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Ivana Filipovića 4, 51000 Rijeka  
Hrvatska – Croatia  
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# Improving the perceived contribution of sustainable tourism through the residents' empowerment and support for tourism development: A different age group context\*

Lorena Bašan<sup>1</sup>, Ivana Perušina<sup>2</sup>, Marija Ham<sup>3</sup>

## Abstract

*This study aims to investigate the relationships of the residents' empowerment and support for tourism development with the perceived contribution of sustainable tourism and to identify precise attributes among different resident age groups, which can be used to improve the residents' perceived contribution of sustainable tourism. Research was conducted on a convenience sample of adult Croatian residents using a survey method. The results reveal that empowerment and support for tourism development are essential predictors of perceived sustainable tourism contribution in the group of residents older than 36 years of age. Furthermore, support for tourism development positively affects the perceived contribution of sustainable tourism among younger residents. In addition, the correlation analysis identified stronger relationships between all empowerment attributes and the perceived contribution of sustainable tourism among older residents. In both age groups of residents, all tourism support attributes are positively correlated with a perceived contribution of sustainable tourism. These findings give a comprehensive framework for understanding how the residents' empowerment and tourism support development shape perceived sustainable tourism outcomes while considering age-related variations in community responses.*

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<sup>1</sup> Full Professor, University of Rijeka, Faculty of Tourism and Hospitality, Management, Primorska 46, P.P. 97, 51410 Opatija, Croatia. Scientific affiliation: tourist destination marketing, sustainable marketing, forest therapy, children and tourism. E-mail: [lorenab@fthm.hr](mailto:lorenab@fthm.hr).

<sup>2</sup> MSc Student, University of Rijeka, Faculty of Tourism and Hospitality Management, Primorska 46, P.P. 97, 51410 Opatija, Croatia. Scientific affiliation: tourism marketing. E-mail: [ivanaperusina@gmail.com](mailto:ivanaperusina@gmail.com).

<sup>3</sup> Full Professor, Josip Juraj Strossmayer University of Osijek, Faculty of Economics and Business, Trg Ljudevita Gaja 7, 31000 Osijek, Croatia. Scientific affiliation: sustainable marketing, consumer behaviour, marketing strategy. E-mail: [marija.ham@efos.hr](mailto:marija.ham@efos.hr).

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## 1. Introduction

Tourism is one of the fastest-growing industries in the world, playing a crucial role in the economic development of many regions. It has the potential to provide significant benefits, including job creation, infrastructure development, and the promotion of cultural exchange. However, tourism also introduces challenges, such as environmental degradation, cultural commodification, and social inequalities within local communities. As a result, sustainable tourism has emerged as an essential practice for balancing the economic advantages of tourism with its potential negative impacts. Sustainable tourism prioritizes the long-term welfare of destinations, focusing on preserving environmental integrity, promoting social equity, and ensuring economic benefits for local populations.

Understanding the role of resident empowerment in sustainable tourism development has gained increasing attention in academic and policy circles (Birkić et al., 2019).

A fundamental aspect of sustainable tourism is the empowerment and engagement of residents, who are key stakeholders in tourism development. Residents provide a destination's cultural and social foundations, shaping its uniqueness and appeal. Without local communities' active participation and support, tourism initiatives risk creating discontent, social disruption, and unsustainable practices. A better understanding of the residents' role in sustainable tourism development and knowledge about tailored activities that will motivate residents to engage actively in the decision-making process and apply sustainability will enable more participatory, efficient, and effective sustainable tourism practices at the destination.

A critical research gap in the previous body of research exists in fully understanding the different dimensions of resident empowerment—economic, psychological, sociological, and political—and how these forms of empowerment influence local support for sustainable tourism. Existing studies have primarily focused on the economic benefits that tourism brings to communities or the environmental challenges it presents. Furthermore, while economic and psychological empowerment has been shown to influence residents' support for tourism positively, the role of political empowerment remains less clear, with some studies suggesting a negative correlation (Ahn and Bessiere, 2022). There is also a need for more in-depth research on how the support of residents translates into tangible contributions to sustainable tourism and how these contributions vary across different social and economic contexts (Neuts et al., 2021). However, less

attention has been given to the multi-faceted nature of empowerment and how it affects residents' perceptions of and support for tourism. As Yu et al. (2018) point out, a holistic approach considering various impacts on community quality of life is essential for understanding and fostering resident support for tourism. Moreover, there is insufficient exploration of how different demographic groups within local communities, such as various age groups, experience and respond to tourism development and empowerment differently. Understanding these variations is crucial for designing tailored approaches that enhance resident participation and support for sustainable tourism initiatives.

Given these gaps, this study aims to advance insights into the complex relationship between resident empowerment and the perceived contribution of sustainable tourism, focusing on the different dimensions of empowerment. Additionally, it will examine how demographic factors, particularly age, affect the correlation of empowerment and support for tourism development attributes with the perceived contribution of sustainable tourism. By addressing these underexplored aspects, this research aims to provide a more nuanced understanding of how local communities can be effectively engaged in sustainable tourism development, contributing to both their well-being and the long-term viability of tourism destinations. It will also provide actionable insights for policymakers, tourism planners, and community leaders seeking efficient sustainable tourism practices.

Based on those mentioned above, the following hypotheses have been defined:

- *H1: Residents' empowerment significantly and positively affects the perceived contribution of sustainable tourism.*
- *H2: Residents' support for tourism development significantly and positively affects the perceived contribution of sustainable tourism.*
- *H3: Significant differences exist in the correlation of the perceived contribution of sustainable tourism with empowerment attributes among different age groups.*
- *H4: Significant differences exist in the correlation of the perceived contribution of sustainable tourism with support for tourism attributes among different age groups.*

The paper is organized into five main parts. After the introduction, a literature review with an overview of previous research and the development of research hypotheses is presented. The paper's third part first details the methodology description. This part explains the measurements used, the research procedure and sample characteristics, and a description of the analysis conducted. The research results and discussion follow this part. The fifth and final part is the concluding remarks.

## **2. Literature review and hypotheses development**

This chapter lays the foundation for the research by examining existing literature and developing hypotheses central to the study. It is organized into three key sections. The first section explores the role of destination residents in tourism development, emphasizing their active participation as a critical component of successful initiatives. The second section delves into strategies for empowering destination residents, highlighting their influence on fostering sustainable tourism practices. Finally, the chapter presents the development of hypotheses, integrating insights from the literature to address the study's objectives.

### **2.1. Destination resident's participation in tourism development**

Tourism development is a dynamic and ongoing global phenomenon, continuously evolving and expanding across the planet. However, alongside its growth, tourism also introduces a range of negative impacts, particularly on the environment, local cultures, and communities. As the tourism sector continues to evolve rapidly, the challenge of mitigating these negative effects has become more urgent. In response, efforts are increasingly directed toward promoting sustainable tourism—an approach that seeks to reduce tourism's environmental footprint and ensure that it benefits future generations. Sustainable tourism is defined by its focus on enhancing the quality of life for residents of tourist destinations, emphasizing the importance of economic, environmental, and social sustainability over mere profit maximization (Boley and McGehee, 2014).

A critical aspect of sustainable tourism is the central role played by the local population. Any destination's unique atmosphere, culture, and identity are defined mainly by its residents, who are essential actors alongside tourists and local authorities in shaping a distinctive tourism offering. The involvement of local communities, combined with their natural and cultural heritage, helps create a compelling and authentic destination that attracts visitors (Birkić et al., 2019). Tourism must foster a symbiotic relationship between all stakeholders to function effectively and sustainably. Residents, authorities, and tourists must feel valued, respected, and empowered to achieve this. Building and maintaining positive relationships between these stakeholders is crucial for enabling continued tourism development without compromising the residents' quality of life. Research has shown that when local communities are given a voice in tourism development, negative attitudes towards tourism are significantly reduced, as residents feel a sense of influence and agency in shaping their community's future (Lankford and Howard, 1994).

The involvement of local populations in the tourism development process can take many forms. Residents can participate in decision-making processes and manage

tourism-related activities within their community. In this context, participation encompasses any tourism ventures in which local communities are involved and derive economic benefits and social outcomes, such as improved education and tourism skills (Birkić et al., 2019). This type of involvement ensures that local populations contribute to tourism development and directly benefit from it, leading to more equitable and inclusive growth.

Access to quality education is crucial in enhancing local contributions to tourism development. Educated individuals are better equipped to contribute to various economic sectors, including tourism, and to invest in their communities. This is vital for their personal advancement and a tourist destination's overall economic prospects and reputation. Research suggests that community-based entrepreneurship significantly supports social development by offering employees opportunities to improve their skills and investing in their health and well-being (Giampiccoli and Kalis, 2012). In decision-making, active resident participation is essential for building trust between the local community and the tourism industry (Muganda et al., 2013). Residents who feel their voices are heard and their contributions valued are more likely to support tourism initiatives, leading to more sustainable outcomes. Consultations with residents also help identify appropriate solutions to community-specific challenges, fostering confidence in future tourism projects.

## **2.2. Empowering destination residents to support sustainable tourism development**

Empowerment plays a crucial role in achieving sustainable tourism. Sustainability is realized through residents' economic, social, environmental, and psychological empowerment. Empowerment is when individuals or groups move from vulnerability or dependence to relative control over their lives, communities, and environment (Boley and McGehee, 2014). This concept is crucial for individual development and the growth and sustainability of organizations and communities. When local communities are not meaningfully engaged or empowered in the tourism process, negative consequences can arise for both the community and the destination.

The ultimate goal of empowerment is to harness the strengths of individuals and communities to achieve the collective well-being of all stakeholders (Hall and Richards, 2000). The research underscores the importance of local support for sustainable tourism development. It demonstrates that when residents are empowered through leadership, participation, and capacity building, they are more likely to support sustainable initiatives (Khalid et al., 2019). The support of the local population is pivotal to the success of sustainable tourism, as their engagement directly impacts the long-term viability of tourism in a destination. Furthermore, it has been shown that there are varying levels of support for tourism development

among different segments of the local population. For example, individuals working in tourism often express the strongest support for future development, while students, the unemployed, and retirees tend to show less support (Soldić Frleta and Smolčić Jurdana, 2020).

Empowerment is a multidimensional construct encompassing psychological, economic, social, and political dimensions. Psychological and economic empowerment has positively affected residents' support for tourism. In contrast, political empowerment has been shown to have a negative relationship with tourism development (Ahn and Bessiere, 2022). Research also suggests local communities strongly support continued tourism development (Neuts et al., 2021).

Regarding education and knowledge, there was a statistically significant difference in the level of education of the questioned population and their understanding of sustainability and sustainable development. It is found that young people equally value the concept of sustainability as a whole and components of sustainable development while, at the same time, their knowledge of sustainable development is deficient (Kušljčić, 2022). Another research points out age as a significant determinant that shapes perceptions of socio-economic issues (Hübel et al., 2023a). When talking about age, a similar study was conducted among different age groups, showing that Baby Boomers tend to be less supportive of sustainable practices while also placing low importance on sustainability (Nichols and Holt, 2023). According to the research, it is clear and safe to conclude that sustainable tourism development is significantly and positively influenced by community empowerment and support by local people, regardless of age (Wani et al., 2023). Additionally, to ensure sustainable tourism management's successful implementation, it is crucial to establish a new culture of dialogue that facilitates ongoing communication between local stakeholders and decision-makers (Lee, 2013).

### **2.3. Hypotheses development**

The hypotheses of this study are designed to address the research gap identified in the literature (Gautam and Bhalla, 2024; Khalid et al., 2019) on resident empowerment and its relationship to sustainable tourism contribution. Specifically, the study seeks to explore the multidimensional nature of empowerment (economic, political, psychological, and social) and its impact on residents' perceptions of sustainable tourism contribution. Based on the comprehensive analysis of the theoretical and empirical models published between 1990 and 2020, Šegota et al. (2024) recently concluded that future research needs to move beyond the focus on the unidimensional relationship between perceived impacts and attitudes. The present study aims to investigate how resident support for tourism development and age-related differences influence these relationships based on a call of researchers to further investigate these interrelations (Hübel and Condrea, 2023b).

Each hypothesis contributes to closing the research gap by focusing on a specific underexplored aspect of resident empowerment and tourism sustainability.

The first hypothesis tests the relationship between resident empowerment and their perception of sustainable tourism contribution. The current research gap lies in the lack of a comprehensive understanding of how empowerment in various forms (beyond just economic empowerment) affects local communities' engagement with and support for sustainable tourism. As revealed by Šegota et al. (2017), highly informed and highly involved residents have better perceptions of tourism than all other groups. Furthermore, as pointed out by Gautam and Bhalla (2024) in a recent study, although the term empowerment is frequently employed in studies on resident attitudes, it is still unclear how this concept is related to others. It is essential to comprehend the components that empower and the factors that empower effects.

This hypothesis addresses whether empowering residents leads to more positive perceptions of tourism's sustainability benefits, thus providing a more holistic view of empowerment's role in sustainable tourism development.

*H1: Residents' empowerment significantly and positively affects the perceived contribution of sustainable tourism.*

Within this main hypothesis, four auxiliary hypotheses were set. The first auxiliary hypothesis focuses on economic empowerment, the most widely studied in tourism literature. It explores whether residents' perceptions of personal economic gains, such as job creation or increased income, positively influence their view of sustainable tourism's contribution. Economic benefits are often highlighted as crucial for resident support (Boley et al., 2018; Li et al., 2022; Ranasinghe and Pradeepamali, 2019) and according to Šegota et al. (2024) employment and business opportunities are the most common personal benefits from tourism that influence residents to form positive perceptions of tourism impacts.

Although economic factors are often overemphasized (Šegota et al., 2024) there is a need for future research to focus on examining how residents perceive other noneconomic benefits and costs from tourism, i. e. social and cultural benefits (Šegota et al., 2024) and to clarify the relative importance of economic empowerment compared to other forms of empowerment (Aleshinloye et al., 2022; Strzelecka et al., 2017).

The first auxiliary hypothesis tests whether this aspect alone significantly influences the perception of sustainable tourism contribution.

*H1.1: Personal economic benefits significantly and positively affect the perceived contribution of sustainable tourism.*

The second auxiliary hypothesis is related to political empowerment. Political empowerment refers to residents having a voice in the decision-making processes related to tourism development. Political empowerment is often considered beneficial. For example, Ranasinghe and Pradeepamali (2019) found that political empowerment influenced on positive impacts, leading to residents' support for tourism development. Also, more recently, Gautam and Bhalla (2024) found that political empowerment influenced inhabitants' quality of life most significantly. At the same time, some studies have suggested a negative relationship between political empowerment and support for tourism (Ahn and Bessiere, 2022). This hypothesis tests whether political empowerment contributes positively to residents' perception of sustainable tourism contribution or whether it introduces challenges such as dissatisfaction with the decision-making process. This hypothesis addresses the unclear role of political empowerment in sustainable tourism, helping to resolve contradictions in existing literature and offering a deeper understanding of how political involvement affects perceptions of sustainability.

*H1.2: Political empowerment significantly and positively affects the perceived contribution of sustainable tourism.*

The third auxiliary hypothesis is related to psychological empowerment, which refers to the sense of agency, self-confidence, and autonomy that residents feel as participants in tourism development. Recent studies highlight the importance of psychological empowerment in tourism contexts alongside economic and political dimensions (Li et al., 2022). According to a recent study of Gautam and Bhalla (2024), psychological empowerment was the most critical antecedent of residents' support for sustainable tourism development, followed by social empowerment. Also Strzelecka et al. (2017) found that residents within Central and Eastern Europe settings are more influenced by the pride and self-esteem boost associated with psychological empowerment than the economic promises of tourism. Furthermore, psychological empowerment has been found to influence residents' place attachment and quality of life significantly (Aleshinloye et al., 2022). However, this form of empowerment is still underexplored in tourism studies compared to economic and political empowerment (Singhania, 2021). Hidayat et al. (2017) point out that while economic and social empowerment efforts have progressed, psychological empowerment is still at an early reinforcement stage (Hidayat et al., 2017). This hypothesis tests whether psychological empowerment enhances residents' perceptions of sustainable tourism by increasing their involvement and pride in local tourism initiatives. It explores the psychological dimension of empowerment, filling a gap in the literature where the emotional and cognitive aspects of resident empowerment have received limited attention. Understanding psychological empowerment's role in shaping perceptions of sustainability is essential for a more comprehensive view of community engagement.

*H1.3: Psychological empowerment significantly and positively affects the perceived contribution of sustainable tourism.*

The fourth auxiliary hypothesis refers to social empowerment, which involves strengthening social networks, cultural identity, and community cohesion through tourism. Recent studies highlight the importance of community empowerment in sustainable tourism development. Social empowerment positively influences residents' perceptions of tourism's environmental impacts and participation in sustainable tourism initiatives (Shafieisabet and Haratifard, 2020). Also, community involvement in the tourism industry and decision-making processes is associated with positive perceptions of social empowerment indicators (Rachmawati et al., 2022). The study of Strzelecka et al. (2017) also found that the perceptions of increased community cohesion (i.e. social empowerment) has stronger influence on residents within Central and Eastern Europe than economic benefits of tourism. This hypothesis examines whether tourism contributes to social empowerment and how this affects residents' perceptions of its sustainability. While economic and political empowerment are commonly studied, the social benefits of tourism, such as preserving cultural heritage and strengthening community ties, are less often explored. This hypothesis fills a gap by examining how social dynamics and cultural empowerment contribute to sustainable tourism, offering new insights into tourism's social benefits beyond individual economic gains.

*H1.4: Social empowerment significantly and positively affects the perceived contribution of sustainable tourism.*

The second hypothesis investigates the relationship between resident support for tourism development and their perceptions of its sustainability. While some research has suggested that support from the local population is essential for tourism's long-term success and that positive perceptions of tourism benefits are associated with increased support for sustainable tourism development (Rodrigues et al., 2014; Kodaş et al., 2022), there has been limited examination of how this support translates into perceptions of tourism's positive contributions (Pazhuhan et al. 2023). In their study in a touristic city in Iran, Pazhuhan and associates (2023) empirically confirmed that inhabitants' positive perceptions and local community participation support sustainable tourism development. This hypothesis explores whether active local support enhances sustainable tourism outcomes. It helps to clarify the importance of local support for tourism development and how it influences sustainability perceptions, contributing to the broader understanding of community-based tourism initiatives.

*H2: Residents' support for tourism development significantly and positively affects the perceived contribution of sustainable tourism.*

The third hypothesis addresses the demographic variation in how residents experience empowerment and perceive tourism development. Age is an essential

factor in shaping perceptions of tourism, as different age groups may have varying levels of interest, engagement, and dependence on the tourism sector. Understanding these differences is critical for developing policies that engage all population segments (Wang, 2013). Also, as Hübel and Condrea (2023b) point out, exploring age-related perceptions is crucial for shaping sustainable tourism policies and practices. The third hypothesis explores the diversity of experiences within local communities, focusing on age as a critical variable. This contributes to closing the gap related to the heterogeneous nature of resident populations and how their demographic characteristics affect their views on empowerment and sustainable tourism.

*H3: Significant differences exist in the correlation of the perceived contribution of sustainable tourism with empowerment attributes among different age groups.*

The fourth hypothesis examines whether different age groups vary in their level of support for tourism development and how this affects their perceptions of sustainability. As Trivellas et al. (2016) point out, age may influence support, with younger residents showing less enthusiasm for tourism development. Age-related differences may arise due to generational perspectives on tourism's economic, social, and environmental impacts. For example, younger residents may be more concerned with environmental sustainability, while older residents may prioritize economic stability. Recently, Koščak et al. (2023) investigated the neglected voices of children affected by tourism employing an experimental design in six diverse European destinations. They revealed that the attitude of children towards tourists is negative, while they perceive locals to hold a subordinate position to tourists, which calls for further research in this domain. This hypothesis addresses the underexplored demographic dimension of tourism development, offering new insights into how support for tourism varies across different age groups. It contributes to the literature by highlighting the need for age-specific strategies in sustainable tourism planning.

*H4: Significant differences exist in the correlation of the perceived contribution of sustainable tourism with support for tourism attributes among different age groups.*

Collectively, these hypotheses contribute to closing the research gap by providing a multidimensional exploration of resident empowerment and support for sustainable tourism. They move beyond the traditional focus on economic empowerment, incorporating political, psychological, and social factors while considering age-related variations in community responses. This study will offer a comprehensive framework for understanding how residents' empowerment and support for tourism development shape perceived sustainable tourism outcomes, addressing critical gaps in the literature on community participation, empowerment, and demographic diversity in sustainable tourism development.

### **3. Methodology**

This part explains the measurements used, the research procedure and sample characteristics, and a description of the analysis conducted.

#### **3.1. Measurements**

Following the proposed hypotheses, a quantitative approach was taken to fulfill the research goal. Empirical research was conducted using a survey method based on a structured questionnaire. The questionnaire items were taken and adapted from previous studies by Ranasinghe and Pradeepamali (2019) for the empowerment of the local community through tourism, presented in the Appendix – Table A.1; Woosnam (2012) for resident's support for tourism development, shown in the Appendix – Table A.2 and College Values Online for the perceived contribution of sustainable tourism to the local community, presented in the Appendix – Table A.3. Questions in the first part of the instruments were related to the dimensions considered in this research: empowerment, support for tourism development, and contribution of sustainable tourism. Respondents were asked to evaluate each attribute of the abovementioned dimensions on a 7-point Likert scale (ranging from 1 = strongly disagree to 7 – strongly agree). The second part of the instruments included questions related to the socio-demographic characteristics of the respondents: gender, age, education, working status, and average monthly income.

The validity of research results was ensured by designing a questionnaire based on previous studies, as mentioned above. Factors are formed as the sums of corresponding items. Factor loading was calculated within both resident groups to test the validity of the research instrument used (Table 1).

The calculated factor loading values for all proposed items are above 0.4 in both resident groups and can be used for measuring survey dimensions:

- Local community empowerment construct measured with Personal economic benefit from tourism (PEBT), Political (PE), Psychological (PSYCHE) and Social (SOCE) dimensions
- Support for tourism development (SUPPTD)
- Perceived contribution of sustainable tourism (PCST).

Table 1: Factor loading for survey dimensions (Communalities – Extraction)

CODE	18-35 years old	above 36 years old
Personal economic benefit from tourism (PEBT)		
PEBT1	0.827	0.852
PEBT2	0.843	0.863
PEBT3	0.744	0.866
PEBT4	0.694	0.799
Political empowerment (POLE)		
POLE1	0.682	0.812
POLE2	0.551	0.815
Psychological empowerment (PSYCHE)		
PSYCHE1	0.732	0.663
PSYCHE2	0.634	0.693
PSYCHE3	0.579	0.741
PSYCHE4	0.464	0.642
Social empowerment (SOCE)		
SOCE1	0.737	0.718
SOCE2	0.716	0.815
SOCE3	0.735	0.743
Resident's support for tourism development (SUPPTD)		
SUPPTD1	0.789	0.850
SUPPTD2	0.820	0.872
SUPPTD3	0.836	0.815
SUPPTD4	0.750	0.738
SUPPTD5	0.674	0.786
SUPPTD6	0.551	0.755
SUPPTD7	0.656	0.755
SUPPTD8	0.730	0.424
SUPPTD9	0.617	0.723
Perceived contribution of sustainable tourism (PCST)		
PCST1	0.543	0.676
PCST2	0.603	0.785
PCST3	0.579	0.661
PCST4	0.438	0.477
PCST5	0.626	0.728

Source: Author's calculations

The validity of the research results is also evident from the internal consistency of the scales for each dimension and within each resident's group. A reliability analysis was conducted to verify the consistency of the dimensions and validity of the used research instrument. The Cronbach alpha ( $\alpha$ ) coefficients were calculated to test the internal consistency of dimensions (Table 2).

Table 2: Dimension's reliability

No.	Dimensions and attributes	Cronbach alpha ( $\alpha$ )		
		total sample	18-35 years old	above 36 years old
1.	Perceived empowerment			
1.A	Personal economic benefits from tourism	0.913	0.869	0.936
1.B	Political empowerment	0.744	0.682	0.792
1.C	Psychological empowerment	0.825	0.734	0.865
1.D	Social empowerment	0.853	0.844	0.870
2.	Support for tourism development	0.898	0.895	0.900
4.	Perceived contribution of sustainable tourism	0.845	0.797	0.871

Source: Author's calculations

The results in Table 2 show all values of the Cronbach alpha coefficients for the dimensions considered in this research: empowerment, support for tourism development, and contribution of sustainable tourism within a total sample, younger (below 35 years) and older (above 36 years) group of residents. Cronbach's alpha coefficient should be above 0.7 ( $>0.70$ ), as the recommended minimum level (Hair et al., 2014) for acceptable internal consistency. The following implies acceptable internal consistency of the scales (for Cronbach alpha values between 0.7 and 0.8), good (for Cronbach alpha values between 0.8 and 0.9), and excellent (for values of Cronbach alpha above 0.9).

Cronbach's alpha value for Political empowerment within a younger resident group (below 35 years) is lower than 0.7. For that reason, the inter-item correlation was performed. The intercorrelation stands at 0.518. Considering that intercorrelations should exceed 0.30 (Hair et al., 2014), the authors retained this factor to avoid losing useful information for destination managers.

Following above mentioned, it can be determined that Cronbach alpha values confirm the internal consistency for all analyzed dimensions and the validity of the research instruments and results, which is additionally confirmed through factor analysis and communalities – extraction values for both age groups of respondents.

Data analysis was carried out using the SPSS 23 statistical software. Descriptive statistics were used to analyze sample characteristics. Inferential statistics was implemented to examine the relationships between dimensions (bivariate correlations) and the influences of different independent variables (personal economic benefit from tourism, political, psychological, and social empowerment and support for tourism development) on a dependent variable (perceived contribution of sustainable tourism) were examined by implementing multiple linear regression analysis.

### 3.2. Procedure and sampling

The primary research was conducted in Croatia from 1st April until 1st May 2024 for the master thesis (Perušina, 2024). The questionnaire was created using Google Forms to conduct an online survey through social media. The survey was conducted on a convenience sample of adult Croatian residents. A total of 185 questionnaires were collected and included in the analysis. The sample size can be considered adequate since the observations per variable are above the recommended minimum of at least five observations per variable (Hair et al., 2014). The socio-demographic characteristics of the respondents are presented in Table 3.

Table 3: Characteristics of the sample structure (N=185)

	Gender	Frequency (N)	Relative share (%)
1	Female	63	65.9
2	Male	122	34.1
	Age		
1	18-25	53	28.6
2	26-35	39	21.1
3	36-45	34	18.4
4	46-55	31	16.8
5	above 56 years	28	15.1
	Educational level		
1	Secondary school graduates	32	17.3
2	High school graduates	10	5.4
3	University undergraduates	51	27.6
4	University graduates	63	34.0
5	Master's or doctoral degree	29	15.7
	Employment		
1	Unemployed	6	3.3
2	Student	33	17.8
3	Employed	144	77.8
4	Pensioner	2	1.1
	Average personal monthly income		
1	< 300 €	16	8.6
2	301-599 €	15	8.1
3	600-799 €	10	5.4
4	800-999 €	12	6.5
5	1.000-1.299 €	56	30.0
6	> 1.300 €	76	41.1

Source: Author's calculations

Regarding sample characteristics, mostly are females (65.9%), have a university degree (34.1%), are employed (77.8%), and 71.4% of them have an average personal income greater than 1,000 € (30.3% from 1,000-1,299 € and 41.1% above 1,300 €).

Following the research concept and regarding age, respondents are grouped into two groups: 18 to 35 and older than 36. The group aged 18 to 35 in the structure of respondents makes up 49.7%, while the share of people over 36 years old is slightly higher and makes up 50.3% of the sample. It is evident that in the respondent's sample, there are equal shares of respondents under the age of 35 and over 36, which is important for the objectivity of the research conducted and the comparison of results between different age groups.

#### **4. Research results and discussion**

The multiple linear regression analysis was performed to identify influences of empowerment factors and support for tourism development on the perceived contribution of sustainable tourism for different resident age groups. Previous research also confirmed that age is crucial in shaping perceptions of sustainable tourism and social responsibility (Hübel and Condrea, 2023b).

Thus, an analysis was performed on two different age groups: the younger resident group, which was below 35 years old, and the older resident group, which was above 36 years old. Empowerment factors and support for tourism development were independent variables, and the perceived contribution of sustainable tourism was the dependent variable (Table 4).

The multiple regression results reveal that support for tourism development and empowerment are particular predictor variables for a perceived contribution of sustainable tourism among residents above 36 years (Adjusted  $R^2=0.687$ ) and explain a high 68.7% variance related to the perceived contribution of sustainable tourism. For the residents below 35 years, these predictors in the model explained only 34.3% (Adjusted  $R^2=0.343$ ) of the total variance for a perceived contribution of sustainable tourism. Following this, for the resident group below 35 years, other factors, in addition to those analyzed, influence their perceived contribution of sustainable tourism.

Within the empowering residents construct, the influence of most dimensions on the perceived contribution of sustainable tourism is insignificant. In the younger age group (under 35 years), only Personal economic benefits – PEBT ( $\beta=0.208$ ,  $p=0.043$ ) significantly influence the perceived contribution of sustainable tourism, which confirms hypothesis H1.1. In the older age group, over 36, only Psychological empowerment – PSYCHE ( $\beta=0.177$ ,  $p=0.048$ ) significantly influences the per-

ceived contribution of sustainable tourism, thus confirming hypothesis H1.3. Political empowerment – POLE and Social Empowerment – SOCE do not significantly influence the perceived contribution of sustainable tourism in either younger or older age groups. Therefore, hypotheses H1.2 and H1.4 were not confirmed.

It is evident from the above that two auxiliary hypotheses were confirmed (H1.1 and H1.3), while two were refuted (H1.2 and H1.4). Thus, it can be concluded that hypothesis H1 is partially confirmed.

Table 4: Multiple linear regression analysis – different age group’s context

Perceived contribution of sustainable tourism – PCST (18-35 years old)	B	SE	BETA	t	Sig.
Constant					
Personal economic benefit from tourism (PEBT)	0.149	0.073	0.208	2.055	0.043
Political empowerment (POLE)	-0.037	0.153	-0.025	-0.239	0.811
Psychological empowerment (PSYCHE)	0.019	0.135	0.015	0.139	0.890
Social empowerment (SOCE)	0.216	0.114	0.204	1.903	0.060
Resident’s support for tourism development (SUPPTD)	0.270	0.058	0.451	4.680	0.000
$R^2$	0.376				
Adjusted $R^2$	0.343				
Standard error	2.726				
F ratio	10.520				
Significance	0.000				
Perceived contribution of sustainable tourism – PCST (above 36 years old)	B	SE	BETA	t	Sig.
Constant					
Personal economic benefit from tourism (PEBT)	0.050	0.051	0.064	0.981	0.329
Political empowerment (POLE)	0.103	0.122	0.058	0.844	0.401
Psychological empowerment (PSYCHE)	0.204	0.101	0.177	2.006	0.048
Social empowerment (SOCE)	0.012	0.123	0.009	0.100	0.921
Resident’s support for tourism development (SUPPTD)	0.429	0.054	0.661	7.999	0.000
$R^2$	0.703				
Adjusted $R^2$	0.687				
Standard error	2.486				
F ratio	41.751				
Significance	0.000				

Source: Author’s calculations

Gautam and Bhalla (2023) identified psychological empowerment as a crucial predictor of support for sustainable tourism development, followed by social empowerment (Gautam and Bhalla, 2023), which is confirmed by the results of this research related to the psychological empowerment of the older age group. Social empowerment has an insignificant influence in both resident groups, contrary to the previous one and following Moreira dos Santos et al. (2024) findings related to the insignificant influence of social empowerment. Further, Moreira dos Santos et al. (2024) found a significant but negative relationship between political empowerment and support for sustainable tourism development, which coincides with political empowerment's influence on the younger resident groups and the significant and direct relationship between economic empowerment support for sustainable tourism development, as found in this research for younger resident groups.

The regression analysis results also indicate a positive and statistically significant influence ( $p < 0.05$ ) of support for tourism development on the perceived contribution of sustainable tourism within both age groups. Accordingly, hypothesis H2 is confirmed. The impact intensity of the support for tourism development on the perceived contribution of sustainable tourism is stronger in the older age group ( $\beta = 0.661$ ,  $p = 0.000$ ) than in those aged below 35 years ( $\beta = 0.451$ ,  $p = 0.000$ ).

Some recent studies have also explored the relationships between community empowerment, support for tourism, and sustainable tourism development. Research indicates that community empowerment positively influences sustainable tourism development and residents' support for tourism (Khalid et al., 2019; Wani et al., 2022), and the research results follow these previous findings with specificity related to the respondent's age group.

Additionally, correlation analyses were carried out to assess the relationships between empowerment and support for tourism development attributes and the perceived contribution of sustainable tourism. The purpose was to identify precise attributes in both dimensions and for different resident age groups, which can be used to improve the perceived contribution of sustainable tourism to their tourist destinations.

The correlation analysis results of perceived empowerment attributes and perceived contribution of sustainable tourism are presented in Table 5.

Table 5: The correlation between empowerment attributes and the perceived contribution of sustainable tourism – different age group's context

No.	Dimensions/ Attributes	18-35 years old		Above 36 years old	
		Pearson correlation (r)	Sig. (2-tailed)	Pearson correlation (r)	Sig. (2-tailed)
EMPOWERMENT DIMENSIONS AND ATTRIBUTES					
1.	Personal economic benefits from tourism (PEBT)				
	PEBT1	0.299**	0.004	0.377**	0.000
	PEBT2	0.347**	0.001	0.292**	0.004
	PEBT3	0.357**	0.000	0.347**	0.001
	PEBT4	0.188	0.072	0.243**	0.018
2.	Political empowerment (POLE)				
	POLE1	0.285**	0.006	0.245**	0.017
	POLE2	0.15	0.889	0.304**	0.003
3.	Psychological empowerment (PSYCHE)				
	PSYCHE1	0.313**	0.002	0.455**	0.000
	PSYCHE2	0.150	0.153	0.483**	0.000
	PSYCHE3	0.361**	0.000	0.637**	0.000
	PSYCHE4	0.290**	0.005	0.673**	0.000
4.	Social empowerment (SOCE)				
	SOCE1	0.220*	0.035	0.470**	0.000
	SOCE2	0.147	0.163	0.467**	0.000
	SOCE3	0.402**	0.000	0.601**	0.000
5.	PERCEIVED CONTRIBUTION OF SUSTAINABLE TOURISM (PCST)	4.08		3.8	

Note: \*\*Correlation is significant at the 0.01 level (2-tailed) ; \*Correlation is significant at the 0.05 level (2-tailed)

Source: Author's calculations

The resident's empowerment is a multidimensional construct and was measured through four dimensions: personal economic benefit from tourism, political, psychological, and social empowerment. Research results indicate higher Pearson coefficient values and a significant relationship between all empowerment attributes and the perceived contribution of sustainable tourism for the resident group above 36 years. In the younger group of residents (under 35 years), the correlation values are lower with the existence of insignificance of the correlation for four

empowerment factors (one factor in each dimension: PEBT4, POLE2, PSYCHE2, and SOCE2). Following the abovementioned, the hypothesis H3 is confirmed. These results coincide with Trivellas et al. (2016) findings, which point out that younger residents show less enthusiasm for tourism development.

The Pearson coefficient ( $r$ ) was explained following de Vaus (2002). In the older age group, a strong and moderate correlation of specific psychological and social empowerment factors with the perceived contribution of sustainable tourism was identified. Psychological empowerment factors that strongly correlate with a perceived contribution of sustainable tourism are PSYCHE4 – Tourism makes me want to tell others about what we have to offer ( $r=0.673$ ,  $p=0.000$ ) and PSYCHE 3 – Tourism reminds me that I have a unique culture to share with visitors ( $r=0.637$ ,  $p=0.000$ ). In addition to the mentioned psychological factors, a strong relationship is determined by one social empowerment factor for the older resident group, and it is SOCE3 – Tourism provides ways for me to get involved in my community ( $r=0.601$ ,  $p= 0.000$ ). Following a strong correlation with the perceived contribution of sustainable tourism, destination marketing managers can primarily use these factors to influence the older residents' perception of sustainable tourism contribution to the local community. All other factors in the older residents group have a significant but weak and moderate relationship with a perceived contribution of sustainable tourism.

Four factors moderately related to the perceived contribution of sustainable tourism are identified for the younger residents group. There are identified one social empowerment factor SOCE3 – Tourism provides ways for me to get involved in my community ( $r=0.402$ ,  $p= 0.000$ ), one psychological empowerment factor PSYCHE3 – Tourism reminds me that I have a unique culture to share with visitors ( $r=0.361$ ,  $p=0.000$ ) and two personal economic benefit from tourism factors PEBT3 – Economically benefit from more tourism development ( $0.357$ ,  $p=0.000$ ) and PEBT2 – A portion of my income is tied to tourism ( $0.347$ ,  $p=0.001$ ). The other five factors are weakly related, and four have an insignificant relationship with the perceived contribution of sustainable tourism for the younger residents group.

Table 6 shows the correlation analysis results between perceived support for tourism attributes and the perceived contribution of sustainable tourism.

Table 6: The correlation between support for tourism development attributes and perceived contribution of sustainable tourism to the community – different age groups context

Dimensions/ Attributes	18-35 years old		Above 36 years old	
	Pearson correlation (r)	Sig. (2-tailed)	Pearson correlation (r)	Sig. (2-tailed)
Support for tourism development (SUPPTD)				
SUPPTD1	0.435**	0.000	0.780**	0.000
SUPPTD2	0.418**	0.000	0.727**	0.000
SUPPTD3	0.438**	0.000	0.676**	0.000
SUPPTD4	0.354**	0.000	0.553**	0.000
SUPPTD5	0.384**	0.000	0.585**	0.000
SUPPTD6	0.477**	0.000	0.617**	0.000
SUPPTD7	0.304**	0.003	0.565**	0.000
SUPPTD8	0.443**	0.000	0.513**	0.000
SUPPTD9	0.358**	0.000	0.551**	0.000
PERCEIVED SUSTAINABLE TOURISM CONTRIBUTION (PCST)	4.08		3.88	

Note: \*\*Correlation is significant at the 0.01 level (2-tailed)

Source: Author’s calculations

The results for both resident groups, younger than 35 and older than 36, show that all support for tourism attributes significantly correlate, at the 0.01 level (2-tailed), with a perceived contribution of sustainable tourism. Comparing the values of the calculated Pearson coefficients among residents’ age groups, higher coefficient values are present in the older age group, where relationships are substantial to very strong of all support for tourism attributes with a perceived contribution of sustainable tourism. For a younger age group, these relationships are significant but moderate to substantial. These results again confirm Trivellas et al. (2016) findings, which point out that younger residents show less enthusiasm for tourism development. Following the abovementioned research results, there are no significant differences in the correlation of perceived sustainable tourism contribution with support for tourism attributes among different age groups. Thus, hypothesis H4 is not confirmed.

In previous research, local support has been found to mediate the relationship between community empowerment and sustainable tourism development (Khalid et al., 2019; Wani et al., 2022). These findings suggest that empowering local communities and fostering their support for tourism are essential for sustainable tourism development, as confirmed in this research and by taking into account specificity related to the resident age groups.

## 5. Concluding remarks

This study aims to explore the relationships between residents' empowerment and support for tourism development with sustainable tourism's perceived contribution and identify precise significant attributes among different resident age groups. The regression analysis results indicated a positive and statistically significant influence of support for tourism development on the perceived contribution of sustainable tourism within both age groups. Additionally, for residents above 36 years, support for tourism development and empowerment are significant predictors of a perceived contribution to sustainable tourism.

Furthermore, for the resident group above 36 years, higher values of the Pearson coefficient and a significant relationship between all empowerment attributes and the perceived contribution of sustainable tourism were determined. Finally, a positive and significant correlation between all support for tourism attributes and a perceived contribution of sustainable tourism was identified for both resident groups. Still, stronger relationships were generally found in the older resident age group.

The paper has theoretical and empirical contributions. There is insufficient research, and the research gap exists in understanding the influences of different residents' empowerment dimensions and how various demographic groups within local communities respond to empowerment and tourism development in their destinations. A limited number of papers investigate age residents' context, and this paper fulfills this gap by considering age-related variations in community responses to empowerment and support for tourism development for shaping sustainable tourism outcomes. Empirical contribution is evident for policymakers, tourism planners, and community leaders that can use identified precise factors with significant and positive influence for different resident age groups to improve residents' perceived contribution of sustainable tourism to their destinations. By implementing targeting activities for residents of various age groups and improving the perceived contribution of sustainable tourism among them, destination managers will enable sustainable tourism practices that are more participative, efficient, and effective. Better understanding and perception of sustainable tourism contribution among residents will contribute to their greater engagement in the decision-making process, which can influence the efficiency of sustainable tourism development. Consequently, such an approach can lead to greater effectiveness in achieving sustainable tourism goals at the destination.

