VRS.

2.1 Data Explanation and Processing

In this paper, 4 indicators were chosen to evaluate the efficiency of the CEC FDI, the input indicators are corporate overseas assets and overseas employee; the output indicators are corporate overseas income and Transnationality Index (Bílková, 2022).

Corporate overseas assets refer to current assets, fixed assets, long-term investments, and intangible and deferred assets owned or controlled by Chinese companies in foreign countries, Hong Kong, Macao and Taiwan. It reflects the extent of the company's FDI, in US dollars.

Overseas employees: refers to the total number of employees of Chinese companies in foreign countries, Hong Kong, Macao and Taiwan.

Corporate overseas income refers to the total income of Chinese enterprises in foreign countries, Hong Kong, Macao and Taiwan, reflecting the overall profitability of the company in terms of US dollars.

Transnationality Index (TNI): The index is the main criterion for United Nations Conference on Trade and Development's (UNCTAD) evaluation of Transnational Corporations (TNCs), which examines the overseas operations and international management of multinational corporations. Clearly demonstrate the quality and development level of FDI from the perspective of scale. The cross-country index of most global multinational companies is between 30-60.

TNI= （corporate overseas assets/ total assets+ Overseas employees/total employees+ Corporate overseas income/total income）/3×100%

By arranging the list of China's top 100 multinational companies jointly announced by the China Enterprise Confederation and the China Entrepreneur Association, it is possible to

obtain 11 energy enterprise index data such as CNPC, SINOPEC, CNOOC, Sinochem Group and Datang Power Generation from 2018 to 2020.

3. Results

This article will apply DEA technology to calculate the technical efficiency, pure technical efficiency, and scale efficiency of a single PSB. DEA method is a linear programming technique that converts multiple incommensurable inputs and outputs of each decision unit (DMU) into a scalar measure of operational efficiency relative to its competing DMU. DEA determines the "peer" DMU of a single DMU, and then estimates the efficiency of the DMU by comparing its performance with the best practice DMU selected from peers. Please note that the best practices here are not theoretical concepts that may not be achievable, but rather the best performing DMU among its peers, with an efficiency score of 1. These units constitute the recommended "standards" and "surround" other units, thus forming an effective boundary. DEA involves solving linear programming problems for each DMU. The solution to linear programming problems includes information about the peer of DMU and the efficiency of DMU.

The CCR model is used to measure the technical efficiency (TE) of the DMU under the constant state of the company. The BCC model can decompose the technical efficiency (TE) into factors such as the elimination of scale factors affecting pure technical efficiency (PTE) and eliminating management level and scientific research input. The scale efficiency (SE) of the impact is measured and TE = PTE * SE.

In the paper, software DEA-SOLVER-LV8 was used to process data. The results are as follows.

3.1 Technical Efficiency (TE) Analysing

Technical efficiency, that is, comprehensive technical efficiency, is used to measure the relationship between input and output. It refers to maximizing output under certain circumstances, or minimizing investment in a certain output, reflecting the enterprise's Management level and ability to configure resources. When the enterprise is at the frontier of production, its technical efficiency is effective. Its economic definition was first proposed by Farrell (1957). He explained the technical efficiency from the input point of view. Later, Leibenstein (1966) gave the output from the perspective of output. The measure of TE for a DMU_0 can be defined as

$$DMU_0 = Actual\ output_0 / Maximum\ possible\ output_0$$

Using the output-oriented DEA model, the technical efficiency of the 11 corporations can be calculated.

Table 1: The Average Technical Efficiency Value

No.	DMU	Score 2018	Rank 2018	Score 2019	Rank 2019	Score 2020	Rank 2020	Average Score	Average Rank
1	CNP	0.16	11	0.09	10	0.61	7	0.29	9
2	SINP	0.32	5	0.14	9	0.76	5	0.41	6
3	CNO	0.53	3	0.33	6	1	1	0.62	5
4	SIC	1	1	1	1	1	1	1	1
5	SG	0.28	6	0.06	11	0.13	11	0.16	11
6	YG	0.21	9	1	1	1	1	0.73	3
7	HG	0.21	8	0.66	5	0.31	9	0.40	7
8	EC	0.20	10	1	1	0.70	6	0.64	4
9	DG	0.22	7	0.28	7	0.33	8	0.28	10
10	SH	0.40	4	0.27	8	0.25	10	0.31	8
11	HX	1	1	1	1	1	1	1	1

Source: author's calculations (2024)

It can be seen that during period of 2018-2020, SINOCHEM AND HUAXIN are the most efficient companies. ENERGY CHINA, YANKUANG GROUP and CNOOC are in the second level, the scores of them are greater than average value (0.5328). But the rest companies are not high scored, lower or even far lower than the average.

Judging from the current investment efficiency of Chinese energy companies' FDI, the overall efficiency is not optimistic. As the largest giant of energy companies, CNPC's investment efficiency continues to be low, and the other two giants SINOPEC and CNOOC are far from achieving the highest efficiency. What's more, the technical efficiency of another large state-owned energy company STATE GRID even stayed the last place in the 3 years.

3.2 Pure Technical Efficiency (PTE) Analysing

Pure technical efficiency reflects the output efficiency of the enterprise input factor at the optimal scale, which is the technical efficiency level after the impact of the comprehensive technical efficiency elimination scale factor, reflecting the management level of the company management and the application of science and technology and other factors. The impact of efficiency. When the pure technical efficiency is equal to 1, the enterprise is at the frontier of efficiency, which means that the company is effective in the use and allocation efficiency of resources under the current management level and scientific research technology.

The results for the score of each company is shown in table 2.

Table 2: The Average Pure Technical Efficiency Value

No.	DMU	Score 2018	Rank 2018	Score 2018	Rank 2019	Score 2020	Rank 2020	Average Score	Average Rank
1	CNP	1	1	0.45	9	1	1	0.82	6
2	SINOP	1	1	0.36	10	1	1	0.79	8
3	CNO	0.91	6	0.53	8	1	1	0.82	5
4	SINOC	1	1	1	1	1	1	1	1
5	SG	1	1	0.06	11	0.15	11	0.41	11
6	YG	0.56	10	1	1	1	1	0.86	3
7	HG	0.59	8	1	1	0.36	10	0.65	10
8	EC	0.57	9	1	1	0.77	8	0.78	9
9	DG	0.49	11	0.99	6	1	1	0.83	4
10	SH	0.86	7	0.99	6	0.52	9	0.79	7
11	HX	1	1	1	1	1	1	1	1

Source: author's calculations (2024)

We can see from table 2 that the average value of PTE (0.7953) is higher than the score of TE (0.5328). SINOCHEM AND HUAXIN are the most efficient companies, efficiencies of 2 companies which are STATE GRID and HUANENG GROUP got 0.40 and 0.65. The other 7 companies are in the middle.

Comparing with the scores of TE, the PTE scores of the top five large energy companies were generally better, both higher than the average score, except STATE GRID continued to lag behind. The pure technical efficiency value can reflect the efficiency of the management level and scientific research input of each company when the scale is optimal. The higher the management level of the company, the higher the level of science and technology, the higher the pure technical efficiency. Energy companies, especially STATE GRID, still have a lot of room to improve in improving the company's management level and improving the soft power of companies such as research and technology.

3.3 Scale Efficiency (SE) Analysis

The scale efficiency is mainly affected by the company's production scale, which is reflected in the gap between the actual production scale and the optimal scale of the enterprise under the established management level and technical level. It is expressed as the ratio of comprehensive technical efficiency to pure technical efficiency. When the production scale deviates from the optimal scale, its production efficiency cannot be achieved most effectively. The factors affecting the scale of production of enterprises generally include capital expenditures, total assets, and quantities of overseas staff and so on.