The research presented in this paper has some limitations. First, only the Croatian residents are included in the sample. This implies that other citizens may have a different perception of sustainable tourism's contribution to their destinations. Thus, future research should focus on different citizens, and it will be helpful to identify significant differences among them. Second, only age is taken as a demographic criterion in this research. In the future, other criteria can be implemented (e.g.,

gender, educational level, average monthly income) to define demographic groups within local communities. Future research should consider existing differences among different demographic resident groups related to empowerment and support for tourism development. Following this, destination marketing managers can foster more inclusive and effective sustainable tourism initiatives and practices.

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## Appendix

Table A.1: Empowerment of the local community through tourism

CODE	Taken and adapted items
PEBT	Personal economic benefit from tourism
PEBT1	Tourism helps me pay my bills.
PEBT2	A portion of my income is tied to tourism.
PEBT3	Economically benefit from more tourism development.
PEBT4	My family’s economic future depends upon tourism.
POLE	Political empowerment
POLE1	I have a voice in tourism development decisions.
POLE2	My vote makes a difference in how tourism is developed.
PSYCHE	Psychological empowerment
PSYCHE1	I’m proud to be a resident here.
PSYCHE2	I feel special because people travel to see my area’s unique features.
PSYCHE3	Tourism reminds me that I have a unique culture to share with visitors.
PSYCHE4	Tourism makes me want to tell others about what we have to offer.
SOCE	Social empowerment
SOCE1	It makes me feel more connected to my community.
SOCE2	It fosters a sense of “community spirit” within me.
SOCE3	Tourism provides ways for me to get involved in my community.

Source: Ranasinghe and Pradeepamali (2019)

Table A.2: Resident’s support for tourism development

CODE	Taken and adapted items
SUPPTD	Resident’s support for tourism development
SUPPTD1	I support tourism and want to remain important to my place.
SUPPTD2	I believe tourism should be actively encouraged in my place.
SUPPTD3	My place should support tourism development.
SUPPTD4	I support new tourism facilities that will attract new visitors to my place.
SUPPTD5	My place should remain a tourist destination.
SUPPTD6	In general, the positive benefits of tourism outweigh the negative impacts.
SUPPTD7	Tourism will continue to play a major role in my place’s economy.
SUPPTD8	Long-term planning in my place can control negative environmental impacts.
SUPPTD9	It is important to develop plans to manage the growth of tourism.

Source: Woosnam (2012)

Table A.3: The perceived contribution of sustainable tourism to the local community

CODE	Taken and adapted items
PCST	Perceived contribution of sustainable tourism
PCST1	Tourism brings benefits to the local economic development.
PCST2	Tourism development ensures benefits for the community and the environment.
PCST3	Tourism meets profitability and sustainability.
PCST4	Tourism becomes part of the local culture.
PCST5	Tourism reinvests in the local development.

Source: College Values Online (2024)

## Poboljšanje percipiranog doprinosa održivog turizma kroz osnaživanje i potporu stanovnika razvoju turizma: kontekst različitih dobnih skupina

Lorena Bašan<sup>1</sup>, Ivana Perušina<sup>2</sup>, Marija Ham<sup>3</sup>

### Sažetak

Cilj je ovog rada istražiti odnose osnaživanja i podrške stanovnika razvoju turizma s percipiranim doprinosom održivog turizma, te identificirati atribute među različitim dobnim skupinama stanovnika, koji se mogu upotrebljavati za poboljšanje percepcije stanovnika o doprinosu održivog turizma. Istraživanje je provedeno na prigodnom uzorku punoljetnih stanovnika Hrvatske metodom anketiranja. Rezultati ukazuju na to da su osnaživanje i potpora razvoju turizma ključni prediktori percipiranog doprinosa održivog turizma u skupini stanovnika starijih od 36 godina. Nadalje, podrška razvoju turizma pozitivno utječe na percipirani doprinos održivog turizma među mlađim stanovnicima. Dodatno, korelacijskom analizom utvrđena je snažnija povezanost između svih atributa osnaživanja i percipiranog doprinosa održivog turizma za skupinu stanovnika stariju od 36 godina. U objema dobnim skupinama stanovnika svi atributi podrške turizmu pozitivno su povezani s percipiranim doprinosom održivog turizma. Ovi rezultati daju sveobuhvatan okvir za razumijevanje kako osnaživanje stanovnika i potpora razvoju turizma oblikuju percipirane rezultate održivog turizma, uzimajući u obzir varijacije reakcije lokalne zajednice povezane s dobi stanovnika.

**Ključne riječi:** osnaživanje stanovnika, podrška stanovnika razvoju turizma, doprinos održivog turizma, dobne skupine stanovnika, Hrvatska

**JEL klasifikacija:** M31, Z32, Q32

<sup>1</sup> Redovita profesorica, Sveučilište u Rijeci, Fakultet za menadžment u turizmu i ugostiteljstvu, Primorska 46, P.P. 97, 51410 Opatija, Hrvatska. Znanstveni interes: marketing turističke destinacije, održivi marketing, šumska terapija, djeca i turizam. E-mail: lorenab@fthm.hr.

<sup>2</sup> Studentica, Sveučilište u Rijeci, Fakultet za menadžment u turizmu i ugostiteljstvu, Primorska 46, P.P. 97, 51410 Opatija, Hrvatska. Znanstveni interes: marketing u turizmu. E-mail: ivanaperusina@gmail.com.

<sup>3</sup> Redovita profesorica, Sveučilište Josipa Jurja Strossmayera u Osijeku, Ekonomski fakultet u Osijeku, Trg Ljudevita Gaja 7, 31000 Osijek, Hrvatska. Znanstveni interes: održivi marketing, ponašanje potrošača, marketinška strategija. E-mail: marija.ham@efos.hr.

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# Political considerations and fiscal regulation in a spatial duopoly: Effects on product differentiation\*

Hamid Hamoudi<sup>1</sup>, Ana Belen Miquel Burgos<sup>2</sup>, Ourania Dimakou<sup>3</sup>

## Abstract

We examine the impact of political orientation on fiscal regulation and product differentiation within a spatial duopoly. Using a modelling approach a la Hotelling, we explore how the regulator's political stance -whether pro-consumer or pro-business- affects market outcomes through distinct optimal designs of fiscal intervention. We identify three regulatory profiles: (i) pro-consumer regulation with high tax rates leading to minimal product differentiation and lower prices; (ii) pro-business regulation with no taxation resulting in maximum product differentiation and higher prices, and (iii) moderate regulation, balancing the interests of firms and consumers, in which taxes can be moderate but the firms are not induced to follow the regulator's designated levels of differentiation. Our findings highlight the significant role of political orientation in shaping market dynamics and regulatory effectiveness, emphasising the need to consider political factors and the balancing of various actors in policy design within spatial competition models.

**Keywords:** optimal fiscal policy, product differentiation, regulation and political affiliation in oligopolistic setting

**JEL classification:** L13, L50, R32, H21, C72

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<sup>1</sup> Full Professor, Universidad Rey Juan Carlos, Fundamentos de Análisis Económico, Paseo de los Artilleros, 38, 28032 Madrid, Madrid, Spain. Scientific affiliation: microeconomics and general equilibrium, spatial competition, environmental microeconomics. E-mail: hamid.hamoudi@urjc.es.

<sup>2</sup> Assistant Professor, Universidad Rey Juan Carlos, Fundamentos de Análisis Económico, Paseo de los Artilleros, 38, 28032 Madrid, Madrid, Spain. Scientific affiliation: welfare policies and economic wellbeing of societies, in-work poverty and gender economics, spatial competition. E-mail: anabelen.miquel@urjc.es.

<sup>3</sup> Assistant Professor, Universidad Rey Juan Carlos, Fundamentos de Análisis Económico, Paseo de los Artilleros, 38, 28032 Madrid, Madrid, Spain. Scientific affiliation: macroeconomic theories and policies, debt and central banking theories, public health policies, gender economics, spatial competition. E-mail: ourania.dimakou@urjc.es.

## 1. Introduction

The primary objective of this work is to investigate the influence of political orientation on fiscal regulation and its subsequent impact on product differentiation within an oligopolistic setting. We examine how the political positions of districts influence both policy design and market outcomes. Regulation is a defining feature of most, if not all markets; its form, motivation and objective can vary considerably. From improving upon a particular market failure to incorporating social, environmental or broader sustainability dimensions, political orientation is always present and determines, to a great extent, the shape and format of the regulation, as well as the final outcome. Political orientation may also manifest due to policy ‘capture’, lobbying of strong interest groups or simply political ideology driving the vision and design of government intervention.

Our paper focuses on the differentiation of products by firms within a spatial competition model. In particular, our analysis reconfigures equilibrium product differentiation of firms and explores how the degree of differentiation responds to fiscal regulation, itself influenced by distinct political stances. This is a noticeable novelty as, within the literature on product differentiation in oligopolistic settings, the main focus is either on market-drivers alone or on policy intervention of a ‘social planner’. Political economy considerations are largely absent, despite their presence and relevance in real-life markets.<sup>4</sup>

Building on the seminal work of Hotelling and the vast literature that followed, we develop a duopoly model with horizontal product differentiation in which a politically charged regulator attempts to influence the market-based differentiation level through a combination of taxation and subsidisation schemes. The political orientation of the regulator is modelled through a welfare function that attaches different weights towards firms and consumers. In that sense, the resulting regulation scheme can be thought to be more pro-profits or more pro-consumers depending on the political stance or policy ‘capture’ of the regulator and is in line with works such as Hamoudi and Risueno (2012), White (2002) and Ghosh and Meagher (2015).

Our contribution focuses on understanding how political orientation influences the design of public interventions and the resulting outcomes, which are significantly affected by firms’ responses. Specifically, our analysis identifies three categories of political profiles each associated with different regulatory strategies and distinct market results. Within the first range, the policymaker values consumers’ interests more and this is reflected in a pro-consumer interventionist regulatory regime. Relying on the highest possible tax rate, the regulator proposes the centre as

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<sup>4</sup> A notable exception is Ghosh and Meagher (2015), where in a different oligopolistic setting they investigate how the role of consumers as voters can influence transport infrastructure investment.

the ideal firms' location (differentiation). Fiscal policy is successful in inducing the firms to conform with its regulatory targets, and indeed firms locate at the market centre. The resulting differentiation is minimal, which intensifies competition and reduces prices to zero, benefiting consumers the maximum. In the second range, corresponding to the middle zone of political affiliation and more moderate regulatory profiles, the optimal tax rate is decreasing and differentiation increasing with respect to the relative weight attached to firms. In other words, firms' position is strengthened at the expense of consumers as political affiliation approaches more *liberal* positions. Within this range, two different subcases can be distinguished. First, if regulators are moderately inclined towards consumers, they prefer firms locating at the market centre. However, they do not succeed in inducing firms to follow, and the equilibrium result is moderate firms' differentiation. Second, regulators with a moderately free-market oriented profile choose reference locations at the extremes of the market. Again, they do not achieve this and the equilibrium result is also moderate; albeit the differentiation obtained is greater than in the previous case. Finally, regulators within the upper range of the political spectrum can be thought of as the most pro-business *liberal* ones. They apply a zero tax rate, while no preferred regulatory location is determined. Firms are not taxed and are let free to choose their location. The outcome is maximum differentiation and higher prices for consumers, coinciding with the market equilibrium in the absence of regulation.

In short, the key contribution of our work is that the regulation framework can be distinct due to the political stance of the corresponding policymaker and consequently the equilibrium of the system may no longer be the normative socially efficient. As present in the political economics literature that nonetheless has a macroeconomic focus, our microeconomic model attempts to delineate the policy design and market outcomes of, say, social democratic and more liberal political positions (and all spectrum therein). Drawing a parallelism from a general international comparison of different fiscal/welfare models, we see that they themselves reflect the broad political and ideological leanings of the countries involved. Countries with more interventionist social democratic models typically adopt systems with a higher tax burden, which also include subsidies and grants. Conversely, countries with more liberal ideologies tend to maintain greater market freedom and reduce the tax burden. In this context, Stenkula (2012) offers an international comparison of various welfare models and their tax systems, highlighting their impact on entrepreneurship. In the Scandinavian model with its social democratic traces (exemplified by countries such as Sweden and Denmark), firms face high levels of taxation, although social provision and in-kind transfers are also significant. In contrast, the Anglo-Saxon model, which has more liberal tendencies, features lower taxes that encourage entrepreneurship, though it offers fewer benefits and more targeted social transfers. Finally, the continental model (found in countries such as Germany and France) is situated among the two with intermediate levels of taxation and social provision and fiscal spending. In a very

broad, if not simplistic, way our three identified political profiles capture these three realities. Quinn and Shapiro (1991) address how ideological differences between political parties in the US affect corporate taxation, reflecting the Democratic vs Republican contrast. While Democratic administrations tend to increase taxes on businesses and capital owners to promote consumption, Republicans prefer to reduce taxes on businesses to encourage investment. Janeba (2014) confirms what most of the political economics literature also predicts that left-wing politicians generally support higher tax rates on capital and business income, whereas right-wing politicians favour lower rates to stimulate investment.

## 2. Related literature

The seminal work of Hotelling (1929), initially intended to solve Bertrand's paradox (Bertrand, 1883), incorporated the concept of firm location in a linear space and used distance across firms to formalise product differentiation. Based on linear transportation costs, Hotelling showed that firms would agglomerate in the centre, later named the *principle of minimum differentiation*. d'Aspremont et al. (1979), using quadratic costs, refuted Hotelling's result, validating the principle of *maximum differentiation*. This stems from market power, leading firms to disperse in order to mitigate price competition, whereas *minimum differentiation* is driven by the market share effect; firms want to agglomerate, reduce prices and attract a bigger part of the market. Those two opposite principles have generated a long discussion and extensive literature on product differentiation. By altering particular assumptions of the original model, different equilibrium location configurations can be achieved. The most relevant modifications include: transportation costs, demand elasticity (e.g. Kitahara and Matsumura (2013), consumer heterogeneity (Tolotti and Yopez (2020)), distribution of consumer locations, uncertainty, different shapes and sizes of space (starting with the seminal work of Salop (1979)), number of firms, mixed duopolies (Cremer et al. (1991)), managerial delegation (see Bárcena-Ruiz et al. (2005), Kou and Zhou (2015), Matsumura and Matsushima (2012), Wang and Buccella (2020)). Regardless of the assumptions considered, in these models, firms always simultaneously confront the two opposite forces, power and market share, leading to a dilemma in location decision-making. In any case, depending on the approach, there may be a total or partial dominance of one of these effects such that, in the equilibrium, a minimum, maximum or intermediate differentiation is obtained. See Brenner (2001) and Biscaia and Mota (2013) for critical, although not exhaustive, reviews. Those two opposing effects are also present in our work and we demonstrate how the magnitude of each can be affected by the design of fiscal regulation, itself a product of political affiliation.

The aforementioned contributions all assume only market forces, ignoring the importance of regulation. Consequently, a part of the literature extends to incorporate

a variety of regulation instruments, which can be grouped into three categories: i) fiscal, ii) zoning, and iii) environmental regulation. Lambertini (1997) relies on a taxation/ subsidisation fiscal regime to induce firms to select socially efficient locations, while Cremer and Thisse (1994), Kitahara and Matsumura (2013), Casado-Izaga (2010) and Colombo (2010) employ unitary, ad valorem and/or uniform commodity taxation and study their implications. Area zoning regulation and its impact on product differentiation is examined, amongst others, by Lai and Tsai (2004), Bárcena-Ruiz et al. (2014) and Cao and Wang (2022). Within the environmental regulation category, Conrad (2006) considers environmentally conscious consumers, while He and Deng (2020) bring to the fore the subjective and social effects of environmental awareness. Hamoudi and Aviles – Palacios (2022) consider both conscientious consumers and a regulator promoting a sustainable good. Lambertini (2013) provides a review.

The work most similar to ours is by Lambertini (1997), as both studies employ a fiscal scheme consisting of taxes and/or subsidies to encourage firms to choose the regulator's locations (or levels of differentiation) within a model of horizontal differentiation. However, we differ notably from Lambertini (1997) as we incorporate political considerations which determine the vision of the regulator and impact on the design of regulation and market outcomes obtained. Although political economy frameworks are common and flourishing in other areas of macroeconomic and microeconomic analysis alike (see for example Persson and Tabellini (2000)), they are not common within this line of microeconomic product differentiation research. To this end, our work is related to White (2002) and Hamid Hamoudi and Carmen Aviles-Palacios (2022) where either political objectives are present or a different vision of environmental sustainability is attached to the regulator. Either way the *social welfare function* is altered with important implications in the strategic interaction between the regulator and the firms and in market outcomes.

The remainder of the paper is structured as follows: Section 2 outlines the model; Section 3 determines the firms' optimal prices and locations and Section 4 examines the regulators' strategies and establishes three optimal tax rates associated with three political profile ranges. Section 5 presents the conclusion.

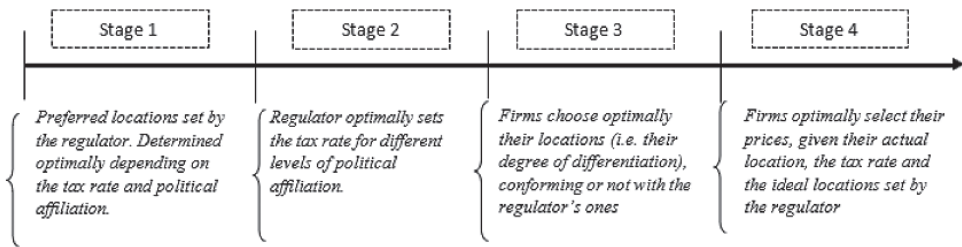
### 3. The Model

The basic framework of the model is the spatial private duopoly of d'Aspremont et al. (1979). The market is represented by a linear space where a continuum of consumers is uniformly distributed and where two firms produce a homogenous good, assuming zero production costs and no location restrictions (similar to Lambertini (1993) and Tabuchi and Thisse (1995)). As in Lambertini (1997), a

fiscal regulator is introduced in the model, however, the fundamental difference from the latter lies on the political orientation of the policymaker. In line with White (2002), Hamoudi and Risueno (2012) or Hamoudi and Avilés-Palacios (2022) we move away from a *neutral* social planner to capture more realistic public stances in which regulators are driven by their political alignment and this is reflected on the regulatory schemes proposed. The regulator’s strategic scheme consists of proposing certain reference locations and relying on a taxation/ subsidisation system to induce firms to select them. The particular regulatory scheme will depend on the political profile of the policymaker.

The model is formalised as a non-cooperative game in four stages. In the initial stage, the regulator sets its preferred locations. In the second one, the regulator decides its optimal tax rate for given levels of political affiliation, and, finally, in the last two successive stages the firms choose their locations and prices, respectively. As standard, the model is solved backwards.

Figure 1: Timeline of the model



Source: Authors’ elaboration

### 3.1. Consumers, firms and the regulatory authority

Consumers are faced with a unit demand. Each consumer located at  $x \in [0, 1]$  has a high enough individual income  $r$  to purchase the good and has no preference between the two firms when acquiring the product other than its price and transportation cost. The locations of the firms are denoted by  $x_i, i = 1, 2 \in R$  with  $x_1 \leq x_2$ , and each good is sold at price  $p_i, i = 1, 2$ . The utility of consumer  $x$  when purchasing the good from firm located at  $x_i$ , is defined as:

$$u_i(x) = r - p_i - t(x - x_i)^2, \quad i = 1,2 \tag{1}$$

where  $r$  is their (exogenous) income and  $t$  denotes the disutility of consumers to the distance they need to cover in order to get the good in question, given by the quadratic term  $(x - x_i)^2$ .

The indifferent consumer  $\tilde{x}$  is located at the point in which he/she is indifferent between the two goods and is determined through the equality  $u_1(\tilde{x}) = u_2(\tilde{x})$ , given by:

$$\tilde{x}(p_1, p_2) = -\frac{p_2 - p_1}{2t(x_2 - x_1)} + \frac{x_2 + x_1}{2}, \quad x_1 < x_2,^5 \quad (2)$$

The demands for firms 1 and 2 are given by:

$$D_1(p_1, p_2) = \tilde{x}(p_1, p_2), \quad D_2(p_1, p_2) = 1 - \tilde{x}(p_1, p_2) \quad (3)$$

and since production costs are assumed to be zero, profits are equal to revenues

$$I_i(p_1, p_2) = p_i D_i(p_1, p_2), \quad i = 1, 2 \quad (4)$$

At the pure market-based equilibrium, firms locate symmetrically at  $x_1^* = -1/4$ ,  $x_2^* = 5/4$ . If firms are constrained to locate within the linear city  $[0, 1]$ , they will choose symmetrical locations, given by the opposite boundaries,  $x_1^* = 0$ ,  $x_2^* = 1$ . In the absence of public intervention, the resulting *maximum differentiation* generates too much differentiation relative to the social optimum. Following Tirole (1990), by introducing a public administrator as manager of the two firms, that is, by setting up a public duopoly, one can achieve the socially efficient locations ( $x_1^* = 1/4$ ,  $x_2^* = 3/4$ ). In order to achieve the same socially optimum point, Lambertini (1997) introduces a fiscal regulator whose welfare function is represented by the linear combination of equally weighted consumer and producer surpluses. Lambertini adopts a taxation/subsidization scheme based on the firms' locations<sup>6</sup>, with the following linear expression. We use the same specification in our model.

$$T_1(s_1, k) = A + k(s_1 - x_1), \quad T_2(s_2, k) = A + k(x_2 - s_2) \quad (5)$$

where  $s_1, s_2 \in R$ , with  $s_1 \leq s_2$ , represent the reference locations for the public authority. For model symmetry reasons and without loss of generality, it is assumed that  $s_1 + s_2 = 1$ . This implies that  $s_2$  is rendered as a residual decision, in other words as soon as  $s_1$  is optimally set, so is  $s_2$ . The tax rate,  $k$ , also a choice variable for the regulator, is considered non-negative and has a multiplicative effect on the deviation between the regulator's preferred locations and those chosen by the two firms. Parameter  $A$  is a real number that represents a lump-sum transfer and, depending on its value and sign,  $T_i$  can be a tax or a subsidy. The firms' profits are

$$B_i(p_1, p_2) = I_i(p_1, p_2) - T_i(x_i), \quad i = 1, 2 \quad (6)$$

<sup>5</sup> For  $x_1 = x_2$  firms are located at the same point. The indifferent consumer cannot be determined. The solution of the problem is given by Bertrand's paradox.

<sup>6</sup> Since the market is completely covered at equilibrium, the price structure does not affect the standard welfare function.

The regulation proposed by Lambertini (1997) reflects the position of a fiscal regulator that is neutral with respect to the interests of consumers and firms, which also offers a normative definition of socially efficient locations. That is, firms’ and consumers’ surpluses are weighted equally. However, such neutrality does not always correspond to realistic situations. Policymakers establish regulatory mechanisms according to their political profiles and this is the main contribution of our model. We extend the model by considering a range of policymakers, with corresponding regulatory schemes, that represent more pro-business or pro-consumers political stances. In the same vein as White (2002) and others, the associated objective function is represented by a social welfare function in which a weighting factor is applied to the firms’ and consumers’ surpluses. In White’s words, “while the standard, equally-weighted welfare function may be desirable for normative reasons, based on utilitarianism or fairness doctrines (as in Harsanyi, 1955), it may be restrictive for purposes of predicting the behaviour of actual public firms and the resulting market outcomes” (White, 2002, p. 489). Our extended welfare function is formulated as a linear combination of the surpluses of firms  $S_F$ , and, jointly, of consumers  $S_C$  and the public authority  $S_G$ . The regulator’s political stance is quantified through the assignment of different weights to the interests of firms and consumers.

$$W = \lambda S_F + (1 - \lambda) (S_C + S_G), \tag{7}$$

where:

$$S_F = \sum_{i=1}^2 B_i(p_1, p_2), \quad S_C = R - \sum_{i=1}^2 I_i(p_1, p_2) - C_T, \quad S_G = \sum_{i=1}^2 T_i(x_i) \tag{8}$$

$$C_T = \int_0^{\tilde{x}} c_1(x) dx + \int_{\tilde{x}}^1 c_2(x) dx, \quad R = \int_0^1 r dx$$

$R$  is total income for all consumers and  $C_T$  is total transport cost, given by the distance that each consumer has to cover to buy their selected product, and measured as the sum of distances to the left ( $c_1(x)$ ) and right ( $c_2(x)$ ) of the indifferent consumer.

The weighting parameter  $\lambda$  belongs to  $[0,1]$  and indicates the differentiated political stance and hence the degree of attention that the policymaker may grant to private duopoly profits as opposed to consumers’ welfare. When  $\lambda = 1$ , the regulator has a pro-business orientation and exclusively favours the interests of firms. At the other extreme, when  $\lambda = 0$ , the regulator prioritises consumers solely. Intermediate values for  $\lambda$  capture the whole spectrum of political profiles, balancing the interests of firms and consumers, with higher values indicating a tilt towards pro-business regulation while a lower  $\lambda$  a tilt towards pro-consumer policies. Similar in spirit representations of welfare functions (with

weighted preferences) are also to be found in the political economics literature (see for example, Pickering and Rockey (2011)). The principle is that party or policymaker’s ideology is reflected in the design of policy intervention, and this has distinct final market outcomes.

Substituting the terms of the surpluses given by expressions in (8) in equation (7), the welfare function is given by

$$W = (2\lambda - 1) [B_1(p_1, p_2) + B_2(p_1, p_2)] + (1 - \lambda)[R - C_T] \quad (9)$$

By considering the regulator’s political affiliation towards consumers and/or firms, the model includes all types of regulators and includes the work of Lambertini (1997) as a particular case. The following sections move to the backwards solving of the model.

#### 4. Optimal firm strategies

At this stage of the game, firms compete on prices. Each firm maximises its profits with respect to its price, given the reference locations  $(s_1, s_2)$  and the tax rate  $k$  set by regulator with political stance  $\lambda$ , and to firms’ locations  $(x_1, x_2)$ . Considering profit functions given in (6), equilibrium prices are derived from the first-order condition of profit maximisation.

$$p_1^*(x_1, x_2) = \frac{t}{3}(x_2 - x_1)(2 + x_2 + x_1),$$

$$p_2^*(x_1, x_2) = \frac{t}{3}(x_2 - x_1)(4 - x_2 - x_1) \quad (10)$$

Optimal prices,  $p_1^*(x_1, x_2)$ ,  $p_2^*(x_1, x_2)$ , are not directly affected by fiscal regulation and neither is the demand. Substituting equilibrium prices  $p_1^*(x_1, x_2)$  and  $p_2^*(x_1, x_2)$  into the profit functions given in (6), we obtain

$$B_1(x_1, x_2) = \frac{t}{18}(x_2 - x_1)(2 + x_2 + x_1)^2 - A - k(s_1 - x_1) \quad (11)$$

$$B_2(x_1, x_2) = \frac{t}{18}(x_2 - x_1)(4 - x_2 - x_1)^2 - A - k(x_2 - s_2) \quad (12)$$

With regards to location and taking into account equations (11) and (12), equilibrium firms’ locations do depend on the fiscal scheme selected by the regulation and this is analysed in proposition 1 below.

**Proposition 1.**

For any  $t > 0$ ,  $s_1 \in \left[-\frac{1}{4}, \frac{1}{2}\right]$  and  $k \geq 0$ , there is one unique equilibrium location if and only if  $0 \leq k \leq t/2$ , and  $A \leq g(k)$ . The unique equilibrium is given by:

$$x_1^*(k) = -\frac{1}{4} + \frac{3k}{2t}, \quad x_2^*(k) = \frac{5}{4} - \frac{3k}{2t}.$$

Firms are being:

- subsidized if  $A \in ]-\infty, h(k, s_1)]$
- taxed if  $A \in ]h(k, s_1), g(k, s_1)]$

where

$$g(k, s_1) = \frac{1}{4t} [6k^2 - kt(4s_1 + 7) + 3t^2], \quad h(k, s_1) = \left(\frac{k}{4t}\right) [6k - t(4s_1 + 1)]$$

*Proof:* See appendix

In other words, uniqueness of a location equilibrium is ensured when the tax rate stays within its lower range,  $[0, t/2]$  and when  $A$  ensures profits are non-negative. At this game stage, no explicit relationship appears between firms’ optimal locations and the regulator’s political stance, as depicted by  $\lambda$ . This point will be further explored in the subsequent stages of the non-cooperative game. The choice between taxes or subsidies depends on the transfer  $A$ , as well as on the tax rate  $k$  and the preferred reference locations  $s_i$ . When the regulator is politically *neutral*, that is, it attaches the same weights to consumers’ and firms’ interests,  $\lambda = 1/2$ , we obtain the following result, which matches Lambertini (1997).

**Result 1.** (Due to Lambertini (1997)) If  $s_1, s_2 \in ]-1/4, 5/4]$  and  $s_1 + s_2 = 1$ , firms locate at the socially efficient positions if  $k = t/3$ . For  $A \in ]t(1 - 4s_1)/12, t(1 - s_1)/3]$  firms are being taxed, while they are being subsidised if  $A < t(1 - 4s_1)/12$ .

This result is obtained by determining firms’ optimal locations, and subsequently, deducting the tax rate that induces the firms to those socially optimal locations. In this scenario, the choice between taxes and subsidies depends only on transfer  $A$  and the regulator’s reference locations  $s_i$ .

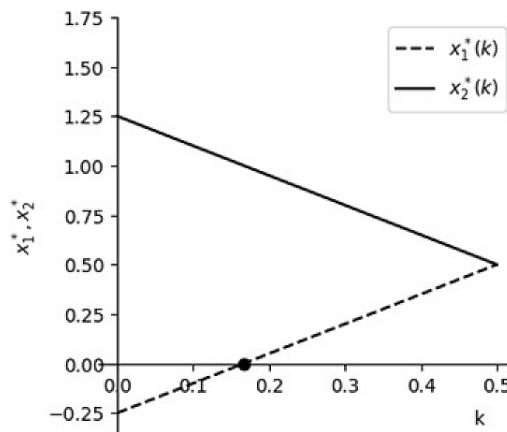
The introduction of a tax rate  $k$  in our model leads to a reduction in differentiation and prices. Product differentiation, defined as the distance in optimal locations across the two firms, is given by  $Z(k)$  as a function  $k$  below.

$$Z(k) = (x_2^*(k) - x_1^*(k)) = \frac{3}{2t}(t - 2k) \tag{13}$$

$$p_1^* = p_2^* = \frac{3}{2}(t - 2k) \tag{14}$$

Within the range  $\left[0, \frac{t}{2}\right]$  for the tax rate, firms choose the same location,  $x_1^* = x_2^* = 1/2$ , differentiation is minimal, price competition very intense,  $p_1^* = p_2^* = 0$ , and revenues zero. Assuming zero production costs, the profits are simply what results from the fiscal scheme, and the regulator will have to subsidise the firms. At the lowest limit, given by the null rate ( $k = 0$ ), each firm is located far away from its rival  $(x_1^*, x_2^*) = (-1/4, 5/4)$  and competition is significantly softened  $p_1^* = p_2^* = \left(\frac{3t}{2}\right)$ . However, depending on the lump-sum transfer  $A$  the regulator’s fiscal policy can be a tax or a subsidy. For values of  $k$  such that  $0 < k < t/2$ , one finds that as the rate  $k$  increases, product differentiation decreases, moving from maximum to minimum. Figure 2 illustrates the relationship between optimal locations  $(x_1^*, x_2^*)$  and the tax rate  $k$  for a numerical example in which  $t = 1$ .

Figure 2: Optimal firms’ locations and the tax rate



Source: Authors’ calculations

By substituting the equilibrium locations  $(x_1^*, x_2^*)$  respectively into equation (5) of the tax scheme and (11) and (12) of profits, we obtain

$$T_i^*(k, s_1) = \frac{1}{4t} [-6k^2 + kt(4s_1 + 1) + 4At] \tag{15}$$

$$B_i^*(k, s_1) = \frac{1}{4t} [6k^2 - kt(4s_1 + 7) + 3t^2] - A \tag{16}$$

As can be observed in equation (16), the regulator’s fiscal instruments,  $s_1, k$ , may significantly affect firms’ profits. Hence, the regulator will try to determine an optimal fiscal policy to induce firms to follow its guidelines. In the next section, we

analyse optimal regulator strategies for different shades of political orientation, as represented by  $\lambda$ .

### 5. Optimal fiscal framework for different political profiles

The focus here is on the strategic interaction between the fiscal regulator with affiliation  $\lambda$  and the firms by sequentially determining the optimal regulatory instruments  $k^*$  and  $(s_1^*, s_2^*)$ . Subsection 4.1 establishes the optimal tax rate  $k^*$  and subsection 4.2 identifies the reference locations,  $(s_1^*, s_2^*)$  as well as the impact on differentiation between firms.

#### 5.1. Optimal Tax rate

Considering optimal firms' strategies  $(x_1^*, x_2^*)$  and assuming the reference location  $s_1$  in  $[-1/4, 1/2]$  and  $\lambda \in [0, 1]$ , we now determine the optimal tax rate  $k^*$ , by maximising the welfare function, defined in (7),  $W$  with respect to  $k$  in  $[0, t/2]$ . By substituting  $x_1^*$  and  $x_2^*$  in equation (7) and assuming  $s_1 + s_2 = 1$ , the welfare maximisation problem is

$$W = \frac{3}{4t} (11\lambda - 7)k^2 - \frac{1}{2} [4(2\lambda - 1)s_1 + (17\lambda - 10)]k - 2(2\lambda - 1)A + (1 - \lambda)R \tag{17}$$

Given the functional form of  $W$  and the constraint  $k \in [0, \frac{t}{2}]$ , solutions to maximisation problem (17) can be several: (i) corner solutions, corresponding to the extremes of the interval  $[0, \frac{t}{2}]$ , that is,  $k_1^* = t/2, k_3^* = 0$ , (ii) and interior solution(s), given by the first order condition and whose expression for  $\lambda \neq 7/11$  is:

$$k_2^* = k(s_1, \lambda) = \frac{t}{3(11\lambda - 7)} [4(2\lambda - 1)s_1 + (17\lambda - 10)] \tag{18}$$

The tax rates  $k_1^*, k_2^*$  and  $k_3^*$  will be possible solutions if the non-negativity of the profits is verified, i.e.,  $A \leq g(k_i^*)$ , where:

$$g(k_1^*) = \frac{t}{2} (1 - 2s_1), \quad g(k_3^*) = \frac{3t}{4} \tag{19}$$

$$g(k_2^*) = \frac{t}{12(11\lambda - 7)^2} (16 b_1(\lambda) s_1^2 + 4 b_2(\lambda) s_1 + b_3(\lambda)) \tag{20}$$

Expressions  $b_1(\lambda)$ ,  $b_2(\lambda)$  and  $b_3(\lambda)$  are given by:

$$b_1(\lambda) = -14\lambda^2 + 17\lambda - 5, b_2(\lambda) = -205\lambda^2 + 256\lambda - 79, b_3(\lambda) = 358\lambda^2 - 463\lambda + 151.$$

The interior solution  $k(s_1, \lambda)$  reaches the extreme values of the interval  $\left[0, \frac{t}{2}\right]$ , for any value of  $\lambda \neq 1/2$ , in the following cases:

$$k(s_1, \lambda) = 0 \text{ if } s_{11}(\lambda) = \frac{17\lambda - 10}{4(1 - 2\lambda)} \quad (21)$$

$$k(s_1, \lambda) = \frac{t}{2} \text{ if } s_{12}(\lambda) = \frac{1 + \lambda}{8(1 - 2\lambda)} \quad (22)$$

Depending on the variation of  $\lambda$  in its permitted interval  $[0,1]$  and of  $s_1$  in the range  $[-1/4, 1/2]$ , one of the three rates  $k_1^*$ ,  $k_2^*$  and  $k_3^*$ , might be the solution. In the following propositions we determine the different ranges of political affiliation for  $\lambda$ , corresponding to each of the above optimal tax rates.

**Proposition 2.** For  $\lambda$  in  $\left[0, \frac{1}{3}\right]$  such that  $s_{11}(\lambda) \leq -\frac{1}{4} \leq s_{12}(\lambda) \leq \frac{1}{2}$ , and a reference location  $s_1$  in  $\left[s_{12}(\lambda), \frac{1}{2}\right]$ , the optimal tax rate is  $k_1^* = \frac{t}{2}$ , with  $A \leq g(k_1^*)$  where  $g(k_1^*)$  is given by (19).

*Prof.* See appendix

This first interval  $\left[0, \frac{1}{3}\right]$  for  $\lambda$  comprises of regulators that attach a higher weight on consumer's interests. The regulatory profile corresponds to the most interventionist position and the rate  $k_1^*$  is the highest, a result consistent with a pro-consumer political stance. Firms' optimal location strategy is to agglomerate at the market centre,  $x_1^* = x_2^* = 1/2$ . Therefore, differentiation is minimal  $Z(k_1^*) = 0$ , and prices are nil, benefiting consumers to the maximum. By substituting  $k_1^*$  into the welfare function  $W$ , we obtain a new welfare expression that depends on the reference location,  $s_1$

$$W(s_1, \lambda) = -t(2\lambda - 1)s_1 + \frac{5t}{16}(2 - 7\lambda) - 2(2\lambda - 1)A + (1 - \lambda)R \quad (23)$$

In this scenario, the optimal reference locations are given by  $s_1^* = s_2^* = 1/2$ . Nonetheless, this policy choice does not affect the firms' optimal location strategies, which are only directly influenced by the tax rate. This result leads to losses if it is not compensated by a subsidy through the lump-sum transfer  $A$ .

**Proposition 3.** For  $\lambda$  in  $\left[\frac{1}{3}, \frac{1}{2}\right] \cup \left[\frac{1}{2}, \frac{3}{5}\right]$  such that  $\min\{s_{11}(\lambda), s_{12}(\lambda)\} \leq -\frac{1}{4} \leq \max\left\{s_{11}(\lambda), s_{12}(\lambda), \frac{1}{2}\right\}$ , and a reference location  $s_1$  in  $\left[-\frac{1}{4}, \max\left\{s_{11}m(\lambda), s_{12}(\lambda), \frac{1}{2}\right\}\right]$ , the optimal tax rate is  $k_2^* = k(s_1, \lambda)$  with  $A \leq g(k_2^*)$  where  $g(k_2^*)$  is given by (20).

*Proof.* See appendix

In the middle range of the regulatory political spectrum, the optimal rate  $k_2^*$ , as well as firms' differentiation and, therefore, price competition, are moderate. In other words, when the weights on consumers and firms are somewhat similar, the equilibrium result corresponds to moderate differentiation and is closer to the socially efficient location,  $s_1$  and thus the welfare function depends on it as well

$$W(s_1, \lambda) = \frac{3}{4t} (11\lambda - 7)k^2(s_1, \lambda) - 2(2\lambda - 1)A + (1 - \lambda)R \quad (24)$$

In this range,  $s_1$  has a strategic role for the regulator and its selection will affect firms. Policymakers of such political orientation moderately alter the maximum differentiation result of the standard model.

**Proposition 4.** For  $\lambda$  in  $\left[\frac{3}{5}, 1\right]$  such that  $\max\{s_{11}(\lambda), s_{12}(\lambda)\} \leq -\frac{1}{4}$ , and a reference location  $s_1$  in  $[-1/4, 1/2]$ , the optimal tax rate is  $k_3^* = 0$ , with  $A \leq g(k_1^*)$  where  $g(k_3^*)$  is given by (19).

*Proof.* See appendix

In this upper interval  $\left[\frac{3}{5}, 1\right]$  regulators support firms' interests. The rate  $k_3^*$  is a constant which value is the lowest of all feasible solutions. The firms' optimal strategies are given by  $x_1^* = -1/4$ ,  $x_2^* = 5/4$ , regardless of the reference location  $s_1$ . Here, differentiation is maximum, and firms have market power. The pro-business regulation regime benefits the firms' interests. Substituting  $k_3^*$  in the welfare function we obtain

$$W = -2(2\lambda - 1)A + (1 - \lambda)R \quad (25)$$

The results obtained in Propositions 2–4 allow us to segment the political spectrum into three almost equally distributed intervals, given by  $I_1 = \left[0, \frac{1}{3}\right]$ ,  $I_2 = \left[\frac{1}{3}, \frac{1}{2}\right] \cup \left[\frac{1}{2}, \frac{3}{5}\right]$  and  $I_3 = \left[\frac{3}{5}, 1\right]$ , with associated optimal tax rates  $k_1^*$ ,  $k_2^*$  and  $k_3^*$  respectively. The results obtained show that the greater the pro-business orientation of regulators, the lower the tax rate applied to them. In the next subsection we seek to determine the optimal reference location  $s_1^*$  for the middle

range of political orientation since, as has been shown, for the lower and upper political profiles, the reference location,  $s_1^*$ , has no influence on firms' behaviour.

### 5.2. Optimal reference locations

In the last stage, the regulator's optimal reference locations,  $s_1^*$ , are determined. As mentioned above, in the pro-consumers' political range  $[0, \frac{1}{3}]$ ,  $s_1^* = \frac{1}{2}$ , while in the pro-business range, given by  $I_3 = [\frac{3}{5}, 1]$ ,  $s_1^*$  may be any value in  $[-\frac{1}{4}, \frac{1}{2}]$ . Focusing on the middle range  $I_2 = [\frac{1}{3}, \frac{1}{2}[ \cup ]\frac{1}{2}, \frac{3}{5}]$  and considering the optimal firms' strategies  $(x_1^*, x_2^*)$  and the regulator's optimal rate  $k_2^*$  optimal  $s_1$  is given by maximising the welfare function, given by equation (24). The optimal regulation locations are specified in Proposition 4.

**Proposition 5.** For the optimal rate  $k_2^* = k(s_1, \lambda)$ , the optimal reference location  $s_1^*$  is:

$$s_1^* = \begin{cases} \frac{1}{2}, & \text{if } \lambda \in [0, \frac{1}{3}], & A \leq 0 \\ \frac{1}{2}, & \text{if } \lambda \in [\frac{1}{3}, \frac{1}{2}], & A \leq \frac{3t(1-3\lambda)(4\lambda-3)}{4(11\lambda-7)^2} \\ -\frac{1}{4}, & \text{if } \lambda \in ]\frac{1}{2}, \frac{3}{5}], & A \leq \frac{3t(61\lambda^2-78\lambda+25)}{4(11\lambda-7)^2} \\ [-\frac{1}{4}, \frac{1}{2}], & \text{if } \lambda \in [\frac{3}{5}, 1] & A \leq \frac{3t}{4} \end{cases}$$

*Proof.* See appendix

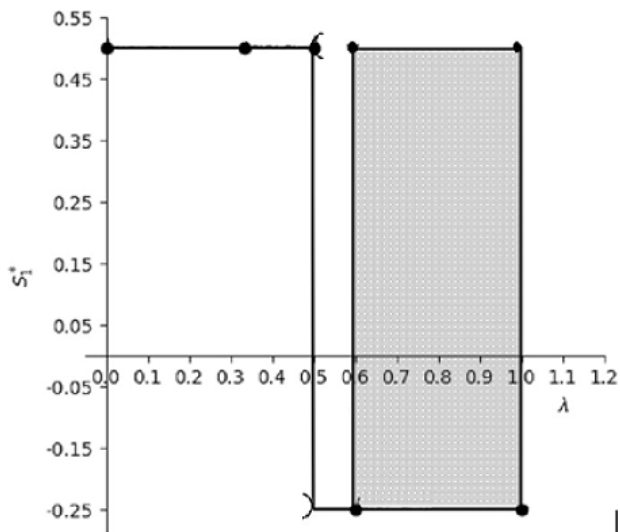
Figure 3 plots the optimal reference location  $s_1^*$  for different levels of political affiliation, as  $\lambda$  increases the regulator gets more pro-business. The dashed line, in  $\lambda = 1/2$  corresponds to Lambertini (1997) result The following properties can be highlighted.

**Property 1.** The two types of regulators with bias  $\lambda \in [\frac{1}{3}, \frac{1}{2}[$  and  $\lambda \in ]\frac{1}{2}, \frac{3}{5}]$  have fully opposite location preferences, ranging from minimum differentiation  $[s_1^* = s_2^* = (\frac{1}{2})]$  to maximum  $[s_1^{**} = -(\frac{1}{4}), s_2^{**} = (\frac{5}{4})]$ , respectively. The inflexion point is given by weight  $\lambda = 1/2$ .

**Property 2.** By substituting values of  $s_1^*$ , by  $(1/2)$  and  $(-1/4)$ , in equation (18), we obtain respectively:

$$k_2^*(\lambda) = k\left(\frac{1}{2}, \lambda\right) = \frac{t(7\lambda - 4)}{(11\lambda - 7)}, \quad k_2^{**}(\lambda) = k\left(-\frac{1}{4}, \lambda\right) = \frac{t(5\lambda - 3)}{(11\lambda - 7)} \quad (26)$$

Figure 3: Optimal regulator’s location and degree of political affiliation



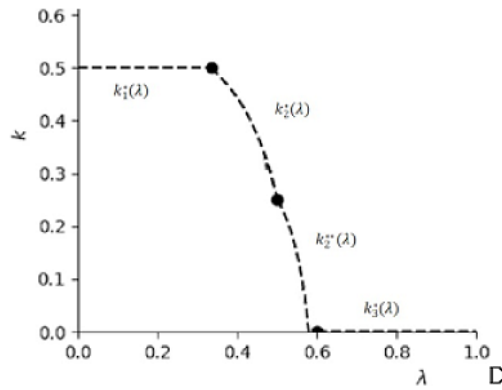
Source: Authors’ calculations

The optimal rate  $k_2^*(\lambda)$ , defined for  $\lambda \in \left[\frac{1}{3}, \frac{1}{2}\right]$  approximates the upper value ( $t/2$ ) as the relative weight on firms  $\lambda$  decreases. Optimal rate  $k_2^{**}(\lambda)$  defined for  $\lambda \in \left[\frac{1}{2}, \frac{3}{5}\right]$  approaches its lower limit (0), as the bias  $\lambda$  increases. However, as one would expect, the two optimal rates become more moderate as  $\lambda$  approaches ( $1/2$ ), and one has

$$\lim_{\lambda \rightarrow \left(\frac{1}{2}\right)^-} k_2^*(\lambda) = \lim_{\lambda \rightarrow \left(\frac{1}{2}\right)^+} k_2^{**}(\lambda) = \frac{t}{3} \quad (27)$$

To illustrate more clearly the relationship of optimal tax rates with respect to political orientation  $\lambda$ , in the spectrum  $[0,1]$ , the different functions obtained  $k_1^*$ ,  $k_2^*$ ,  $k_2^{**}(\lambda)$  and  $k_3^*$  are plotted in Figure 4.

Figure 4: Optimal tax rates and degree of political affiliation



Source: Authors' calculations

As shown in Figure 4, as the relative weight,  $\lambda$  increases, i.e., as the weight given to firms by regulators increases, the optimal tax rates decrease. In particular, the decreasing rate is gradually increasing<sup>7</sup>. In other words, Figure 4 shows a coherent pattern between the variation in optimal tax rates and the variation in regulators' relative weight on firms; from more interventionist profiles with high rates of  $k$  to those more inclined to *laissez-faire* with low rates.

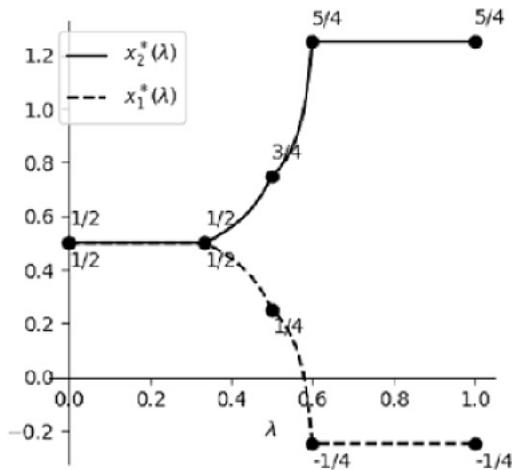
**Property 3.** By substituting respectively  $k_1^*$ ,  $k_2^*(\lambda)$ ,  $k_2^{**}(\lambda)$  and  $k_3^{**}(\lambda)$  into the firms' optimal locations  $(x_1^*, x_2^*)$  along the political orientation spectrum  $[0,1]$ , one obtains the firms' optimal locations as a function of  $\lambda$  only. In other words,

$$x_1^*(\lambda) = \begin{cases} \frac{1}{2} & \text{if } \lambda \in \left[0, \frac{1}{3}\right] \\ \frac{(31\lambda - 17)}{4(11\lambda - 7)} & \text{if } \lambda \in \left[\frac{1}{3}, \frac{1}{2}\right] \\ \frac{(19\lambda - 11)}{4(11\lambda - 7)} & \text{if } \lambda \in \left[\frac{1}{2}, \frac{3}{5}\right] \\ 0 & \text{if } \lambda \in \left[\frac{3}{5}, 1\right] \end{cases}$$

And  $x_2^*(\lambda)$  can be deduced from the symmetry relation  $x_1^*(\lambda) + x_2^*(\lambda) = 1$ . Figure 5 depicts the variation of firms' optimal locations  $(x_1^*(\lambda), x_2^*(\lambda))$  depending on the political orientation of regulations, assuming that  $t = 1$ .

<sup>7</sup> The decreasing rate of  $k_2^{**}(\lambda)$  is higher than that of  $k_2^*(\lambda)$  for  $\lambda \in \left[\frac{1}{3}, \frac{1}{2}\right]$

Figure 5: Optimal firms' locations and degree of political affiliation



Source: Authors' calculations

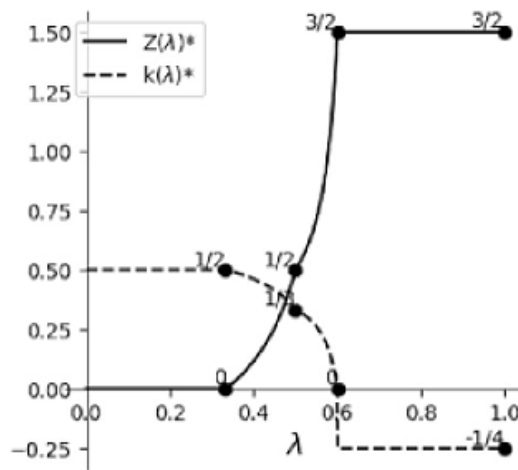
For  $\lambda \in [0, \frac{1}{3}]$ , the two optimal location functions  $(x_1^*(\lambda), x_2^*(\lambda))$  are equal to  $1/2$  in Figure 5. For  $\lambda \in [\frac{1}{3}, \frac{1}{2} \cup \frac{1}{2}, \frac{3}{5}]$ , the location of firm 1,  $x_1^*(\lambda)$ , is a monotonically decreasing function, represented by the dotted curve, and the location of firm 2,  $x_2^*(\lambda)$ , represented by a solid curve, is increasing. Finally, for  $\lambda \in [\frac{3}{5}, 1]$ ,  $x_1^*(\lambda)$ , the dotted line, is constant and equal to  $-1/4$  and  $x_2^*(\lambda)$ , the solid line, is constant and equal to  $5/4$ . This result is consistent with proposition 1, as well as with Figure 2 and conclusions therein.

**Property 4.** Product differentiation between firms, as measured by the different in location,  $Z^*(\lambda) = x_2^*(\lambda) - x_1^*(\lambda)$ , depends on the variation of  $\lambda$  in regulatory political spectrum  $[0,1]$ , given by

$$Z^*(\lambda) = \begin{cases} 0 & \text{if } \lambda \in [0, \frac{1}{3}] \\ \frac{3(1 - 3\lambda)}{2(11\lambda - 7)} & \text{if } \lambda \in [\frac{1}{3}, \frac{1}{2}] \\ \frac{3(1 - \lambda)}{2(11\lambda - 7)} & \text{if } \lambda \in [\frac{1}{2}, \frac{3}{5}] \\ \frac{3}{2} & \text{if } \lambda \in [\frac{3}{5}, 1] \end{cases}$$

Following the results of proposition 1 in section 3, differentiation  $Z$  and tax rate  $k$  vary in opposite directions, as also shown below, in Figure 6. Differentiation is observed to increase as the regulator’s support towards firms grows. Indeed, in the first segment of the political spectrum  $\lambda \in \left[\frac{3}{5}, 1\right]$  in which the policymaker values consumers’ well-being more hence it has a more *leftist* political leaning one obtains minimum differentiation. Regulation is more, as reflected in the higher tax rate, which induces firms to locate close to one another and offer lower prices.

Figure 6: Optimal firms’ locations and differentiation at different levels of political affiliation



Source: Authors’ calculations

In the opposite spectrum where  $\lambda$  belongs to the upper range of  $\left[\frac{3}{5}, 1\right]$ , maximum differentiation is achieved. The regulator holds a pro-business liberal economic vision in which regulation is minimal (lower taxation on firms) and consumer prices are higher. In the central part of political affiliation, that is  $I_2 = \left[\frac{1}{3}, \frac{1}{2} \left[ \cup \right] \frac{1}{2}, \frac{3}{5} \right]$  differentiation is moderate, gradually increasing from one extreme to the other. These remarks reinforce all the results obtained previously (Propositions 1–4). Thus, our work highlights the importance of policymaker’s political leaning in determining both the optimal regulation design and the degree of product differentiation and price structure.

Our main findings have important policy implications and suggest that oligopolistic and regulated markets should not be analysed ignoring political realities, as these may have important distributional consequences. This is evident, for example, in

the energy sector and the urgent intervention undertaken by EU member states due to the Ukraine-Russian war in 2021 and 2022. Although a common set of objectives and strategies were identified at the EU level, particularities were also observed. Putting granularities aside, direct government intervention to control prices for consumers took, among other things, the form of price caps or producer subsidies. However, many policymakers presume that price caps interfere with market forces. Another intervention included the payment of cash benefits to different vulnerable groups of society. Different countries selected a different policy mix and this may reflect distinct political positions and economic visions, which is the main argument of our paper. The distributional implications are different. For example, Germany and the Netherlands to maintain the price signal and encourage households and firms to save energy, adopted a *tiering* mechanism, subsidising households' and firms' consumption up to a maximum volume. Spain and Portugal introduced a measure known as the *Iberian mechanism* which consisted of price capping and subsidising electricity producers' gas purchases to limit price rises for end-consumers (Carluccio et al., 2024; Sgaravatti et al., 2021). The health sector, although it entails a mixed (public and private health providers) oligopolistic setting is another regulated sector in which the design of regulation and the market outcomes vary tremendously depending on policymakers' political preferences (see for example, Kooshkebaghi et al. (2022) or Trottmann et al. (2023)).

## 6. Conclusion

In a spatial duopoly based on the approach by D'Aspermont et al. (1979), we consider a politically charged fiscal authority that implements a taxation/subsidization system in order to induce firms to select their reference locations. Political orientation is formalised through varying weighting factors assigned to firms' and consumers' interests. This is formulated through a weighted welfare function as a linear combination of economic agents' surpluses. In other words, we analyse the regulation effects on firms' equilibrium location, obtaining that product differentiation varies according to the fiscal profile, from minimum to maximum, through moderate differentiation. Besides, we determine relationships between the regulator's political considerations, its preferred locations, chosen fiscal regime and firms' optimal locations.

The results obtained enable us to identify three regulation profile ranges, somewhat equally distributed along the possible spectrum of political orientation. The first range gives a higher weight to consumers and corresponds to pro-consumer interventionist regulators. Relying on the highest possible tax rate, the regulators propose the centre as the ideal firms' location. Fiscal policy successfully achieves its objectives, leading firms to locate at the market centre. The resulting differentiation is minimal due to the threat of taxation. This intensifies competition and reduces

prices to zero. In the second range, corresponding to the middle zone of political affiliation and most moderate regulatory profiles, the optimal tax rate is decreasing and differentiation increasing with respect to  $\lambda$ , so firms' position is improved at the expense of consumers as political affiliation approaches more liberal positions. Within this range, two different cases can be distinguished. First, if regulators are moderately inclined to the left of the spectrum (towards consumers), they prefer firms locating in the market centre. However, they do not succeed at inducing firms to follow and the equilibrium result is moderate firms' differentiation. Second, regulators with a moderately free-market oriented profile choose reference locations at the extremes of the market. Again, they do not, however, achieve this and the equilibrium result is also moderate, although the differentiation obtained is greater than in the previous case. Finally, regulators within the upper range can be thought of as the most pro-business liberal ones, apply a nil tax rate, so their fiscal scheme is limited to the lump-sum transfer, which they may use to pursue interests other than location (such as revenues, and so on). In particular, under this political profile range, no reference location is determined, letting firms free to choose their location. The result is maximum differentiation, coinciding with equilibrium in the absence of regulation.

This work generalises Lambertini's (1997) approach, which considers a *neutral* policymaker, choosing socially efficient locations. While firms prefer to differentiate in order to relax competition and increase profits, consumers prefer strong price competition which reduces prices and increases their surplus. The optimal normative position is centrally located between extremes, considered both *neutral* and *socially optimal*. Nonetheless, a neutral stance on fiscal policy may not always occur in practice. Either due to electoral objectives, lobbying interests or ideology, policymakers have distinct political orientations and these are inevitably reflected on the regulatory schemes they put forth. The weight given to consumers or firms plays a fundamental role in policy schemes designed and in the resulting principle of differentiation undertaken by firms. Our work offers a political economy approach to regulation within duopolistic settings allowing for more realistic fiscal profiles and corresponding market results to be explored.

Notwithstanding, limitations remain and potential avenues for future research can be identified. First, we may reconfigure the assumption that the consumer's and regulator's surpluses coincide and explicitly allow for a separate component attached solely to the public sector. This way we can account for a more enriched political environment, to which we can add political or electoral considerations. Further elements that can both enhance the theoretical setting and make it more realistic would entail the incorporation of a more complex (and non-linear) tax/subsidy structure, corporate social responsibility (CSR), new technologies and information asymmetry. Second, the model's applicability could be broadened by considering an oligopolistic market with more than two firms. The current duopoly

framework, while insightful, does not capture the competitive interactions and strategic behaviours that emerge in markets with multiple oligopolistic players. Extending the model to include a greater number of firms would provide a more comprehensive understanding of how fiscal regulation and political orientation influence market outcomes, and reflect better the ample presence of oligopolistic markets in the real world. Third, this work could benefit greatly from a more profound empirical front. Matching our theoretical model and predictions with an applied counterpart would be a fruitful future avenue.

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## Appendix

### Proof of proposition 1

*Proof.* The location equilibrium is determined by simultaneously maximising the profit functions (11) and (12) with respect to  $x_1$  and  $x_2$ . Solving the first-order conditions,

$$\frac{\partial B_1(x_1, x_2, s_1)}{\partial x_1} = \frac{t}{18} \{(2 + x_1 + x_2)(x_2 - 3x_1 - 2)\} + k = 0$$

$$\frac{\partial B_2(x_1, x_2, s_1)}{\partial x_2} = \frac{t}{18} \{(4 - x_1 - x_2)(4 + x_1 - 3x_2)\} + k = 0,$$

the following solution is obtained:

$$x_1^* = -\frac{1}{4} + \frac{3k}{2t}, \quad x_2^* = \frac{5}{4} - \frac{3k}{2t}.$$

It is verified that sufficient conditions are satisfied, moreover:

$$x_1^* + x_2^* = 1, \quad x_2^* - x_1^* = (3/2t)(t - 2k)$$

So that

$$x_2^* \geq x_1^* \Leftrightarrow 0 \leq k \leq \frac{t}{2}.$$

Substituting optimal  $(x_1^*, x_2^*)$  into the profit functions (11) and (12), and considering that  $s_1 + s_2 = 1$ , the firms' profits are given by  $B_i^*(k, s_1) = \frac{1}{4t} [6k^2 - kt(4s_1 + 7) + 3t^2] - A$ ;  $i = 1, 2$ , thus, it is verified that profits are non-negative for  $A \leq g(k, s_1)$ , where  $g(k, s_1) = \frac{1}{4t} [6k^2 - kt(4s_1 + 7) + 3t^2]$ . Similarly, substituting  $(x_1^*, x_2^*)$  into equation (5) the fiscal scheme becomes

$$T_i^*(k, s_1) = \frac{1}{4t} [-6k^2 + kt(4s_1 + 1) + 4At]; \quad i = 1, 2$$

In other words,  $T_i$  is positive if  $A > h(k, s_1)$ , where  $h(k, s_1) = \frac{k}{4t} [6k - t(4s_1 + 1)]$ .

It follows that firms are being taxed if  $A \in ]h(k, s_1), g(k, s_1) ]$  and they are being subsidised if  $A \in ]-\infty, h(k, s_1) ]$ .

**Proof of proposition 2**

*Proof.* For any  $\lambda \in \left[0, \frac{1}{3}\right]$ , it can be verified that  $s_{11}(\lambda) \leq -\frac{1}{4} \leq s_{12}(\lambda) \leq \frac{1}{2}$ , hence there are two alternatives. First, for any  $s_1 \in \left[-\frac{1}{4}, s_{12}(\lambda)\right]$ , by solving the first order conditions of the welfare maximisation problem given by expression (17), one obtains the interior solution

$$\underset{k \in \left[0, \frac{t}{2}\right]}{\text{Arg max}} W = k_2^* = k(s_1, \lambda) = \frac{t}{3(11\lambda - 7)} [4(2\lambda - 1)s_1 + (17\lambda - 10)]$$

The second order condition is fulfilled. Second, for any  $s_1 \in \left[s_{12}(\lambda), \frac{1}{2}\right]$ , it holds that  $k(s_1, \lambda) \geq \frac{t}{2}$ , obtaining the corner solution

$$\underset{k \in \left[0, \frac{t}{2}\right]}{\text{Arg max}} W = k_1^* = \frac{t}{2}$$

However, substituting respectively  $k_1^*$  and  $k_2^*$  in the welfare function  $W$ , it is easily verified that

$$W(k_1^*) \geq W(k_2^*)$$

Substituting  $k$  for  $k_1^*$  in the inequality of proposition 1, it is obtained that  $A \leq \frac{t}{2}(1 - 2s_1)$ .

Thus, for any  $\lambda \in \left[0, \frac{1}{3}\right]$  and  $A \leq \frac{t}{2}(1 - 2s_1)$ , the optimal tax rate is given by  $k_1^* = \frac{t}{2}$ .

**Proof of proposition 3**

*Proof.* For any  $\lambda \in \left[\frac{1}{3}, \frac{1}{2}\right] \cup \left[\frac{1}{2}, \frac{3}{5}\right]$ , with  $\min \{s_{11}(\lambda), s_{12}(\lambda)\} \leq -\frac{1}{4} \leq \max \{s_{11}(\lambda), s_{12}(\lambda), \frac{1}{2}\}$  there are several possibilities.

First, for any  $\lambda \in \left[\frac{1}{3}, \frac{1}{2}\right]$ , we have  $s_{11}(\lambda) < s_{12}(\lambda)$  and  $\left[-\frac{1}{4}, \frac{1}{2}\right] \subseteq [s_{11}(\lambda), s_{12}(\lambda)]$ , thus for any  $s_1 \in \left[-\frac{1}{4}, \frac{1}{2}\right]$ , solving the first order conditions of the welfare function maximisation the interior solution is obtained and is given by  $k_2^* = k(s_1, \lambda)$  corresponding to the equation (18) in the main text.

For  $\lambda \in \left[\frac{1}{2}, \frac{3}{5}\right]$ , contrary to the first case, we have  $s_{12}(\lambda) < s_{11}(\lambda)$ , and since we can have  $s_{12}(\lambda) \leq -\frac{1}{4} \leq \frac{1}{2} \leq s_{11}(\lambda)$ , for  $\lambda \in \left[\frac{1}{2}, \frac{4}{7}\right]$  and  $s_{12}(\lambda) \leq -\frac{1}{4} \leq s_{11}(\lambda) \leq \frac{1}{2}$ , there are two cases:

In the first case, when  $\lambda \in \left[\frac{1}{2}, \frac{4}{7}\right]$ , for any  $s_1 \in \left[-\frac{1}{4}, \frac{1}{2}\right]$ , the solution is again given by  $k_2^* = k(s_1, \lambda)$ . In the second case in which  $\lambda \in \left[\frac{4}{7}, \frac{3}{5}\right]$ . In this scenario, we have two alternatives.

- for any  $s_1 \in \left[-\frac{1}{4}, s_{11}(\lambda)\right]$ ,  $\underset{k \in \left[0, \frac{t}{2}\right]}{\text{Arg max}} W = k_2^* = k(s_1, \lambda)$ ,
- for any  $s_1 \in \left[s_{12}(\lambda), \frac{1}{2}\right]$ ,  $\underset{k \in \left[0, \frac{t}{2}\right]}{\text{Arg max}} W = k_3^* = 0$ .

Substituting respectively  $k_1^*$  and  $k_2^*$  in the welfare function  $W$ , it is verified that

$$W(k_2^*) \geq W(k_3^*).$$

Consequently, for any  $\lambda \in \left[\frac{1}{3}, \frac{1}{2}\right] \cup \left[\frac{1}{2}, \frac{4}{7}\right] \cup \left[\frac{4}{7}, \frac{3}{5}\right]$  and  $A \leq g(k_2^*)$ , where  $g(k_2^*)$  is given in (18) the optimal tax rate is  $k_2^* = k(s_1, \lambda)$ .

### Proof of proposition 4

*Proof.* For any  $\lambda \in [3/5, 1]$ :

First, we have  $s_{12}(\lambda) \leq s_{11}(\lambda) \leq -\frac{1}{4}$ , for  $\lambda \in \left[\frac{3}{5}, \frac{7}{11}\right]$  and  $k(s_1, \lambda) < 0$ , thus

$$\underset{k \in \left[0, \frac{t}{2}\right]}{\text{Arg max}} W = k_3^* = 0$$

And the second order condition of  $W$  maximisation is fulfilled.

Second, when  $s_{11}(\lambda) \leq s_{12}(\lambda) \leq -\frac{1}{4}$ , for  $\lambda \in \left[\frac{7}{11}, 1\right]$ ,  $k(s_1, \lambda) > t/2$  and is a minimum, thus

$$\underset{k \in \left[0, \frac{t}{2}\right]}{\text{Arg max}} W = k_3^* = 0$$

Therefore for any  $\lambda \in \left[\frac{3}{5}, \frac{7}{11}\left[ \cup \right] \frac{7}{11}, 1\right]$  and  $A \leq g(k_3^*) = (3t/4)$ , the optimal tax rate is  $k_3^* = 0$

If  $\lambda = \frac{7}{11}$ , the welfare function  $W$  can be expressed as

$$W = -\frac{1}{2}[4(2\lambda - 1)s_1 + (17\lambda - 10)]k - 2(2\lambda - 1)A + (1 - \lambda)R$$

Thus, again  $\text{Arg max}_{k \in \left[0, \frac{t}{2}\right]} W = k_3^* = 0$

Finally, for any  $\lambda \in \left[\frac{3}{5}, 1\right]$ , the optimal tax rate is given by  $k_3^* = 0$ .

### Proof of proposition 5

*Proof.* As seen in subsection 4.1, for the range of  $\lambda \in \left[0, \frac{1}{3}\right]$ ,  $s_1^*$  is equal to  $\frac{1}{2}$  and in the range  $\left[\frac{3}{5}, 1\right]$  regulator's optimal reference location  $s_1^*$  can be any value in  $\left[-\frac{1}{4}, \frac{1}{2}\right]$ .

Therefore, here, we focus on the interval  $\left[\frac{1}{3}, \frac{1}{2}\left[ \cup \right] \frac{1}{2}, \frac{3}{5}\right]$ .

For  $\lambda \in \left[1/3, 1/2\left[ \right]$ , the optimal tax rate is  $k_2^* = k(s_1, \lambda)$ , strictly greater than zero,

$$\frac{\partial W}{\partial s_1} = -2(2\lambda - 1)k(s_1, \lambda) \geq 0 \quad \text{and} \quad \text{Arg max}_{s_1 \in \left[-\frac{1}{4}, \frac{1}{2}\right]} W = \frac{1}{2} = s_1^*$$

The constraint corresponding to  $A \leq g(k_2^*)$ , is verified for:

$$A \leq \frac{3t(1 - 3\lambda)(4\lambda - 3)}{4(11\lambda - 7)^2}.$$

For  $\lambda \in \left]1/2, 3/5\right]$ , the optimal rate is still  $k_2^* = k(s_1, \lambda)$  although in this instance

$$\frac{\partial W}{\partial s_1} = -2(2\lambda - 1)k(s_1, \lambda) \leq 0 \quad \text{and} \quad \text{Arg Max}_{s_1 \in \left[-\frac{1}{4}, \frac{1}{2}\right]} W = -\frac{1}{4} = s_1^*$$

The constraint corresponding to  $A \leq g(k_2^*)$ , is verified for:

$$A \leq \frac{3t(61\lambda^2 - 78\lambda + 25)}{4(11\lambda - 7)^2}.$$

## Politička razmatranja i fiskalna regulacija unutar prostornog duopola: Učinci na diferencijaciju proizvoda

Hamid Hamoudi Amar Khodja<sup>1</sup>, Ana Belen Miquel Burgos<sup>2</sup>, Ourania Dimakou<sup>3</sup>

### Sažetak

U ovom radu ispituje se utjecaj političke orijentacije na fiskalnu regulaciju i diferencijaciju proizvoda unutar prostornog duopola. Koristeći pristup modeliranja a la Hotelling, istražujemo kako političko stajalište regulatora – bilo da je usmjereno na potrošače ili poslovanje – utječe na tržišne rezultate kroz različite optimalne fiskalne intervencije. Identificirali smo tri regulatorna profila: (i) regulacija u korist potrošača s visokim poreznim stopama koje dovode do minimalne diferencijacije proizvoda i nižih cijena; (ii) pro-poslovna regulacija bez oporezivanja što rezultira maksimalnom diferencijacijom proizvoda i višim cijenama, i (iii) umjerena regulacija, koja balansira interese tvrtki i potrošača, u kojoj porezi mogu biti umjereni, ali tvrtke nisu stimulirane da slijede naznačene razine diferencijacije regulatora. Rezultati našeg istraživanja ističu značajnu ulogu političke orijentacije u oblikovanju tržišne dinamike i regulatorne učinkovitosti pritom naglašavajući potrebu razmatranja političkih čimbenika i balansiranja različitih aktera u kreiranju politike unutar modela prostornog natjecanja.

**Ključne riječi:** optimalna fiskalna politika, diferencijacija proizvoda, regulacija i politička pripadnost u oligopolističkom okruženju

**JEL klasifikacija:** L13, L50, R32, H21, C72

<sup>1</sup> Redoviti profesor, Universidad Rey Juan Carlos, Fundamentos de Análisis Económico, Paseo de los Artilleros, 38, 28032 Madrid, Madrid, Španjolska. Znanstveni interes: mikroekonomija i opća ravnoteža, prostorna konkurencija, mikroekonomija okoliša. E-mail: hamid.hamoudi@urjc.es.

<sup>2</sup> Docentica, Universidad Rey Juan Carlos, Fundamentos de Análisis Económico, Paseo de los Artilleros, 38, 28032 Madrid, Madrid, Španjolska. Znanstveni interes: politika socijalne zaštite i ekonomsko blagostanje društva, siromaštvo zaposlenih i rodna ekonomija, prostorna konkurencija. E-mail: anabelen.miquel@urjc.es.

<sup>3</sup> Docentica, Universidad Rey Juan Carlos, Fundamentos de Análisis Económico, Paseo de los Artilleros, 38, 28032 Madrid, Madrid, Španjolska. Znanstveni interes: makroekonomske teorije i politike, teorije duga i središnje banke, javnozdravstvene politike, rodna ekonomija, prostorna konkurencija. E-mail: ourania.dimakou@urjc.es.

## Assessing taxpayers' satisfaction with tax administration e-services\*

Lidija Hauptman<sup>1</sup>, Nika Vetrih<sup>2</sup>, Alenka Kavkler<sup>3</sup>

### Abstract

*As tax administrations worldwide modernize through digital technologies, it has become increasingly important to understand taxpayers' satisfaction with these services. This research aims to estimate the relationships between satisfaction with tax administration e-services and factors such as trust, service quality, age, and gender, addressing a noted gap in the existing literature. Using the questionnaire distributed among taxpayers in Slovenia, four hypotheses were tested. Next to descriptive methods, Pearson correlation analysis, T-tests, and Mann-Whitney U-tests were used. The findings reveal a positive correlation between e-service quality and trust, as well as sustainability, but lower satisfaction with tax administration e-services among the younger generation. Gender differences do not exist, as male and female taxpayers are perceived to be equally satisfied with the e-service. The results suggest that improving tax information's usability, clarity, and security increases taxpayers' confidence and satisfaction. Quality information does not cause confusion and distrust. From the taxpayers' perspective, it is essential to ensure accessible, easy-to-understand information and implement quick feedback mechanisms to enhance clarity and strengthen taxpayers' trust.*

**Keywords:** tax administration, e-service quality, trust, age, gender

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<sup>1</sup> Associate Professor, University of Maribor, Faculty of Economics and Business, Department of accounting, Auditing and Taxation, Razlagova 20, 2000 Maribor, Slovenia. Scientific affiliation: accounting, taxation, and auditing, sustainability. E-mail: lidija.hauptman@um.si.

<sup>2</sup> Master student, University of Maribor, Faculty of Economics and Business, Department of accounting, Auditing and Taxation, Razlagova 20, 2000 Maribor, Slovenia. Scientific affiliation: accounting, taxation, sustainability. E-mail: nika.vetrih@student.um.si.

<sup>3</sup> Full Professor, University of Maribor, Faculty of Economics and Business, Department of Quantitative Economic Analysis, Razlagova 20, 2000 Maribor, Slovenia. Scientific affiliation: quantitative methods. E-mail: alenka.kavkler@um.si.

## 1. Introduction

Satisfaction with tax administration (TA) e-services has become important for building an efficient and reliable tax system. From the taxpayers' perspective, it is crucial that meeting tax obligations in a tax system is easy and seamless to increase tax compliance and develop a positive attitude towards the TA. Taxpayers want up-to-date, understandable, and useful information and expect system and service quality from the TA. In this ongoing process, TAs are looking for new models to reduce burdens for taxpayers to build compliance (OECD, 2023a). In line with this, they apply behavioral insights to improve services and design new practical policies focused on taxpayer behaviour (OECD, 2021). Taxpayers are not a homogeneous group and perceive tax complexity as a multidimensional concept (Paleka and Vitezić, 2023). They are motivated to meet their tax obligations through various mechanisms, which allows them to be categorized as either extrinsically or financially motivated or morally or socially committed (Paleka and Vitezić, 2023). Taxpayer behavior is shaped by numerous economic, non-economic, and socio-demographic factors, which consequently influence perceptions of TA services (Paleka et al., 2023; Güzel et al., 2019; OECD, 2022a; Hauptman et al., 2023; Darmayasa and Hardika, 2024; Matthaei et al., 2023).

In administration, investment focus, especially with the use of advanced technology today (OECD, 2023b), is strengthening trust (OECD, 2023a), easy-to-use and effective services tailored to the specific individual circumstances of taxpayers. New e-services, acting as a one-stop shop for e-government services and providing a central access point for taxpayers, are continuously being upgraded as part of the e-government national portals (OECD, 2024). As TAs strive to improve their e-services primarily through online self-service and artificial intelligence, new e-filing and e-payment options for taxpayers have been developed (OECD, 2020). Satisfaction with the quality of e-services influences taxpayers' compliance, as confirmed by previous research (Saptono et al., 2023; Abed and Robinson-Foster, 2024; OECD, 2023 a,b,c; Basey et al., 2022; Bongomin et al., 2019; Horan and Abhichandani, 2006; Connolly et al., 2017; Geringer, 2021; Opiso et al., 2023; GOV.si, 2022). Therefore, it is in the best interest of TA to ensure high satisfaction levels. Previous research has demonstrated that factors such as age, income level, education, and employment status play a significant role in shaping taxpayer perceptions of TA and their willingness to comply with tax obligations (Paleka et al., 2023).

Digitalization drives economic growth. Therefore, it is also a priority in the Western Balkan region (OECD, 2024). The Slovenian TA digitally modernized its operations (initially introduced in 2003) with the development of the eDavki portal (*e.g.*, *eTaxes portal*), which ensures secure operations by using the latest technology, legal provisions, and the user's responsibility (FURS, 2024). The TA periodically collects data on taxpayer satisfaction with the portal's usability (GOV.si, 2022) but

lacks sufficient analytics to support higher taxpayer satisfaction, leading to more sustainable tax behavior.

Our research aims to address this gap arising from insufficient TA analytics by examining additional factors. Therefore, this research investigates taxpayer satisfaction with TA e-services based on factors such as the TA's information, service quality, trust, and demographic characteristics like age and gender. Although the relationships of the variables such as information and trust can be bidirectional as they may serve as precursors to taxpayer satisfaction, as indicated by previous studies (Artawan et al., 2020; Tambuna and Haryatib, 2022; Paleka, 2023), our research will focus on examining the relationship between taxpayers' satisfaction and the information they receive from the TA.

In addition to accessibility, assistance, simplification, and updating of business operations with customers by the TA, the accessibility and responsiveness of TA employees, lawful and impartial treatment, quick and easy form submission, and flexibility in handling matters (service quality) are essential. Furthermore, factors such as easy registration, easy access to documents, properly documented content, quick submission of tax returns, timely updates on tax legislation and rules, advantages in fulfilling tax obligations, and professional knowledge and experience for submission (system quality) are crucial.

Despite their significance, gender and age in the context of tax sustainability awareness are often overlooked and poorly researched. The OECD (2022b) promotes gender equality as one of the key policy steps for countries to design their tax systems. According to the OECD (2022b), TA and tax compliance have different outcomes for males and females, as actions of the TA can be directed at specific genders. Namely, gender socialization theory advocates for values and social roles for females and males (Helmy et al., 2020), leading to different tax compliance practices and levels (Tjondoro et al., 2019). Value judgments and social and economic behavior impact implicit gender bias especially (Stotsky, 1996). Additionally, taxpayer satisfaction, depending on gender, shows that females are more likely to indicate measures that help them be more tax compliant (Kangave et al., 2021; Twesige, 2024; Paleka et al., 2023) and consequently more sustainably aware. Therefore, TA practices/services may be used more by one gender than by another, and according to the OECD (2022b), the approaches used by taxpayers can have gender-dependent impacts on tax compliance programs. However, the Global Gender Gap Index of the World Economic Forum (2024) and the Gender Equality Index of the European Institute for Gender Equality (2023) rank Slovenia highly among countries in terms of gender equality (GOV.si, 2024), which leads us to assume that taxpayers, on average, are equally satisfied with the e-services of the TA. The TA, regardless of gender, provides them with the same rights and opportunities by the law. We identified a research gap concerning measuring gender differences in taxpayers' satisfaction with TA e-services.

Empirical research also shows mixed results regarding the correlation between age and taxpayer satisfaction (Al-Hammouri and Abu-Shanab, 2017). Some authors argue that the younger population is more satisfied with the TA e-services (Islam et al. 2015), while others claim the opposite (Horan and Abhichandani, 2006). There is a gap in exploring this relationship even in previous research in Slovenia (GOV.si, 2022). Although the TA is required by regulation to assess customer satisfaction with the authority's services to take necessary measures, the questionnaire or its analysis does not cover all the essential aspects. This study aims to address these gaps.

By exploring the relationship between taxpayers' satisfaction with information taxpayers receive from the TA, H1 was set: Taxpayers' satisfaction with the TAs' information is positively linearly related to their trust in the TA. Furthermore, the paper aims to determine whether more satisfied taxpayers are more aware of sustainability issues. Compared to previous research (GOV.si, 2022), our research highlights H2: Taxpayers' satisfaction with the quality of TA e-services is positively and linearly related to the sustainable responsibility of taxpayers. Additionally, the study examines demographic characteristics (age and gender), leading to the third hypothesis (H3): older taxpayers are generally more satisfied with the TA's e-services than younger taxpayers. The fourth hypothesis (H4) suggests that male and female taxpayers who benefit from the TA's services are equally satisfied with those e-services.

The rest of the paper is organized as follows: Section two reviews the literature on measuring satisfaction with TA e-services and relevant factors. Section three addresses the methodology, while Section four outlines the empirical data and analyses. Section five presents and discusses the results. Section six presents conclusions, arguments, and potential implementation of the findings.

## **2. Literature review**

This section offers a theoretical perspective to establish hypotheses at the end of each subsection by elaborating on the variables used in the empirical research that measures taxpayers' attitudes and opinions regarding various aspects of the tax authority's e-services. The first subsection addresses taxpayers' satisfaction with information and their trust in data security and privacy. The second subsection explores previous research on satisfaction, service quality, and sustainability. Finally, the third subsection provides an overview of recent studies examining the relationship between satisfaction and demographic variables such as age and gender.

### **2.1. Tax administrations' information satisfaction and trust in data security and privacy**

A trustworthy, fair, effective, and efficient TA is a top priority for every country (Milosavljević et al., 2023; Bassegy et al. 2022). Taxpayers who are satisfied with the

quality of public services and perceive the tax system as fair demonstrate a greater willingness to voluntarily comply with tax laws and regulations. (Paleka and Vitezić, 2023). Trust in authorities may be a fundamental prerequisite for the phenomenon in which procedural fairness positively influences voluntary tax compliance (van Dijke and Verboon, 2010). Trust- and power-based strategies were found to be crucial for positively influencing taxpayer compliance (Batrancea et al., 2019).

Higher levels of tax compliance and accuracy are more likely to be achieved when taxpayers perceive digital solutions for tax reporting as easy to use (Venkatesh et al., 2003). Authors used various instruments to measure satisfaction, from e-government satisfaction (EGOVSA) and Advanced Travel Information Systems (ATIS) to End-User Computing Satisfaction (EUCS) (Saptono et al., 2023), as each instrument provides a different perspective. The DeLone and McLean (2014) model measures the quality of an information system through two dimensions: information quality and system quality. Information, system, and service quality are measures used in response to the information system output (DeLone and McLean, 2014). In contrast, Davis's TAM model measures only a subset of information system success and does not consider organizational impact, service quality, or the nature of use (Saptono et al., 2023).