The results for the score of each company is shown in table 3.

Table 3: The Average Scale Efficiency Value

No.	DMU	TE 2018	TE 2019	TE 2020	PTE 2018	PTE 2019	PTE 2020	SE 2018	SE 2019	SE 2020
1	CNP	0.16	0.09	0.61	1	0.45	1	0.16	0.21	0.61
2	SINOP	0.32	0.14	0.76	1	0.36	1	0.32	0.40	0.76
3	CNO	0.53	0.33	1	0.91	0.53	1	0.58	0.61	1
4	SINOC	1	1	1	1	1	1	1	1	1
5	SG	0.28	0.06	0.13	1	0.06	0.14	0.28	0.93	0.90
6	YG	0.21	1	1	0.56	1	1	0.37	1	1
7	HG	0.21	0.66	0.31	0.59	1	0.36	0.36	0.66	0.87
8	EC	0.20	1	0.70	0.57	1	0.76	0.36	1	0.91
9	DG	0.22	0.28	0.33	0.49	0.99	1	0.44	0.28	0.33
10	SH	0.40	0.27	0.25	0.86	0.99	0.52	0.46	0.27	0.49
11	HX	1	1	1	1	1	1	1	1	1

Source: author's calculations (2024)

As shown in table 3, SINOCHEM and YANKUANG GROUP are relatively reasonable in scale, and the three efficiency values are all 1, indicating that their input-output levels are high. Among the three major oil giants, CNOOC's scale efficiency value is also at the leading level, with an efficiency value of 0.744, far higher than CNPC and SINOPEC. CNPC 2018-2020 has shown diminishing returns to scale, and there is a problem of low investment efficiency caused by excessive scale. Sinopec's large-scale remuneration is increasing year by year, indicating that the company's investment scale is getting closer to the optimal scale, but its scale efficiency value still has a big gap compared with CNPC and other large foreign oil companies. It needs constant optimization and investment scale. To raise, CNPC needs to reduce its scale to improve efficiency and change its scale of diminishing returns.

4. Analysis of Factors Affecting Investment Efficiency of Chinese Energy Companies

From the data and calculation shown in previous context, the efficiencies of the 11 companies varied sharply. There are many reasons for the difference, and many literatures have also analysed this issue (Cheng 2016), (Nayyar 2018). This article believes that the main reasons are size of the company, staff factors and Transnational level.

4.1 Size of the Company

The size of the company is an important factor affecting the investment efficiency of energy enterprises. According to the characteristics of capital intensive and fixed assets of comprehensive energy companies, this paper selects the total overseas assets as the input index to represent the company scale. Within a certain range, enterprises can reduce the unit cost by expanding the production scale, and form a scale economy, so that the profit curve rises and high returns are obtained. However, when the company's scale expansion exceeds the optimal production scale, the marginal revenue will be less than the marginal cost, the scale will be uneconomical, the profit curve will decline, and the enterprise will be in a state of diminishing

returns to scale. From the previous analysis of the investment efficiency of 11 domestic and foreign energy companies in 2018-2020, especially the scale efficiency, these companies have a negative correlation between the size of the company represented by fixed assets and investment efficiency. Yang Xiuwang found through empirical tests that for every 1% increase in the total assets of energy companies, the efficiency will drop by 0.00304. This is often accompanied by excessive asset and personnel redundancy, low decision-making efficiency, and reduced management levels. This in turn leads to a reduction in the overall investment efficiency of the company. During 2018-2020, CNPC has been in a state of diminishing returns to scale, but its fixed assets are still expanding. The increase in overseas assets in both 2011 and 2012 exceeded 15%, which adversely affected its investment efficiency. Therefore, in the production and operation and investment of China's energy companies, we should pay attention to the impact of scale factors on investment efficiency and try to avoid the phenomenon of gaining profits by expanding the scale.

4.2 Staff Factors

Employees are an important intangible asset of an enterprise and an important factor affecting the normal operation of the company's production and operation. For energy companies, especially comprehensive oil companies, their scale of operation is often large, and the upstream and downstream industry chains are complex. In addition to the need for a large amount of physical assets as a support, a large amount of labor is required as a guarantee. The rational use of labor factors can promote the company's production and operation, improve the company's profitability, but in turn, the company's training of employees, management fees and wages will also increase the company's operating costs.

Kirjavainen and Loikkanent (Kirjavainen et al. 1998) used the Tobit model to verify the impact of the number of employees of energy companies on their investment efficiency. The conclusions show that the efficiency will drop by 0.00191 when the number of employees increases by 1%, and this paper uses the Data Envelopment Analysis Model (DEA). The same conclusion was reached when evaluating the investment efficiency of energy companies, that is, there is a negative correlation between technical efficiency and the number of employees. In fact, the influence of employee factors on the investment efficiency of energy companies is more influential than the investment factors such as capital expenditures, fixed assets and main business costs. When the company's personnel size is too large, it will not only cause redundant staff and labor. If the investment capital is too large and the supervision efficiency is low, there will be a phenomenon that the marginal output of the unit factor is low, and the salary of the position does not match the job output. That is to say, too much investment in the personnel factor will not only increase the operating cost of the company but also make the unit output rate of personnel is reduced, which in turn reduces the overall investment efficiency of the company. The number of employees of ExxonMobil is less than one-third of the total number of CNPC and Sinopec. The wealth generated is the total profit of CNPC and Sinopec. The world's fastest growing private equity firm, Blackstone Group, has less than 1,000 employees worldwide. People create billions of dollars in profits every year. It can be seen that the number of employees is not the standard for winning. Reasonable layout of personnel structure and personnel scale, while improving personnel quality is an effective way to improve investment efficiency.

4.3 Transnational Level

The investment efficiency of energy companies is proportional to the degree of internationalization to a certain extent. In fact, with the globalization of economic development and the multilateralization of strategic cooperation, internationalization has become an important form of energy enterprise development, searching for oil and gas resources

worldwide, cooperating with local governments, and realizing global sales of oil and gas products. It is the normal state of operation of multinational corporations (Zeng et al. 2017). As the first foreign-developed chemical enterprise in China, CNOOC's overseas income accounted for more than 50% of its total revenue. The return on invested capital was significantly higher than that of CNPC and Sinopec, with a maximum of over 20%. It is at the international leading level. CNPC and Sinopec in order to improve their own competitiveness, they also continuously improve their overseas development. The deepening of the transnational level of energy companies not only promotes multilateral cooperation, improves management, and improves resource integration and investment decision-making capabilities. The development of transnational operations also reduces capital expenditures and operating costs and improves exploration and development and production efficiency. Therefore, the degree of transnationality is also an important factor in the efficiency of energy companies' investment, and it is a favourable factor.

In addition, energy companies should pay attention to local political and human factors as well as the adverse effects of changes in international exchange rates on investment efficiency.

5. Conclusion

The improvement of investment efficiency is of great significance for energy companies to increase their income and achieve sustainable development. Especially the basic energy relations such as oil and coal, China's national lifeline and national defence security make the analysis of investment efficiency of energy companies more realistic. Based on the qualitative analysis of the investment status of 11 energy companies in China, this paper uses the data envelopment analysis method to quantitatively analyse the investment efficiency of Chinese energy companies and analyses the investment efficiency of China's energy companies by screening appropriate indicators and quantifying them. The existing problems and the factors affecting them have certain practical significance for each energy company to improve investment efficiency.

Acknowledgements

This paper was created within the project VSB TU Ostrava, SP2024/045.