The perceived service quality of e-tax services positively impacts taxpayers' willingness to comply with tax regulations (Saptono et al., 2023) and depends on trust in tax authorities (Güzel et al., 2019). According to the OECD (2022a) building trust in a tax system requires action and commitments from TA as well as taxpayers, as an ongoing effort (Darmayasa and Hardika, 2024) and is a key domain integrated in the tax compliance framework (Matthaei et al. 2023). Many empirical studies on investing trust in TA support the importance of trust in tax compliance (Nur et al., 2023; Van Lange et al., 2017). Most of the previous research has been focused on different variables impacting trust, such as justice, profession (Güzel et al. 2019), power (Kogler et al. 2022), tax morale (Ciziceno and Pizzuto, 2022), fairness, transparency, neutrality, simplicity (HMRC 2021, 5), and service-oriented behaviors (Kogler et al., 2022). Studies indicate that trust in the independent accounting profession is related to tax compliance (Güzel et al., 2019).

Trust in tax government can be effectively supported through the implementation of digital -based services (Sutrisno and Dularif, 2020; Hamilton-Hart and Schulze, 2016). In this case, it is essential that taxpayers have confidence in the security and privacy of their data. To promote the adoption of these technologies, the security and usability of electronic filing systems must be improved (Tahar et al., 2020). Due to tax secrecy and specific international and national tax laws or GDPR policy, TAs must provide high security by not sharing personal data with others and by protecting the personal data of taxpayers. While some risks emerge from big data technology, particularly regarding tax privacy rights and profiling practices (Politou et al., 2019), is TA obliged to ensure privacy and data protection. Trust in the use of

data and in the security of national tax systems (OECD, 2020) must be considered which is the reason, why trust in electronic services has been widely studied in the context of e-government (Gradison, 2007; Ashiq and Hussain, 2024), e-tax filling systems (Ramdhony et al., 2022).

This research highlights how trust, alongside performance and effort expectations, as well as taxpayers' innovativeness, is a significant driver in e-tax adoption. Usage of taxpayers' intention of e-tax filling system depends on perceived usefulness, service quality and users' satisfaction (Ramdhony et al., 2022). Despite all the research, there has been little research directed to study TA information and trust variable as measurement of taxpayers' satisfaction.

Based on the argumentation above, our research tested H1: Taxpayers' satisfaction with the TAs' information is positively linearly related to their trust in the TA.

## **2.2. Satisfaction, service quality and sustainability**

Sustainability requires a shift in taxpayer behavior (Hlastec et al., 2023; Konstantinos et al., 2022). Tax sustainable behavior supports tax compliance with laws and regulations, as well as the fairness, efficiency, and stability of the tax system to ensure the financing of other sustainability goals set by the government. At the forefront of sustainability and sustainable behavior are ethical principles in generating economic profit, which is not the absolute goal, concern for societal development and humanitarian efforts, education in tax literacy, and accepting financial responsibility for environmental issues. There is empirical evidence confirming how tax services positively affect tax compliance (Riska et al., 2024). If tax services are poor, they can contribute to tax non-compliance (Adekoya et al., 2020). Therefore, TA services are important in determining taxpayer compliance (Rokhman and Salman, 2024). In this paper, we argued that taxpayers more satisfied with the TA's e-services are more sustainably aware.

Our research tested H2: The satisfaction of taxpayers with the quality of TA e-services is positively and linearly related to the sustainable responsibility of taxpayers.

## **2.3. Satisfaction, age, and gender**

Demographic characteristics, including age, gender, education, income level, experience, and familiarity with computer and internet technology (Fu et al., 2004), significantly influence taxpayer satisfaction with e-tax systems (Al-Hammouri and Abu-Shanab, 2017). However, this influence is not always consistent. While Islam et al. (2015) suggest that younger individuals tend to be more satisfied than older ones, findings from OECD (2023c) and Horan and Abhichandani (2006) indicate

that older users are more satisfied than their younger counterparts. Older people are more compliant, generally more risk-aware (Walsch, 2012), have more experience, and are more trusting towards institutions. Satisfaction increases with age (Herzog and Willard, 1981). This makes age an interesting factor (Al-Hammouri and Abu-Shanab, 2017) that needs to be further examined. Previous research in Slovenia (GOV.si, 2022) has not examined the factor of age in the context of its significant impact on taxpayer satisfaction with e-services. To eliminate an existing gap in research, we tested whether:

H3: Older taxpayers are, on average, more satisfied with the e-services of the TA than younger taxpayers.

Gender differences relate to legal arrangements, the historical division of labor, power differences, institutional payment arrangements, and economic incentive patterns over time, across cultures, but also from honesty, risk taking and obedience (Twesige et al. 2024). The research by Ilias et al. (2009) and Connolly et al. (2017) did not find a significant influence of gender on satisfaction with the services of the TA (Al-Hammouri and Abu-Shanab, 2017). However, the literature offers some evidence of behavioral differences between genders (Twesige et al. 2024). To test the impact of gender on e-services satisfaction in Slovenia, we assumed, following the Global Gender Gap Index (World Economic Forum, 2024) and the Gender Equality Index (European Institute for Gender Equality, 2023), that male and female taxpayers are, on average, equally satisfied with the services of the TA. Therefore, the last research hypothesis was:

H4: Male and female taxpayers-beneficiaries are, on average, equally satisfied with the e-services of the TA.

### **3. Methodology**

In the framework of our research on taxpayer satisfaction with the services provided by the tax authority, we focused on corporate taxpayers who utilize the services of the tax authority. The questionnaire was emailed to 167 taxpayers, of whom 120 responded (71.86%). Data collection occurred from January 30th, 2024, to March 15th, 2024. Given the sensitive nature of topics concerning TA assessment, the snowball sampling approach, a non-probability sampling technique, was utilized to identify and recruit respondents in order to gather information from a specific, narrow niche (Dragan and Isaic-Maniu, 2022). In our case, we distributed the questionnaire (through an accounting service) to the target group, which then forwarded it to other taxpayers and users of tax services. We ensured respondents a high data security and confidentiality level, allowing the survey to proceed according to ethical research principles.

In the study, we examined taxpayer satisfaction with the services of the tax authority. We utilized five factors, and thus, the questionnaire was divided into five sections: Information (Section A), System Quality (Section B), Service Quality (Section C), Trust (Section D), and Sustainable Responsibility (Section E). The custom questionnaire was designed based on other studies. The research by Horan and Abhichandan (2010) served as the basis for the statements A1, B2, B3, and B7. The items A4, B1, B4, B5, B6, C1, C2, C3, C8, D1, D3, D4, D5, and D6 were derived from the study by Connolly et al. (2017). The statements A2, A3, C4, C5, C6, C7, C9, and D2 were adopted from the Slovenian Tax Authority survey (GOV.si, 2022). Adjustments were made to reflect the functioning of the Slovenian tax system, and thus, specific questions from foreign studies were partially modified. A part of the questionnaire, which included sustainability statements, was formulated by Vetrih (2024) in Section E.

The first section (A) focused on the information provided by the tax authority to taxpayers via the eDavki online portal. This section includes a list and calendar of form submissions, which reminds taxpayers of when they need to submit a particular form or fulfill their obligations, as well as various updates on the portal, possible system upgrades, errors, issues, and any changes in form submissions, document structure, or submission instructions. It also covers various legislative changes that alter the interaction with the tax authority (FURS, 2024). This section comprised four statements. The second section (B) focused on system quality and included seven statements. These aimed to assess whether taxpayers are satisfied with the usability of the eDavki portal and its offerings, whether all services provided by the tax authority are well organized, and whether taxpayers are satisfied with the system's organization. It also examined whether the submission of forms is quick and straightforward. The third section (C) concerns service quality. It comprised nine statements related to all the services offered by the tax authority, the execution of these services, the responsiveness of the tax authority's employees, and how they assist taxpayers in case of problems or questions. The fourth section (D) focused on taxpayer trust in the tax authority. It included six statements assessing whether taxpayers trust the tax authority with their data, how satisfied they are with the system's performance, and how data protection influences their use of the eDavki portal. The fifth section (E) measured sustainable responsibility, with statements reflecting taxpayers' attitudes towards profit maximization, ethical conduct, tax compliance, pollution, treatment of employees, and their education.

The questionnaire used in the study is presented in Table 1. In addition to measuring satisfaction with tax services, the questionnaire also collected data on various sociodemographic factors, such as gender, age, education, personal income, religion, marital status, type of settlement, employment status, employment sector, statistical region, and the industry of the company where the taxpayer is employed. This data is partially included in the presentation of the research results. The questionnaire included closed-ended statements.

Table 1: Statements used in the questionnaire

A: Information
A1. The information on the eDavki portal seems very useful. A2. The accessibility and timeliness of information is generally satisfactory. A3. Comprehensibility of information on the eDavki portal is generally satisfactory. A4. The general notices on the eDavki portal are beneficial.
B: System quality
B1. Registration with a digital certificate on the eDavki portal is easy. B2. Users of the eDavki portal find it easy to access tax documents (VAT, payroll tax, etc.). B3. The content on the eDavki portal is appropriately organized. B4. The eDavki portal allows quick submission of tax returns. B5. FURS provides timely information about changes in tax legislation and rules. B6. The eDavki portal provides users with numerous advantages when fulfilling tax obligations. B7. Expertise and experience are required to submit forms via the eDavki portal.
C: Service quality
C1. The eDavki portal provides a telephone number for issues. C2. The eDavki portal offers the option to speak with a live person if there is an issue. C3. The eDavki portal has representatives available online to assist customers. C4. FURS' services are generally satisfactory. C5. FURS's simplification and updating of customer relations are overall satisfactory. C6. The accessibility and responsiveness of the employees at the FURS are overall satisfactory. C7. The FURS's lawful, unbiased, and equal treatment of customers is overall satisfactory. C8. The eDavki portal enables quick and easy submission of forms (VAT, payroll taxes, income tax advance payments, etc.). C9. The flexibility of the FURS in resolving matters is satisfactory.
D: Trust
D1. The eDavki portal does not share personal data with other websites. D2. The eDavki portal effectively protects personal data. D3. The reliability of the eDavki portal (e.g., it never crashes or freezes) increases my trust in it. D4. Knowing that the eDavki portal provides contact information increases trust in it. D5. eDavki portal is, overall, highly usable. D6. The portal eDavki portal gives a sense of independent use.
E: Sustainable responsibility
E1. The primary responsibility of the organization where I am employed (or studying) is to focus on increasing profit. E2. The responsibility of the organization where I am employed (or studying) is to allocate a portion of its funds for humanitarian purposes. E3. The responsibility of the organization where I am employed (or studying) is to prioritize ethical principles over economic profit. E4. The responsibility of the organization where I am employed (or studying) is to comply with legislation, even if it would improve business performance to do otherwise. E5. The responsibility of the organization where I am employed (or studying) is to assume full financial responsibility for environmental pollution caused by its activities.

Source: Horan and Abhichandan (2010), (GOV.si, 2022), Vetrih (2024).

Note: FURS (Financial administration of the Republic of Slovenia) and eDavki (eTaxes).

Using a five-point Likert scale (with values ranging from 1 – strongly disagree, 2 – disagree, 3 – neither agree nor disagree, 4 – agree, 5 – strongly agree), we obtained quantitative data on taxpayers' attitudes and opinions regarding various aspects of the tax authority's services. IBM SPSS Statistics software was used in the empirical analysis.

We applied Cronbach's alpha for the five factors (i.e., questionnaire sections). Cronbach's alpha is one of the most used measures of internal consistency of items on a scale and estimates the correlations between items (Vaske et al., 2016). Alpha reflects the reliability of a questionnaire by estimating how well a set of items measures a single construct (Tavakol and Dennick, 2011).

Based on our research idea and literature review, we formulated four hypotheses, as previously explained. The first and second hypotheses test the existence of a positive linear relationship between variables. In contrast, the third and fourth hypotheses examine whether the means of the variable for the two groups are equal. To test the third and fourth hypotheses, we used the non-parametric Mann-Whitney test, which does not assume a normal distribution of variables and is often considered a non-parametric alternative to the t-test for independent samples. The t-test compares the population means, whereas the Mann-Whitney test compares the population medians of two groups and can also detect differences in the distribution of the variable (Hart, 2001). MacFarland and Yates (2016) recommend using the Mann-Whitney test for ranked (typically ordinal) data when the data do not follow a normal distribution and in the case of differently sized groups. We applied correlation analysis for the first and second hypotheses and examined the strength and direction of the linear relationship between variables.

## **4. Empirical data and analyses**

This section details the methodology of a study evaluating taxpayers' satisfaction with TA e-services in Slovenia, including an in-depth explanation of the data collection process, measurement techniques, and data processing methods.

### **4.1. Descriptive statistics and Cronbach's alpha**

The descriptive statistics results reveal that most participating taxpayers are female (65%), while 35% are male. Regarding age demographics, 56.7% of participants are 49 years old or younger, whereas 43.3% are over the age of 50. A more detailed presentation of these results can be found in Table 2.

Table 2: Number and percentage of taxpayers by age group and gender

Age group \ Gender	Male	Female	Total
Up to and including 49 years	24 (35.3%)	44 (64.7%)	68
50 years and more	18 (34.6%)	34 (65.4%)	52
Total	42 (35.0%)	78 (65.0%)	120

Source: Author's calculations

We proceeded by calculating Cronbach's alpha for each section of the questionnaire. In sections B, C, and D, the values were lower than 0.7 (precisely 0.530, 0.686, and 0.573, respectively), which is considered below the lower threshold for good reliability. Therefore, we attempted to improve the reliability of these three sections by eliminating certain statements. After excluding statements B7, C9, and D5, we obtained Cronbach's coefficient values, presented in Table 3. For section D (Trust), the result remained below 0.7 but still represents acceptable reliability. As Taber (2018) explains, these threshold values for alpha serve merely as a rule of thumb. His review of threshold values across numerous empirical studies shows that some authors consider a Cronbach alpha of 0.61 to indicate moderate reliability. Thus, the scales, calculated as the arithmetic means of the individual statement values within each section, are reliable and internally consistent.

Table 3: Values of Cronbach's alpha coefficient by sections of the questionnaire

Section	Cronbach's alpha	Reliability
A Information	0.906	excellent
B System quality	0.891	good
C Service quality	0.885	good
D Trust	0.610	acceptable
E Sustainable responsibility	0.775	good

Source: Author's calculations

#### 4.2. Results of hypothesis testing

We tested hypothesis H1 (Taxpayers' satisfaction with the TA's information is positively linearly related to their trust in the TA) using correlation analysis (Table 4), as we aimed to assess the strength of the linear relationship between the variables *information* and *trust*. The Pearson correlation coefficient is 0.466, indicating a moderate positive linear relationship between the variables. The p-value is less than 0.001, meaning the correlation coefficient is statistically significantly different from 0. Therefore, we can confirm hypothesis H1, as increased taxpayer satisfaction with the TA's information is related to increased trust in the tax administration.

Table 4: Correlation coefficient for hypothesis H1

		Trust
Information	Pearson Correlation	0.466
	Sig.(2-tailed)	<0.001
	N	120

Source: Author's calculations

For hypothesis H2 (The satisfaction of taxpayers with the quality of TA services is positively linearly related to the sustainable responsibility of taxpayers), we also conducted a correlation analysis (Table 5). The Pearson correlation coefficient is 0.371, indicating a weak positive linear relationship between the variables, nearing a moderate correlation. The statistical significance is less than 0.001, meaning the probability of this correlation occurring by chance is less than 0.1%. Based on the data obtained, we can confirm hypothesis H2, indicating that the sustainable responsibility of taxpayers increases with their satisfaction with the quality of TA services.

Table 5: Correlation coefficient for hypothesis H2

		Sustainable responsibility
Service quality	Pearson Correlation	0.371
	Sig.(2-tailed)	<0.001
	N	120

Source: Author's calculations

For hypothesis H3 (Older taxpayers are, on average, more satisfied with the services of the TA than younger taxpayers), we conducted a non-parametric analysis (Mann-Whitney test). The results are presented in Table 6. We found that the p-value of the one-sided Mann-Whitney test is 0.0055 (0.011 divided by 2), indicating statistically significant differences between age groups at the 5% significance level. Therefore, we can confirm hypothesis H3.

Table 6: Mann-Whitney U-test for hypothesis H3

Age group	N	Mean Rank	Sum of Ranks	Sig.
Up to and including 49 years	68	53.46	3635.00	
50 years and more	52	69.71	3625.00	
Total	120			0.011

Source: Author's calculations

For hypothesis H4 (Male and female taxpayers-beneficiaries are, on average, equally satisfied with the TA services), we also performed a Mann-Whitney test (Table 7). The results reveal a p-value of 0.963, indicating no statistically significant differences in satisfaction between the genders. Hypothesis H4 is thus confirmed.

Table 7: Mann-Whitney U-test for hypothesis H4

Gender	N	Mean Rank	Sum of Ranks	Sig.
Male	42	60.30	2532.50	
Female	78	60.61	4272.50	
Total	120			0.963

Source: Author's calculations

We also tested the robustness of the results for hypotheses H3 and H4 using an independent samples t-test. Although the data are not normally distributed, the t-test is known to be robust against the assumption of normality (Posten, 1984). Rasch et al. (2007) provide an overview of studies on the robustness of statistical tests for two independent samples and conclude that, in most applications, the independent samples t-test is sufficiently robust to be recommended in almost every case. We also conducted a homogeneity of variance (Levene's) test and considered potential non-homogeneity. For H3, the p-value of the one-sided t-test is 0.007, leading us to reject the null hypothesis of equal means across both age groups and accept the research hypothesis H3 that older taxpayers are, on average, more satisfied with the quality of TA services. For hypothesis H4, the p-value of the two-sided t-test is 0.677, meaning we cannot reject the null hypothesis that there are no differences in average satisfaction with the quality of services between genders. Thus, for both hypotheses, the results are consistent across the Mann-Whitney test and the t-test.

## 5. Results and discussion

This study focused on examining taxpayer satisfaction with TA services. Four hypotheses were tested, the results of which provide valuable insights into the tax system's functioning and user satisfaction.

The H1 explored confirmed the positive linear relationship between taxpayers' satisfaction with the information provided by the TA and their trust in it, as reflected in a Pearson correlation coefficient of 0.466. The results showed that, on average, taxpayers satisfied with the usefulness, accessibility, timeliness, comprehensibility of the information trust more. TA is not sharing their personal data with others, effectively protecting data, is more reliable. This means that taxpayers' trust increases

with the higher quality of information provided by the TA. Similar findings were reached by Horan and Abhichandani (2006), whose research confirmed that the usefulness of information is a strong and important factor in emotional satisfaction. Similarly, among the variables with the strongest effect on perceived public value is efficiency along with usefulness, while privacy is important but not as much (Connolly et al., 2017). Previous research by the Slovene TA also confirmed that a large portion of users (67 %) are satisfied with the accessibility and timeliness of information, and with the clarity of information (73 %) (GOV.si, 2022). However, nearly one-third of users still rate this aspect of the services as inadequate. Even though neither study measured the correlation, a high level of trust was identified by Horan and Abhichandani (2006) and the Slovene TA (GOV.si, 2022), where 81 % of users expressed satisfaction with the protection of data confidentiality.

The H2 examined the relationship between satisfaction with the quality of TA services and the sustainable responsibility of taxpayers. We found a positive linear correlation between the two variables, confirmed by a Pearson coefficient of 0.371. The correlation suggests that taxpayers' sustainable responsibility increases with higher satisfaction with the TA's services. These results confirm Riska et al. (2024) and Adekoya et al. (2020) conclusions. Tax services affect sustainable tax behavior (tax compliance). Taxpayers who are more satisfied with the services of the TA are more sustainably aware.

The H3 was confirmed, as the p-value was 0.011. It examined the differences in satisfaction between older and younger taxpayers with the services. On average, older users in Slovenia are more satisfied with the TAs' services than younger ones. The quality of services included providing a phone number for issues, the possibility of consulting in case of problems, simplifying and modernizing operations by the TAs, accessibility and responsiveness of employees, lawful, impartial, and equal treatment of clients, and flexibility in resolving issues. Since differences in satisfaction with the TAs' services between the age groups were confirmed, they could be attributed to users' experience and knowledge. Older taxpayers are more familiar with the functioning of the tax system and have more experience and tax knowledge with the TAs' services. On the other hand, younger taxpayers, who may be more accustomed to digital tools, are more likely to express dissatisfaction when encountering difficulties navigating the eDavki portal. To increase satisfaction among younger taxpayers, the TA could develop specific training programs that would equip younger users with the knowledge and skills to manage their tax obligations more effectively. The results align with Horan and Abhichandani's (2006) study, which found that older users were more satisfied than younger ones. However, these findings contradict those of Islam et al. (2015, p. 163), where younger individuals were reported to be more satisfied than older ones, due to the younger generation's greater 'computer savvy'. A direct comparison of this study's results with those of Connolly et al. (2017) and the TA survey in Slovenia (GOV.si,

2022) is difficult, as the latter did not consider age groups. Connolly et al. (2017) assessed the variable 'Contact' as a weak contributor, explaining that taxpayers are computer literate and expect to engage with a government website that understands and addresses their concerns proactively. Similarly, the Slovenian TA survey (GOV.si, 2022) showed that taxpayers are satisfied with the professionalism of the staff (41 %) and the assistance in resolving issues (42 %). Transparency of operations, accuracy and reliability of execution, flexibility in resolving matters, and the simplification and modernization of client-related processes were rated as satisfactory by 40 % of taxpayers. As can be concluded, there is significant room for improvement.

The H4 examined the differences in satisfaction between genders and showed that there is no statistically significant difference between male and female taxpayers. A p-value of 0.963 confirms that both genders are equally satisfied with the TA's services. It indicates that users, regardless of gender, are similarly informed and have the same level of tax knowledge about the TA services and does not suggest any potential gender disparity in treatment. This is consistent with the findings of studies by Connolly et al. (2017) and Ilias et al. (2009), in which the authors conclude that service quality does not differ between genders. Although differences in satisfaction between genders are not present, it is important for the TA to continue ensuring equal treatment of all taxpayers. This includes providing accessible services that meet the needs of all groups, regardless of gender and age.

## **6. Conclusions**

In an era where digitalization and technological advancements are rapidly transforming the interaction between taxpayers and TA, assessing user satisfaction with TA e-services becomes crucial for ensuring their quality and effectiveness. TA must adapt to the needs and expectations of their taxpayer to enhance their effectiveness and build public trust.

The primary goal of our research was to evaluate the level of taxpayer satisfaction with TA services and to understand the factors affecting their experience with these services. The eDavki portal offers numerous benefits for both users and the TA. Using the collected data, we identified key areas that require improvements. One advantage is that taxpayers can easily fulfill their obligations without the need to visit tax offices, leading to greater efficiency and cost reduction. Despite these advantages, some challenges remain. TA in Slovenia should place more emphasis on the usefulness, accessibility, timeliness, clarity, and usability of information, as well as on the security and operation of the system. This focus could enhance taxpayer trust in the TA, as supported by the confirmed positive linear relationship in H1. The quality of information is crucial, as poor, or unclear information can lead to confusion and distrust. It is important that the TA not only provides information

but also ensures that it is easy to understand and accessible to all taxpayers. For this reason, it is recommended to develop additional mechanisms to quickly gather the feedback on the clarity and usefulness of the information, which could further strengthen taxpayers' trust in the TA. By improving tax services, taxpayers could also become more sustainably responsible, as evidenced by the positive linear relationship between service quality and sustainability responsibility in H2. The TA should consider incorporating sustainability principles into its services and communication with taxpayers. Through research and education on sustainable development, the TA could raise awareness of the importance of sustainable responsibility and encourage taxpayers to take an active role in this process. As shown in H3, older taxpayers are more satisfied than younger ones. The results of H3 suggest that lower satisfaction with TA services among the younger generation could be improved by enhancing tax knowledge through targeted programs aimed at young taxpayers. The TA should improve responsiveness, trust, and staff assistance for taxpayers to equalize satisfaction between older and younger taxpayers. Both genders in Slovenia are equally satisfied with the TA's services, indicating no significant gender disparity in treatment (H4).

This study contributes to the existing literature on satisfaction with TA and the factors influencing this perception process. During the research, we encountered several limitations that must be considered when analyzing and interpreting the collected data. One key limitation relates to the time periods of the studies used for comparison. The studies referenced come from different time periods, presenting specific challenges in comparing results. We must consider the technological advancements and changes in TA services, as well as the development of the tax system, over the past decade. Older studies conducted before the widespread adoption of digital solutions in Slovenia (eDavki portal) may not reflect the current level of technological support available to users today. Digital tools, such as online portals and mobile apps, have facilitated easier and faster access to services and reduced the need for physical visits to tax offices, increasing user satisfaction and optimizing procedures. However, developments have not only occurred in technology but also in legislative changes that have impacted how taxpayers meet their obligations. Despite the limitations, the results of this study contribute to the literature and can be beneficial for users, specifically TAs, in measuring and analyzing the perceived satisfaction of taxpayers with their services.

As the questionnaire was limited to studying the usability and effectiveness of TA services in Slovenia, future research could be expanded in various directions, implementing other factors, such as perceived fairness, transparency, and integrity of the tax administration in the study. In future research, it would be also meaningful to examine the differences in tax knowledge between younger and older taxpayers, as this could help more accurately identify which types of knowledge need to be enhanced among the youth to increase their satisfaction.

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## Ocjenjivanje zadovoljstva poreznih obveznika e-uslugama porezne uprave

Lidija Hauptman<sup>1</sup>, Nika Vetrih<sup>2</sup>, Alenka Kavkler<sup>3</sup>

### Sažetak

Kako se porezne uprave širom svijeta moderniziraju pomoću digitalnih tehnologija, razumijevanje zadovoljstva poreznih obveznika njihovim uslugama postaje ključno. Glavni cilj istraživanja bio je procijeniti odnos između zadovoljstva e-uslugama porezne uprave i čimbenika kao što su povjerenje, kvaliteta usluga, dob i spol, čime se adresira uočeni nedostatak u postojećoj literaturi. Upotrebom upitnika distribuiranog među poreznim obveznicima u Sloveniji testirane su četiri hipoteze. Osim deskriptivnih metoda, korištene su Pearsonova korelacijska analiza, T-testovi i Mann-Whitney U-testovi. Rezultati pokazuju pozitivnu korelaciju između kvalitete e-usluga i povjerenja, kao i održivosti, ali niže zadovoljstvo e-uslugama porezne uprave kod mlađe generacije. Razlike u spolu ne postoje, jer su muški i ženski porezni obveznici jednako zadovoljni e-uslugama. Rezultati sugeriraju, da poboljšanje upotrebljivosti, jasnoće i sigurnosti poreznih informacija povećava povjerenje i zadovoljstvo poreznih obveznika. Kvalitetne informacije ne uzrokuju zabunu i nepovjerenje, te je s perspektive poreznih obveznika ključno osigurati dostupne i lako razumljive informacije, kao i brze mehanizme povratnih informacija, kako bi se povećala jasnoća i ojačalo povjerenje poreznih obveznika. Mlađi porezni obveznici mogli bi imati koristi od ciljanih edukativnih programa.

**Ključne riječi:** porezna uprava, kvaliteta usluge, povjerenje, dob, spol

**JEL:** M41, M48, H83, G41

<sup>1</sup> Izvanredna profesorica, Univerza v Mariboru, Ekonomsko-poslovna fakulteta, Katedra za računovodstvo, revizijo in davščine, Razlagova 20, 2000 Maribor, Slovenija. Znanstveni interes: računovodstvo, porezi i revizija, održivost. E-mail: lidija.hauptman@um.si.

<sup>2</sup> Studentica, Univerza v Mariboru, Ekonomsko-poslovna fakulteta, Katedra za računovodstvo, revizijo in davščine, Razlagova 20, 2000 Maribor, Slovenija. Znanstveni interes: računovodstvo, porezi i revizija, održivost. E-mail: nika.vetrih@student.um.si.

<sup>3</sup> Redovita profesorica, Univerza v Mariboru, Ekonomsko-poslovna fakulteta, Katedra za kvantitativnu ekonomsku analizu, Razlagova 20, 2000 Maribor, Slovenija. Znanstveni interes: kvantitativne metode. E-mail: alenka.kavkler@um.si.



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# Academic burnout of digital natives and social sustainability: prevalence and risk factors\*<sup>1</sup>

Sonja Ivančević<sup>2</sup>, Veljko Dmitrović<sup>3</sup>, Marko Ćirović<sup>4</sup>, Nataša Petrović<sup>5</sup>

## Abstract

*As higher education institutions play a key role in setting a foundation for a sustainable workforce, it is their responsibility to create an environment in which students' well-being will be preserved. In this regard, contemporary universities encounter a significant challenge – the increasing presence of academic burnout syndrome which negatively affects students' health, career preparedness, and subsequent job performance. While previous burnout studies mostly focused on Millennial students, this study aims to examine burnout prevalence and risk factors among Generation Z, the first true digital natives. Therefore, the study proposes a conceptual model exploring the impact of seven background factors (demographic and situational) on four dimensions of academic burnout, as well as students' overall burnout. The model is tested on a sample of university students from*

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<sup>2</sup> Junior Researcher, University of Belgrade – Faculty of Organizational Science, 154 Jove Ilića Street, 11000 Belgrade, Serbia. Scientific affiliation: human resource management, multidisciplinary educational research. E-mail: [sonja.ivancevic@fon.bg.ac.rs](mailto:sonja.ivancevic@fon.bg.ac.rs).

<sup>3</sup> Associate Professor, University of Belgrade – Faculty of Organizational Sciences, 154 Jove Ilića Street, 11000 Belgrade, Serbia. Department of Financial Management and Accounting. Scientific affiliation: accounting, financial and non-financial reporting, intellectual capital, financial management. E-mail: [veljko.dmitrovic@fon.bg.ac.rs](mailto:veljko.dmitrovic@fon.bg.ac.rs).

<sup>4</sup> Assistant Professor, University of Belgrade – Faculty of Organizational Sciences, 154 Jove Ilića Street, 11000 Belgrade, Serbia. Department of Management of Technology, Innovation and Sustainable Development. Scientific affiliation: environmental management, sustainable development. E-mail: [marko.cirovic@fon.bg.ac.rs](mailto:marko.cirovic@fon.bg.ac.rs).

<sup>5</sup> Full Professor, University of Belgrade – Faculty of Organizational Sciences, 154 Jove Ilića Street, 11000 Belgrade, Serbia. Department of Management of Technology, Innovation and Sustainable Development. Scientific affiliation: environmental management, sustainable development. E-mail: [natasa.petrovic@fon.bg.ac.rs](mailto:natasa.petrovic@fon.bg.ac.rs).

Serbia, using the Structural Equation Modelling (SEM) analysis. The results indicate that a quarter of the surveyed students experience overall burnout, while over 60% report experiencing some degree of personal burnout. Furthermore, two confirmed hypotheses reveal that Generation Z's academic burnout is significantly linked to age and whether students study in their hometown. Three partially confirmed hypotheses suggest that certain academic burnout dimensions are also connected to gender, GPA, and tuition payment.

**Keywords:** academic burnout, background factors, digital natives, sustainability, finance-related burnout precursors

**JEL classification:** I23, I31, I22

## 1. Introduction

The long-term development of society cannot be achieved without the essential prerequisites that ensure the health of its members (Sen, 1991). Moreover, health has been identified as a key factor in the social aspect of sustainability in every domain, be it organizational, community-related, or individual (Reyna-Castillo et al., 2022). Henceforth, monitoring and nurturing students' health stands out as a foundational element of socially sustainable universities (Reyna-Castillo et al., 2022).

In light of this perspective, one of the greatest challenges of contemporary higher education is the burnout syndrome presence among the population of students. Equivalent in nature to job burnout, academic burnout occurs as a student's reaction to prolonged stress in the academic environment (Shin et al., 2012). It is commonly depicted as a state of the uttermost emotional exhaustion and the depletion of one's resources, accompanied by a series of emotional, physical, and cognitive impairments (Maslach, 2001). The consequences of academic burnout impact not only the suffering individuals but also their families, university, and, in the long run, society as a whole (Neumann et al., 1990). As most of the previous research focused on the burnout of Generation X and Y, it is vital to investigate Generation Z's academic burnout so that adequate interventions can be tailor-made.

With this in mind, the main objectives of this research are a) to examine the prevalence of academic burnout among Generation Z students, and b) to identify background factors that contribute to the occurrence of Generation Z academic burnout by testing a new conceptual model that links these factors to academic burnout. To achieve these objectives and answer the research question – *To what extent does the current population of university students experience academic burnout, and which background factors contribute to its occurrence?*, the study proposes a conceptual model exploring the effects of seven demographic and situational factors – students' gender, age, GPA, employment status, tuition payment status, living expense coverage support, and studying in their hometown –

on four dimensions of academic burnout, and students' overall burnout. The model is tested on the sample of students from the University of Belgrade – Faculty of Organizational Sciences (FOS), utilizing SEM analysis. The student version of the Copenhagen Burnout Inventory – (CBI-S) is used to measure academic burnout.

In contrast to former studies primarily examining generations X and Y burnout, this study makes a scientific contribution by exploring burnout of the under-researched cohort of Generation Z university students. Additionally, by focusing on the role of seven background factors – gender, age, GPA, employment status, tuition payment, living expense support, and studying in one's hometown – the study advances knowledge on how these variables affect overall academic burnout, but also its personal, studies-related, colleagues-related and teachers-related dimensions.

The first part of the paper presents the literature review connected to the observed phenomenon and the examined population. The second part of the paper presents the proposed conceptual models, obtained results, and their discussion. The findings should fill the existing literature gap regarding the burnout of Generation Z and provide guidelines for the design of the corresponding prevention and reduction strategies.

## 2. Literature review

The literature review addresses burnout syndrome, its connection to sustainability, and previous findings regarding the specific burnout risk factors. It also delineates the characteristics of Generation Z.

### 2.1. Academic burnout

Throughout the years, burnout syndrome has become one of the most prevailing stress-related consequences. It was first noticed and subsequently researched among the nursing staff and physicians, the professionals for whom a high degree of emotionally challenging situations and intense contact with people in need is inevitable (Freudenberger, 1974). The succeeding research recognized its presence among all 'helping professions', including psychologists, professors, social workers, and the like (Leiter and Schaufeli, 1996), and finally, it was observed in individuals across all occupations (Leiter and Schaufeli, 1996). Simultaneously, it was discovered that university students can also experience burnout (Backović et al., 2012; Ivančević et al., 2023a).

Academic or student burnout *per se* is viewed as the outcome of prolonged academic stress, energy depletion, and a gradual decline of enthusiasm for academic endeavours caused by a variety of internal, external, and situational factors (Ivančević

et al, 2023b). The syndrome entails numerous psychological, physical, and emotional symptoms including depression, anxiety, and suicidal ideation (Maslach et al., 2001), sleeping difficulties, gastrointestinal and cardiac complications (Ahola and Hakanen, 2014), as well as negative behavioural and communication changes (Ivančević et al., 2023b), affecting these individuals' interaction with the community surrounding them. In addition, burned-out students tend to use ineffective and dysfunctional coping mechanisms, such as substance use, self-blame, behavioural disengagement, and venting (Spataro et al., 2016; Ivančević et al., 2022), that further exacerbate students' health and behavioural issues. All of these changes contribute to a variety of negative academic outcomes, such as a decline in learning motivation and engagement (Sulea et al., 2015), heightened intention to discontinue studies as well as the actual increase in the number of students who leave universities (Bumbacco and Scharfe, 2023).

## **2.2. Social sustainability and academic burnout**

Researchers of social sustainability emphasize that one of the foremost challenges of today's higher education is academic burnout (Reyna-Castillo et al., 2022). Its effects on social sustainability are twofold, encompassing its present and future dimensions as its consequences target both the current population of students and the future workforce. The specific reasons for this impact are explained below.

First and foremost, burnout syndrome comprises the aforementioned health-related problems decreasing students' resilience and overall capacity to positively contribute to society. Further, instead of being preserved and nurtured during their academic years, the health of these individuals is already compromised upon entering the workforce. This causes their increased susceptibility to other illnesses as well as job burnout (Robins et al., 2018), and creates negative work outcomes, such as higher absenteeism rates, lower organizational commitment as well as increased turnover (Azam et al., 2017). These subsequently impact the companies' financial health, leading to increased costs related to employees' sick leaves and the necessity for additional recruitment, selection, onboarding, and training expenses for new hires.

Academic burnout jeopardizes students' cognitive ability and engagement in their coursework (Sulea et al., 2015), which consequently decreases their vocational knowledge, and announces reduced professional achievement (Dyrbye and Shanafelt, 2016). Such lack of competencies and success potential can negatively affect the performance of entire departments and organizations students will work for after graduation, reducing their sustainability. Furthermore, burnout is shown to be connected with university students' drop-out rates (Bumbacco and Scharfe, 2023). Also, students frequently choose courses in accordance with their feeling of exhaustion (Dyrbye and Shanafelt, 2016). Both lead to a shortage of professionals

in certain fields and specialities (Dyrbye and Shanafelt, 2016) and jeopardize the sustainability of those professions. Burnout also deteriorates students' altruistic professional values, reduces their empathy, and increases dishonest conduct (Dyrbye and Shanafelt, 2016) – all trends against desirable and socially sustainable academic and workplace behaviours.

All these reasons underscore the significance of early detection and prevention of burnout within the academic environment.

### **2.3. Digital natives – Generation Z**

Generation Z is a demographic cohort that follows the Millennial generation, encompassing individuals born between 1995 and 2012 (Wulandari et al., 2023). This generation comprises the current population of university students, with its oldest members having already entered the workforce. Generation Z or iGeneration is the first generation that has been exposed to the Internet and portable digital devices since childhood and is therefore considered true digital natives (Francis and Hoefel, 2018). They are characterized as digital integrators, open-minded and realistic, but displaying more individualistic tendencies and less respect for authority than prior generations (Wulandari et al., 2023). Consequently, they are shown to have different attitudes towards both academic and job prospects (Francis and Hoefel, 2018), money, and economic issues (Seyfi et al., 2023). Modern technology and information access made them aware of global issues and their impact from a young age, resulting in them becoming very interested in sustainable development and trying to follow sustainability principles in all their activities (Dabija et al., 2020). Nevertheless, Generation Z representatives are more commonly diagnosed with psychiatric disorders and intellectual disabilities (Buckley et al., 2020). Moreover, according to Schroth (2019), they display a higher level of psychological distress compared to the previous generations, which can be an indicator of higher burnout prevalence.

Additionally, in contrast to the previous generations of students, they have undergone an unprecedented educational experience having spent a part of their university years learning within an emergency online environment (Ivančević et al., 2023a) which differs from regular distance learning (Krsmanovic et al., 2012). During this time, they faced notably heightened levels of anxiety which was related to burnout (Ivančević et al., 2023a). Finally, the data show that they were not able to accumulate substantial human capital skills, necessary for regular socioemotional development (Reyna-Castillo et al., 2022).

Therefore, to ensure a socially sustainable educational environment for Generation Z students and soon-to-be employees, it is important to assess burnout prevalence among them and determine the connected risk factors.

## **2.4. Factors influencing academic burnout**

Several demographic and situational factors will be taken into consideration while examining the academic burnout of Generation Z.

### **2.4.1. Gender**

Social sustainability pays special attention to gender equality. Therefore, it is important to determine whether the examined educational environment equally preserves the well-being of both genders, including their risk of burnout development. Most previous studies examining the influence of gender on student burnout show higher burnout levels in female students (Backović et al., 2012; Spataro et al., 2016). However, Palupi and Findyartini's (2019) study shows no significant differences in the levels of burnout between the two genders, and Talih et al.'s (2018) study shows greater burnout levels in male students. All of these contribute to Fiorilli et al.'s (2022) suggestion that further examination of student burnout-gender connection is required. Therefore, we propose the following hypothesis:

H1: Female gender is positively connected to the measured level of academic burnout.

### **2.4.2. Age**

In addition to gender, Baumgardt et al. (2015) suggest that one of the factors that should be taken into account to increase sustainability regarding burnout is age. Prior research has also provided ambivalent results regarding age as a burnout predictor. Whereas some studies have found that burnout levels increase with age (Dyrbye et al., 2006; Galán et al., 2011), emerging findings targeting Generation Z indicate that burnout levels can be higher in younger students (Fernández-Castillo and Fernández-Prados, 2022). Also, there are results linking age with specific burnout dimensions, such as cynicism, antipathy, inefficacy, and exhaustion (Lee et al., 2013). It is necessary to mention that students' burnout dynamics may also depend on the specific university context and that separate examinations are required. Therefore, the following hypothesis is proposed:

H2: Student age is positively connected to the measured level of academic burnout.

### **2.4.3. Grade point average**

Student performance or success often refers to the extent to which students are progressing in gaining knowledge and developing skills as they work towards their educational goals (Eid and Al-Jabri, 2016). It is usually measured through

students' GPA, indicating an average level of their accomplishments across a range of academic courses. Whereas students with high GPAs are frequently viewed as future social and economic drivers of their countries, striving to achieve high performance can put tremendous stress and pressure on students (Huan et al. 2008), potentially reducing their actual contribution to society. In line with this, previous studies have indicated that students' GPA can be a predictor of burnout or at least of some of its dimensions, such as emotional exhaustion (Jacobs and Dodd, 2003). Due to the specific attitude of Generation Z students toward educational progress (Francis and Hoefel, 2018), it is important to examine whether their academic success can cause burnout. Therefore, the following hypothesis is proposed:

H3: Students' success measured through their GPA is positively connected to the measured level of academic burnout.

#### ***2.4.4. Employment status***

Students' decision to engage in employment during their academic years can be attributed to the necessity of covering their living expenses as well as substantial tuition fees (Drăghici and Cazan, 2022). However, researchers investigating the health of employed students emphasize that they are likely to experience burnout because they need to manage both university and work demands simultaneously (Schramer et al., 2020). Namely, in such a division of engagement and the lack of time and energy for the appropriate self-care routines, they gradually experience exhaustion both concerning their employment and academic responsibilities (Schramer et al., 2020). Nevertheless, Dundes and Marx's (2006) study provides different findings, showing that, in the long run, employment leads to better performance in students and reduced stress level. Thus, to determine whether being employed while studying is socially sustainable, further exploration is needed and we propose the following hypothesis:

H4: Student employment is positively connected to academic burnout.

#### ***2.4.5. Finance-related factors – tuition payment status and living expense coverage support***

Irrespective of employment status, students often face financial burdens that can lead to continuous stress, potentially resulting in burnout. Namely, researchers have confirmed that financial strain is one of the most prevalent sources of stress among university students (Hayes, 2006). It can be generated by specific financial demands and circumstances of students and apart from jeopardizing their integration into academic and social aspects of university life, cause serious psychological problems (Adams et al., 2016). However, there is a lack of evidence regarding the influence of particular finance-related factors on academic burnout.

Therefore, this study is going to examine the relationship between tuition payment status and burnout. Marôco and Tecedreiro (2009) have drawn attention to the stresses associated with financing one's academic studies, and Miltojević et al. (2021) examined the relation between the tuition fee status and inadequacy, cynicism, and exhaustion, as burnout dimensions, showing that a greater proportion of self-financed students demonstrate severe levels of exhaustion in comparison to those who are budget-financed. In contrast, budget-financed students are found to be more prone to feeling inadequacy (Miltojević et al., 2021). Nonetheless, the examination between the tuition payment status and students' burnout dimensions measured by the CBI-S is required.

Also, struggling to cover the costs connected to basic needs, such as housing, food, transportation, and other necessities can cause tremendous stress and exhaustion, while adequate support could alleviate these feelings (Adams et al., 2016). Thus, the study is also going to investigate how the extent of financial support for living expenses influences student burnout.

Therefore, we propose the following hypotheses:

H5: Self-financing one's studies is positively connected to academic burnout.

H6: Full financial parental support is negatively connected to academic burnout.

#### **2.4.6. Studying in their hometown**

The relationship between students studying in their hometown or elsewhere and the occurrence of student burnout has not been frequently examined. However, the distinction between the two might be critical for burnout development. On the one hand, living in a familiar environment can be very comforting for students, providing them with the usual support from their family and friends, which can be considered study resources (Lesener et al., 2020). It also protects them from facing stressors that stem from transitioning and adjusting to a new environment (Yang and Farn, 2005). On the other hand, new surroundings may provide students with new perspectives and experiences, giving them new developmental opportunities (Lesener et al., 2020) and relieving them from the potential pressure they feel at home. Thus, it is important to discover whether this difference significantly influences students' well-being and which option is more socially sustainable burnout-wise.

Therefore, the following hypothesis is proposed:

H7: Studying in their hometown is negatively connected to academic burnout.

### **3. Method**

The section describes the conveyed survey and the used instrument, whereas the analysis employed is depicted in the following section.

#### **3.1. Conveyed survey**

The cross-sectional survey was conducted in 2024 and encompassed the University of Belgrade – Faculty of Organizational Sciences (FOS) students. The survey utilized a convenience sampling method, including students who were present in class and willing to participate in the research. The questionnaire was created in an online format and distributed to students by the academic staff. Students completed the questionnaire on the spot, utilizing their mobile phones. To protect students' rights and ensure the integrity of the research, we addressed the following ethical considerations. Firstly, students were informed about the survey's purpose and how their data would be used. Also, the survey was anonymous, with a guarantee of confidentiality. Finally, as with other student surveys, we aimed to establish a supportive environment where students felt encouraged to give honest answers.

After conducting the survey, the relationships between the selected factors and academic burnout were analysed. Conceptual models designed to evaluate the suggested hypotheses are shown in Figure 1 and Figure 2, presented in the following sections. The models were tested with the use of SEM analysis also presented below.

#### **3.2. Instruments**

The opening segment of the questionnaire encompassed questions regarding students' demographic and situational characteristics, including gender, age, GPA, whether they study in their hometown, employment status, tuition payment status, and the way of financing their costs of living. The following segment of the questionnaire comprised the CBI-S, a standardized inventory measuring student burnout. Kristensen et al. (2005) developed the original scale, and the student adaptation was subsequently created and verified by Campos et al. (2013). CBI-S inventory consists of four scales estimating four dimensions of student burnout – Personal burnout, Studies-related burnout, Colleagues-related burnout, and Teachers-related burnout – comprising six, seven, six, and six items in the corresponding order. Responses from students are rated on a 5-point Likert-type scale (1=Never or 0% of times and 5=Always or 100% of times).

## 4. Empirical data and analysis

The section depicts the sample characteristics and the determined students' burnout levels. It also presents the SEM analysis utilized for examining the relationships between the selected variables within two proposed conceptual models. The results of the models' assessment are presented as well.

### 4.1. Sample characteristics

The sample includes answers provided by 819 FOS students. Out of the total number of respondents, 226 are male students (27.6%) and 593 are female students (72.4%). This perceived gender imbalance was anticipated due to two primary factors: firstly, women are more inclined to participate in surveys, and secondly, there is a higher enrollment of female students at FOS. The research includes students from each of the four academic years: first (26.0%), second (34.6%), third (20.6%), and fourth (18.8%). Respondents' average age is 20.67 with a standard deviation of 1.382. The age span ranges from 18 to 28, with a median of 20. The observed range can be ascribed to the fact that some students may have started their studies a year earlier, while others may have needed to repeat a year. Regardless, all students belong to the targeted Generation Z at the time of the study. The average of all participants' GPAs is 8.16 (measured on a scale of 6 to 10), with a standard deviation of 0.720, and the median being 8.09. Concerning respondents' tuition fee status, 527 (64.3%) of the respondents have their tuition covered by the Republic of Serbia's budget (budget-financed students), while 292 (35.7%) are self-financed. In addition, 375 students, representing 45.8% of the total sample, study in their hometown, compared to 444 (54.2%) who do not. As for respondents' employment status, the majority of students (64.0%) are not employed, whereas 36% of them are employed. Finally, with respect to covering their living expenses, 640 (78.1%) are fully supported by their parents, while 21.9% of students cover all costs on their own or receive only partial financial support from external sources.

### 4.2. Student burnout levels

The first objective of the study is to examine the prevalence of academic burnout among students belonging to Generation Z. For this purpose, the student version of the CBI inventory is utilized. The inventory measures four burnout dimensions, including personal burnout (an overall feeling of exhaustion), studies-related burnout (exhaustion caused by academic pressures), colleagues-related burnout (exhaustion stemming from relationships with peers), and teachers-related burnout (exhaustion caused by interactions with faculty). In addition, unlike the Maslach Burnout Inventory (MBI), the CBI-S enables the determination of an overall burnout score. Analyzing burnout syndrome from both perspectives is

beneficial, as the use of the overall burnout score enables comparisons among student populations and highlights differences in burnout across time, countries, institutions, and educational settings, whereas examining separate dimensions helps pinpoint the most affected aspects of student life, allowing for tailored support systems.

According to Campos et al. (2013), burnout severity is assessed using a scale ranging from 0 to 100, where scores between 50 and 74 indicate that students are moderately exposed to burnout, scores between 75 and 99 indicate high burnout, whereas a score of 100 indicates severe burnout. Scores under 50 suggest the absence of burnout.

Students are mostly exposed to two dimensions of burnout: personal and studies-related, whereas nearly a quarter of students encounter moderate overall burnout.

Table 1: Quantity of students in each dimension of burnout categorized by severity, percentage representation within the sample, and mean, standard deviation, and median for the entire sample

	Severity	Score	Number of students	Percentage of sample	Mean ± STD	Median
Personal burnout	Moderate	50 – 74	308	37.6%	56.23 ± 23.24	54.64
	High	75 – 99	172	21.0%		
	Severe	100	38	4.6%		
Studies-related burnout	Moderate	50 – 74	232	28.30%	46.50 ± 24.64	42.18
	High	75 – 99	128	15.60%		
	Severe	100	3	0.40%		
Colleagues-related burnout	Moderate	50 – 74	132	16.10%	30.26 ± 24.17	25.00
	High	75 – 99	40	4.90%		
	Severe	100	11	1.30%		
Teachers-related burnout	Moderate	50 – 74	97	11.80%	22.60 ± 21.81	16.67
	High	75 – 99	15	1.80%		
	Severe	100	8	1.00%		
Overall burnout	Moderate	50 – 74	195	23.80%	38.90 ± 17.58	37.64
	High	75 – 99	25	3.10%		
	Severe	100	0	0.00%		

Source: Author’s calculations

### 4.3. Exploration of factors that impact the levels of burnout

The second objective of the research is to determine whether different background factors impact the levels of specific students' burnout dimensions, and their overall burnout. To explore these relations, the study proposes two conceptual models that are tested with the use of SEM analysis.

#### 4.3.1. SEM analysis

In this study, we investigate the impact of seven categorical factors on student burnout using Ordinal-Probit SEM-MIMIC model. The traditional Maximum Likelihood (ML) estimator, commonly employed in SEM analysis, was unsuitable for our dataset, which primarily consisted of categorical and ordinal variables from our survey (Milenković et al., 2019). For such non-normal data, Bollen (1989) recommends the Weighted Least Squares (WLS) approach, as it requires fewer distributional assumptions. The Diagonally Weighted Least Squares (DWLS) is a robust WLS method based on the polychoric correlation matrix of the variables included in the analysis. The DWLS is usually used in situations in which the assumption of multivariate normality is severely violated and data are ordinal, as it provides more accurate parameter estimates (Mindrila, 2010). This algorithm uses only the diagonal of weights in inversion, and all weights in estimation of fit and standard error. Therefore, we employed the (DWLS) estimator, available in the R package Lavaan (Rosseel, 2012) for our analysis. This methodology has been successfully applied in different spheres of research, particularly in studies examining public transport satisfaction and loyalty (Allen et al., 2018).

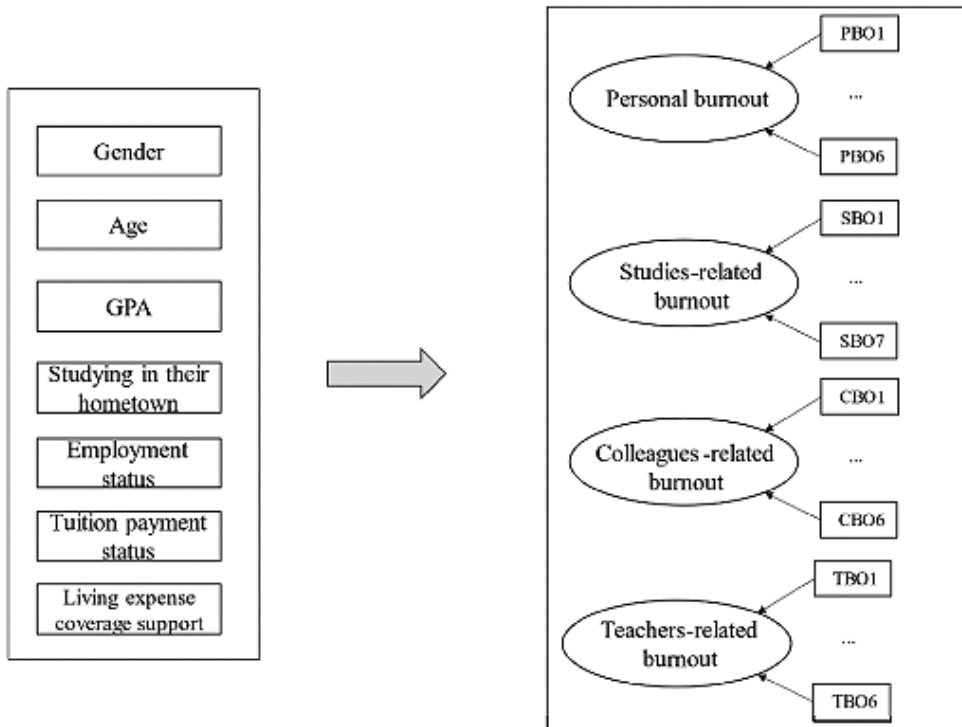
Before we conducted the SEM analysis and verified the proposed conceptual models, the assessment of the internal consistency of the scales within the models had been conducted. For that purpose, we used the Cronbach's alpha (Cronbach, 1951). Besides Cronbach's alpha, we present the AVE (Average Variance Extracted) and CR (Composite Reliability). AVE should be greater than 0.5, while CR should be above 0.7.

The calculated values of Cronbach's alpha, AVE and CR are displayed in Table 2 (per separate academic burnout dimensions) and Table 3 (for the overall burnout scale). Notably, all values are above 0.7, signifying favourable internal consistency of all the observed scales. The measured Cronbach's alphas are on the interval from 0.890 (*Studies-related burnout*) to 0.917 (*Teachers-related burnout* and *Overall burnout*). All AVEs and CRs are also above the defined thresholds. Given the consideration that the metrics of internal consistency are above the defined threshold, we can proceed with the SEM analysis with no modifications to the initial scales.

The first model we evaluated is the model examining the impact of students' gender, age, GPA, employment status, tuition payment status, living expense coverage

support, and studying in their hometown on four separate burnout dimensions, including personal burnout, studies-related, colleagues-related, and teachers-related burnout. The model is visually presented in Figure 1.

Figure 1: Proposed conceptual model 1.



Source: Author's construction

The assessment of the initial model metrics indicates a solid fit (Chi-square=378.455, df=416,  $p < 0.000$ , CFI=0.991, TLI=0.981, SRMR=0.034). Due to model complexity, all paths between predictors and dependent constructs (burnout) that were not statistically significant were removed from the model. Having in mind the sample size and the model complexity, it can be inferred that the slightly improved model satisfactorily fits the data. The final model fit is: Chi-square=368.078, df=379,  $p < 0.000$ , CFI=0.990, TLI=0.980, SRMR=0.033). The removal of these paths did not impact in any way the model quality as the value of the Chi-square statistics comparison test had the p-value greater than 0.05.

The results of Model 1 showing the statistically significant paths are presented in Table 2.

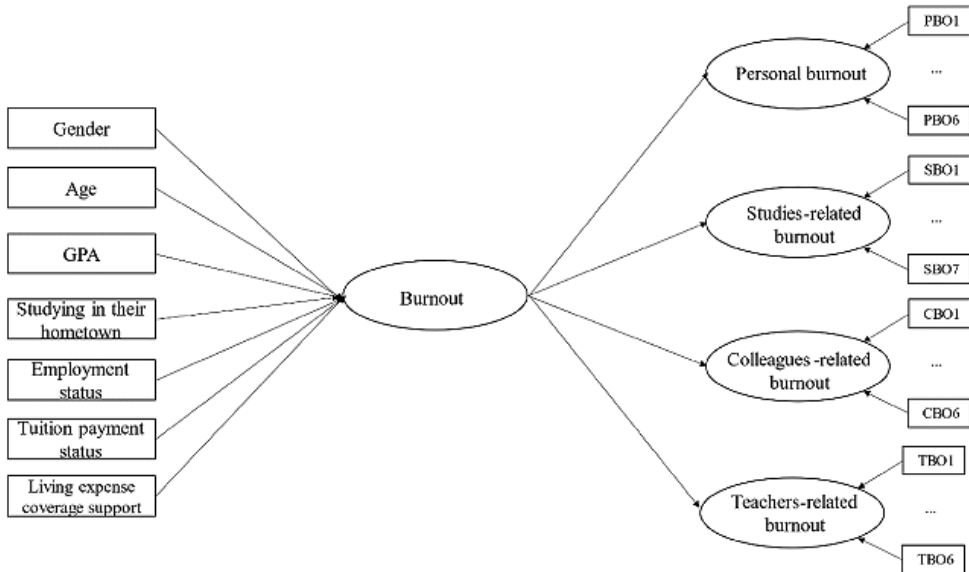
Table 2: Results of the Model 1 assessment – constructs, predictors, estimated paths, values of the Z statistics, R square, Cronbach’s alfa, AVE, and CR

Construct	Predictor	Estimate Std	Z value	P-value	R <sup>2</sup>	Cronbach’s alfa	AVE	CR
Personal burnout	Gender	-0.152	-7.726	0.000	0.034	0.891	0.657	0.920
	Age	0.081	4.153	0.001				
	Studying in their hometown	-0.038	-1.966	0.049				
Studies-related burnout	Gender	-0.047	-2.606	0.009	0.014	0.890	0.617	0.915
	Age	0.085	4.225	0.000				
	Studying in their hometown	-0.054	-2.957	0.003				
	Employment status	-0.041	-2.100	0.036				
	Age	0.139	7.097	0.000				
	GPA	0.055	2.966	0.003				
Colleagues-related burnout	Age	0.139	7.097	0.000	0.022	0.908	0.700	0.933
	GPA	0.055	2.966	0.003				
Teachers-related burnout	Gender	0.098	4.858	0.000	0.029	0.917	0.710	0.936
	Age	0.085	4.202	0.000				
	GPA	-0.043	-2.154	0.031				
	Studying in their hometown	-0.095	-5.138	0.000				

Source: Author’s calculations

Embracing the possibility of estimating an overall burnout score that the CBI-S allows for, we also evaluated a model that examines the impact of students’ gender, age, grade point average (GPA), employment status, tuition payment status, living expense coverage support, and studying in their hometown on students’ overall burnout. The model is visually presented in Figure 2. In Model 2, we created a higher-level construct *Burnout* instead of using mean sub-scale values to create it. More precisely, to create the construct *Burnout*, we have not used the mean values of scales Personal burnout, Studies-related burnout, Colleagues-related burnout, and Teachers-related burnout. Namely, each of the subscales is modelled as an individual construct, which is used to form the construct *Burnout*. The same approach was taken in the study of Ivančević et al. (2023a).

Figure 2: Proposed conceptual model 2.



Source: Author’s calculations

The initial model had a solid fit to the data (Chi-square = 890.194,  $df = 439$ ,  $p < 0.000$ , RMSEA 0.037, CFI = 0.958, TLI = 0.983, SRMR= 0.049). As in the first model, all paths between predictors and dependent constructs (burnout) that were not statistically significant were removed from the model. The final model fit is: Chi-square = 855.841,  $df = 415$ ,  $p < 0.000$ , RMSEA 0.033, CFI = 0.986, TLI = 0.991, SRMR= 0.048. The values of the CFI and TLI indices are above the 0.9 suggested threshold, the RMSEA is below the 0.05 threshold. The removal of these paths did not impact in any way the model quality as the value of the Chi-square statistics comparison test had the p-value greater than 0.05.

The results of Model 2 showing the statistically significant impacts are presented in Table 3.

Table 3: Results of the Model 2 assessment – constructs, predictors, estimated paths, values of the Z statistics, R square, Cronbach’s alfa, and CR

Construct	Predictor	Estimate Std	Z value	P-value	R <sup>2</sup>	Cronbach’s alfa	CR
Overall burnout	Gender	-0.052	-3.208	0.001	0.046	0.917	0.963
	Age	0.135	7.425	0.001			
	GPA	0.051	2.594	0.009			
	Studying in their hometown	-0.073	-4.719	0.001			
	Tuition payment status	0.154	8.039	0.001			

Source: Author’s calculations

## 5. Discussion

Our study indicates that 26.90% of students experience overall burnout. This figure surpasses the findings regarding Millennial generation students, such as those showing that 17% of them experienced burnout (Campos et al., 2012), as well as the more recent findings by Wing et al. (2018), indicating a 20.1% burnout rate among Generation Z non-medical students. However, the percentage is, as expected, lower if compared to medical students’ burnout, with an average prevalence of around 50% (Gilbey et al., 2023). On the other hand, the study shows that an alarming 63.2% of students experience personal and 44.3% experience studies-related burnout. These levels are the same as Serbian students’ burnout levels measured during the COVID-19 pandemic when the learning was conducted within the emergency online environment (Ivančević et al., 2023a), signalling that burnout is not connected merely with the characteristics of the learning environment but other factors as well.

*Hypothesis 1* has been partially confirmed. Female students report significantly higher levels of overall burnout, personal and studies-related burnout, whereas male students are more prone to teachers-related burnout.

The findings regarding students’ overall, studies-related as well as personal burnout which encapsulates a general feeling of exhaustion, irrespective of any specific source of stress, align with those of Spataro et al. (2016) and Miltojević et al. (2021). Such results might be attributed to higher levels of internalized problems in female students (Walburg, 2014), their greater fear of failing academically, and their orientation toward emotion-oriented coping strategies (Meléndez et al., 2012), all of which cause increased stress levels and subsequent exhaustion. Finally, women’s greater use of self-blame as a maladaptive coping strategy can also contribute to higher rates of exhaustion and burnout (Spataro et al., 2016).

The discovery that male students experience higher burnout from interactions with teachers contrasts with Backović et al.'s (2012) findings of increased stress among females in similar encounters. However, it aligns with the findings of Chuming et al.'s (2017) meta-analysis on medical students' burnout, showing that male students experience higher levels of it, partly due to strained relationships in the educational environment. It should be noted that one of the key roles of academic staff is to provide social support to students, which, if lacking, significantly increases student burnout (Ivančević et al., 2023b). On the other hand, research indicates that female students utilize social support more effectively (Meléndez et al., 2012), while male students tend to hinder their ability to express their challenges openly and seek support (Khairaniet al., 2020), which in turn may increase feelings of disappointment and alienation, and lead to burnout. Finally, the traditional teaching methods may favour female learning styles, additionally challenging male students' attitudes towards teaching staff, potentially leading to burnout.

*Hypothesis 2* has been confirmed. The levels of students' overall burnout are shown to increase with age, as well as their personal, studies-related, colleagues-related, and teachers-related burnout levels. The finding aligns with those of Dyrbye et al. (2006) as well as Galán et al. (2011) targeting the Millennial generation but contrasts with the results of a recent study on Gen Z students, by Fernández-Castillo and Fernández-Prados (2022). This might suggest that the connection between age and burnout does not depend on generational characteristics but on other factors.

On the one hand, students' academic demands and responsibilities increase with the years and heightened workloads and more complex tasks can contribute to students' exhaustion levels (Jacob and Dodd, 2003), increasing their studies-related as well as personal and overall burnout levels. On the other hand, the rise in colleagues-related and teachers-related burnout levels implies that the social dynamics within the academic environment increases student burnout as they advance in their studies. This can be explained by the bidirectional nature of the burnout-communication relationship. In the beginning, insufficient, inadequate, and low-quality communication with their peers and academic staff may increase students' stress and foster feelings of loneliness, and not being understood, and appreciated, eventually resulting in burnout (Ivančević et al., 2023b). Once developed, burnout can impair individuals' communication skills and exacerbate depersonalization, leading to increased isolation or interpersonal conflicts (Maslach et al., 2001). In this way, the vicious circle of burnout is formed, with its levels increasing with age. This finding is important as, apart from the increased academic demands, it recognizes the impact of relational dynamics on university social sustainability, indicating that monitoring of communication quality within the academic environment, and providing students with timely social support are needed.

*Hypothesis 3* has been partially confirmed. The results show that students' GPA is positively connected to student overall and colleagues-related burnout, while it is

negatively connected to their teachers-related burnout. The findings are complex and only partially in line with those regarding the Millennial generation (Jacobs and Dodd, 2003), possibly due to a combination of factors.

The connection between students' higher academic achievement and their overall burnout, that it is their overall experience of exhaustion, is in line with Velasco's (2019) findings regarding male students at Filipino Universities. One of the reasons might be that Generation Z members are depicted as self-learners who demonstrate a greater inclination to acquire knowledge online rather than in traditional educational environments (Francis and Hoefel, 2018). As traditional classrooms were designed for generations of digital immigrants, learning in them requires more energy and adjustments from digital natives, gradually exhausting them and potentially leading to burnout. Moreover, Generation Z students tend to approach institutions with a more pragmatic and analytical mindset, and they also prioritize personal values and causes over traditional measures of success (Francis and Hoefel, 2018). Hence, striving for a higher GPA, a traditional measure of success, may not align with their authentic values. This mismatch can lead to increased exhaustion, which can ultimately harm their overall health. Finally, the focus on maintaining a high GPA negatively affects students' relationships with their peers. These interactions can become time-consuming and exhausting, additionally contributing to burnout occurrence.

The only positive outcome of higher GPA burnout-wise is found to be regarding teachers-related burnout, indicating the improved quality of students' relationships with academic staff caused by better achievement. The finding might be expected as teachers commonly tend to develop more positive relationships with students who excel academically, providing them with affirming feedback and encouragement. This can enhance a sense of mutual respect and trust, which can in turn generate a more supportive environment acting as a buffer against burnout (Ivančević et al., 2023b).

*Hypothesis 4* has been partially confirmed. Results show that students who are not employed have higher studies-related burnout, whereas other burnout dimensions as well as student overall burnout are not significantly connected to students' employment. This result is in contrast with findings regarding the Millennial generation, which indicated that employment significantly raises student burnout levels (Dyrbye et al., 2008). However, it is mostly in line with the recent study by Fiorilli et al. (2022) showing no difference in burnout levels between employed and non-employed students.

The beneficial effect of employment on studies-related burnout can be explained by various factors. Firstly, there are data showing that working can provide students with discipline and structure, and more efficient use of the time they dedicate to studying as well as less procrastination (Dundes and Marx, 2006), which can lead to greater overall resilience, better health, and satisfaction. Moreover, employment can equip students with the financial means to engage in activities such as hobbies, recreation,

and travel that may alleviate burnout and are often unavailable to non-working students (Thibaut et al., 2017), compensating for the potential drawbacks of being employed. More importantly, employment can enable students to pay their tuition fees. In contrast, students who do not work may additionally worry about financing their studies, and the increased financial strain may impede their focus and concentration, making the process of learning more difficult for them and leading to burnout. Lastly, raised during the global economic turmoil, Generation Z is less idealistic than the Millennial generation, valuing financial stability and looking for employment at a younger age than their predecessors (Francis and Hoefel, 2018). Therefore, having a job is not perceived as a burden but as a privilege which, according to this finding, does not cause additional stress that would increase Gen Z students' burnout levels.

*Hypothesis 5* has been partially confirmed. Self-financed students are found to experience higher overall burnout.

This finding reaffirms earlier research indicating that paying tuition is one of the most significant stressors for students (McCullough, 2022). Tuition fees are frequently high nowadays, and students struggle to find financial resources to cover these costs. Relying on their parents' financial support can put additional pressure on them to justify the investment and excel academically, which can, in turn, lead to burnout (McCullough, 2022). Alternatively, they can rely on loans but concerns about debt repayment along with interest rates are also shown to contribute to students' health and raise the risk of burnout development (Garrett et al., 2022). Finally, some students work to finance their expensive education. On the one hand, it may decrease their financial stress, and, as previously explained, is not jeopardizing *per se*. However, if their earnings are insufficient to pay the entire tuition fee, let alone afford leisure and other activities, it may increase their frustration and contribute to burnout. Therefore, introducing support mechanisms for students who self-finance their studies is necessary for burnout mitigation and the promotion of students' well-being.

*Hypothesis 6* has been rejected. The results show no statistically significant difference regarding student overall burnout as well as separate burnout dimensions, between students who are and who are not financially supported by their parents. The results are in contrast with McCullough's (2022) observation that students responsible for covering their living expenses often struggle.

Even though this finding might seem counter-intuitive, it can be explained by several reasons. Firstly, students who are not financially supported by their parents may support themselves through employment, and as shown herein, employment does not generate burnout among Generation Z students, on the contrary. In addition, some students may support themselves through other means, including scholarships, which can mitigate any potential impact of not receiving parental financial support. Moreover, financial independence gained in such ways is appreciated by the members of

this generation (Francis and Hoefel, 2018). Finally, it is also important to emphasize that the lifestyle and purchasing habits of Generation Z differ from those of former generations in that they are found to make more responsible and rational decisions (Seyfi et al., 2023). If these are coupled with Generation Z members' overall inclination towards sustainable behaviour (Dabija et al., 2020), they might influence the adoption of more modest living arrangements and the reduction of unnecessary living expenses, which may, in turn, alleviate their overall financial burden.

All in all, this research has revealed that tuition fees present the greatest financial challenge for Gen Z students leading to increased overall burnout levels. In contrast, covering their own living expenses is not identified as a significant threat to students' health.

*Hypothesis 7* has been confirmed. The students who do not study in their hometown are shown to have higher overall burnout, as well as their personal, studies-related, and teachers-related burnout. The insight is in line with limited prior findings showing that students screened for burnout typically live away from their families (Talih et al., 2018). This might be the consequence of several factors.

Firstly, studying away from their hometown can deprive students of their primary support networks, which typically include family and close friends. Without adequate social support, they might feel isolated and disconnected, and thus more susceptible to burnout (Maslach et al., 2001). In addition, they face challenges connected to adapting to a new environment (Yang and Farn, 2005) which can be often coupled with the responsibility of living alone for the first time, both contributing to their increased levels of stress and burnout. They might also feel additional pressure to excel academically and justify their families' investments and expectations (Adams et al., 2016). Therefore, these students may need additional support from the faculty, and if such a need is not recognized and fulfilled, burnout levels can rise.

## 6. Conclusions

As academic burnout negatively affects the social sustainability of universities, this study aimed to examine burnout prevalence among Generation Z students and identify associated risk factors through seven proposed hypotheses.

The findings indicate that a quarter of the examined students experience overall burnout with around 60% and 45% of them experiencing personal and studies-related burnout respectively. These alarming figures emphasize that university management and policymakers should develop interventions aimed at preventing student burnout and fostering resilience. In addition, five hypotheses connected to burnout risk factors have been fully or partially confirmed, showing that Generation Z students' burnout is significantly connected to students' gender, age, GPA, tuition payment status, and the

fact that they do or do not study in their hometown. On the other hand, two hypotheses have been rejected showing that Gen Z students' employment as well as their living expense coverage do not increase their burnout. These findings contradict the majority of findings connected to Millennial and Generation X students and present important contributions of the study. They indicate that managing their costs of living is not as stressful to this generation of students as it was to the previous ones and that they can work and study simultaneously without additionally deteriorating their health. These findings are also insightful as they reflect the economic stability of the Gen Z student population, which can only positively contribute to the sustainability of the future workforce.

According to the findings of the study, several practical implications for university management and policymakers can be offered. Firstly, as burnout is shown to be significantly connected to gender, age, GPA, and whether students study in their hometown, implementing tailored interventions can be suggested. For instance, gender- and age-specific programs can be developed to address the unique stressors different student groups face. Additionally, specialized support systems including academic counselling and the provision of stress management resources perhaps via online platforms should be at the disposal to students aiming for high academic achievement. Also, academic staff should be instructed to provide additional support to students studying away from their hometowns, to help them adapt to new environments.

Secondly, the increased levels of relational burnout dimensions signalize the need for improving communication and fostering peer connections within university settings. Universities should create more opportunities for collaborative activities, and mentorship programs, and organize social events that would promote a sense of community and reduce students' isolation. Thirdly, as one of the identified burnout risk factors is financial stress related to tuition fees, policymakers should introduce strategies to make education more affordable, including offering more scholarships, financial aid, and more flexible payment plans. Addressing the burden of high tuition fees could significantly reduce stress and prevent burnout occurrence.

Finally, universities should consider integrating well-being programs into their broader institutional approach to students. These programs should include regular assessments of student burnout levels, lectures on burnout and other health problems, as well as making mental health services more accessible. This would increase awareness of burnout, reduce the stigma of mental health issues, and foster a more supportive and sustainable educational environment for Generation Z students.

The study is not without limitations. The first limitation includes a sample bias towards technical and technological sciences, as students in other academic disciplines face different stressors throughout their higher education. For instance, medical students frequently interact with patients during their studies, which has been shown to contribute to higher burnout levels. As a result, these findings may

not fully reflect the experiences of students in non-technical fields. Second, the sample is limited to students from a single university, which may also affect the generalizability of the findings. The results may not apply to students at institutions with different academic environments, or resources. Additionally, the findings may be specific to the culture in which the study was conducted and may not be applicable to societies where different educational and cultural norms and practices have been in place for a longer time. Lastly, the study's cross-sectional design, which assesses the situation at a single point in time, limits the ability to draw causal conclusions.

Based on these limitations, we offer several recommendations for future research. First, we suggest conducting a longitudinal investigation to track students' burnout progression from freshman year to graduation. This approach would provide valuable insights into how burnout develops over time. Also, we recommend comparative studies across academic disciplines or cultural contexts. Such studies would expand the scope of the research and offer a deeper understanding of burnout variability among Generation Z students in diverse environments.

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## Akademsko sagorijevanje digitalnih domorodaca i socijalna održivost: prevalencija i čimbenici rizika

Sonja Ivančević<sup>1</sup>, Veljko Dmitrović<sup>2</sup>, Marko Ćirović<sup>3</sup>, Nataša Petrović<sup>4</sup>

### Sažetak

*Budući da sveučilišta imaju ključnu ulogu u postavljanju temelja za održivu i otpornu radnu snagu, njihova je odgovornost stvoriti okruženje u kojem će se očuvati opća dobrobit studenata. U tom smislu, suvremena sveučilišta susreću se sa značajnim izazovom – sve većom prisutnošću akademskog sindroma sagorijevanja koji negativno utječe na zdravlje studenata, njihovu spremnost na karijeru i budući radni učinak. Dok su se prethodne studije o sagorijevanju većinom fokusirale na studente Milenijalce, ova studija ima za cilj ispitati prevalenciju sagorijevanja i faktore rizika među generacijom Z, prvom generacijom pravih digitalnih domorodaca. Stoga, ova studija predlaže konceptualni model koji istražuje utjecaje sedam pozadinskih (demografskih i situacijskih) čimbenika na četiri dimenzije akademskog sagorijevanja, kao i ukupno sagorijevanja studenata. Model je testiran na uzorku studenata iz Srbije, koristeći analizu modeliranja strukturnih jednadžbi (SEM). Rezultati pokazuju da četvrtina ispitanih studenata doživljava ukupno sagorijevanje, dok preko 60% navodi da je doživjelo određeni stupanj osobnog sagorijevanja. Nadalje, dvije potvrđene hipoteze otkrivaju da je akademski sagorijevanje Generacije Z značajno povezano s dobi i time studiraju li studenti u svom rodnom gradu. Tri djelomično potvrđene hipoteze sugeriraju da su određene dimenzije akademskog sagorijevanja također povezane s spolom, prosječnom ocjenom i plaćanjem školarine.*

**Ključne riječi:** Akademsko sagorijevanje, pozadinski čimbenici, digitalni domoroci, održivost, prethodnici izgaranja povezani s financijama

**JEL klasifikacija:** I23, I31, I22

<sup>1</sup> Znanstvena novakinja, Univerzitet u Beogradu, Fakultet organizacijskih znanosti, 154 Jove Ilića ulica, 11000 Beograd, Srbija. Znanstveni interes: upravljanje ljudskim resursima, multidisciplinarna obrazovna istraživanja. E-mail: sonja.ivancevic@fon.bg.ac.rs.

<sup>2</sup> Izvanredni profesor, Univerzitet u Beogradu, Fakultet organizacijskih znanosti, 154 Jove Ilića ulica, 11000 Beograd, Srbija, Katedra za finansijski menadžment i računovodstvo. Znanstveni interes: računovodstvo, finansijsko i nefinansijsko izvještavanje, intelektualni kapital, finansijsko upravljanje. E-mail: veljko.dmitrovic@fon.bg.ac.rs.

<sup>3</sup> Izvanredni profesor, Univerzitet u Beogradu, Fakultet organizacijskih znanosti, 154 Jove Ilića ulica, 11000 Beograd, Srbija, Katedra za menadžment tehnologije, inovacija i održivog razvoja. Znanstveni interes: upravljanje okolišem, održivi razvoj. E-mail: marko.cirovic@fon.bg.ac.rs.

<sup>4</sup> Redovita profesorica, Univerzitet u Beogradu, Fakultet organizacijskih znanosti, 154 Jove Ilića ulica, 11000 Beograd, Srbija. Katedra za menadžment tehnologije, inovacija i održivog razvoja. Znanstveni interes: upravljanje okolišem, održivi razvoj. E-mail: natasa.petrovic@fon.bg.ac.rs.

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# The effect of use-side gross domestic product on poverty level achievement in Indonesia\*

Thomas Ola Langoday<sup>1</sup>

## Abstract

Poverty is an indicator in the economy that shows the level of people's welfare. One of the factors that affect the level of poverty is the Gross Domestic Product (GDP). This study aimed to determine the effect of use-side GDP on achieving the poverty rate in Indonesia. The research method used is quantitative, and data collection taken from secondary data in the form of poverty data and GDP data sourced from the Central Statistics Agency (BPS) from 2009 to 2021, which were then processed with Excel and analyzed using the Eviews9 application, using path analysis techniques to determine the model used is whether it adheres to the expected effect, fixed effect, and random effect by going through the chow test. The study results show that consumption expenditures, government expenditures, private investment, and net exports affect the poverty level in Indonesia. This study's findings indicate that poverty is not only solved by increasing economic growth. Thus, improving the quality of human resources will influence poverty reduction significantly.

**Keywords:** measurement and analysis poverty, economic growth, expenditure government

**JEL classification:** I32, O15, H53

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<sup>1</sup> Associate Professor, Sekolah Tinggi Ilmu Ekonomi (STIE) Oemathonis Kupang, Jln. Frans Seda - Kelurahan Kelapa Lima - Kecamatan Kelapa Lima - KOTA KUPANG 85228 - NTT. - Nusa Tenggara Timur - Indonesia. Scientific affiliation: development economics, macroeconomics. Phone: +62 813-3932-0099. E-mail: thomasolalangoday01@gmail.com.

## 1. Introduction

The success of development carried out by a country, including Indonesia, can be seen from the welfare conditions of its people (Priharta and Gani, 2024). The problem of poverty is one of the development policy targets in every country so that the income gap becomes smaller. Poverty is a multidimensional development problem because the issues faced are not limited to matters relating to the cause-and-effect relationship of poverty but also involve preferences, values, and politics to overcome poverty (Margareni et al., 2016). Poverty alleviation has become a fundamental development objective and has become a measuring tool for assessing the effectiveness of the implementation of various types of development programs.

The economic development of a region is a series of activities carried out consciously and continuously to create better conditions. Within that framework, economic development also aims to spur development equity, increasing people's welfare fairly and equitably.

Economic growth is a significant indicator in analyzing the economic development that occurs in a country. Economic growth shows how much economic activity will generate additional income for the community in a certain period because economic activity is a process of using factors of production to produce output, which is measured using the gross domestic product (GDP) indicator. Where in a formula  $Y=C+I+G+(X-M)$ , economic growth can be created through consumption (C), investment (I), government spending (G), exports (X), and imports (M). When Consumption, investment, government spending, and net exports increase, income or economic growth also increases (Affandi, 2016). According to Tumimomor (2023), the government needs regular income to restore and prosper people's lives.

GDP is the government's total production (output). GDP is the value of goods and services produced in a country in a certain period. GDP is a concept used in calculating national income (Sukirno, 2004). In Indonesia, the GDP is calculated and released quarterly and consists of three main sectors: agriculture, industry and services. The agricultural sector includes crop production, animal husbandry and fisheries. The industrial sector includes producing goods, such as machinery, vehicles and building materials.

In contrast, the service sector includes trade, transportation, finance, and the public sector. GDP is the total added value generated by all business units in a particular country or the total value of final goods and services produced by all economic units. GDP at current prices illustrates the added value of goods and services calculated using prevailing prices yearly. In contrast, GDP at constant prices shows the added value of these goods and services calculated using prices prevailing in a particular year as a basis. GDP at current prices can be used to see shifts and economic structure, while constant prices determine economic growth from year to year.

Indonesia's GDP always provides optimistic predictions that increase yearly. Based on a report from the Central Statistics Agency (BPS), GDP grew by 3.70% in 2021, higher than the 2020 achievement of 2.07%. Relatively high economic growth will significantly affect the level of poverty because, with a growing economy, there will be much production of goods and services produced by an area, which in turn will absorb labor so that the per capita income of the population is higher which in turn will reduce poverty. The poverty rate in an area (Mas'ud and Rochaida, 2022). Foreign parties such as the World Economic Forum (WEP) describe that the Indonesian economy has begun to be driven by an efficient economy from the originally factor-driven economy. The Economist even called him a candidate for a new world economic power (world leading economies).