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A Comparative Study of the Global Gateway Plan and the Belt and Road Initiative

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Abstract
The Global Gateway plan and the Belt and Road initiative are large-scale overseas infrastructure construction plans of the European Union and China. Both have a profound impact on filling the global infrastructure gap and regional connectivity. The Global Gateway Plan and the Belt and Road Initiative have both similarities and differences in terms of construction goals, coverage areas, construction fields, financing instruments. A comparative study of the Global Gateway Plan and the Belt and Road Initiative can help us to better understand the possibility of competition and cooperation between the two sides' projects in the future. In the long run, the Belt and Road Initiative and the Global Gateway Plan should consider cooperating with each other. If cooperation cannot be achieved in the short term, then the two can pursue complementary competition. At the same time, Recipient countries should take advantage of the differences between initiatives to negotiate the best deals for their own development projects.

Keywords: *Belt and Road Initiative, Comparison, Global Gateway Plan*

JEL Classification: *F50, O57, P45*

1. Introduction

Entering the 21st century, global economic growth is sluggish, and the international and regional situation is becoming increasingly complex. Against this background, China has proposed the Belt and Road initiative, a large-scale overseas infrastructure project, based on its own development status. On December 1, 2021, the European Commission released the Global Gateway document based on the core spirits of the G7 Summit such as "recovery," "rules," "low carbon," and "order," and formally proposed the global infrastructure investment: Global Gateway Plan (European Commission, 2021). The Belt and Road Initiative is the integration of China's large-scale overseas infrastructure plans, and the Global Gateway Plan is the integration of the EU's connectivity and overseas infrastructure projects in recent years. A comparative study of the Global Gateway plan and the Belt and Road Initiative can help us better understand the potential for future competition and cooperation between the two projects, and provide suggestions for future cooperation between the two.

2. Overview of the Global Gateway Plan

The Global Gateway Plan, the new European strategy to boost smart, clean and secure links in digital, energy and transport and strengthen health, education and research systems across the world. It stands for sustainable and trusted connections that work for people and the planet, to

tackle the most pressing global challenges, from climate change and protecting the environment, to improving health security and boosting competitiveness and global supply chains. The Global Gateway Plan aims to mobilise up to 300 billion euros in investments from 2021 to 2027 to underpin a lasting global recovery, taking into account the needs of partners and EU's own interests.

This will allow EU's partners to develop their societies and economies, but also create opportunities for the EU Member States' private sector to invest and remain competitive, whilst ensuring the highest environmental and labour standards, as well as sound financial management.

2.1 Background of the Global Gateway Plan

On December 1, 2021, European Commission President Ursula von der Leyen proposed a Global Gateway Plan to invest 300 billion euros in 2021-2027. The background proposed by the Global Gateway Plan includes the following three aspects. The first is to balance the influence of the joint construction of the Belt and Road Initiative.In order to counter the influence and shaping power of the Belt and Road Initiative, the Global Gateway Plan counterattacks the Belt and Road trade network and infrastructure projects, aiming to provide developing countries with alternatives to jointly build the Belt and Road Initiative. Some projects have penetrated into Africa, Indonesia and other countries co-building the Belt and Road Initiative. Second, the Ukraine crisis has caused Europe to face an energy crisis. The Ukraine crisis is a historical turning point in European security and energy policies. The Global Gateway Plan takes technical exchanges and cooperation in the climate and energy fields as a key link and is committed to building a more resilient global green energy and technology supply chain, mitigating energy supply interruptions and potential geopolitical implications. Third, Europe's global actions are fragmented. European global development financing actions are carried out at the EU and national levels. They are fragmented and prone to overlap, discontinuity and inefficiency. This is not conducive to Europe's clear expression of its geopolitical position. The Global Gateway Plan will be realized through the "European Team" mechanism to consolidate the overall development financing process in Europe (Li Zhang and Zhang, 2023).

2.2 Main Contents of the Global Gateway Plan

The Global Gateway Plan will adopt a values-based approach to ensure that the project complies with European values and standards. From a value perspective, the Global Gateway Plan will guide the EU spending based on principles such as Democratic values and high standards, Good Governance and Transparency, Equal partnerships, Green and clean, Security-focused, Catalysing private sector investment. From the perspective of investment focus, investments in the digitalisation, health, climate and energy and transport sectors, as well as in education and research will be a priority. Equally, improving the quality and quantity of infrastructure and the enabling environment in beneficiary countries and regions are key priorities. The EU started 70 overseas infrastructure construction projects in 2023. The EU intends to provide more than 280 million euros in grants to South Africa through Global Gateway program to help transform its coal-fired power stations and develop renewable energy. The first construction projects of the Global Gateway Plan include digital cables under the Black Sea, undersea fiber-optic cables connecting the Mediterranean and countries in North Africa, and a dam and hydropower station in Cameroon. From the perspective of funding sources, the Global Gateway Plan funds mainly come from European Fund for Sustainable Development Plus (EFSD+), EU external assistance programmes, European financial and

development finance institutions. The EU will also mobilize the private sector, the European Fund for Sustainable Development Plus fund will provide guarantees to encourage private sector investment (European Commission, 2021). Affected by the US dollar interest rate hike and the conflict between Russia and Ukraine, a large amount of capital has flowed into the United States, making it difficult to finance the Global Gateway Plan.

2.3 The Latest Progress and Development Trends of the Global Gateway Plan

Judging from the latest progress, the Global Gateway Plan has the characteristics of "based on Africa and expanding to Southeast Asia and Latin America." The first is to regard Africa as a key investment area. The EU has successively announced the EU-Africa: Global Gateway Investment Package, EU-Africa: Global Gateway Investment Package Health, EU-Africa: Global Gateway Investment Package --Education & Training and many other plans. These plans aim to support Africa in achieving a strong, inclusive, green and digital recovery and transformation. These plans will focus on investments in Africa's green transformation, digital transformation, sustainable growth and decent work, health systems, education and training. At the Global Gateway Forum, the EU and African countries signed multiple cooperation agreements. For example, EU Commissioner for International Cooperation Jutta Urpilainen and Finnish Fund CEO Jaakko Kangasniemi officially signed the Africa Connected Programme. Aims to mobilize more than 1 billion euros in sustainable investment in digital infrastructure and digital services platforms in sub-Saharan Africa. The EU has also reached consensus on cooperation in digital infrastructure construction with Senegal, Kenya, Cape Verde and others. In terms of infrastructure construction, the EU also signed a memorandum of understanding on the same day with the United States, Congo (DRC), Zambia, Angola, the African Development Bank and the African Finance Corporation to support the development of the "Lobito Corridor". The European Commission website states that this transport corridor will connect southern Congo (DRC) and northwestern Zambia with regional and global trade markets through the port of Lobito in Angola (European Commission, 2023).

The second is to expand to Southeast Asia. In December 2022, the EU-ASEAN: Global Gateway Plan was released, with a plan to invest 783 million euros to help Laos, Vietnam, the Philippines, Indonesia, Cambodia and other countries achieve green transformation. At the Global Gateway Forum, in the Indo-Pacific region, the EU signed relevant agreements on energy transition with Vietnam and Bangladesh respectively, and the European Investment Bank and Vietnam reached a cooperation worth 500 million euros on energy transition investment. The EU also signed a green economy financing agreement with the Philippines worth 60 million euros.

Judging from the development trend, the Global Gateway Plan is moving from a global initiative to regional cooperation. Africa, Southeast Asia and Latin America will be the key targets of this plan. In addition, the global portal has been implemented from the framework concept to the project construction. The Global Gateway Plan has arranged a series of specific projects. Third, the investment methods and key areas of the Global Gateway Plan are highly similar to those of the Belt and Road Initiative, and it has the intention of replacing the Belt and Road Initiative.