However, if one looks closely, there are indications that this economic growth is artificial (bubble economics). It is indicated by Indonesia's still high poverty rate, even though GDP growth is said to be good. Poverty has long been a problem for the Indonesian nation, and until now, it has not shown any signs of disappearing. Statistical figures continue to provide information that there are still many poor people. Based on BPS data, the number of poor people in Indonesia in September 2021 was 26.50 million (9.71%).

The economic development of a country can be seen from several economic indicators. One of them is poverty alleviation. Poverty is a worldwide humanitarian problem to date. Poverty in developing countries is a serious problem, considering that development indicators achieve optimal poverty reduction and economic growth. Poverty is a socioeconomic disease and quite a complex problem, even though most of them have succeeded in carrying out economic development. In general, tackling poverty is by using a strategy that leads to achieving the highest level of growth in production and national income.

Based on the description above, the researcher aims to determine how much influence the GDP has on the usage side based on the level of Consumption, investment, government spending, and net exports on the poverty level in Indonesia.

## **2. Literature Review**

This section examines the understanding of the development of research hypotheses, research relationships and the conceptual framework of the research conducted.

### **2.1. Poverty**

According to Ibrahim et al. (2024), poverty is a condition that is deficient in meeting minimum needs, so it does not feel like a decent life. The Central Bureau of Statistics 2021 uses the ability to fulfill basic needs (basic need approach) to

measure poverty (Kurniawan et al., 2022). With this approach, poverty is seen as an economic inability to meet basic food and non-food needs measured from the expenditure side. In other words (Badawi et al., 2024), poverty is seen as an economic inability to meet basic food and non-food needs. The measure of poverty, according to (Suparmono, 2004), in a simple and commonly used way, can be divided into two meanings:

#### ***a. Absolute Poverty***

A person is classified as absolutely poor if his income is below the poverty line and insufficient to meet his basic needs. This concept is intended to determine a minimum income level sufficient to meet physical needs for food, clothing and housing to ensure survival. The main difficulty in absolute poverty is determining the composition and level of minimum needs because these two things are influenced by not only customs but also climate, the level of progress of a country, and other economic factors. However, people need goods and services to satisfy their physical and social needs to live decently (Saputra et al., 2023).

#### ***b. Relative Poverty***

A person belongs to the relatively poor group if he has been able to meet his basic needs but is still far lower than the condition of the surrounding community. Based on this concept, the poverty line will change if the people's living level changes, so the concept of poverty is dynamic or will always exist.

### **2.2. Gross Domestic Product use side**

GDP is the market value of a country's final goods and services in a certain period (Parkin, 2018). The value of goods and services referred to here is the added value generated by the economic unit concerned. Added value is obtained from the difference between the output produced and the input used by the economic unit. The resulting output is income from selling goods or services, while the input is the expenses or costs used to obtain output (Harjunawati and Hendarsih, 2020).

GDP figures are obtained through three approaches, namely the production approach, income approach, and expenditure approach. The production approach calculates GDP by adding up the added value of goods and services produced by various production units in the territory of a country in a certain period. The income approach calculates GDP by adding up the remuneration received by the production factors participating in a country's production process in a certain period, namely wages and salaries, land rent, interest on capital and profits. This value is calculated before deducting income tax and other direct taxes. The GDP approach also includes depreciation and net indirect taxes, namely indirect taxes

minus subsidies. In the expenditure approach, GDP is calculated by adding up all components of final demand: household consumption expenditure and non-profit private institutions, government consumption expenditure, formation of gross domestic fixed capital, changes in inventories, and net exports. Net exports are the difference between exports and imports.

GDP on the usage side (expenditure) explains the value of goods and services produced in the domestic area (output) to be used as the *final* Consumption for society. Specifically, what is meant by final Consumption is the use of products in the form of goods or services whose purpose is not to be further processed (consumed), which is realized in the form of final household consumption (including non-profit institutions that serve households) and of government, formation of gross fixed capital (PMTB), changes in inventory and exports.

### ***a. Consumption***

Consumption is spending on goods and services carried out by households to meet the needs of those who shop (Sitanggang, 2015). The amount of Consumption each person issues is influenced by the diversity of his needs. The diversity of needs that must be met encourages a person to make primary and secondary consumption choices. Household consumption is usually one of the references for calculations in macro analysis, where, for several reasons, household consumption spending is used because household consumption has provided a significant income for a country's income. So, it can be concluded that the higher the public Consumption, the more the economic growth of a country will also increase (Hidayah et al., 2024; Sudirman and Alhudhori, 2018)

### ***b. Investment***

Based on economic theory, investment means purchasing (and producing) capital goods that are not consumed but used for future production (produced goods). Investments that increase from year to year will cause the absorption of the working workforce to be even more significant because, with high investment, the production process will increase and require more and more of the workforce to work. Some economists believe that investment formation can increase production factors or economic growth and provide employment opportunities for the community (Ain, 2019).

### ***c. Government Spending***

The course of the economy is regulated through government action, with the community as a liaison so that requests occur where facilities and infrastructure are the targets of community requests, which may not all be fulfilled, and this is what

is called government spending (Fitria, 2020). If government expenditure is more significant, there will be an increase in per capita income, which will also positively impact achieving economic growth and vice versa.

#### ***d. Export Net***

Indonesia is a country that adopts an open economy mechanism while trading with other countries by exporting and importing. If the value of exports is higher, imports will contribute income through foreign exchange. In other words, trade is in surplus. The difference between exports and imports is net exports (Putra, 2022).

### **2.3. The relationship between Gross Domestic Product on the usage side and the achievement of the poverty level**

Economic growth is closely related to a country's production increase, known as a country's per capita income. Therefore, economic growth is closely related to GDP, or if the context is within the scope of the area, it is called Burrito Regional Domestic Product (PDRB) (Suliswanto, 2012). According to Damanik and Sidauruk (2020), GRDP can reduce the poverty rate; if the GRDP value is high, domestic development can be optimized, and community prosperity can be achieved by reducing the poverty rate. A high GRDP value indicates that the economy in a region is good, and vice versa. Several studies have shown that economic growth and poverty are closely related.

The new growth theory emphasizes the importance of the government's role, especially in increasing human capital development. Improving the quality of human resources can be shown by increasing one's knowledge and skills. Increasing knowledge and skills will boost one's work productivity, which will help reduce poverty. Economic growth is related to the increase in a country's production. Therefore, economic growth is closely related to the GDP or gross regional domestic product if it is within the region's scope.

Several studies have found that economic research, HDI, and poverty are closely related. Asian Development Bank (2008) states that dynamic economic growth has dramatically reduced poverty. Research conducted by Jayadi and Brata (2016) on the impact of economic growth on reducing the number of poor people. The research results found that economic growth significantly reduced the number of poor people, although with a relatively small magnitude, such as inflation, population, and share of the agricultural and industrial sectors. In addition, Nurmi (2021) state that the availability of quality human resources is essential for sustainable economic development.

## 2.4. Conceptual framework

Based on the central issues and theoretical foundations described, the conceptual framework is contained in Figure 1, and a hypothesis is formulated as a temporary conclusion to the problems posed, namely as follows.

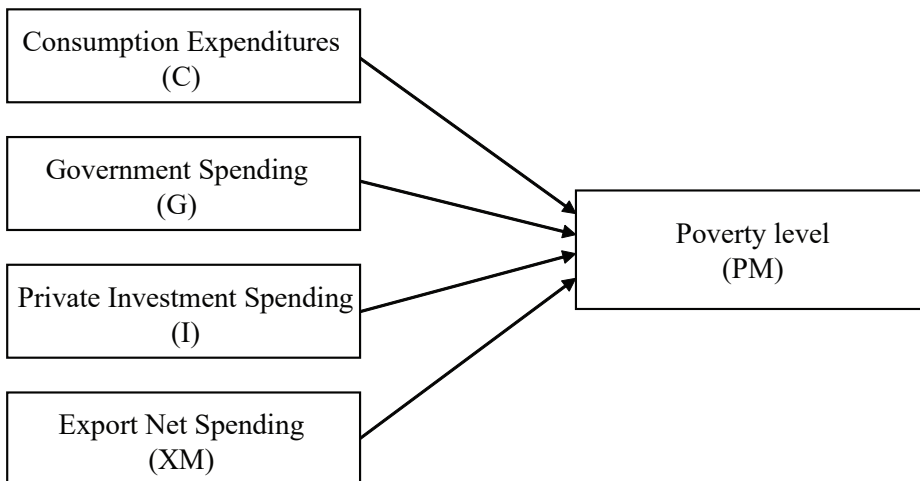
H1: Consumption expenditure has a significant effect on the poverty level.

H2: Government spending has a significant effect on the poverty level

H3: Private investment spending has a significant effect on the poverty level

H4: Export net expenditure has a significant effect on the poverty level

Figure 1: Conceptual Framework



Source: Author's construction

## 3. Methodology

The section discusses the research carried out in relation to research data, data analysis, and research methods carried out so that research analysis and discussion can be carried out.

### 3.1. Data collection

The approach in this research is quantitative because it is presented with numbers. It follows the opinion of Suharsimi (2013) that quantitative research is a research approach that requires many numbers, starting from data collection, interpretation

of the data, and the appearance of the results. This research was conducted using an associative paradigm. The type of data used in this research is secondary data, which means that researchers obtain data from various relevant agencies according to research purposes. This study uses the documentation method sourced from the Central Statistics Agency regarding data on poverty rates, GDP, and economic growth by taking populations in 34 provinces in Indonesia. The data used is in the form of panel data from 2009 to 2021. Panel data is a combination of time series and cross-section data.

### **3.2. Data analysis**

This study uses the independent variable (X) and the dependent variable (Y). The independent variables used are consumption expenditure (C), government expenditure (G), private investment expenditure (I), and net export expenditure (X-M). In contrast, the dependent variable is the poverty rate (PM).

The data analysis technique used to solve the problems in this study is a quantitative analysis technique with the help of the Eviews 9 program in the form of panel data. This research is proposed as empirical research to determine the effect of government spending, Consumption, investment, and net exports on poverty levels in Indonesia. The panel data analysis aims to determine whether the model adheres to standard, fixed, and random effects. The first thing to do is choose which model is the best among the three models by conducting the Chow and Hausman tests. The Chow test was conducted to test the common effect and fixed effect models, while the Hausman test was conducted to test whether the data were analyzed using a fixed effect or a random effect. The test was carried out with Eviews 9. The guidelines that will be used in concluding the Chow test are as follows.

- The common effect model is selected if the specification test results show a Chi-square probability of more than 0.05.
- If the specification test results show a Chi-square probability of less than 0.05, then the selected model is the fixed effect.
- Furthermore, the data is regressed using a random effect model to carry out the Hausman Test. The following guidelines will be used to conclude the Hausman test.
- The selected model is a random effect if the random cross-section probability value exceeds 0.05.
- The fixed effect models should be used if the Chi-square probability value is less than 0.05.

The significant test in this study was carried out through the t-test and F-test. The t-test determines whether each independent variable significantly influences the dependent variable. F-testing or model testing determines whether the analysis results are significant, or the suspected model is appropriate.

## **4. Results and discussion**

This section discusses the results and discussion of research that has been tested as well as understanding related to the research conducted.

As for the analysis of Economic Growth and the Poor Population in Indonesia, the results of the research carried out are described in the following section.

### **4.1. Economic growth and poor population in Indonesia**

From 2009 to 2021, the Indonesian economy experienced strong economic growth with an average of 4.63%. In 2020, the COVID-19 pandemic caused Indonesia to experience a contraction in economic growth of 2.07% from 5.02% in 2019. The leading cause of the decline in economic growth in Indonesia is inseparable from the impact of handling the spread of the Coronavirus, which has begun to affect all aspects of life, including economic activities in Indonesia, both in terms of production, distribution and consumption sector, foreign trade (exports and imports). as well as investment activities (Akhmad, 2022). The government has implemented various methods as part of a program to recover the Indonesian economy, which has declined due to COVID-19. It was proven by economic growth, which again increased by 3.7%.

Even though Indonesia's economic growth has increased again, the poverty rate is still relatively high. The development of economic growth in 2009 – 2021 can be seen in Figure 2. Meanwhile, the development of the poverty rate in 2009 – 2021 can be seen in Table 1.

Figure 2: Economic Growth in Indonesia in 2009 – 2021



Source: Author’s calculations based on Badan Pusat Statistik (2021-a)

Table 1: Number of Poor Population in Indonesia in 2009–2021

Year	Poverty Indicator	
	Total Poor Population (Million)	Percentage of Poor Population (%)
2009	26920.2	14.43
2010	31066.1	13.78
2011	29890.3	12.94
2012	28593.1	12.29
2013	28576.8	12.2
2014	22979.5	11.69
2015	28572.7	11.27
2016	27805.41	11.51
2017	27771,25	11.31
2018	25949.84	10.81
2019	25139.73	10.46
2020	26424.06	10.43
2021	25373.45	10.76

Source: Author’s calculations based on Badan Pusat Statistik (2021-b)

Based on Table 1, it can be seen that the percentage of poor people in Indonesia has decreased from 2009 to 2021. The percentage of poor people in 2009 showed a figure of 14.43%, with a total poor population of 26.92 million people, which continued to fall from year to year and reached a percentage of 10.76% in 2021, with a total poor population of 25.37 million souls. It shows that Indonesia's poverty percentage decreased by 3.67%. The highest number of poor people during this period was in 2010, with a total of 31.06 million people, with a percentage of 13.78%.

The decline in the percentage and number of poor people in Indonesia during this period could have occurred due to several factors, including economic growth. Soleh (2015) states that economic growth can positively impact poverty reduction if the economic growth is pro-poor. According to him, the poverty rate can increase on a small scale if the poor only benefit a little from the total benefits arising from this economic growth. If economic growth favors the rich compared to the poor, this condition is said to provide opportunities for an increase in the poverty rate due to increased income inequality.

The economy can grow when the production of goods and services increases from the previous year (Dewi, 2010). Achievements in economic growth should also pay attention to the achievements of other development benchmarks. A reduced unemployment rate and an equal distribution of wealth should have followed rapid economic growth. The leading sector, an area's growth point, is expected to impact people's welfare by creating new job opportunities to reduce the unemployment rate and equalize income distribution. It is based on the theory of the trickle-down effect, which was first developed by Yeung (2017). The Trickle-Down Effect is an impact that is expected to appear in an indirect strategy of economic development to equalize welfare, which emphasizes the emergence of economic growth.

### **4.3. Panel Regression Model Conformity Test Results**

To reduce poverty, the government often takes steps to increase economic growth by expecting a trickle-down effect. An increase in economic growth is closely related to an increase in GDP.

Therefore, panel data analysis is carried out to determine the magnitude of the influence of GDP on poverty. Several model selection tests can be carried out to determine the best model (Baltagi, 2005; Gujarati, 2012; Widarjono, 2009). Following are the results of the Chow test in this study.

Table 2: Chow test results

Redundant Fixed Effect Tests		
Pool: TEST		
Test cross-section fixed effects		
Effect Test	Statistic	d.f
Cross-section F	1.1963456 0.3133	(16.32)
Cross-section Chi-square	25.993752 0.0643	16

Source: Author’s calculations

Based on the test results shown in Table 2, it is known that both the p-value > and chi-square values for both models are significant (p-value > 5%). It follows the test criteria that have been described, and it can be seen that the results of the Chow test, namely the chi-square cross-section of 0.0643, more significant than 0.05, so it can be concluded that this study used the Common Effect and no longer needed the Hausman test to select the fixed effect. Model or random effect model as a suitable regression model.

#### 4.4. Panel Data Regression Results

The random effect model is used, so the analysis results obtained each year are interpreted in Table 4.

Table 3: Model of the Influence of Household Expenditure, Government, Private Investment, and Net Exports on Poverty in Indonesia in 2009-2021

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	-0.289248	0.183462	-1.73921	0.01836
G	-0.002857	0.008312	-1.38467	0.00221
I	-0.287529	0.082461	-2.92381	0.01848
XM	-0.017483	0.174592	-0.07394	0.003611
PM	0.001732	0.000438	3.89247	0.566172

Source: Author’s calculations

A constant with a value of -0.289248 indicates that if all the independent variables are equal to zero (0), Consumption is denoted by C -0.289248. A constant with a value of 0.002857 indicates that if all independent variables are equal to zero (0), then Government Expenditure is denoted by G -0.002857. A constant of

-0.287529 indicates that if all independent variables are equal to zero (0), then Private Investment is denoted by I -0.287529. A constant with a value of -0.017483 indicates that if all independent variables are equal to zero (0), then Net Exports is denoted by XM -0.017483.

Table 4: The Effect of Each Variable on Poverty in Indonesia

Variable	Coefficient	Std.Error	t-Statistic	Prob.	Dec.
C	-0.289248	0.183462	-1.73921	0.01836	Accepted
G	-0.002857	0.008312	-1.38467	0,00221	Accepted
I	-0.287529	0,082461	-2.92381	0.01848	Accepted
XM	-0.017483	0.174592	-0.07394	0.003611	Accepted
PM	0.001732	0.000438	3.89247	0.566172	

Source: Author's calculations

From the results of the panel data regression in Table 4, it can be concluded that partial household expenditure has a positive effect on the poverty rate (C), government expenditure (G), private investment (I), and net exports (XM) have a negative and significant effect on the related variables (poverty), it is just a different level of significance. Next, find out the contribution of the independent variable to the dependent variable by looking at the coefficient of determination (R2) value. The coefficient of determination R2 is (64.21%), indicating that 64.21% of the poverty variable will be explained by the independent variables: household expenditure, government, private investment and net exports. In contrast, the remaining 35.79% of the poverty variable will be explained by other variables not discussed in this study. This model has also passed the autocorrelation and multicollinearity tests.

According to the findings of testing hypothesis 1, consumption spending has a detrimental impact on the poverty rate. It is shown that the low level of household consumption affects the poverty level. It is a representation that low household consumption causes a country's economic level not to work because people's purchasing power cannot increase a country's macro income. The results of this study support previous research that has been conducted (Rusdiansyah, 2014; Sudirman and Alhudhori, 2018).

According to the findings of testing hypothesis 2, government spending had a detrimental impact on the poverty rate. It proves that the government spending that occurs can achieve per capita income. The results of this study confirm that high government spending in the 2009-2021 period has seen an increase in the number of people living at the poverty level. The important thing that needs to be seen is that

the percentage has decreased. However, government spending can stem the number of people at the poverty level to change their economic capacity (Fitria, 2020). It is presumed that the people who were recorded at the poverty level from the previous year received an increase in the economy while the population continued to grow. The government can overcome the complexity of these conditions so that spending, suspected to be used for per capita income, tends to stimulate the community to improve their household economy.

According to the findings of testing hypothesis 3, private investment has a detrimental impact on the poverty rate. High private investment can trigger an increase in public spending. Private parties that invest in the business expansion can trigger state revenues. With so many businesses popping up, it will create more jobs and decrease poverty (Saraswaty et al., 2023). The emergence of private investment is expected to stimulate the continuity of economic development, absorb labor, and reduce poverty to improve people's welfare and distribute it evenly.

Based on the results of testing hypothesis 4, it was found that net exports affect the level of poverty. This study's results align with previous studies, which show that export activities are beneficial in creating new opportunities abroad. Export activities can create opportunities to open overseas markets to become more global, grow investment, and widen domestic reach (Putra, 2022). Labor capacity is needed to fulfill export production capacity to create broad employment opportunities. It can be concluded that net exports open up opportunities to reduce unemployment, increase people's incomes, alleviate poverty, and, as a whole, encourage people's welfare.

The probability value can be used to determine the variable significantly impacting the poverty level during the study period. The independent variable with the lowest probability value is the variable with the most dominant influence on the dependent variable. Based on the calculation results in Table 4, it can be concluded that the variable that has the most dominant influence on the amount of poverty is government spending.

## 5. Conclusion

Based on recent research on the Indonesian economy, it has experienced a relatively good increase in economic growth. However, this has yet to have a significant effect on poverty reduction in Indonesia. This study's findings indicate that poverty is not only solved by increasing economic growth. Thus, improving the quality of human resources will influence poverty reduction significantly.

This study used quantitative methods to collect secondary poverty and GDP data from the Central Bureau of Statistics (BPS). This study aimed to determine the effect of use-side GDP on achieving the poverty rate in Indonesia. Therefore,

poverty that must be solved is poverty that befalls individuals. This concept provides for aspects of production, services, and others, so an effort must be made to guarantee their basic needs and encourage them to fulfill them. Achieve this by creating a fair and even economic distribution in society.

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## Utjecaj korištenja bruto domaćeg proizvoda na određivanje razine siromaštva u Indoneziji

Thomas Ola Langoday<sup>1</sup>

### Sažetak

Siromaštvo je indikator u gospodarstvu koji pokazuje razinu blagostanja ljudi. Jedan od faktora koji utječu na razinu siromaštva je bruto domaći proizvod (BDP). Ovo je istraživanje imalo za cilj utvrditi učinak korištenja BDP-a na stopu siromaštva u Indoneziji. Korištena metoda istraživanja je kvantitativna, a prikupljanje podataka preuzeto je iz sekundarnih podataka u obliku podataka o siromaštvu i BDP-u iz Državnog zavoda za statistiku (BPS) od 2009. do 2021. godine, koji su zatim obrađeni u Excelu i analizirani pomoću aplikacije Eviews9, koristeći tehnike analize putanje kako bi se utvrdilo da li se korišteni model pridržava očekivanog učinka, fiksnog učinka i slučajnog učinka prolaskom kroz Chow-test. Rezultati studije pokazuju da izdaci za potrošnju, državni izdaci, privatna ulaganja i neto izvoz utječu na razinu siromaštva u Indoneziji. Nalazi ove studije pokazuju da se siromaštvo ne rješava samo povećanjem gospodarskog rasta. Stoga će poboljšanje kvalitete ljudskih resursa značajno utjecati na smanjenje siromaštva.

**Gljučne riječi:** mjerenje i analiza siromaštva, ekonomski rast, državna potrošnja

**JEL klasifikacija:** I32, O15, H53

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<sup>1</sup> Izvanredni profesor, Sekolah Tinggi Ilmu Ekonomi (STIE) Oemathonis Kupang, Jln. Frans Seda - Kelurahan Kelapa Lima - Kecamatan Kelapa Lima - KOTA KUPANG 85228 - NTT. - Nusa Tenggara Timur - Indonezija. Znanstveni interes: razvojna ekonomija, makroekonomija. Tel.: +62 813-3932-0099. E-mail: thomasolangoday01@gmail.com.



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# Factors influencing perceived value and revisit intention among Vietnamese restaurant consumers\*

Thi Mai Le<sup>1</sup>, Bao Trung Phan<sup>2</sup>, Viet Trung Dang<sup>3</sup>, Thi Thuy Anh Tran<sup>4</sup>

## Abstract

*The burgeoning smokeless industry faces fierce competition, prompting restaurants to devise effective strategies to satisfy customers and maintain profitability. A study examined factors influencing customers' perceived value and revisit intentions in restaurants. Analysing data from 211 Vietnamese respondents who dined in the restaurant recently using SPSS version 22 and Smart PLS 3, the research revealed that customer satisfaction directly influences revisit intentions. Moreover, hedonic value and utilitarian values indirectly affect revisit intentions through customer satisfaction. Food and service quality impact hedonic value, with only food quality influencing utilitarian value. Other factors showed weak correlations or were poorly assessed. This study contributes to academia and practice by addressing previous research limitations and providing practical recommendations for restaurant improvement.*

**Keywords:** Revisit intention, customer satisfaction, utilitarian value, hedonic value

**JEL classification:** L8, M1, M3

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<sup>1</sup> PhD, Lecturer, International School, Vietnam National University Hanoi, 144 Xuan Thuy Street, District Cau Giay, Hanoi City, 100000, Vietnam. Scientific affiliation: consumer behavior, big data application, e-marketing. E-mail: [mailt@vnui.edu.vn](mailto:mailt@vnui.edu.vn); [lethimai@vnu.edu.vn](mailto:lethimai@vnu.edu.vn). ORCID: 0000-0001-9720-308X.

<sup>2</sup> MSc, Lecturer, International School, Vietnam National University Hanoi, 144 Xuan Thuy Street, District Cau Giay, Hanoi City, 100000, Vietnam. Scientific affiliation: economics, finance, and management. E-mail: [Trungpb@vnui.edu.vn](mailto:Trungpb@vnui.edu.vn).

<sup>3</sup> Student, International School, Vietnam National University Hanoi, 144 Xuan Thuy Street, District Cau Giay, Hanoi City, 100000, Vietnam. Scientific affiliation: management, accounting and finance. E-mail [16071127@vnu.edu.vn](mailto:16071127@vnu.edu.vn).

<sup>4</sup> MSc, Lecturer, International School, Vietnam National University Hanoi, 144 Xuan Thuy Street, District Cau Giay, Hanoi City, 100000, Vietnam. Scientific affiliation: management, accounting and finance. E-mail: [Anhhtt@vnui.edu.vn](mailto:Anhhtt@vnui.edu.vn). ORCID: 009-003-4935-7940.

## 1. Introduction

In recent years, the service industry, particularly the restaurant sector, has experienced significant growth, driven by economic development and increasing consumer demand for leisure activities such as dining out. The Asia-Pacific region, led by countries like Vietnam, has emerged as a key player in the global tourism service market, with substantial revenue generation (GlobalData, 2022). Vietnam, renowned for its rich culinary heritage, boasts a thriving food and beverage industry, comprising diverse establishments catering to various preferences (Lam, 2023). However, amidst this growth, the industry faces intense competition and challenges. The influx of new restaurants each year narrows the market, making it increasingly difficult for businesses to attract and retain customers. Moreover, the COVID-19 pandemic has profoundly impacted consumer behaviour and the industry's landscape, posing significant challenges to businesses striving to maintain customer loyalty (Van Huynh et al., 2022; Phuong, 2021).

Customer loyalty is crucial for restaurant survival, given the industry's notorious difficulty in sustaining ventures. Studies have highlighted the importance of service quality and customer satisfaction in driving repeat patronage and positive word-of-mouth (Han and Ryu, 2009; Liu and Jang, 2009). Understanding the factors that influence revisit intentions is crucial, as retaining current customers is more cost-effective than acquiring new ones, as highlighted by Verhoef and Donkers (2001) and Bitran and Mondschein (1997). Research indicates that customer intentions to revisit restaurants are influenced by various factors, including food quality, price, service quality, and atmosphere, with service quality being particularly significant (Yan et al., 2015). Improvements in food quality, taste, freshness, and nutritional value can enhance customer satisfaction and increase the likelihood of return visits (Kim et al., 2009).

Additionally, there exists a robust correlation between customer satisfaction and loyalty, where factors such as consumption experience and satisfaction significantly impact long-term behaviour, as evidenced by previous studies (Allen, Machleit, and Kleine, 1992; Anderson and Sullivan, 1993; Cronin Jr and Taylor, 1992; Szymanski and Henard (2001). Customer satisfaction serves as a primary driver of behavioural intentions, with hedonic and utilitarian values playing pivotal roles in shaping satisfaction levels, as indicated by research from (Eroglu et al., 2005, Babin et al., 1994). Perceptions of hedonic and utilitarian values directly and indirectly shape customer behaviour, as demonstrated by findings from (Ryu et al., 2010).

The study aims to fill gaps in existing research by investigating the relationship between perceived values (both hedonic and utilitarian) and customer satisfaction and revisit intention. It seeks to understand how factors such as food quality, atmosphere, service quality, and perceived price contribute to customer satisfaction and revisit intentions. By examining these factors comprehensively, the study aims

to provide insights to help restaurants enhance customer experiences and foster long-term loyalty. This study seeks to identify and comprehend factors that affect Vietnamese perceived values and customers' revisit intentions for restaurants, proposing the research question: How do factors influence perceived values and customers' revisit intentions for the restaurant? The rest of the paper is organized as follows: In Section 2, some key theories and previous studies are presented; Section 3 focuses on materials and methods; Section 4 analyses baseline results, discusses their sensitivity, and checks the robustness of our results; and in Section 5, some concluding remarks are highlighted.

## **2. Literature review**

This segment critically examines pertinent literature regarding the research inquiries. Specifically, it delves into the existing body of work concerning revisit intention, customer satisfaction, and perceived value. Subsequently, it develops research hypotheses and constructs a conceptual model through a comprehensive review of prior research.

### **2.1. Theory description**

Combining the Expectancy-Disconfirmation Theory (EDT) with the Value Percept Theory offers a comprehensive approach to understanding customer behavior and satisfaction in restaurants. EDT assesses the variance between expectations and actual performance, while Value Percept Theory highlights the importance of meeting individual needs and values. This integrated approach provides nuanced insights into customer perceptions and behaviors, enhancing the overall dining experience and fostering repeat patronage.

#### ***Expectancy-disconfirmation theory***

Research recognizes the Expectancy Disconfirmation Theory (EDT) as a model for understanding customer satisfaction and repurchase intention Chiu et al. (2005). According to Oliver (1980), customer satisfaction follows a five-step process, beginning with pre-purchase expectations and concluding with acceptance of the product or service. In the second step, customers form perceptions based on key attributes during initial consumption. Subsequently, they compare these perceptions to initial expectations, determining satisfaction or discontent based on the degree of disconfirmation. Positive disconfirmation mitigates disappointment, while confirmation maintains satisfaction. Ultimately, satisfied customers intend to repurchase. According by Oliver and Swan (1989), EDT forecasts customer behavior by comparing expectations to perceived performance, shaping personal satisfaction or dissatisfaction.

### ***Value Percept Theory***

Value Percept Theory, developed by Westbrook and Reilly (1983), proposes that satisfaction arises from comparing a product or service's perceptions with an individual's values, needs, wants, or desires. This cognitive evaluative process elicits an emotional response leading to satisfaction. The theory contrasts the expectation-confirmation model with the value-percept disparity model. Value-disparity refers to the extent to which a product fulfills consumers' needs or desires. In this theory, satisfaction is defined by meeting consumers' needs, values, or wants rather than solely meeting their expectations. The theory has found application in various service research contexts (Munyoki et al., 2020; Kinyanjui, 2020).

### **2.2. Previous studies on research**

Restaurant quality, comprising tangible (food quality, cleanliness, price, ambiance) and intangible (service quality, hospitality) elements, significantly influences customer satisfaction (Lee and Christiarini, 2021; Song et al., 2022; Souki et al., 2023). Recent studies underscore its pivotal role in shaping perceived value and revisit intention. Factors such as personalized service (Bui et al.; Ghorbani et al., 2023), emotional brand connections (Alshreef et al., 2023) and positive social influence through recommendations (Bushara et al., 2023) contribute significantly to customers' perceived value and likelihood of returning to the restaurant. Understanding and addressing these factors are crucial for restaurants seeking to excel in a competitive market. Table 1 summarizes some of the latest research findings on the importance of restaurant quality and factors that contribute to customers' perceived value and revisit intention.

**Table 1: Previous studies relating to research**

Authors	Study Focuses	Results
Lamai et al. (2020)	This research focuses on examining service dimensions, food quality, and price perception and their influence on revisit intention. It applies models like SERVQUAL, customer satisfaction, and repeat behavioral intention, with theoretical support from the Theory of Reasoned Action.	Perceived service quality, food quality, and price perception directly impact customer satisfaction and indirectly affect revisit intention. Quality is the most influential factor, while food quality has Perceived service the least impact on customer satisfaction among these variables.
Kyun (2023)	This research explores factors influencing customers' return intentions at Bangkok restaurants, focusing on staff, pricing, and aesthetics.	This research conclude that positive experiences related to employees, reasonable pricing, and appealing aesthetics are critical in encouraging customers to revisit restaurants in Bangkok
Zaw and Nuangjamnong (2023)	This research focuses on examining how food quality, service quality, physical environment quality, and pricing affect both customer satisfaction and revisit intention at "Feel Restaurant" in Yangon, Myanmar.	This research reveals that customer satisfaction is significantly influenced by price, physical environment quality, service quality, and food quality. Additionally, it confirms that customer satisfaction strongly affects revisit intention.
Sodsee and Sangchoey (2023)	This research investigates how service quality, food quality, and price value affect customer satisfaction and how satisfaction influences revisit intention in Bangkok's fine dining sector.	The findings suggest that service quality, food quality, and price value positively contribute to satisfaction, and satisfaction notably affects revisit intention within the fine dining scene in Bangkok.
Pham et al. (2016)	This research aims to identify the factors influencing revisit intention while exploring the interplay between brand equity, perceived value, and revisit intention.	This research findings suggest that within quick-service restaurants, both brand equity and perceived value exert significant influence on customer revisit intention. Particularly noteworthy is the prominence of perceived value as a more influential determinant compared to brand equity in shaping customers' intentions to revisit these establishments.
Zhu et al. (2024)	This research aims to investigate how tourists' perceptions of food experience value affect their perception of destination image and intention to revisit, focusing on local culinary offerings.	Tourists' perceptions of functional, social, emotional, cultural, and health values in local food experiences significantly affect their destination image perception and revisit intention. Perceived destination image partly mediates the link between tourists' food experience value perceptions and revisit intention, with gender acting as a partial moderator.
Zhao and Liu (2023)	This research aims to identify specific service attributes and their sentiments from online restaurant reviews, and to analyze how these sentiments affect both customer satisfaction and revisit intention simultaneously.	This research ranks service themes like location, service, environment, price, and food by importance, finding that food has the greatest impact on customer satisfaction and revisit intention. It also pinpoints the most prominent attribute within each theme.

Source: Author's construction

Table 1: Previous studies relating to research (continues)

Authors	Study Focuses	Results
(Evelina et al., 2020)	The influence of utilitarian value, hedonic value, social value, and perceived risk on customer satisfaction in e-commerce	Utilitarian and hedonic values significantly influence customer satisfaction, while social value does not.
(Zeba et al., 2020)	Engagement of online consumers through hedonic and utilitarian values	Hedonic and utilitarian values significantly drive customer engagement in online shopping.
(Wang, 2017)	The influence of utilitarian and hedonic benefits of retail food packaging on perceived product quality and purchase intention	Utilitarian and hedonic benefits of packaging significantly influence perceived product quality and purchase intention, with hedonic benefits having a greater impact on perceived quality.
(Bae and Jeon, 2022)	Relationships among brand experience, perceived product quality, hedonic value, utilitarian value, and brand loyalty in unmanned coffee shops	Relationships among brand experience, perceived product quality, hedonic value, utilitarian value, and brand loyalty in unmanned coffee shops
(Ghali, 2020)	Effect of utilitarian and hedonic values on consumer willingness to buy and to pay for organic olive oil in Tunisia	Utilitarian value has a significant effect on willingness to buy and pay for organic food, with trust in nutritional value and quality being key.
(Calvo-Porrall and Lévy-Mangin, 2021)	Influence of store environment in hedonic and utilitarian shopping	Store internal ambience and merchandise layout are major drivers for customer satisfaction in hedonic shopping contexts.
(Zeba et al., 2020)	Hedonic and utilitarian values behind engagement of online consumers	Hedonic experiential values are important for engaging online consumers, alongside utilitarian values.
(Ong et al., 2022)	Influence of service quality, hedonic, and utilitarian value on shopper's behavioral intentions in urban shopping malls during the COVID-19	Service quality, utilitarian, and hedonic values significantly influence shopper's behavioral intentions in urban shopping malls, with service quality primarily affecting satisfaction and utilitarian and hedonic values embodying shopping mall values.
(Alam et al., 2020)	Millennials' preference of hedonic value over utilitarian value: Evidence from a developing country	Service quality, trust, and customer engagement are important predictors of customer loyalty, alongside hedonic value, particularly in the context of superstores in Bangladesh.
(Saygılı and Yalçıntekin, 2021)	Effect of hedonic value, utilitarian value, and customer satisfaction in predicting repurchase intention and willingness to pay a price premium for smart watches	Customer satisfaction significantly influences willingness to pay a price premium, while utilitarian value significantly affects repurchase intention.
(Lee and Wu, 2017)	Consumer online flow experience: The relationship between utilitarian and hedonic value, satisfaction and unplanned purchase	Hedonic value, along with a pleasant atmosphere and fun environment, has a greater effect on satisfaction with an online store compared to utilitarian value. Also, Utilitarian value is influenced by perceived price competitiveness and shopping efficiency, while hedonic value is influenced by the pleasantness of the online shopping experience.

Source: Author's construction

This literature review emphasizes the profound impact of restaurant quality on customers' intentions to revisit, highlighting the importance of managing various factors such as service quality, food quality, ambiance, price-value relationships, online reviews, and cultural considerations. It introduces a novel perspective by focusing on both utilitarian and hedonic dimensions of customer satisfaction and revisit intention, offering a comprehensive understanding of how restaurant experiences shape return behavior. By integrating both utilitarian (utility) and hedonic (pleasure) aspects, the study provides a comprehensive and complex view of customer satisfaction and repeat intentions, going beyond traditional assessments of food and service quality to consider ambiance, price, and pleasure factors in evaluating the overall restaurant experience.

### **2.3. Revisit intention**

Customer loyalty is crucial for business success, particularly in today's competitive market (Rane et al., 2023). To attract new customers, businesses must enhance the value of existing ones and maintain repurchase behaviors (Hanai et al., 2008). Revisit intention, defined as the likelihood of returning to a restaurant, is influenced by positive attitudes toward the establishment (Han et al., 2009; Ramayah et al., 2023). Additionally, another study defined revisit intention as the behaviours associated with repurchasing and the willingness to recommend a provider (Pervaiz et al., 2024). Reasons for patrons returning to restaurants include stress relief, desire for quality, value, and a comfortable environment (Capito and Pergelova, 2023; Bonfanti et al., 2023). Promotional programs recalling positive memories and highlighting new attractions can significantly impact revisit intentions (Salah et al., 2023).

### **2.4. Customer satisfaction and revisit intention**

Customer satisfaction is pivotal in marketing theory due to its potential for long-term profitability, including customer loyalty and sustained benefits (Nur, 2021). In another research, the author defines satisfaction as the pleasurable consumption-related fulfillment resulting from product, service, or self-evaluation (Saricam, 2022). In the service industry, such as restaurants, customer satisfaction is crucial for maintaining relationships and fostering loyalty (Weiss, 2003). Satisfaction with restaurant features like food quality, service, price, and atmosphere significantly influences customers' intention to revisit (Chun and Nyam-Ochir, 2020; Rajput and Gahfoor, 2020). Highly satisfied customers are more likely to return to a restaurant in the future, creating positive bonds with the business (Rane et al., 2023). Additionally, satisfied customers are inclined to share positive experiences, attracting new customers (Salah et al., 2023). Thus, investigating the positive relationship between customer satisfaction and intention to revisit is warranted.

H1: Customer satisfaction is positively associated with revisit intention.

## **2.5. Utilitarian value, hedonic value and customer satisfaction**

Perceived value, a fundamental concept in marketing, encapsulates the overall assessment of a product or service's worth based on the benefits received relative to the costs incurred (Zeithaml, 1988; Ryu et al., 2010; Riva et al., 2022). This concept integrates both utilitarian and hedonic dimensions, reflecting functional and emotional aspects of consumption experiences (Kuppelwieser et al., 2022). Customers perceive high utilitarian value when they believe a product or service effectively meets their needs (Zeithaml, 1988). In restaurants, attributes like food quality, service efficiency, and value for money contribute to utilitarian value, positively influencing customer satisfaction (Lee and Christiarini, 2021; Lamai et al., 2020).

Conversely, hedonic value encompasses emotional and experiential gratification gained from consumption, such as enjoyment and sensory stimulation (Kusmarini et al., 2020; Yang et al., 2024). In restaurants, factors like ambiance, aesthetics, and personalized service contribute to hedonic value, enriching customers' dining experiences (Zhu et al., 2024; Kyun, 2023). Customers who derive pleasure from consumption experiences are more likely to be satisfied (Ryu and Han, 2010; Handoyo and Mani, 2021; Ponsignon, 2023). Therefore, both utilitarian and hedonic values play crucial roles in enhancing customer satisfaction. Based on these definitions, the following hypotheses are developed:

H2: Utilitarian value is positive correlation with customer satisfaction.

H3: Hedonic value is positive correlation with customer satisfaction

## **2.6. Food quality and utilitarian value, hedonic value**

Food quality, often defined as the degree to which a food product meets consumer expectations regarding attributes such as taste, freshness, safety, and nutritional value, plays a crucial role in shaping consumer preferences (Ghali, 2020). Recent research in the field of consumer behavior has shed light on the intricate relationship between food quality and consumers' perceptions of utilitarian and hedonic values. According to Wang (2017), the author explored the distinct effects of utilitarian and hedonic benefits of retail food packaging on perceived product quality and purchase intention. Building upon this, Ghali (2020) investigated the effect of utilitarian and hedonic values on consumer willingness to buy and pay for organic olive oil in Tunisia. These studies suggest that as food quality increases, consumers are more likely to attribute utilitarian value, characterized by practical benefits, and hedonic value, associated with emotional or experiential enjoyment, to the product (Kusmarini et al., 2020; Pérez-Villarreal et al., 2020; Bae and Jeon, 2022). Furthermore, Otterbring et al. (2023) delved into the influence of hunger on option quality for hedonic and utilitarian food products,

providing insights into how physiological states may interact with perceived food quality. To sum up, these findings support the hypotheses that food quality is positively associated with both utilitarian and hedonic values, underscoring the importance of product quality in shaping consumer perceptions and purchase decisions across diverse food contexts.