3. Overview of the Belt and Road Initiative

In 2013, President Xi Jinping proposed the Belt and Road Initiative for the first time and listed it as an important policy for political and economic development. "One Belt" refers to the land channel that runs through China, passes through Central Asia and extends to Eastern Europe,

and "one road" refers to the sea channel that connects ports in China, Southeast Asia, Africa and the Middle East. "Belt and Road" refers to the Silk Road Economic Belt and the 21st Century Maritime Silk Road. The "Belt and Road" strategy is not a new mechanism, but a concept and initiative for cooperative development. It will rely on existing bilateral and multilateral mechanisms between China and relevant countries to gradually launch measures such as infrastructure, transportation interconnection, and trade and investment facilitation. Rely on the millennium inheritance of economy, humanities and commerce of the "Silk Road" and give it new significance for cooperation.

3.1 The Background of the Belt and Road Initiative

Against the backdrop of the current slow recovery of the global economy, strengthening regional cooperation is an important driving force for world economic development and has become a trend. In September and October 2013, during his visits to Central and Southeast Asian countries, Chinese President Xi Jinping proposed the strategic concept of jointly building the "Silk Road Economic Belt" and the "21st Century Maritime Silk Road", which attracted great attention from the international community. The joint construction of the Belt and Road is a strategic concept proposed by the Chinese government based on the profound changes in the international and regional situation, as well as the new situations and new tasks faced by China's development. This plan is committed to maintaining the global free trade system and an open economic system, which promotes countries along the Belt and Road to strengthen cooperation, overcome difficulties and seek common development.

3.2 Contents of the Belt and Road Initiative

The joint construction of the Belt and Road adheres to the concepts of peaceful cooperation, openness and inclusiveness, mutual learning, and mutual benefit, with the "five links" as the main content, namely"policy communication, facility connectivity, unimpeded trade, financial integration, and people-to-people connectivity" (China National Development and Reform Commission, Ministry of Foreign Affairs, Ministry of Commerce, 2015). This initiative promotes pragmatic cooperation in all aspects and builds a community of interests, responsibilities and destiny featuring political mutual trust, economic integration and cultural tolerance. The first is policy communication. Strengthen intergovernmental cooperation, build a multi-level intergovernmental macro policy communication and exchange mechanism, deepen the integration of interests, and promote political mutual trust. The second is facility connectivity. Strengthen the docking of infrastructure construction planning and technical standard systems with countries along the route, jointly promote the construction of international backbone corridors, and gradually form an infrastructure network connecting various sub-regions in Asia and between Asia, Europe and Africa. The third is unimpeded trade. Eliminate investment and trade barriers, promote investment and trade facilitation, and build a good business environment within the region and in each country. The fourth is financial integration. Deepen financial cooperation and promote the construction of Asia's monetary stability system, investment and financing system and credit system. Expand the scope and scale of bilateral currency swaps and settlements among countries along the Belt and Road, and strengthen financial regulatory cooperation. The fifth is people-to-people connectivity. Extensively carry out cultural exchanges, academic exchanges, talent exchanges and cooperation, media cooperation, youth and women exchanges, volunteer services, etc., to lay a solid public opinion foundation for deepening bilateral and multilateral cooperation.

3.3 The Latest Progress and Development Trends of the Belt and Road Initiative

Over the past ten years, the joint construction of the Belt and Road has evolved from a Chinese initiative to international practice, from concept to action, from vision to reality, and has become an important international public product and international cooperation platform. Its achievements and highlights have been recognized by more and more foreign media. Over the past ten years, the joint construction of the Belt and Road has achieved major historic achievements. The changes in cooperation data in various fields are intuitively visible: from 2013 to 2022, the cumulative scale of trade in goods between China and co-building countries reached 19.1 trillion U.S. dollars, The cumulative two-way investment between China and co-building countries exceeds 380 billion US dollars, of which direct investment in co-building countries exceeds 240 billion US dollars, covering multiple fields of economic and social development; the average annual turnover of contracted projects in the co-building countries is approximately 130 billion US dollars, and a series of projects such as the China-Laos Railway, the Jakarta-Bandung High-speed Railway, and the Mombasa-Nairobi Railway have been built. The landmark project has effectively improved the infrastructure conditions of the host country and greatly enhanced the level of interconnection. In this process, bilateral cooperation mechanisms have been continuously consolidated. The "Belt and Road" global partnership network is expanding year by year. As of the end of June 2023, China has signed more than 200 Belt and Road cooperation documents with more than 150 countries and more than 30 international organizations (xinhuanet, 2023).

The third Belt and Road Forum for International Cooperation was held in Beijing from October 17 to 18, 2023. The forum achieved a number of results. During the forum, all parties produced a total of 458 results, far exceeding the number of the second summit forum. These include a number of important cooperation initiatives and institutional arrangements, as well as specific goals such as conducting 100,000 green development trainings for partner countries by 2030 and expanding joint laboratories to 100. The Entrepreneurs Conference also reached US$97.2 billion in business contracts, helping to create more jobs and growth for various countries (the third Belt and Road Forum for International Cooperation, 2023).

4. Comparison Between the Global Gateway Plan and the Belt and Road Initiative

The Global Gateway Plan and The Belt and Road Initiative were launched in different years, when the global economic environment was also different. The two plans have similarities but also great differences in terms of goals and principles, coverage areas, construction fields and financial instruments. The commonalities between them point to potential areas for cooperation, while the differences highlight the characteristics of the initiatives that may or may not be attractive to recipient countries.

Table 1: Basic Information of the Global Gateway Plan and the Belt and Road Initiative

Compare Categories	Global Gateway Plan	Belt and Road Initiative
Starting time	2021	2013
Initiator	EU	China
Goals and Principles	Democratic values and high standards, Good Governance and Transparency, Equal partnerships, Green and clean, Security-focused, Catalyzing private sector investment	Open cooperation, Harmony and Inclusiveness, Market operation, Mutual benefit and Win-win results
Coverage areas	Africa, Southeast Asia, Latin America	Countries and regions along the Belt and Road
Construction fields	Digital, Climate and energy, Transport, Health, Education, and research	Policy communication, Facility connectivity, Unimpeded trade, Financial integration, People-to-people connectivity, Cooperation in new fields
Financial instruments	European Fund for Sustainable Development Plus (EFSD+), EU external assistance programmes, European financial and development finance institutions	China's policy bank, large commercial banks, state-owned insurance institutions, China's aid agencies, Overseas Development, Investment funds and other lending institutions.
Development stage	Under implementation, Starting stage	Under implementation, Experienced

Source: Drawn by the author based on the following documents: *Promote the vision and actions of jointly building the Silk Road Economic Belt and the 21st Century Maritime Silk Road* (2015), *The Guiding Principles on Financing the Development of the Belt and Road* (2017), *The Global Gateway* (2021)

4.1 Goals and Principles – Discussion of Similarities and Differences

From the perspective of goals and principles, the Global Gateway Plan, as the EU's future large-scale global infrastructure investment project, overlaps in some economic construction goals with the Belt and Road initiative, which is also an overseas infrastructure guidance project. Both are committed to promoting themselves and economic development in other parts of the world. Large-scale overseas infrastructure investment can not only continuously expand overseas markets and enable both parties to achieve win-win results in mutually beneficial economic cooperation, but also promote regional peace through economic development and provide a safe environment for their own economic development.

However, due to the different backgrounds proposed and the gap in strength and cognition between the subjects, the two have different manifestations in the direct goals of the policy and the basic principles of construction. The Global Gateway Plan places greater emphasis on value conditions in its principles. Judging from the policy principles of the two, the Belt and Road initiative is characterized by inclusiveness, openness and mutual benefit. It meets the needs of world economic development from the common perspective of itself and its partners. The Global Gateway Plan is based on its own strategic interests and has many additional value conditions in investment. The EU attempts to spread the EU value model through investment, hoping to play the role of soft power or normative power to play a leadership role in the international community.

4.2 Coverage Areas – Discussion of Similarities and Differences

From the perspective of coverage area, the Global Gateway plan and the Belt and Road initiative are both large-scale infrastructure investment plans for the world. The implementation areas of both are mainly concentrated in Asia, Africa and Europe, with a high degree of overlap. There are three main reasons for this: Firstly, both plans focus their construction on their own continents to promote the economic recovery and development of regional countries, thereby maintaining surrounding peace and stability. Secondly, both plans set their sights on Africa. From a supply perspective, China and Europe both have a good tradition and foundation of assistance in Africa, and Africa has a broad market and development prospects. From a demand perspective, Africa's economic development urgently requires massive infrastructure investment, but Africa itself lacks construction funds. Finally, both plans focus on the two continents of Asia and Europe, because the development of Sino-European relations and the development of Eurasian relations have huge economic and strategic interests for both sides.

However, the Global Gateway Plan and the Belt and Road Initiative have different judgments on priority construction areas and key countries and projects for construction in different regions. The selection of areas for the Belt and Road Initiative is an innovation based on the inheritance of the traditional Silk Road. The selection takes into account both historical continuity and geographical location. Through two routes, land and sea, we can connect the three continents of Asia, Europe and Africa to the greatest extent, and achieve a high degree of cross-continental connectivity to maximize the benefits of economic cooperation. In general, the construction areas of the the Belt and Road initiative have highly coordinated, complete, and connected plans. The selection of areas for the construction of the Global Gateway Plan is based on the EU's own strategic needs, relying on existing strategic planning. Overall, it has the characteristics of decentralization and singleness. For example, The EU regards Eastern Europe, the Balkans, the Middle East and other regions as the focus of regional investment, and in relevant investment plans emphasizes supporting the above-mentioned regions to improve "security" construction in different fields and promote economic recovery. This is essentially closely related to the EU's peripheral security policy.

4.3 Construction Fields – Discussion of Similarities and Differences

From the perspective of construction field, there are many overlaps between the Global Gateway Plan and the Belt and Road Initiative in specific construction areas, such as investment in transportation facilities, construction of communication networks, health and medical cooperation, etc.. These overlapping parts are not difficult to understand. Because they are the most basic and extensive investment areas in overseas concentrated facility investment, developing countries urgently need investment in these areas to help regional development, and China and the EU have relatively mature industrial chains in these fields and can provide complete investment and product services.

However, the construction of the Belt and Road Initiative involves five aspects: policy, facilities, funds, trade, and people's hearts. It focuses on solving the entire process of construction issues from the three levels of government, enterprises, and citizens, so as to realize the realization of inter-country cooperation. The Global Gateway Plan focuses on specific areas and projects for cooperation, making large-scale investments in the two fields of transportation and education. From the three perspectives of infrastructure, supervision, and market, it strives to build an interconnection model that complies with EU standards. Generally speaking, China pays more attention to the "hard connectivity" areas of interconnection (physics, information, etc.), while the EU focuses on "soft connectivity" (humanities, society, rules). Comparatively speaking, the scope and level of the Belt and Road Initiative

construction area are broader, and the EU has focused its main attention on industries that have development potential and can meet the EU's development needs.

4.4 Financial Instruments – Discussion of Similarities and Differences

From the perspective of financial instruments, the Belt and Road Initiative has chosen diversified financing instruments, the EU's financing model is a mixture of grants, soft loans and guarantees. Both have chosen a variety of financing channels.

However, the financing subjects and methods of the two are different. The Belt and Road Initiative promotes the connectivity of financial instruments among cooperating countries based on existing mature financing methods. In the investment and financing process, it follows a sustainable and inclusive development model and takes into account the common interests of both creditors and debtors. This model can effectively meet the capital needs of the Belt and Road Initiative for large-scale investment. The Global Gateway Plan continues the model led by the European Union, trying to change the shortcomings of traditional overseas infrastructure investment in the selection of financial instruments, proposing innovative financial instruments, and setting up a variety of evaluation tools in investment to improve the quality of investment. The EU's financing model aims to attract private sector investment, while the Belt and Road Initiative focuses solely on loans. European mainstream media's criticism of the Belt and Road Initiative mostly focuses on the project's debt and financing risks. China is currently actively promoting the sustainability of the debt of the Belt and Road Initiative and promoting the development of green finance.

Generally speaking, the EU has vigorously innovated in financial instruments in an attempt to avoid the debt and financing risks caused by traditional financial instruments. The EU has certain competitive advantages in this field because of its extensive financial influence and mature experience in using foreign financial investment tools. However, China has continued to make efforts in the financial field in recent years and built a series of financial institutions that are conducive to overseas investment. At the same time, its foreign aid experience in recent decades and the problems encountered in the implementation of the Belt and Road Initiative have also enabled China to continuously improve its financial instruments. Both China and the EU have their own advantages in the field of financial instruments. In the future, the two plans should seek cooperation in financial instrument innovation, summarize the experiences of both parties, and strive to overcome this common problem in the global infrastructure field.

4.5 Development Stage – Discussion of Similarities and Differences

From the perspective of cooperation stages, the Global Gateway plan has been launched for a short period of time, it still needs time to be integrated and promoted; while the Belt and Road initiative has been in development for more than ten years, and China has formed bilateral or multilateral cooperation documents with dozens of countries. The development strategies of many countries have been effectively aligned. It is particularly noteworthy that "third-party market cooperation" agreements have been formed with European countries including France, Italy, and the United Kingdom.

5. Conclusion

A comparison revealed that the two global initiatives have both similarities and differences. The development of the Global Gateway plan and the Belt and Road Initiative is of vital significance and will help bridge the global infrastructure development funding and capacity gap, respond to global challenges, and achieve the sustainable development goals. Based on the above analysis, the following policy recommendations are put forward.

In the long term, the Global Gateway plan and the Belt and Road Initiative should consider cooperating with each other. China-EU relations are characterized by complementary advantages. Since the establishment of the comprehensive strategic partnership, China and the EU have truly achieved all-round cooperation in economic and trade exchanges, scientific and technological cooperation, and joint response to climate change. This confirms from the side that China and the EU are partners first, and consensus far outweighs differences. Therefore, for the Belt and Road Initiative and the Global Gateway Plan, reaching cooperation and docking will play an important role in promoting common development and progress. On the one hand, just like China-EU relations, the Global Gateway Plan and the Belt and Road Initiative also have strong complementary advantages. The experience and practices accumulated by the Belt and Road Initiative in hard infrastructure construction and other aspects can be fully used by the Global Gateway. For reference, the Global Gateway plan's new concepts and new thinking in digital, climate change and other aspects will also help broaden the development cooperation ideas of the Belt and Road Initiative. On the other hand, replacing competition with cooperation is also the common voice of different countries. At the Global Gateway forum, Bangladesh Prime Minister Hasina said that Bangladesh does not seek to choose sides, but seeks investment for its own development. If China-EU cooperation can be achieved, different participating countries will avoid the difficult choice of sides in the future and truly achieve common development and progress.