H4a: Food quality is positively associated with utilitarian value.

H4b: Food quality is positively associated with hedonic value.

### **2.7. Atmosphere and utilitarian value, hedonic value**

The restaurant atmosphere significantly influences customers' perceptions of Utilitarian and Hedonic Values (Rayburn and Voss, 2013). Firstly, it positively correlates with Utilitarian Value, which encompasses practical benefits (Andersson et al., 2012). A conducive atmosphere, including comfortable seating and appropriate lighting, meets customers' dining needs, enhancing their perceived practical requirements (Ladhari et al., 2017). A well-designed atmosphere facilitates ease of conversation and interaction with staff, contributing to Utilitarian Value (Andersson et al., 2012).

Secondly, atmosphere positively correlates with Hedonic Value, representing emotional benefits (Anggriani et al., 2020). A welcoming and enjoyable atmosphere evokes positive emotions, enhancing overall satisfaction (Andersson et al., 2012). Factors like decor, music, and ambiance contribute to creating a memorable dining experience, enhancing Hedonic Value (Handriana and Meyscha, 2020).

H5a: Atmosphere is positively associated with utilitarian value.

H5b: Atmosphere is positively associated with hedonic value.

### **2.8. Service quality and utilitarian value, hedonic value**

Service quality, defined as the standard or excellence of service provision including aspects such as reliability, responsiveness, assurance, empathy, and tangibles (Han et al., 2018), plays a pivotal role in shaping consumer perceptions and experiences. Some researches indicate a significant positive impact of service quality on utilitarian value (Han et al., 2018; Sagala and Sumiyana, 2020). To be specific, in the research of (Sagala and Sumiyana, 2020), the authors suggest that although service quality may not directly affect perceived value, it contributes to user satisfaction, subsequently influencing utilitarian value, particularly in electronic shopping via social media. Additionally, efficient and attentive service fulfills practical needs, enhancing Utilitarian Value (Hellén and Sääksjärvi, 2011; Lee and Hong, 2006).

In addition, there is little positive correlation between service quality and perceived value, encompassing hedonic dimensions (Kusmarini et al., 2020). While Sagala and Sumiyana (2020) observed that service quality might not directly impact perceived value, other studies Kusmarini et al. (2020) implied a positive relationship between service quality and hedonic value, potentially mediated by factors like atmosphere perception and customer loyalty. Furthermore, friendly and personalized service creates positive emotional experiences, increasing Hedonic Value (Hellén and Sääksjärvi, 2011; Rahman et al., 2017).

H6a: Service quality is positively associated with utilitarian value.

H6b: Service quality is positively associated with hedonic value.

## **2.9. Perceived price and utilitarian value, hedonic value**

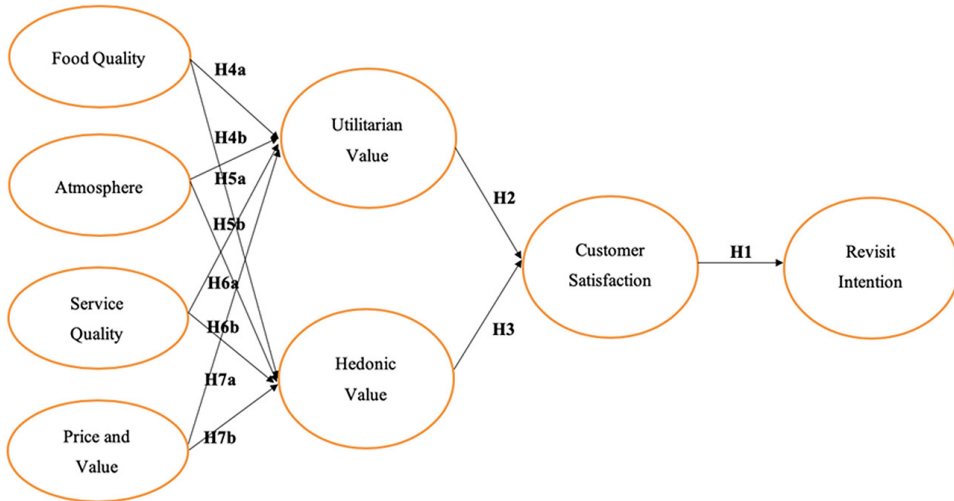
Perceived price moderates the relationships between quality dimensions (food, service, and physical environment) and satisfaction, as noted by (Ryu and Han, 2010). When perceived price is reasonable, it can elevate customer satisfaction levels regarding food, service, and physical environment quality. Perceived price refers to customers' assessment of whether the price of a product or service is fair and reasonable (Zhong and Moon, 2020). These authors also mentioned that customers perceive higher prices as indicative of better quality, leading to enhanced Utilitarian Value. Significantly, the research by Lee and Wu (2017) found that utilitarian value is influenced by factors such as perceived price during online shopping experiences. Furthermore, a research suggests that perceived price affects customers' perceptions of the emotional or hedonic aspects of a purchase experience (Hasbi et al., 2021). Consumers often associate higher prices with quality or luxury, which can enhance the hedonic value of a product or experience. Additionally, the study by Vieira et al. (2018) suggested that both hedonic and utilitarian shopping values provide parallel mediating effects on perceived value, indicating a potential positive relationship between perceived price and hedonic value. Therefore, the perceived price can positively impact Hedonic Value by influencing customers' emotional responses to the dining experience.

H7a: Perceived price is positively associated with utilitarian value.

H7b: Perceived price is positively associated with hedonic value.

Having reviewed the literature, figure 1 performs research farmework which is established to examine the association between factors affecting to utilitarian and hedonic values (in terms of food quality, atmosphere, service quality and perceived price), customers' satisfaction towards revisit intention to the restaurant.

Figure 1. Theoretical Study Model



Source: Author's elaboration

### 3. Methodology

The quantitative method was employed using a questionnaire for data collection. Details on sample selection and data analysis techniques are provided.

#### 3.1. Sample selection

Convenience sampling was utilized in this study, with 211 customers participating in Vietnam from February to June, 2023 through online survey. The sample size was determined using the formula proposed by Hair et al. (1998), resulting in a sample size of 205 based on 41 included questions. The survey was translated from English to Vietnamese using the reverse translation process to ensure accuracy. Respondents were required to confirm prior dining experiences at any restaurant within the previous month before completing the main survey. The participant demographics consisted of 68.2% women and 31.8% men, with the majority (46%) aged between 20 and 25. A significant portion of the participants were students (55%), and a majority reported dining out 1-2 times per month. Table 2 displays the full findings.

Table 2: Demographic of Respondents (n=211)

Variables	Valid	Frequency	Percent (%)
Gender	Male	67	31.8
	Female	144	68.2
Age	Under 20	38	18.0
	20 - 25	97	46.0
	26 - 30	15	7.1
	31 - 40	33	15.6
	Over 40	28	13.3
Occupation	Student	116	55.0
	Employee	51	24.2
	Self – employee	17	8.1
	Specialist	17	8.1
	Housewife	3	1.4
	Retirement	7	3.2
Frequency of dining at restaurant (Per month)	1 - 2 times	126	59.7
	3 - 4 times	54	25.6
	5 - 6 times	15	7.1
	6 - 7 times	2	0.9
	Over 7 times	14	6.7
Willing to pay (Euro)	Under 37	121	57.3
	38-74	71	33.6
	75 – 150	13	6.2
	151 – 224	2	0.9
	Over 225	4	2.03

Source: Data processed by SPSS 22

Independent sample T-test and one way Anova were used to compare mean between different demographic characteristics and consumers' responses.

Table 3: T-test results by gender

Demographic	Characteristics	Mean	Std	t	p-value
Gender	Male	3.496	0.788	5.804	0.017*
	Female	3.804	0.620		

Note: \*  $p < 0.05$

Source: Author's calculation

This table 3 plainly presents that, there is considerable difference in revisit intention to restaurant between male ( $N = 67$ ,  $M = 3.496$ ,  $SD = 0.788$ ) and female ( $N = 144$ ,

M = 3.804, SD = 0.620), t = 5.804, p-value = 0.017. This consequence indicates that female has higher revisit intention than male.

Table 4: Analysis of Variance between Purchase Intention and Profile

Demographic	Levene Statistic	Sig	F-value	p-value
Age	1.182	0.320	1.770	0.136
Occupation	2.748	0.020	0.591	0.707
Income	1.565	0.185	0.828	0.509
Frequency	2.533	0.041	0.767	0.548
Willing to pay	3.514	0.008	0.470	0.758

Source: Author’s calculation

Table 4 shows that there is no significant difference between them and the revisit intention to the restaurant.

### 3.2. Measurement

Table 5 outlines the measurement factors considered for each construct in this study. Statements in the measurement were developed based on relevant literature and expert advice, with feedback from restaurant-goers to ensure content validity. After refining the draft to eliminate ambiguity, a survey was conducted in two parts. The first part assessed respondents’ perceptions of each research model concept, while the second part collected demographic information. Table 5 presents the research constructs and questionnaire items, utilizing a seven-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 5: The variables and items in the questionnaire

Variables	Items	Measurements	Sources
Revisit intention	RI1	I would want to return to the restaurant for dinner.	(Ryu et al., 2010; Ryu et al., 2012; Chow et al., 2013)
	RI2	I would tell my friends or other people about the restaurant.	
	RI3	I would say positive things about the restaurant to others.	
Customer satisfaction	CS1	I am completely delighted with my overall experience at the restaurant.	(Ryu et al., 2012; Chow et al., 2013; Namkung and Jang, 2007)
	CS2	I was in a good mood overall after visiting the restaurant.	
	CS3	I am happy I dined at the restaurant.	
	CS4	I think that choosing to eat at the restaurant was the appropriate decision.	
	CS5	The restaurant has left me with positive impressions.	

Variables	Items	Measurements	Sources
Hedonic value	HV1	I ate out at restaurant since I could have good feelings.	(Ryu et al., 2010)
	HV2	Dining at the restaurant was fun and pleasant.	
	HV3	I get excited when I search food at the restaurant.	
	HV4	Although the cost is high, I still like to eat out at the restaurant.	
	HV5	Eating-out at the restaurant is my hobby.	
Utilitarian value	UV1	Eating-out at the restaurant was convenient.	(Ryu et al., 2010; Kim and Hall, 2020)
	UV2	Eating-out at the restaurant offers benefits that I need.	
	UV3	Eating-out at the restaurant helps me save time.	
Food quality	FQ1	The food was delicious.	(Namkung and Jang, 2007; Ryu et al., 2012)
	FQ2	The food was nutritious.	
	FQ3	The restaurant served fresh food.	
	FQ4	The flavor and aroma of food are fascinating.	
	FQ5	The cuisine was presented in an eye-catching way.	
	FQ6	Diverse food menu with various choices.	
Atmosphere	AP1	Facilities are completely clean.	(Ryu et al., 2010; Yan et al., 2015)
	AP2	No bad smell or door in dining room.	
	AP3	The space is warm and comfortable.	
	AP4	No annoying ambient noise.	
	AP5	The spatial distance between dining tables ensures Covid-19 prevention.	
Service quality	SQ1	The restaurant served me food exactly as I ordered it.	(Ryu et al., 2012; Chow et al., 2013; Ramseook-Munhurrun, 2012; Liu and Tse, 2018)
	SQ2	The restaurant served food quickly.	
	SQ3	The restaurant provides me accurate bill.	
	SQ4	The restaurant's parking lot is convenient.	
	SQ5	The restaurant has instructions for COVID-19 prevention measures (temperature measurement, hand washing, antiseptic, etc.)	
	SQ6	The staff have knowledge of the menu.	
	SQ7	The staff made me feel comfortable in dealing with them.	
Perceived price	PP1	The food value that I got is fair compared to the price I paid.	(Yüksel and Yüksel, 2003; Ryu et al., 2012; Kim et al., 2009)
	PP2	The price paid for the meal is very reasonable.	
	PP3	The restaurant provides numerous discount choices.	
	PP4	The restaurant provides me great value as compared to others.	
	PP5	Dining experience at the restaurant appears to be a bargain.	

Source: Author's construction

### **3.3. Statistical data analysis**

The survey data underwent coding, recording, and adjustments as necessary. Statistical analytic techniques were then applied to process the data, including descriptive statistics for profiling the subjects and Cronbach's reliability alpha analysis to assess the internal consistency of the questionnaire. Subsequently, both the measurement model and structural equation model were tested. Data analysis was conducted using Smart PLS version 3 and Statistical Package for Social Science (SPSS) software version 22.

## **4. Results and discussion**

The techniques utilized to make the connection between these key characteristics clear are covered in the Results and Discussion section. Initially, confirmatory factor analysis was used to test the measurement model. The factors in the structural model are food quality, atmosphere, service quality, perceived price, utilitarian value, hedonic value, customer satisfaction, revisit intention.

### **4.1. Measurement model**

The internal consistency of the indicators or each examined construct is examined using Cronbach's Alpha. Table 6 displays the computed Cronbach's values, which range from 0.821 to 0.934 and are higher above the advised threshold of 0.70 (Hair, 2011). As a result, each construct was dependable and internally consistent.

According to Hair (2011), standardized factor loadings above 0.70 are recommended for convergent validity. In this study, the factor loadings ranged from 0.773 to 0.925, all significant in the model. Additionally, composite reliability (CR) and average variance extracted (AVE) were assessed to support convergent validity. Table 3 indicates that CR and AVE values exceeded the recommended thresholds, ranging from 0.894 to 0.943 and 0.673 to 0.848, respectively, as suggested by (Hair, 2011). Discriminant validity was evaluated using the latent variable correlation matrix, following the guidelines of (Fornell and Larcker, 1981), where the diagonal items should outweigh the off-diagonal elements.

We used Harman's single factor test to investigate the possibility of common method bias. Using principal components and varimax rotation, an exploratory factor analysis was performed on all the items. The first factor's percentage of variation equaled 46.69%, which is less than 50%, indicating that the extraction cannot be completed. Therefore, it can be said that common method bias did not seem to be a possible issue in this investigation (Cooper et al., 2020).

Table 6: Reliability and validity of the constructs

Construct	Item	Cronbach's Alpha	Standardized Factor loading	Composite Reliability (CR)	Average variance Extracted (AVE)
Food quality (FQ)	FQ1	0.902	0.839***	0.925	0.673
	FQ2		0.809***		
	FQ3		0.857***		
	FQ4		0.863***		
	FQ5		0.773***		
	FQ6		0.777***		
Atmosphere (AP)	AP1	0.907	0.879***	0.932	0.734
	AP2		0.867***		
	AP3		0.891***		
	AP4		0.828***		
	AP5		0.817***		
Service quality (SQ)	SQ1	0.927	0.838***	0.942	0.699
	SQ2		0.844***		
	SQ3		0.843***		
	SQ4		0.776***		
	SQ5		0.822***		
	SQ6		0.851***		
	SQ7		0.874***		
Perceived price (PP)	PP1	0.903	0.850***	0.928	0.722
	PP2		0.855***		
	PP3		0.833***		
	PP4		0.868***		
	PP5		0.841***		
Utilitarian value (UV)	UV1	0.821	0.890***	0.894	0.737
	UV2		0.868***		
	UV3		0.817***		
Hedonic value (HV)	HV1	0.887	0.825***	0.918	0.692
	HV2		0.884***		
	HV3		0.818***		
	HV4		0.817***		
	HV5		0.814***		
Customer satisfaction (CS)	CS1	0.934	0.853***	0.950	0.793
	CS2		0.920***		
	CS3		0.905***		
	CS4		0.890***		
	CS5		0.883***		
Revisit intention (RI)	RI1	0.909	0.921***	0.943	0.848
	RI2		0.925***		
	RI3		0.917***		

Note: \*\*\* p < 0.001. Source: Data processed by SmartPLS 3.0

**Table 7: The latent variable correlation matrix: Discriminant validity**

Variables	FQ	AP	SQ	PP	UV	HV	CS	RI
FQ	0.821							
AP	0.767	0.857						
SQ	0.822	0.775	0.836					
PP	0.719	0.762	0.775	0.849				
UV	0.434	0.328	0.387	0.404	0.859			
HV	0.494	0.341	0.432	0.424	0.678	0.832		
CS	0.602	0.474	0.543	0.544	0.645	0.797	0.891	
RI	0.608	0.492	0.575	0.521	0.590	0.701	0.835	0.921

Note: Square root of AVE is on the diagonal.

Source: Data processed by SmartPLS 3.0

#### 4.2. Structural equation model

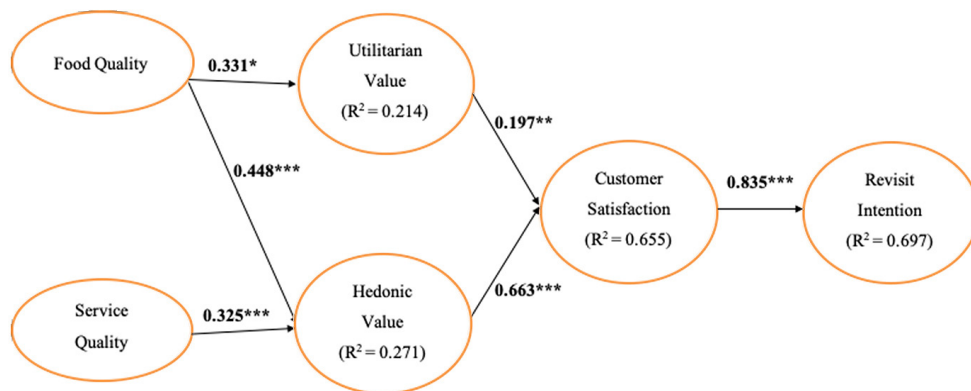
The structural model’s outcomes are performed in Table 8 and Figure 2, and the standardized path coefficient indicates the relationship between the model’s structures.

**Table 8: Results for Structural equation model**

Path	Coefficients	t-value	p-value	Hypothesis	Hypothesis support
Food quality → Utilitarian value	0.331	2.597	0.011	H4a	Supported
Food quality → Hedonic value	0.448	3.801	0.000	H4b	Supported
Atmosphere → Utilitarian value	-0.150	0.887	0.867	H5a	Rejected
Atmosphere → Hedonic value	-0.264	1.523	0.953	H5b	Rejected
Service quality → Utilitarian value	0.326	1.943	0.108	H6a	Rejected
Service quality → Hedonic value	0.325	2.132	0.000	H6b	Supported
Perceived price → Utilitarian value	-0.040	0.173	0.762	H7a	Rejected
Perceived price → Hedonic value	0.003	0.016	0.564	H7b	Rejected
Hedonic value → Customer satisfaction	0.663	13.022	0.000	H3	Supported
Utilitarian value → Customer satisfaction	0.197	3.326	0.003	H2	Supported
Customer satisfaction → Revisit intention	0.835	26.824	0.000	H1	Supported

Source: Data processed by SmartPLS 3.0

Figure 2: The result of research model



Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Source: Data processed by SmartPLS 3.0

According to the structural model testing in Figure 2, customer satisfaction ( $H1: \beta = 0.835, t = 26.824, p < 0.001$ ) exhibits a significant positive relationship with revisit intention, consistent with previous findings (Ryu et al., 2010; Han et al., 2009). Customer satisfaction, influenced by factors like food quality, atmosphere, service quality, and perceived price, emerges as the key determinant of revisit intention.

Additionally, the analysis reveals significant positive associations between utilitarian ( $H2: \beta = 0.197, t = 3.326, p < 0.01$ ) and hedonic shopping values ( $H3: \beta = 0.663, t = 13.022, p < 0.001$ ) and customer satisfaction. This aligns with prior research highlighting the impact of utilitarian and hedonic values on customer satisfaction (Ryu et al., 2010), contrasting with Mursid (2023)'s regarding emotional value's influence on revisit intention.

Furthermore, satisfaction ( $\beta = 0.835, p < 0.001$ ) is shown to directly influence revisit intention, while both hedonic and utilitarian values indirectly affect revisit intention through customer satisfaction. This supports the contention that perceived value and customer satisfaction are crucial predictors of revisit intention (Ryu et al., 2010). Notably, hedonic value has a more significant impact on customer satisfaction compared to utilitarian value (0.663 vs. 0.197). Food quality and service quality impact hedonic value, with food quality exerting a stronger influence. However, atmosphere and perceived price do not relate to perceived value in the context of customers in Vietnam.

Food quality ( $H4a: \beta = 0.331, t = 2.597, p < 0.05$ ), ( $H4b: \beta = 0.448, t = 3.801, p < 0.001$ ) strongly impact on both hedonic value and utilitarian value indicated that  $H4a$  and  $H4b$  were accepted. Through that finding, it revealed food quality had a significant indirect effect on customer satisfaction via perceived value. It is

supported by Hongdiyanto and Liemena (2021) that regularly offering the quality food is important to attract the loyal customers in the food industry according to the satisfaction. The research of Namkung and Jang (2007) also proved the connection between food quality and customer satisfaction. This research pointed out that food quality greatly affects to both utilitarian value and hedonic value. In Vietnam, with the increasing demand for food, the issue of ensuring food hygiene and safety is now more and more alarming than ever. The food safety situation in the country, especially in urban areas, is creating a lot of worries for people, so food safety is becoming increasingly concerned by the consumers. Besides, Vietnamese people in eating have the opinion: delicious, nutritious, cheap so appetizing food is also one of the important factors that help promote the return behaviour of customers.

Regarding H6a and H6b, service quality positively influences hedonic value (H6b:  $\beta = 0.325$ ,  $t = 2.132$ ,  $p < 0.001$ ) but does not affect utilitarian value (H6a:  $\beta = 0.326$ ,  $t = 1.943$ ,  $p > 0.05$ ). However, H5a, H5b, H7a, H7b were rejected due to negative correlations between atmosphere, perceived price, and perceived value (H5a:  $\beta = -0.150$ ), (H5b:  $\beta = -0.264$ ), (H7a:  $\beta = -0.040$ ), (H7b:  $p > 0.05$ ). These results are similarity with some previous studies. For instance, Liu and Jang (2009) found that there is no significant relationship between ambience and perceived value and in other study, it was shown that the atmosphere as ambience and facility aesthetics had no statistically significant impact on the intention to return (Kement et al., 2021). Lee and Christiarini (2021) implied that atmosphere was found not significant to customer satisfaction. A study by Jang and Namkung (2009) found that the quality of food and service exerts a more substantial influence on young customers' loyalty than price or ambience alone. Similarly, Ha and Jang (2012) emphasized that the emotional response to the dining experience, such as feelings of satisfaction and delight, plays a critical role in fostering repeat visits, even when traditional variables like atmosphere and price are controlled. This suggests that young customers prioritize intrinsic factors, such as the authenticity of the cuisine or personalized service, over extrinsic elements like pricing or decor when deciding whether to return to a restaurant. These findings indicate the importance of delivering a holistic dining experience to attract and retain younger clientele. Another essential point is that Vietnamese cuisines have been well known for their affordable prices in general, which is largely assumed by customers, specially youngsters (Avieli, 2013; Stutter, 2017).

The multiple R<sup>2</sup> values are 0.271, 0.214, 0.665, and 0.697 for each path of hedonic value, utilitarian value, customer satisfaction, and revisit intention, respectively. Specifically, two exogenous variables explain 27.1% of the variance in hedonic value and one exogenous variable account for 21.4% of the variance in utilitarian value, which in turn explains 65.5% of the variance in customer satisfaction. Customer satisfaction, in turn, explains 69.7% of the variance in revisit intention.

## 5. Conclusions

This research aims to identify the factors influencing the level of revisit intention towards restaurants and propose essential improvements. It involves profiling customers, examining the elements impacting value, assessing satisfaction levels, and predicting return behaviour to restaurants. The study offers both academic insights and practical recommendations.

Results indicate that males have a higher intention to revisit restaurants than females. Additionally, demographic factors such as age, income, occupation, frequency of visits, and the amount of money willing to be spent do not show essential differences among groups in returning to use restaurant services. The study makes significant contributions by addressing specific academic gaps in the existing literature regarding factors influencing customer satisfaction and revisiting intention in the context of restaurants. Specifically, it enhances the understanding of how food quality, atmosphere, service quality, and perceived price affect perceived value (both utilitarian and hedonic) and customer satisfaction, which in turn fosters revisit intention. Another one of the key theoretical contributions is the exploration of the dual dimensions of perceived value: utilitarian and hedonic. By drawing from the expectancy-disconfirmation theory and value percept theory, the study provides a nuanced understanding of how different factors influence these two types of value. This approach allows for a more detailed analysis of customer behavior and satisfaction, which is less common in existing literature that often treats perceived value as a monolithic construct. Furthermore, the development and validation of a conceptual model that investigates the relationships between food quality, atmosphere, service quality, perceived price, perceived value (utilitarian and hedonic), customer satisfaction, and revisit intention is another significant theoretical contribution. This model offers a comprehensive framework for future research and practical applications, filling a gap in the theoretical models available for understanding customer behaviour in the restaurant industry.

This study's findings provide some useful management insights.

The findings suggest that male customers have a higher intention to revisit the restaurant than female customers, while other demographic factors such as age, income, occupation, dining frequency, and willingness to pay show no significant differences in revisit intention. This suggests that restaurant should focus on strategies to maintain and enhance male customer revisit while simultaneously addressing factors that may increase revisit intentions among female customers. For male customers, targeted promotions such as sports-themed events, hearty meal options, or drink specials could be effective. To attract more female customers, the restaurant could consider offering health-conscious menu items, creating a more inviting ambiance, or promoting group-friendly dining experiences. Additionally,

maintaining high-quality service, cleanliness, and overall value will appeal universally to all demographic groups.

The study highlights the significant role of food quality in perceived value (Utilitarian Value and Hedonic Value), emphasizing the importance of enhancing sweetness, healthiness, visual appeal, freshness, and customers' sense of health in restaurant menus. Improving food quality involves ensuring fresh and delicious menu options, as well as meticulous attention to ingredient sourcing, food standards, hygiene, and professional food processing techniques. Hedonic value is heavily influenced by service quality, suggesting additional service activities and online information to enhance amusement and customer happiness.

Improving service quality by professionalizing staff and providing modern facilities can lead to better customer reviews and a greater likelihood of revisit intention. Furthermore, although not emphasized in the study, investing in improving dining room space and price competitiveness can enhance the dining experience and attract more customers, especially during special occasions. Marketing activities targeting female consumers and offering discounts, promotions, and gifts are also recommended to boost consumption intentions.

This study aimed to provide accurate insights into existing customers; however, three main limitations should be considered. First, the use of a convenience sample presents challenges, particularly in terms of representativeness. The current study provides valuable insights for theory development and business practice even though representativeness is not a primary concern and the methods used were compliant with approved principles and procedures. Furthermore, it was noted that the sample respondents were predominantly female, and the age range of 20 to 25 years may not fully represent the broader population, potentially affecting the results. Therefore, future research should include samples from a more diverse demographic. Second, this paper focuses solely on a case study in Vietnam, and further studies should consider multi-cultural comparisons across different countries. Third, the relationship between perceived value and revisit intention was only tested indirectly through customer satisfaction. Although there are a few theories that mention that relationship, future studies should investigate this association more thoroughly. Finally, future research should also consider possible mediators and moderators within the model.

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## Čimbenici koji utječu na percipiranu vrijednost i namjeru ponovnog posjeta među potrošačima vijetnamskih restorana

Thi Mai Le<sup>1</sup>, Bao Trung Phan<sup>2</sup>, Viet Trung Dang<sup>3</sup>, Thi Thuy Anh Tran<sup>4</sup>

### Sažetak

Rastuća bezdimna industrija suočava se s oštrom konkurencijom, što primorava restorane da osmisle učinkovite strategije za zadovoljstvo kupaca i održavanje profitabilnosti. U radu se istražuju čimbenici koji utječu na percipiranu vrijednost kupaca i namjere ponovnog posjeta restoranima. Analizirajući podatke od 211 Vijetnamskih ispitanika koji su u restoranu nedavno večerali koristeći SPSS verziju 22 i Smart PLS 3, utvrđeno je da zadovoljstvo kupaca izravno utječe na namjeru ponovnog posjeta. Štoviše, hedonistička vrijednost i utilitarne vrijednosti neizravno utječu na namjere ponovnog posjeta kroz zadovoljstvo korisnika. Kvaliteta hrane i usluga utječe na hedonističku vrijednost, pri čemu samo kvaliteta hrane utječe na utilitarnu vrijednost. Ostali čimbenici pokazuju slabu korelaciju ili da su loše procijenjeni. Ovo istraživanje doprinosi akademskoj zajednici i praksi rješavanjem prethodnih ograničenja istraživanja i pružanjem praktičnih preporuka za poboljšanje restorana.

**Ključne riječi:** namjera ponovnog posjeta, zadovoljstvo korisnika, utilitarna vrijednost, hedonistička vrijednost

**JEL klasifikacija:** L8, M1, M3

<sup>1</sup> Doktor znanosti, predavač, International School, Vietnam National University Hanoi, 144 Xuan Thuy Street, District Cau Giay, Hanoi City, 100000, Vietnam. Znanstveni interes: ponašanje potrošača, primjena velikih podataka, e-marketing. E-mail: [mailt@vnuis.edu.vn](mailto:mailt@vnuis.edu.vn); [lethimai@vnu.edu.vn](mailto:lethimai@vnu.edu.vn). ORCID: 0000-0001-9720-308X.

<sup>2</sup> Magistar znanosti, predavač, International School, Vietnam National University Hanoi, 144 Xuan Thuy Street, District Cau Giay, Hanoi City, 100000, Vietnam. Znanstveni interes: ekonomija, financije i menadžment. E-mail: [Trungpb@vnuis.edu.vn](mailto:Trungpb@vnuis.edu.vn).

<sup>3</sup> Student, International School, Vietnam National University Hanoi, 144 Xuan Thuy Street, District Cau Giay, Hanoi City, 100000, Vietnam. Znanstveni interes: menadžment, računovodstvo i financije. E-mail [16071127@vnu.edu.vn](mailto:16071127@vnu.edu.vn).

<sup>4</sup> Magistar znanosti, predavač, International School, Vietnam National University Hanoi, 144 Xuan Thuy Street, District Cau Giay, Hanoi City, 100000, Vietnam. Znanstveni interes: menadžment, računovodstvo i financije. E-mail: [Anhhtt@vnuis.edu.vn](mailto:Anhhtt@vnuis.edu.vn). ORCID: 009-003-4935-7940.

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## Financial institutions efficiency: a systematic literature review\*

Danijel Petrović<sup>1</sup>, Goran Karanović<sup>2</sup>

### Abstract

*This study conducts a systematic literature review on the effect of risk management on financial institutions' efficiency. Using the PRISMA method, we analysed 173 studies published between 1990 and 2023 in journals ranked by Academic Journal Guide, issued by the Chartered Association of Business Schools in 2021. The results reveal that both parametric (Stochastic Frontier Approach) and non-parametric (Data Envelopment Analysis) models are equally utilized in estimating the efficiency of financial institutions. The limitations of these methodologies are discussed, while also indicating a lack of consensus on the classification of variables. Furthermore, the results show that recent studies mainly focus on the effects of mergers and acquisitions activities, regulation, and risk management on the efficiency of banks and insurance companies. Finally, a current trend towards developing composite indices in efficiency estimation is emphasized. Findings from this study will be useful to academics, researchers, financial institution managers, policymakers, and regulators interested in financial institutions' efficiency.*

**Keywords:** efficiency, risk management, financial institutions, composite indices

**JEL classifications:** C61, G21, G22

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<sup>1</sup> PhD Student, University of Rijeka, Faculty of Tourism and Hospitality Management, Primorska 46, Ika p.p. 97, 51410 Opatija, Croatia. Teaching Assistant, Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković", Preradovićeve 1/1, 52100 Pula, Croatia. Scientific affiliation: risk management, insurance, financial institutions efficiency. E-mail: [dpetrovic@unipu.hr](mailto:dpetrovic@unipu.hr).

<sup>2</sup> Full Professor, University of Rijeka, Faculty of Tourism and Hospitality Management, Primorska 46, Ika p.p. 97, 51410 Opatija, Croatia. Scientific affiliation: corporate finance, risk management, behavioural finance. E-mail: [gorank@fthm.hr](mailto:gorank@fthm.hr).

## 1. Introduction

Financial institutions are essential in providing financial services to the private and public sectors. They serve as financial intermediaries that enhance capital allocation, thereby fostering economic growth and development. Furthermore, these institutions enable effective risk management, hedging, and pricing. Efficient financial institutions reduce the costs and risks associated with goods and services, contributing to economic growth and development (Herring and Santomero, 1995), while simultaneously improving the competitiveness of the financial system for optimal resource allocation.

Financial institutions can fail due to internal mismanagement or external factors such as market shocks, regulatory changes, pandemics, wars, political crises, and democratic instability (Mousavi et al., 2015). Research indicates that robust risk management and effective corporate governance enhance institutional resilience, although this may come at the expense of performance (Stulz, 2023). Identifying institutions with strong risk management practices is essential for investors seeking to increase their wealth. The survival of banks is crucial for economic developments, as it ensures the efficient transfer of financial resources (Kocenda and Iwasaki, 2021). For managers, a thorough understanding of risk management is vital for maintaining institutional resilience.

Berger and DeYoung (1997) identified that risk management influences efficiency through internal factors, such as managerial skills or *bad management* as well as external factors like market uncertainty, often referred to as *bad luck*. Increased cost (and profit) efficiency can result in mixed performance during market shocks (Assaf et al., 2019). Regulators emphasize stability and fairness underscoring the importance of information sharing among institutions with varying risk management capabilities to enhance macroprudential policies (Kim and Santomero, 1988; Herring and Santomero, 1995; Assaf et al., 2019). The public values efficiency for its role in reducing transaction costs and risks, while relying on institutional stability to prevent financial losses and crises. Trust and reputation are crucial for maintaining a stable financial system (Adeabah et al., 2022; van der Crujisen et al., 2023). Accurate bankruptcy prediction is essential for mitigating the impacts of crises, with survival analysis models demonstrating the most effective results, followed by linear probability and multivariate discriminant analysis models (Mousavi et al., 2015).

Since the survey conducted by Berger and Humphrey (1997), empirical studies on the efficiency of financial institutions have grown significantly, as noted in a recent review by Ardia et al. (2023). Bhatia et al. (2018) highlighted a growing focus on risk and uncertainty in bank efficiency, noting the most frequently employed methods as the Stochastic Frontier Approach (SFA) and the Data Envelopment Analysis (DEA). Recent studies by Elshandidy and Acheampong (2021), Bhatia

et al. (2018), and Ahmad et al. (2020) identified and examined various variables influencing efficiency and bank performance like risk and uncertainty, ownership, financial crisis, economics of scale, and failure to disclose risk information. The latest studies utilized composite indices as a tool for early warnings of systemic risks (Ellis et al., 2022; Gulati, 2022; Malafronte et al., 2018).

The main objective of this study is defined through the following research questions:

- RQ1: What are the most used methods employed in studies on the efficiency of financial institutions?
- RQ2: What are the most used variables for measuring the efficiency of financial institutions?
- RQ3: What are the most used measures of risk and efficiency for evaluating the impact of risk management on operational efficiency? Are composite indices utilized in the efficiency assessment of financial institutions?

Our systematic literature review (SLR) is based on the Web of Science (WoS) database and adheres to the journal quality criteria implemented by de Abreu et al. (2018) focusing on the Chartered Association of Business Schools ABS (2021) journal list categories of 3, 4, and 4\*. This SLR focuses on works that examine risk management and its impact on efficiency in banks and insurance companies. To our knowledge, this is the first review that explores risk management and composite indices within financial institutions efficiency. Additionally, we evaluate the strengths and weaknesses of parametric and non-parametric methods for estimating the efficiency of banks and insurance companies. Our findings aim to help improve decisions made by financial institutions, based on the interplay between risk management, efficiency, and stability.

This paper is structured as follows: Section 2 outlines the methodology and the search procedure. Section 3 presents the bibliometric analysis. Section 4 discusses the main findings, while Section 5 provides the conclusion.

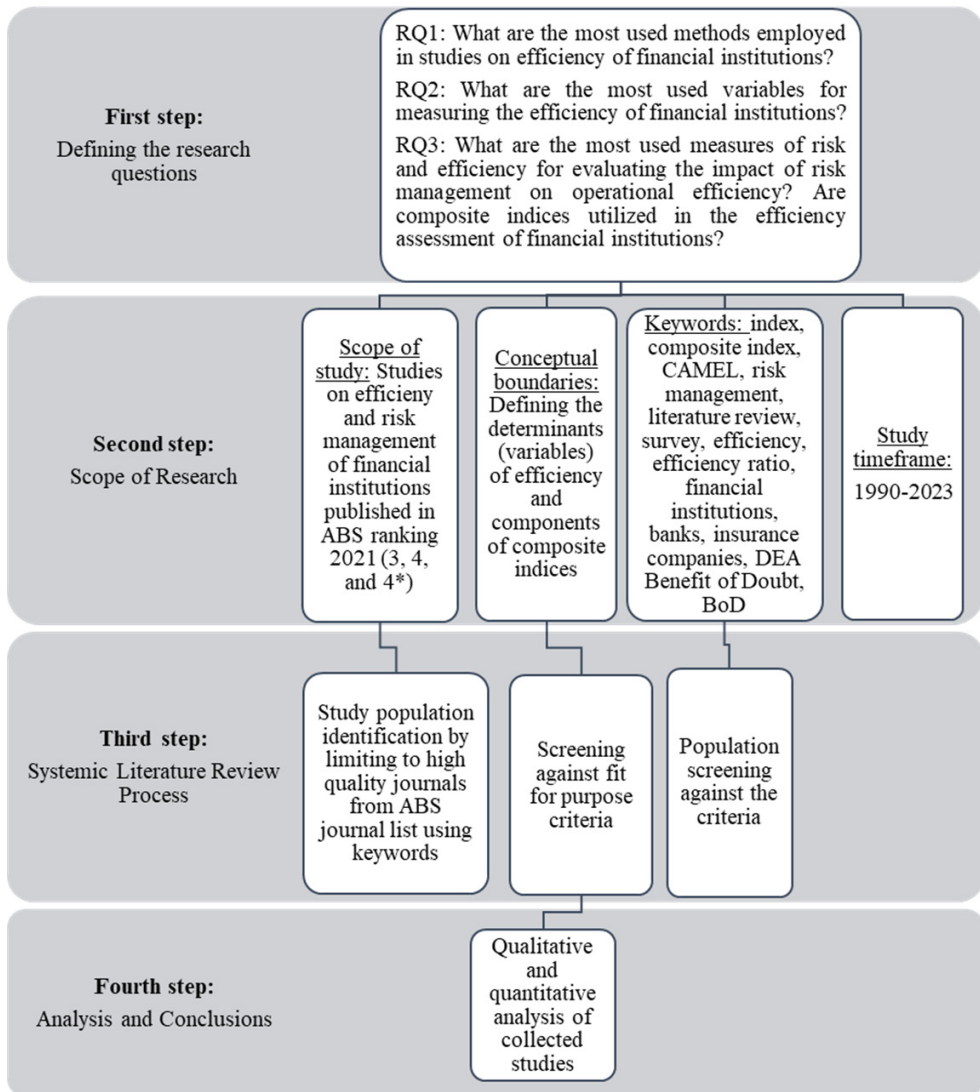
## **2. Methodology**

In retrospect to traditional literature reviews, SLRs are superior due to their structured and objective methodology (Figure 1).

Page et al. (2021) claim that SLRs mitigate subjectivity, bias, and personal judgment through clearly defined search methods, research questions, and data extraction techniques. SLRs not only synthesize existing knowledge but also help identify research gaps and guide future studies. This paper adopts the

*Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) framework. Following the work of Kuiziniene et al. (2022), Nazareth and Ramana Reddy (2023), and Shakeel et al. (2023), the authors apply the PRISMA stages: Identification, Screening, Eligibility, and Inclusion. This structured methodology enhances the review’s transparency and replicability, ensuring a rigorous and high-quality analysis.

Figure 1: Stepwise process of a SLR



Source: Authors’ construction according to the PRISMA framework by (Page et al., 2021)

## 2.1. Identification

To define a representative sample, authors in this study included published articles, reviews, and empirical studies in English from 1990 to 2023, while excluding conference proceedings, books, book chapters, working papers, early open-access publications, and unpublished studies. The focus on investigating only the WoS (Web of Science) database is based on studies by Martín-Martín et al. (2021), Visser et al. (2021), and Mongeon and Paul-Hus (2016) who reported a significant overlap of 80% to over 90% with the Scopus database. WoS is considered a gold standard for bibliometric studies (Birkle et al., 2020; Zhu and Liu, 2020). Following the guidelines established by Ali et al. (2023), Almeida and Gonçalves (2023), and de Abreu et al. (2019) our SLR focused on journals ranked 3, 4, and 4\* in the ABS (2021) list, a common quality criterion among UK academics (Walker et al., 2019). This categorization allows for an objective measure of study quality by focusing on highly rated journals (Ali et al., 2023; Ali and Wilson, 2023; Almeida and Gonçalves, 2023; de Abreu et al., 2019).