The Global Gateway Plan and the Belt and Road Initiative can pursue complementary competition if cooperation is not possible in the short term. In terms of specific projects, infrastructure plans supported by both initiatives may bid at the same time, and there may be competition in areas of "strategic significance" or "flagship projects that benefit most." Instead of competing fiercely on projects with high returns and low risks, institutions under the two initiatives should consider diversifying their funds into projects in different fields, which can not only give full play to their respective comparative advantages, but also strengthen risk mitigation measures. According to the funds, capabilities, willingness and risk appetite of Global Gateway Plan and Belt and Road Initiative, institutions from the Belt and Road Initiative can support a series of projects in a certain region or field, while Global Gateway investment institutions can support other projects. For projects that are competitive, the institution with competitive advantages will be awarded the project. Institutions under the Belt and Road Initiative and Global Gateway can also switch to supporting other, less competitive projects. In addition, agencies under both initiatives can focus on more cooperation with local financing institutions and recipient countries, rather than competing with each other.

Recipient countries should take advantage of the differences between initiatives to negotiate the best deals for their own development projects. Together, the two initiatives provide the world with options to support both soft and hard infrastructure in potential recipient countries. This gives countries the opportunity to negotiate the best deals for domestic development projects. Recipient countries can select specific partners based on their preferred project types, financing options, standards and bilateral relationships. Given that the two initiatives also require the coordination of different financing institutions in their respective governments, recipient countries have the opportunity to request the initiatives to provide multiple forms of mixed financing and obtain more favorable cooperation conditions. Recipient countries can therefore decide on partners based on their own needs rather than geopolitical considerations.

The Global Gateway Plan is an overseas construction and investment project led by the EU and The Belt and Road Initiative is a large-scale overseas infrastructure project proposed by China. There is a certain overlap between the two plans in terms of implementation areas and construction fields. There are considerable differences in principles, cooperation mechanisms and financial instruments. From the comparison, we can also see that the Global Gateway Plan

itself is affected by the dual influence of the EU's "normative power" and "geopolitics". In addition, it is affected by practical problems such as internal divisions in the EU and difficulty in cashing out funds. It is difficult for it to completely defeat the Belt and Road Initiative in the competition. At the same time, for the Belt and Road Initiative, the EU's participation in the field of interconnection construction is also of great value to its further development in the future. The Global Gateway Plan has lessons to learn from in the fields of financial instruments and emerging industry investment. In places where the Belt and Road Initiative will develop in the future, the impact of the Global Gateway Plan cannot be ignored. To sum up, for both parties, cooperation is in the interests of both parties. The purpose of the comparative study is not to distinguish the superior strategy between the two, but to lay the foundation for future research on cooperation and competition between the two plans.

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Competitiveness in the Field of Railway Transport Development in Kazakhstan: Insights from the Czech Republic and Improving EU-Aligned Procedures

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Abstract
This study analyzes the management of freight rail transport in Kazakhstan, focusing on enhancing its economic competitiveness and operational efficiency through the lens of European integration. It emphasizes the impact of route delays on economic growth and concentrates on refining procedural processes in alignment with EU standards and best practices. Drawing on the experience of the Czech Republic, an EU member state, the research aims to develop practical recommendations for reducing route delays and improving transportation efficiency. Employing a comprehensive approach, this study seeks to provide valuable insights for achieving goals in economic growth, sustainability, and innovation in freight railway operations, further aligning them with European norms and integration efforts.

Keywords: *analysis, economic globalization, European Union, Kazakhstan railways, procedural optimization, railway competitiveness*

JEL Classification: *F02, C01, C38*

1. Introduction

This study examines the interplay between innovation and user satisfaction in railway travel and transport, emphasizing the rapid technological advancements from the late 20th century to today. Research from 2015 to 2023 indicates that intelligent technology in rail transport is enhancing travel experiences and logistics, while introducing new services that boost user satisfaction. However, route delays remain a significant concern, affecting the reliability and efficiency of the system (Dekker, 2021).

In the context of economic globalization, the competitiveness of railway sectors is crucial, particularly for countries like Kazakhstan and the Czech Republic, which are strategically positioned for regional and international trade. This study focuses on Kazakhstan's railway development, assessing its competitive edge amid global economic dynamics and suggesting strategies to improve efficiency and punctuality.

Kazakhstan, located at the nexus of Europe and Asia, plays a key role in transcontinental trade. Its railway system is integral to the economy, handling half of the cargo turnover and most exports and transit goods. Despite the pandemic, there has been a significant annual increase in rail transit shipments over the last six years, with no major downturns, showing resilience and growth. Kazakhstan has developed an extensive network of railways designed for the transportation of large volumes of coal, oil, and other mineral resources required for processing

and consumption, as well as for the delivery of production materials and finished products. In addition to domestic freight transport, a significant part of transportation is directed towards and from neighboring countries, including the states of Central Asia. These routes have remained important since Kazakhstan gained independence. Simultaneously, Kazakhstan Railways (KTZ) is striving to diversify its markets, focusing on serving intra-regional and Eurasian transit routes, including directions to and from China.

The work also assesses the impact of railway transport in Kazakhstan on economic activities in Europe. Given Kazakhstan's strategic geographical position at the crossroads of Europe and Asia, the efficient operation of its railway system is crucial for facilitating the transit of goods between continents. Systematic improvement of procedures in the railway transport sector in Kazakhstan can contribute to strengthening trade ties with European countries and increasing transportation volumes through Europe.

The Czech Republic's influence on Kazakhstan's transportation system primarily involves knowledge sharing, technological expertise, and potential collaboration in railway development projects. As both countries have unique experiences and capabilities in the transportation sector, there may be opportunities for partnerships, joint ventures, or technology transfers. However, due to the geographical distance between the two countries and the differences in their transportation infrastructures, the direct impact of the Czech Republic on Kazakhstan's transportation system may be limited compared to other neighboring countries or regions. Nonetheless, collaboration and exchange of best practices can still contribute positively to the development and efficiency of Kazakhstan's transportation networks.

1.1 Transport Structure in Kazakhstan

In Kazakhstan, railway transport plays a significant role in the economy, especially in terms of the transit of goods between Europe and Asia. The country is actively investing in the modernization and development of its railway infrastructure to become a key player on the global transportation stage. Prioritizing the improvement of processes and enhancing the efficiency of freight transport are key for Kazakhstan as it leverages its geographical location to strengthen its role in international trade.

The government of Kazakhstan and Kazakhstan Temir Zholy (KTZ) provide limited information on the composition of international railway freight transportation, including data on export, import, and transit. According to a 2021 study by the United Nations Economic Commission for Europe (UNECE), in 2019, the share of export and import in the total volume of railway freight transportation could have been approximately 31%, while in the total freight turnover, it might have reached 43%. Transit shipments were estimated to constitute about 5% of the cargo volume and 11% of the freight turnover (Alexa et.al., 2019).

Recent modeling research conducted by the International Transport Forum (ITF) confirms that the Northern Trans-Asian Railway and TRACECA routes are the most heavily utilized railway freight corridors.

1.1.1 Railway Innovation and Collaboration: Driving Growth in the Czech Republic, Kazakhstan, and the EU

In the Czech Republic, railway transport is primarily considered in terms of domestic passenger and freight movements, but it also plays an important role in international connections. The country focuses on improving the quality of services and enhancing the accessibility of railway services for its population. Additionally, the Czech Republic aims to

integrate its railway system into the pan-European network, which requires coordinated efforts and collaboration with other European Union countries.

The transfer of technologies and procedures from the Czech Republic to Kazakhstan in the field of railway transportation holds significant potential for improving infrastructure and efficiency in railway systems. Czech companies can provide technical equipment, management and monitoring systems, as well as training for specialists. Involvement of Czech companies in infrastructure projects, standardization and certification, as well as innovative solutions, can also be beneficial for modernizing railway infrastructure in Kazakhstan.

Currently, there is much discussion about the necessity of implementing breakthrough technologies, including digital ones, in the railway transport sector. However, digitization can bring not only benefits but also significant challenges for railway companies. Incorrect choices in automation levels, errors in forming databases of technical assets, or the lack of objective information about the actual state of technical resources can lead to serious consequences. It is also important to assess the financial costs of implementing new technologies, which can significantly change the rules of technical maintenance in railway transport

In Europe, there are various railway agreements and contracts, including COTIF, CIV, and CIM, regulating international and domestic railway transport. Also important are agreements on cross-border freight transport (FRET), international freight transport on inland waterways (AGC), and the Open Skies Agreement for the aviation industry (European Parliament, 2023).

The successful implementation of digital technologies in the railway industry can be exemplified by the experience of the Austrian Federal Railways (ÖBB), which are successfully implementing the ISO 55000 standard in railway transport. Additionally, Italian, Irish, and Belgian railways are investing substantial funds in creating information asset management systems. These companies strive for effective network management and value creation both within the company and for stakeholders.

In the context of the European Union, it is important to note that many railway companies in member states are also actively implementing digital technologies. For example, Deutsche Bahn in Germany and SNCF in France are developing and implementing innovative approaches to asset management and safety in railway transport. This experience can be useful and inspiring for other railway companies in the European Union, helping them to adapt to the new requirements and challenges of the digital age.

It's also important to consider the issue of route delays, which remains one of the main challenges for the railway industry in the European Union. Schedule delays are often associated with various factors such as technical malfunctions, weather conditions, as well as infrastructure and management issues. Digital technologies can play a key role in improving predictability and operational efficiency of train movements, helping companies effectively respond to unforeseen situations and minimize delays (Porter, 2000).

2. Problem Formulation and Methodology

The management of freight rail transportation within Kazakhstan Temirzholy company is facing inefficiencies, particularly significant route delays, which undermine the sector’s global competitiveness and effectiveness in integrating into international trade networks. This study aims to explore the competitiveness of Kazakhstan's railway transport in the global context, with a focus on enhancing procedural efficiencies and addressing the issue of train delays. It involves a systematic analysis of contributing factors to these delays, examining current procedures, the regulatory environment, technological applications, and integrating global best

practices that have been successful elsewhere. In EU countries also there are indeed issues with train delays, as in many other parts of the world. Delays can be caused by various factors, including technical malfunctions, weather conditions, incidents on the tracks, as well as infrastructure deficiencies or inadequate funding for maintaining and improving the railway network.

The methodology of this study involves applying various analytical approaches to investigate competitiveness in the development of railway transport in Kazakhstan within the context of economic globalization and to improve procedures. In the context of analyzing the competitiveness of railway transport in Kazakhstan during its development in a globalized economy with the aim of improving procedures, methods and methodology can be adapted to address the problem of delays in routes. Case study analysis can also be included to identify specific problems and formulate recommendations for their solution. Cluster analysis allows for the identification of groups of similar observations, while factor analysis helps identify the key factors driving variation in the data. These methods can be particularly useful when analyzing temporal patterns of arrivals and departures, as they enable the identification of different segments of passengers or clients with unique characteristics (Baltagi, 2013).

For instance, cluster analysis can help identify groups of passengers with similar preferences regarding arrival and departure times, while factor analysis can uncover key factors such as seasonality or day of the week that influence these temporal patterns. The insights gained from these analyses can be used to more accurately segment users, optimize schedules, or improve service delivery, ultimately leading to increased customer satisfaction and service efficiency.

2.1 Pareto Analysis of the Transport System at Station of "Kazakhstan Temir Zholy"

When managing the process of trains arriving at the final destination, the Kazakhstan Temir Zholy company uses a Pareto diagram to identify the main causes of delays.This tool allows you to classify the causes by their frequency, identifying priority areas for improving the process. The Pareto diagram is based on defining the goal - improving the transport process, choosing the type of data - the causes of train delays, units of measurement - the number of cases of problems per month, collecting and systematizing statistical data for the month, as well as counting and organizing data in descending order. After analysis, each cause is classified into one of three categories: A (80% of the causes), B (15%) or C (the remaining 5%). Then, the main focus is on eliminating category A problems, which makes it possible to improve the efficiency of the transport process (Kasprzak, Lewis, 2014).

The analysis of the efficiency of the Railway during the first six months was carried out, focusing on concluded contracts and fixed time frames for the departure and arrival of freight trains. Using reports similar to those presented in KTZ reports for 2021, a consolidated table was compiled for all routes, reflecting the percentage of freight train departures and arrivals. Detailed data for the following months are provided in KTZ reports for 2021.

Table 1 shows that company will focus on addressing the following issues:

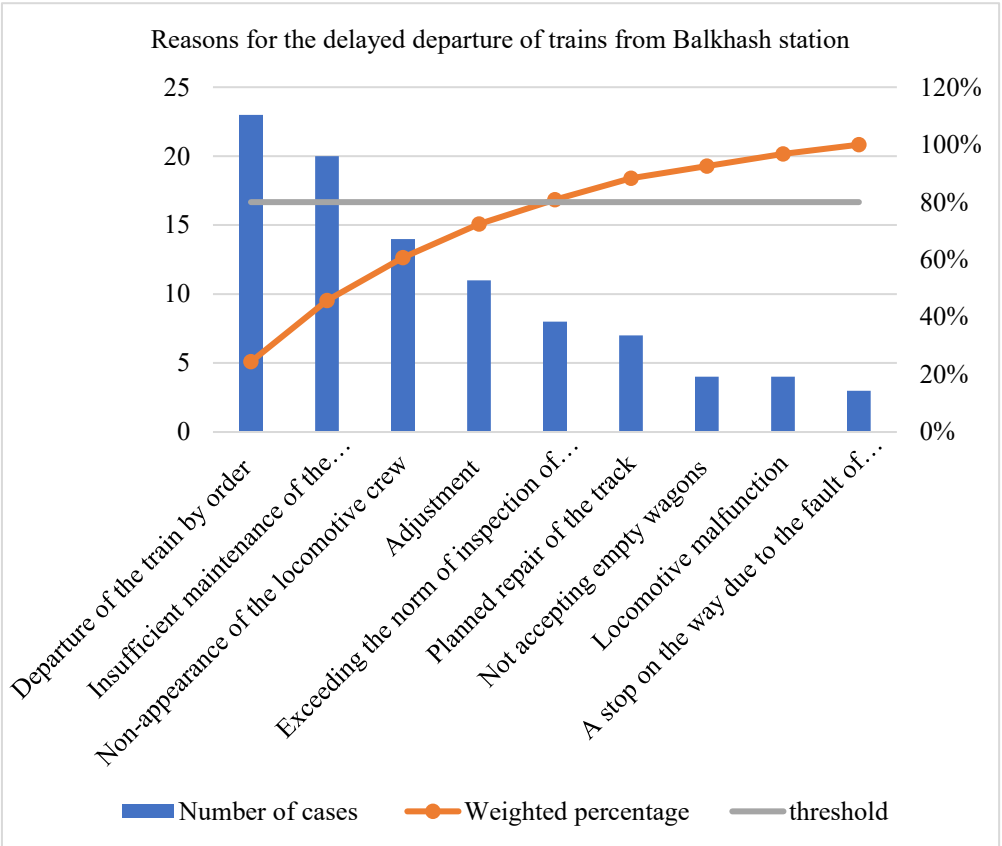
- Train departure based on specific orders
- Lack of presence of the locomotive crew
- Insufficient maintenance of the locomotive fleet
- Adjustments
- Rejection of empty wagons

Table 1: Reasons for the Delayed Departure of Trains

Reasons for late departure	Number of cases	Weighted percentage
Departure of the train by order	23	23%
Insufficient maintenance of the locomotive fleet	20	43%
Non-appearance of the locomotive crew	14	56%
Adjustment	11	67%
Exceeding the norm of inspection of wagons	8	75%
Planned repair of the track	7	82%
Not accepting empty wagons	4	86%
Locomotive malfunction	4	90%
A stop on the way due to the fault of the locomotive crew	3	93%

Note: The last column contains the cumulative percentage.
Source: Bureau of national statistics, 2023; Own processing, 2024

Figure 1: Reasons for Delayed Train Departures from Station



Source: Bureau of national statistics, 2023; Own processing, 2024

Figure 1 appear that factors covered by area A:

- Custom-made train package
- The client's setting up a train not according to the agreed trajectory
- Departure of empty wagons not according to the agreed trajectory

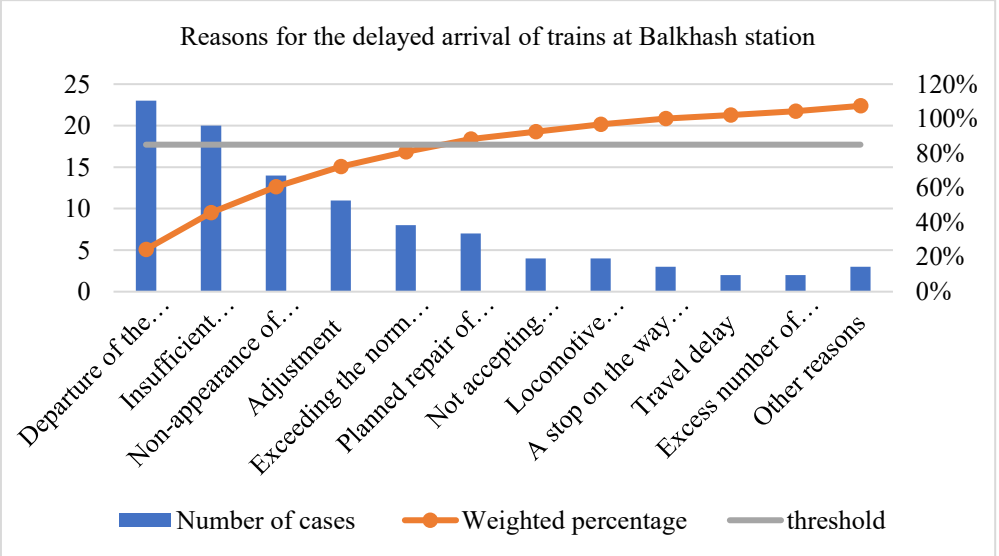
Table 2: Reasons for the Delayed Arrival of Trains

Reasons for late departure	Number of cases	Weighted percentage
Departure of the train by order	23	23%
Insufficient maintenance of the locomotive fleet	20	43%
Non-appearance of the locomotive crew	14	56%
Adjustment	11	67%
Exceeding the norm of inspection of wagons	8	75%
Planned repair of the track	7	82%
Not accepting empty wagons	4	86%
Locomotive malfunction	4	90%
A stop on the way due to the fault of the locomotive crew	3	93%
Travel delay	2	95%
Excess number of wagons at another station	2	97%
Other reasons	3	100%

Note: The last column contains the cumulative percentage.
Source: Bureau of national statistics, 2023; Own processing, 2024

The Pareto diagram can be seen in following Figure 2.

Figure 2: Reasons for the Delayed Arrival of Trains at Balkhash Station



Source: Bureau of national statistics, 2023; Own processing, 2024

Table 2 and Figure 2 be in view the reasons included in Zone A include:

- Departure of the train on an individual order
- Insufficient number of locomotives in the fleet
- Non-appearance of the locomotive crew
- Adjustment
- Exceeding the standards for inspection of wagons
- Planned track repairs.

3. Problem Solution

The competitiveness of the railway transportation industry reflects its ability to compete with other modes such as road, air, and maritime transport, as well as within the industry itself, among different railway companies. This competitiveness depends on various factors including efficiency, service quality, pricing, technological innovations, and regulatory frameworks (Melecký, Staníčková, 2021).

For example, continuous investments in maintaining and modernizing infrastructure, including tracks, stations, and signaling systems, are critical. Modern infrastructure can reduce travel time, enhance safety, and increase capacity.

Service quality, including train frequency, minimizing delays, comfort, and customer service, is also important for customer satisfaction and attraction. Pricing strategies such as competitive pricing and dynamic pricing can attract a wide range of customers and maximize revenue (Lee, Peterson, 2000).

An analysis of the operation of the Balkhash station over the previous six months shows the stability of the causes of delays in the departure and arrival of freight trains. The most common reason for the delayed departure of trains, which regularly enters zone A for six months, is the delay in the delivery of the train by the client. The company is unable to influence this external factor, and even the application of fines does not solve this problem, which is repeated from time to time. Thus, Kazakhstan Temir Zholy JSC loses a significant part of its profits due to the impact of causes that it does not manage.

The Pareto model provides only a visual representation of the frequency of problems, without taking into account their impact on time delays, train speeds and schedule compliance. In addition, it does not establish a link between the causes and the effectiveness of routes.

4. Conclusion

The competitiveness in the development of railway transport in Kazakhstan, coupled with insights from the Czech Republic, underscores the critical importance of improving procedures for enhancing operational efficiency and economic competitiveness. While Kazakhstan focuses on leveraging its strategic geographical position and investing in modernizing its railway infrastructure to bolster its role in international trade, the Czech Republic emphasizes the refinement of service quality and integration into the broader European transportation network.

Czechia and Kazakhstan are both working to enhance their railway systems, prioritizing service quality improvement and integration into the broader European transportation network. Both nations acknowledge the vital role of modern technologies and innovations in maintaining the competitiveness of their railway systems. By sharing experiences and

collaborating, they can achieve mutually beneficial outcomes and strengthen their positions in the global transportation industry.

In the context of rapid economic globalization, the efficiency of Kazakhstan's railway transport is increasingly critical to its competitiveness. Managing route delays effectively is a key aspect of this efficiency. Quick analysis and prompt resolution of these issues are essential for the smooth functioning of logistic chains and enhancing overall transportation efficiency. Therefore, improving procedural approaches is crucial for boosting the competitiveness of the country's railway infrastructure and its successful integration into the global economy. A model for data convolution analysis has been proposed, enabling the identification and timely correction of inefficiencies, thereby improving route functionality.

The topic of competitiveness in the development of railway transport in Kazakhstan, explored in this paper through the analysis of the Czech Republic's experience and the enhancement of procedures aligned with European Union standards, represents an important direction for further research. The author intends to continue research in this area as part of their dissertation, aiming to delve even deeper into the factors influencing the competitiveness of railway transport and to develop recommendations for improving its efficiency and compliance with global standards. Thus, this work serves as just the beginning of a more extensive and profound exploration of this issue, which the author will undertake in the future.

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Authors	Collective of Authors
Editors	Michaela Staníčková, Lukáš Melecký
Department	Department of International Economic Relations (120)
Title	Proceedings of the 7th International Conference on European Integration 2024
Place, Year, Edition	Ostrava, 2024, 1st edition
Number of pages	420
Publisher	VSB – Technical University of Ostrava, Czech Republic
Press	A.D.M. reprografické studio Ostrava
Number of copies	15 (print) Published on a publicly accessible website (on-line)
	Not for sale

ISBN 978-80-248-4733-7 (print)
ISBN 978-80-248-4734-4 (on-line)
ISSN 2571-029X (print)
ISSN 2788-0958 (on-line)

TVOŘÍME EVROPU
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VSB - Technical University of Ostrava
Faculty of Economics
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ISBN 978-80-248-4733-7 (print)
ISBN 978-80-248-4734-4 (on-line)

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