In this SLR, we selected 454 journals rated 3, 4, and 4\* from the ABS (2021) list. Followed by a manual search of the WoS database using a specific combination of keywords such as *index* OR *composite index* AND *CAMEL* (Capital Adequacy, Asset Quality, Management Efficiency, Earnings, Liquidity) AND *risk management literature review* OR *survey* AND *efficiency* OR *efficiency ratio* AND *financial institutions* OR *banks* OR *insurance companies*, as well as methodological terms *DEA* AND/OR *Benefit of Doubt* OR *BoD*. This search strategy yielded 19,383 results as of December 31<sup>st</sup>, 2023, with searches conducted between September and December 2023.

## 2.2. Screening

From the initial pool of 19,383 results, we used Excel's duplicate detection tool to eliminate 13,783 duplicate papers, which left us with 5,600 papers for the screening phase. The screening process, conducted alongside the identification phase, involved excluding papers beyond the scope of the study. By reviewing the titles and abstracts, 5,427 non-relevant studies were eliminated, resulting in a final sample of 173 studies, of which 120 (69%) are from rank 3 journals, 40 (23%) from rank 4, and 13 (8%) from rank 4\* journals.

## 2.3. Eligibility

To evaluate the eligibility of the full-text articles sample we have applied specific inclusion and exclusion criteria:

#### Inclusion Criteria:

- Studies that focus on the risk-adjusted efficiency of financial institutions.
- Studies that incorporate composite indices to measure the efficiency of financial institutions.
- Studies that outline and compare various methods for estimating efficiency.

#### Exclusion Criteria:

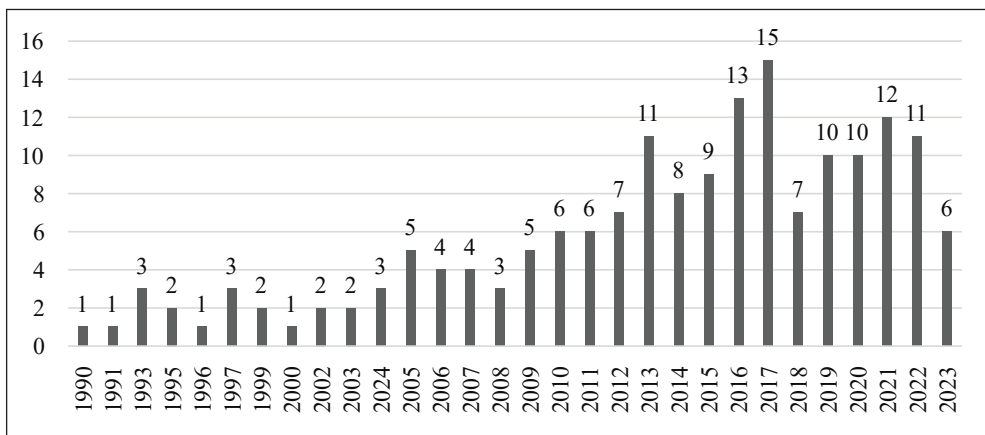
- Studies that have exclusively focused on the financial market from a macroeconomic perspective and deal with trading efficiency and stock price movements.
- Studies that do not focus on the efficiency of financial institutions, risk management, and composite indices in finance.
- Studies with unclear methodologies.

Among the 173 articles evaluated, 35 were identified as theoretical or conceptual, while 138 were classified as empirical studies and included in the bibliometric analysis (Figure A in the Appendix).

## 2.4. Inclusion

Bibliometric analysis involved the collection of author details, year of publication, journal, keywords, methods, variables, and results. Figure 2 illustrates the distribution of 173 published articles from 1990 to 2023. The highest number of articles was published in 2017 (15), followed by 2016 (13), 2021 (12), and both 2013 and 2022 with 11 alongside 2019 and 2020 with 10 articles.

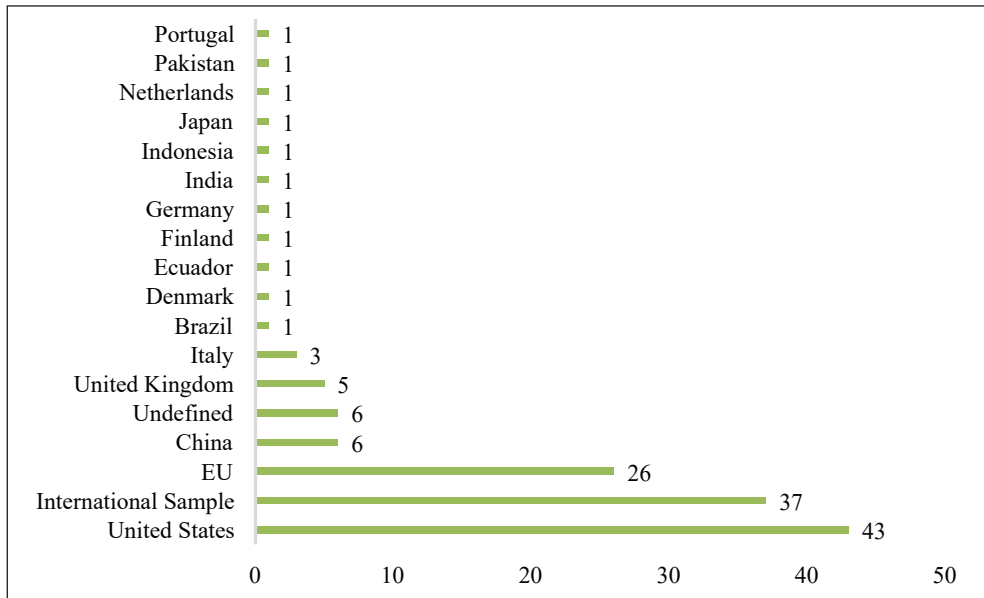
Figure 2: Temporal distribution of published articles



Source: Author's construction

Total of 541 authors contributed to these studies, with most papers co-authored by two authors (67 papers; 39%) or three authors (43 papers; 25%). Single-author studies accounted for 17% (30 papers), while 15% (26 papers) had four authors, and 3% (5 papers) had five authors. Only one study involved six (Babecký et al., 2014) and another seven authors (Mohsin et al., 2021). Figure 3 illustrates the geographical distribution of the 138 empirical studies reviewed. Among these, 43 studies (31%) focused on U.S. financial institutions, 37 studies (27%) utilized international samples, and 26 studies (19%) analysed data from European Union countries. Additionally, six studies (4%) concentrated on Chinese financial institutions, and five studies (4%) examined UK institutions, while the geographical area remained unidentified in six studies (4%).

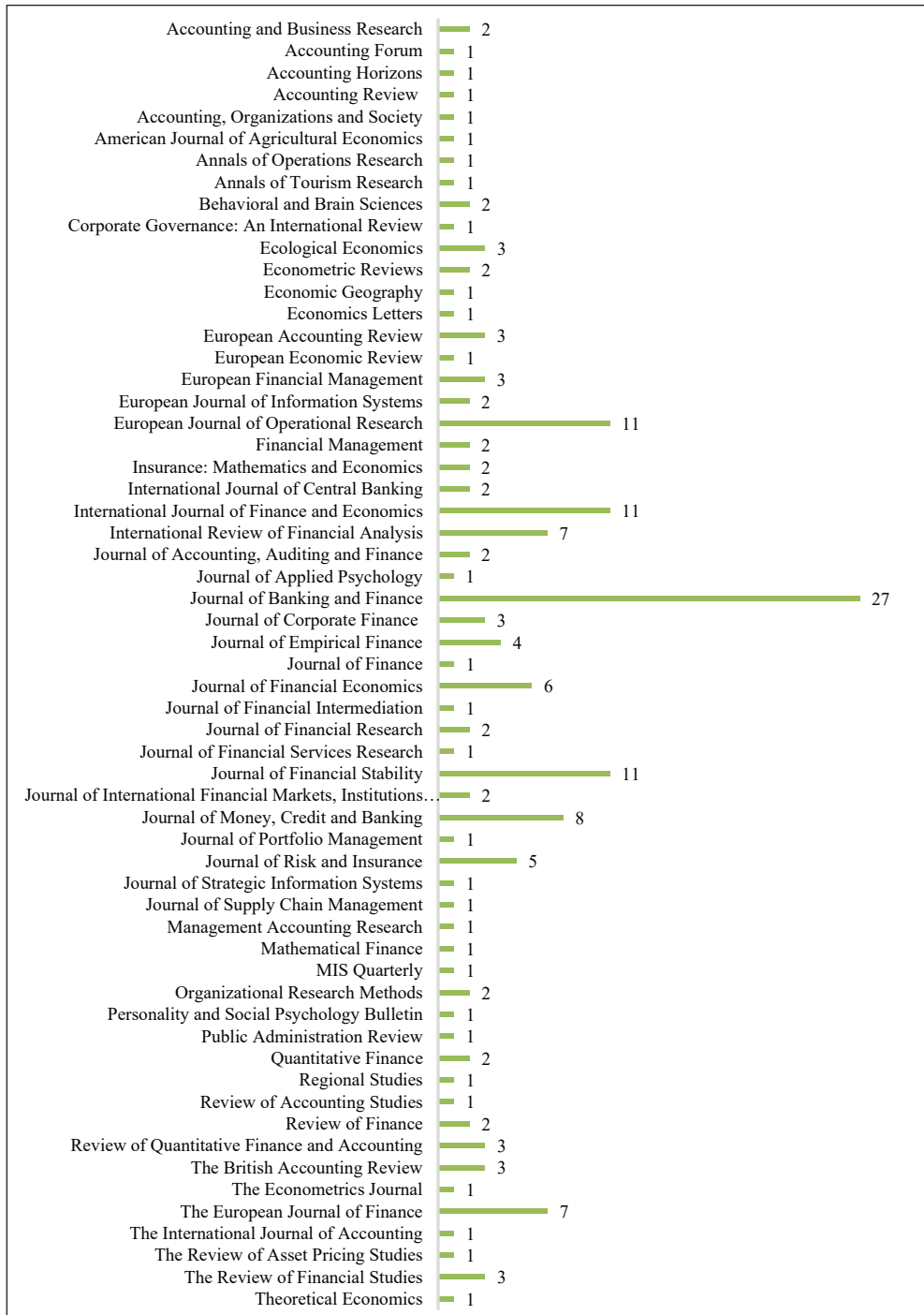
Figure 3: Geographical distribution of 138 empirical studies



Source: Author's construction

Out of the 173 studies, 59 were published at the top ranked journals according to the ABS (2021) list (Figure 4). *Journal of Banking and Finance* leads with 27 papers and boasts the highest citation count, followed by the *Journal of Financial Stability* (11 papers), the *International Journal of Finance and Economics* (11 papers), and the *European Journal of Operational Research* (11 papers). The *Journal of Money, Credit and Banking* published 8 papers, while both the *International Review of Financial Analysis* and the *European Journal of Finance* published 7 papers each.

Figure 4: Distribution of sampled empirical studies by publications in journals



Source: Author’s construction

Most cited studies are Landis et al. (2000) on composite measures (849 citations), Berger and DeYoung (1997) on problem loans and cost efficiency (828 citations), and Acharya et al. (2017) on systemic risk (741 citations). Followed by Berger et al. (2009) with 529, beside Bonin et al. (2005) with 514, and Abedifar et al. (2013) with 356 citations. Recently, studies on risk and financial stability such as Benoit et al. (2017), Schaeck and Cihák (2014), Altunbas et al. (2007) and Crook et al. (2007) each amassed over 200 citations.

Recent topics in literature concentrate on determinants of risk and its effects on financial institutions' efficiency and stability. Furthermore, the development and comparison of composite indices yield equal or greater insights than individual financial indicators, as noted by the OECD (2008). Composite indices are invaluable for policymakers and stakeholders, as they distil complex, multidimensional concepts into more comprehensible formats. Ghosh (2015) and Gambacorta and Shin (2018) examined the determinants of non-performing loans (NPLs) and the role of capital in monetary policy. Based on findings from this SLR, the most frequently cited authors are Allen Berger (Berger et al., 2009; Berger and Bonaccorsi di Patti, 2006; Berger and DeYoung, 1997; Berger and Humphrey, 1997; Berger et al., 1993) and Mamatzakis (Mamatzakis et al., 2023; Mamatzakis, 2015; Kalyvas and Mamatzakis, 2014; Mamatzakis and Bermpei, 2014), followed by Rogge (Rogge, 2018; Van Puyenbroeck and Rogge, 2018; Verbunt and Rogge, 2018).

### **3. Review of the sampled literature**

The primary advantage of employing PRISMA framework in a SLR is its focus on quality and transparency (Page et al., 2021). This framework guarantees a comprehensive presentation of commonly utilized methods, variables, and performance or efficiency metrics within the field, thereby enhancing the reliability and replicability of the research findings.

#### **3.1. Overview of the methods in financial institutions' efficiency estimation**

Financial institutions' efficiency is traditionally assessed using financial data from balance sheet and profit/loss statements, with a focus on profitability ratios such as return on assets (ROA) and return on equity (ROE). However, the efficiency ratio, which compares non-interest costs (overhead) to gross income, is a more suitable measure of efficiency (Fukuyama and Tan, 2022; Hays et al., 2009; Forster and Shaffer, 2005). Although financial indicators are widely accessible and relatively straightforward to interpret, they can sometimes be misleading. To mitigate this issue, parametric (SFA) and non-parametric (DEA) models are frequently employed (Murillo-Zamorano, 2004; Berger and Humphrey, 1997). Recent discussions by Učkar and Petrović (2021b) highlight that the efficiency of financial institutions is

influenced by various economic theories, including microeconomic theory, agency theory, and financial intermediation theory. Demsetz's (1973) efficient structure hypothesis suggests that institutions that operate more efficiently are likely to be more profitable and capture a larger market share. Both parametric and non-parametric methods are employed almost equally in efficiency estimation (Učkar and Petrović, 2021b; Berger and Humphrey, 1997).

The 138 empirical studies can be categorized into two groups (Table 1) based on frontier analysis: parametric studies (SFA) with 22 (15.94%) articles and 32 (23.19%) non-parametric studies (DEA). Additionally, econometric methods, such as OLS and panel regression were employed in most studies 84 (60,87%). Many studies, regardless of the model, conducted robustness tests on efficiency results through both static (OLS) and dynamic (GMM) panel data analyses. Studies using SFA and econometric models focus on the effects of regulation on bank performance (Barra et al., 2022; Ayadi et al., 2016; Kalyvas and Mamatzakis, 2014; Dimitras et al., 2018), on the effect of regulatory capital and bank failure (Abou-El-Sood, 2015), and the implementation of International Financial Reporting Standards (IFRS) by Kyiu and Tawiah (2023). SFA is also used to evaluate the impact of corporate governance on efficiency (Chen et al., 2021; Abedifar et al., 2013; Leventis et al., 2013), transparency and competition (Andrievskaya and Semenova, 2016). A major topic of SFA studies is the effect of mergers and acquisitions (M&A) on efficiency (Mamatzakis et al., 2023; Gang et al., 2018; Altunbas et al., 2007; Choi and Weiss, 2005; Williams and Gardener, 2003; Shaffer, 1993) that support Demsetz's (1973) efficient structure hypothesis. Nonetheless, studies by Mühlnickel and Weiss (2015), Amel et al. (2004), Cummins et al. (1999), and Fixler and Zieschang (1993) report contradictory results. Similar studies on M&A employ DEA methodology (Proaño-Rivera et al., 2023; Nippani and Ling, 2021; Učkar and Petrović, 2021a; McKee and Kagan, 2018; Pessarossi and Weill, 2015; Hadad et al., 2011). Followed by studies on regulation (Mohsin et al., 2021; Chortareas et al., 2016) and on the impact of risk on efficiency. Positive effects from adequate risk management on efficiency are reported by Stulz (2023), Lartey et al. (2021), Eling and Jia (2018), Mamatzakis and Bermpei (2014), and Chan et al. (2013) while Boussemart et al. (2019) reports negative effects.

Table 1: Parametric and non-parametric models

Model	Number of studies	Definition	Banks	Insurance Companies	Context
SFA	22/138 (15.94%)	SFA is the most widely used parametric method for estimating efficiency. Described by Berger and Humphrey (1997) as an econometric frontier approach it was introduced by Aigner et al. (1977), Battese and Corra (1977), and Meeusen and van Den Broeck (1977). This method is frequently modelled using a Cobb-Douglas production function (Williams and Gardener, 2003)	Agliardi et al. (2012), Altunbas et al. (2007), Barra et al. (2022), Berger et al. (2009), Bolt and Humphrey (2010), Bonin et al. (2005), Bos and Kool (2006), Dong et al. (2017), Fries and Taci (2005), Gang et al. (2014), Kalyvas and Mamatzakis (2015), Mamatzakis (2014), Mamatzakis and Bemppei (2014), Maudos et al. (2002), Mester (1996), Safullah and Shamsuddin (2019), Shamshur and Weill, (2019), Sun and Chang (2011), Williams, (2004), Williams and Gardener (2003), Zamore et al. (2023).	Mamatzakis et al. (2023)	The primary limitation of SFA is the necessity of a functional form and the relationships involving costs, profits, or production in relation to inputs, outputs, and environmental factors (Berger and Humphrey, 1997). Defining these relationships is relatively straightforward for goods producers, it becomes more complex for service providers, particularly in the financial sector. Depending on the model employed, variables such as deposits in banking or incurred claims in insurance may be classified as inputs, outputs, or both (Učkar and Petrović, 2021b). SFA necessitates compliance with sample size and distribution axioms due to its stochastic nature.
DEA	32/138 (23.19%)	DEA is a linear programming approach designed to optimize input-output efficiency. First introduced by Charnes et al. (1978) under the assumption of constant returns to scale (CRS), known as the CCR model. Banker et al. (1984) extended the model to account for variable returns to scale (VRS), also known as the BCC model.	Asmild and Zhu, (2016), Ayadi et al. (2016), Barth et al. (2013), Boussemart et al. (2019), Canhoto and Dermine (2003), Chan et al. (2013), Chang (1999), Chortareas et al. (2016), Chortareas et al. (2012), Eling and Jia (2018), Fukuyama and Tan (2022), Gaganis et al. (2021), González(2009), Hadad et al. (2011), Lartey et al. (2021) Maudos et al. (2002), McKee and Kagan (2018), Mohsin et al. (2021), Nippani and Ling (2021) Pessarossi and Weill (2015), Proaño-Rivera et al. (2023), Spokeviciute et al. (2019).	Cummins et al. (1999), Eling and Jia, (2018), Huang et al. (2011)	DEA methodology is widely utilized across various disciplines, including finance, due to its simplicity, versatility, and minimal assumptions regarding the inputs and outputs of decision-making units (DMUs). It is particularly well-suited for smaller sample sizes (Emrouznejad and Yang, 2018). Its primary limitation is the absence of a random error term, making it highly sensitive to inaccurate data. Inaccuracies are classified as DMU inefficiency rather than statistical noise. Consequently, studies typically employ a two-stage procedure or an econometric approach to further validate their results.

Source: Author's construction

Studies by Zamore et al. (2023), Tan and Tsionas (2022), Baule and Tallau (2021), Nippani and Ling (2021), Simper et al. (2019), and Marton and Runesson (2017) used NPLs, loan loss provisions (LLPs) and loan loss reserves (LLRs) as credit risk proxies and reported a positive relationship between risk management and efficiency. Furthermore, Alzayed et al. (2023) and Kumar et al. (2022) utilized the CAMEL framework to study the effect of corporate governance and risk management on efficiency. Abendschein and Grundke (2022) and Acharya et al. (2017) report that bank-specific variables are more relevant in less volatile markets. Bernard et al. (2019), Bohnert et al. (2018), and Lechner and Gatzert (2018) state that enterprise risk management is positively influenced by firm size and diversification (Lee and Li, 2012), therefore enhancing efficiency. Fredriksson and Moro (2014), Zhang et al. (2013), and Brewer and Jackson (2006) find that incorporating bank-specific risk variables diminishes the significance of the negative relationship between market concentration and performance, where lower-risk banks perform better.

### **3.2. Input and output data in efficiency estimation**

The selection of methods and variables for efficiency estimation is critical, as it significantly influences the reliability of results. Due to the absence of a consensus on the most effective approaches, efficiency studies yield varied outcomes (Aiello and Bonanno, 2018). Učkar and Petrović (2021b) highlighted the importance of evaluating key variables, particularly in sectors such as banking and insurance, where inadequate variable selection (e.g., deposits or incurred losses) can adversely affect empirical findings. Consequently, choosing appropriate variables is essential to prevent misleading conclusions.

Although there is no consensus, studies indicate some overlap in variables used in efficiency estimation as shown in Table 2 (Ahmad et al., 2020; Bhatia et al., 2018; de Abreu et al., 2018; Berger and Humphrey, 1997).

Table 2: Most common input and output variables

Model	Studies	Inputs	Outputs
SFA	Altunbas et al. (2007), Barra et al. (2022), Gang et al. (2018), Kalyvas and Mamatzakis (2014), Mamatzakis et al. (2023), Mamatzakis and Bermpei (2014), Pessarossi and Weill (2015), Williams and Gardener (2003), Zamore et al. (2023), Bolt and Humphrey (2010), Bos and Kool (2006), Mester (1996), Ruinan (2019), Safiullah and Shamsuddin (2019), Shamshur and Weill (2019), Srairi (2010), Williams (2004).	<i>Banks</i> : Loan-loss reserves; interest rate spread/3-year government bonds; operating expenses/total assets; number of employees; number of branches; loan loss reserves/gross loans (as proxy for risk); nonperforming loans; labour expenses; administrative expenses; interest expenses; non-interest expenses; total cost; administration expenses/total assets; net technical provisions/total assets; equity; assets; personnel expenses/total assets; total earning assets, total operating expenses/fixed assets; interest expenses/total assets; book value of equity/total assets; operating costs or overhead	<i>Banks</i> : ROA; ROE; current assets/current liabilities; loans (differentiated by type); services; securities; net claims paid; total investments; customer deposits; non-interest income; ordinary profits/sum of equity and reserves; net loans/total assets; ln (total assets);
DEA	Boussemart et al. (2019), Chan et al. (2013), Chortareas et al. (2016), Chortareas et al. (2012), Eling and Jia (2018), Hadad et al. (2011), Lartey et al. (2021), McKee and Kagan (2018), Mohsin et al. (2021), Nippani and Ling (2021), Pessarossi and Weill (2015), Proaño-Rivera et al. (2023), Barth et al. (2013), Canhoto and Dermine (2003), Chang (1999), Cummins et al. (1999), González (2009), Huang et al. (2011), Ruinan (2019), Spokeviciute et al. (2019)	<i>Insurance companies</i> : Total equity, total investments, operating costs, investment costs, claims incurred	<i>Insurance companies</i> : ROA; ROE; Earned premiums, investment income

Source: Author’s construction

The main approaches are the *intermediation approach*, which emphasizes the transfer of funds through deposits and premiums, and the *operating approach*, which focuses on financial operations. Inputs and outputs typically encompass balance sheet components such as total assets, loans, equity, and deposits, with income and expenses categorized by type (e.g., interest, non-interest, or incurred claims for insurance). Recent studies also use environmental factors (Breitenstein et al., 2021; Lozano-Vivas et al., 2002; Pastor et al., 1997), control variables for GDP, inflation, ownership and bank size (Barth et al., 2013; Sun and Chang, 2011; Srairi, 2010), and financial indicators such as ROA, ROE, and NPLs, LLRs and LLPs to account for credit risk (Bischof et al., 2022; Bhat et al., 2021; Chen et al., 2021; Afzal et al., 2020; Dong et al., 2017; Ghosh, 2015; Matousek et al., 2015; Leventis et al., 2013). For instance, Safiullah and Shamsuddin (2019) utilized common inputs and outputs and introduced risk proxies for operational risk (standard deviation of ROA), insolvency

risk (Altman's Z-score), credit risk (LLRs), and liquidity risk (liquidity ratios). Ferro and León (2018) report on a consensus on inputs (labour and capital) for insurance companies but note a lack of agreement on methodologies and variable combinations across studies (Aiello and Bonanno, 2018). Consequently, the results between studies vary significantly (de Abreu et al., 2019; Bhatia et al., 2018), thus complicating cross-study comparisons (Henriques et al., 2020).

### **3.3. Measures of risk and efficiency**

From our study, we may conclude that the effect of risk management on financial institutions has become a central focus of numerous studies. Mester (1996) noted that neglecting the influence of risk on efficiency could lead to misleading conclusions. Building on the work of Hughes and Mester (2008), Berger and DeYoung (1997), and Berger and Mester (1997), many studies have investigated risk-adjusted efficiency. Brewer and Jackson (2006) discovered that banks with lower NPLs tend to offer lower deposit rates. Sun and Chang (2011) and Chang (1999) demonstrated that risk measures (such as NPLs) significantly influence bank efficiency. Berger and DeYoung (1997) argued that cost efficiency during stable periods mitigates the risk of failure during crises, a viewpoint supported by Assaf et al. (2019), who emphasized the importance of cost efficiency over profit efficiency due to riskier investments.

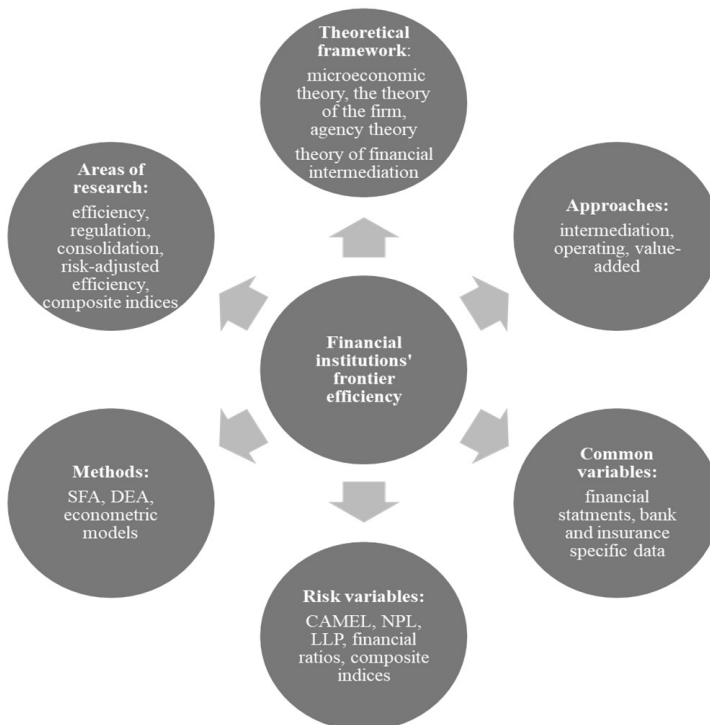
The results from our SLR show an uptake in the use of composite indices in efficiency estimation. When constructed properly, composite indices can effectively inform government policy. Unlike financial ratios, composite indices incorporate multiple components to summarize multidimensional concepts without sacrificing essential information (Purvis and Genovese, 2023). The PRISMA framework used in this SLR has identified several studies that utilized composite indices (Pinto et al., 2020; Rogge, 2018; Verbunt and Rogge, 2018; Acharya et al., 2017; Babecký et al., 2014; Schaeck and Cihák, 2014; Foster et al., 2013; Leventis et al., 2013; Groh et al., 2010; Sahoo and Acharya, 2010). Composite indices must be constructed with care, following the 10-step framework outlined in the OECD (2008) Handbook. A common challenge in constructing composite indices is determining the weight of each component (Foster et al., 2013). Some studies assign equal weights, while others base the weights on professional opinion, employing questionnaires to rank the importance of each component (Hatefi and Torabi, 2018). Paruolo et al. (2013) recommended utilizing Pearson's correlation coefficient to address issues related to weighting and aggregation while Choi (2023) proposed projected principal component analysis. To mitigate the limitations of equal weighting, more sophisticated methods have been employed, such as the ASW algorithm used by Elshandidy et al. (2024). The Benefit of Doubt (BoD) DEA model, introduced by Melyn and Moesen (1991), is frequently applied to minimize bias in the allocation of component weights (Gulati, 2023; Gulati et al., 2023; Maricic and Jeremic, 2023; Gulati et al., 2020; Färe et al., 2019; Rogge,

2018; Verbunt and Rogge, 2018; Van Puyenbroeck and Rogge, 2018; Cherchye et al., 2008). CAMEL framework has been adopted as a risk proxy in various studies (Alzayed et al., 2023; Kumar et al., 2022; Chen et al., 2021; Nippani and Ling, 2021; Afzal et al., 2020; Hwa et al., 2018; Beltratti and Paladino, 2016). Williams and O’Boyle (2011) and Landis et al. (2000) found that composite indices generally enhance model fit in structural equation models.

#### 4. Discussion

Utilizing the PRISMA framework, this study’s results indicate that DEA and SFA are the most frequently used methods for assessing efficiency in financial institutions, providing valuable insights for academics, investors, policymakers, managers, regulators, and the general public. The study focuses on identifying key input and output variables and explores the use of composite indices in constructing risk management indices and estimating risk-adjusted efficiency. Our findings, summarized in Figure 5, identify six key determinants of financial institutions’ efficiency.

Figure 5: Financial institutions’ frontier efficiency estimation framework



Source: Authors' construction

Depending on whether the intermediation or operating approach is employed, data is sourced from either the balance sheet or the income statement. Studies also incorporate bank and insurance company's specific data (such as ownership, employee count, and risk measures), macroeconomic indicators (including inflation and GDP), and environmental variables. The choice between a parametric and nonparametric model is contextual, as both have distinct advantages and limitations (Ahmad et al., 2020; Aiello and Bonanno, 2018; Bhatia et al., 2018; de Abreu et al., 2018; Murillo-Zamorano, 2004; Berger and Humphrey, 1997). Our SLR categorizes studies focusing on *efficiency* (Proaño-Rivera et al., 2023; Kumar et al., 2022; Nippani and Ling, 2021; Shamshur and Weill, 2019; Eling and Jia, 2018), the impact of *regulation* on efficiency (Kyi and Tawiah, 2023; Mohsin et al., 2021; Gambacorta and Shin, 2018; Pessarossi and Weill, 2015; Kalyvas and Mamatzakis, 2014; Barth et al., 2013), the effects of *consolidation* (Andrievskaya and Semenova, 2016; Mühlnickel and Weiss, 2015; Bolt and Humphrey, 2010; Amel et al., 2004; Cummins et al., 1999; Fixler and Zieschang, 1993), the role of *risk management* (Mies 2024, Sen, 2023; Zamore et al., 2023; Bhat et al., 2021; Boussemart et al., 2019; Lechner and Gatzert, 2018; Lee and Li, 2012), and the application of *composite indices* (Choi, 2023; Abendschein and Grundke, 2022; Gaganis et al., 2021; Gang et al., 2018; Mohanram et al., 2018; Acharya et al., 2017; Babecký et al., 2014; Schaeck and Cihák, 2014; Islami and Kurz-Kim, 2013; Hu et al., 2012). The diversity of financial institutions' efficiency is evident in the thematic map shown in Figure 6, which shows multiple connections between the 773 keywords used in 138 empirical studies.

Figure 6 not only provides a snapshot of the thematic diversity in financial institutions' studies but also highlights critical areas requiring further exploration. The largest cluster (red) is on risk and its impact on bank efficiency, competition, returns and financial stability which indicates the rising interest in risk-adjusted efficiency of financial institutions. The green cluster specifically focuses on technical efficiency, scale, cost efficiency and the effect of ownership on bank efficiency and other financial institutions. The blue cluster focuses on efficiency and performance of financial institutions including risk-taking, identifying DEA as one of the most important methods for efficiency estimation and composite indicators as a new avenue for efficiency studies. Methodological advancements in these areas could support the development of standardised metrics in efficiency estimation, allowing for direct ranking and comparability between financial institutions. The fourth cluster is denoted as yellow and outlines keywords such as determinants of bank efficiency, financial institutions, capital, earnings and cost management as the main topics of several empirical studies. The last cluster is purple and focuses on risk management, insurance, financial crisis and earnings which encompasses the consequences of inadequate risk management during the great financial crisis and more recently the collapse of Silicon Valley Bank.



## 5. Conclusion

Although numerous studies have synthesized the extensive literature on the efficiency of financial institutions, significant gaps remain in understanding the most utilized theories, methodologies, variables, and research domains. This systematic review further investigates risk-adjusted efficiency and expands comprehension of composite risk management indices, simultaneously elucidating new evidence on precise efficiency estimations. Ongoing challenges, such as the lack of consensus on approaches, methods, and variables, contribute to the heterogeneity observed within the literature. This review determines that parametric (SFA) and non-parametric (DEA) methods are the predominant techniques utilized for efficiency estimation (RQ1). Furthermore, it is anticipated that future developments will increasingly incorporate machine learning (ML) and artificial intelligence (AI) to overcome existing methodological limitations. Although significant progress has been made in the field, numerous challenges remain unresolved, including inconsistencies in the classification of variables, along with insufficient practices and broader considerations such as macroeconomic, environmental, and governance factors. Proxies, including non-performing loans (NPLs), loan loss provisions (LLPs), loan loss reserves (LLRs), capital ratios, and profitability ratios, have gained prominence in financial institutions efficiency studies (RQ2). However, further research is required to explore the practical implementation of these proxies. The growing use of composite indices shows potential for synthesizing complex multidimensional data into accessible metrics that assess risk-adjusted efficiency (RQ3).

This study provides several innovative contributions. First, it identifies the most commonly employed theories, methodologies, and variables in efficiency estimation, providing valuable insights into the current state of the field. Moreover, the focus on risk-adjusted efficiency and composite indicators makes this SLR unique in its approach to synthesise the large body of knowledge provided by studies on financial institutions efficiency. Secondly, this SLR not only outlines the current state of financial institutions efficiency but also highlights areas for improvement, including the integration of risk-adjusted efficiency measures and the formulation of composite indicators to enhance risk management quality ranking and comparability among financial institutions. The importance of this area of study cannot be overstated. The efficiency of financial institutions is fundamental for maintaining financial stability, fostering economic growth and enhancing institutional resilience. In an era marked by rising risks and systemic shocks such as war conflicts, trade wars, biohazard threats and technological disruptions, a deeper understanding of the risk-adjusted efficiency of financial institutions is more important than ever. Additionally, the growing significance of cryptocurrencies and blockchain technology adds to this complexity. This study lays a foundation for addressing future challenges and provides valuable insights for both researchers and policyholders.

Future research should prioritize illuminating the existing lack of consensus concerning key variables, specifically deposits in the banking sector and incurred claims in the insurance industry. Additionally, further studies are encouraged to explore the influence of risk management practices in conjunction with environmental, social, and governance (ESG) factors on the efficiency of financial institutions. The methodological limitations of DEA and SFA outlined in this study can be improved by integrating ML and AI techniques to incorporate an error term in nonparametric models and specify an adequate production function specifically tailored to financial institutions. It is vital for future studies to prioritize the implementation of composite indices in efficiency estimation, particularly the development of Risk Management Indices (RMI). These indices could significantly enhance decision-making processes by providing standardized measures of risk management quality and facilitating comparability across institutions. The findings from this study are valuable to regulators as the advancements in risk-adjusted efficiency could refine regulatory frameworks, including Basel IV and Solvency II. These improvements could also strengthen early warning systems and support macroprudential objectives aimed at ensuring financial stability, thus supporting policyholders macroprudential goals. An understanding of risk-adjusted efficiency provides managers with valuable insights into best practices in risk management, thereby facilitating the identification of critical areas for improving operational performance. The RMI could provide a basis for practical insights in identifying institutions that possess a competitive advantage in cost management and financial stability. By addressing these priorities, future research has the potential to bridge the gaps identified in this review, stimulate the development of innovative methodologies, and provide guidance to stakeholders in their pursuit of more accurate and meaningful efficiency estimations within financial institutions.

The findings of this study provide several practical implications for policymakers and regulators by providing insights into the most important methodologies in efficiency estimation, as well as new trends in estimating risk-adjusted efficiency and the use of composite indices. The advancements in risk-adjusted efficiency indices, including the development of RMIs, can advise the refinement of regulatory frameworks such as Basel IV and Solvency II. The development of standardized measures of risk management quality, such as the proposed RMIs could be of support to policymakers in achieving their macroprudential objectives of an efficient and stable financial system by enhancing early warning systems and reducing the probability of financial institutions failures. On a similar note, financial institution managers could be motivated by the insights provided in this study to estimate risk-adjusted efficiency and leverage insights from studies to identify best practices in risk management and operational performance. Thus, the development of RMIs would serve as benchmarks for assessing and improving cost management and financial stability.

While this study provides valuable insights, it is not without limitations. By focusing exclusively on risk-adjusted efficiency of financial institutions, it excludes studies on the efficiency of entire financial systems and those examining ESG factors. Although this exclusion was intentional to maintain a clear scope, it highlights areas for improvement in future studies. Additionally, the reliance on studies published in high-quality journals, as identified by the ABS journal guide, and the sole focus on the WoS database may have excluded relevant studies from other sources, such as Scopus. Limitations of this study, also, could be identified in its geographical scope, as regions such as Africa and Latin America remain underrepresented. Despite the outlined limitations, we believe that this SLR contributes to the understanding of financial institutions efficiency while defining new research paths for future scholars.

Finally, this study contributes to a deeper understanding of financial institutions' efficiency and offers a novel area for future research. By addressing the identified gaps, researchers can develop more standardised and innovative approaches to efficiency estimation. Policymakers, in turn, can leverage these advancements to design more effective regulatory frameworks, ensuring the resilience and stability of financial systems. The integration of risk-adjusted efficiency metrics into decision-making processes represents a crucial step forward, fostering a more robust and sustainable financial system.

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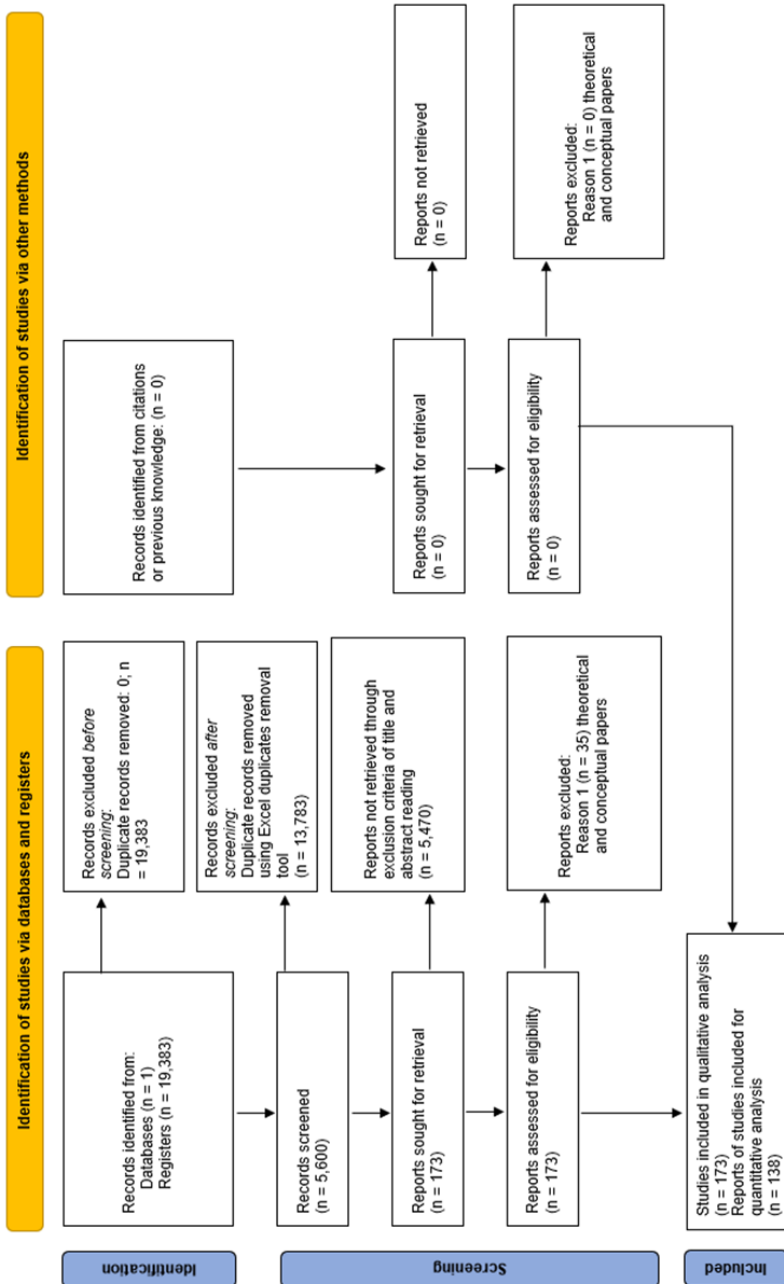
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## Appendix

Figure A: PRISMA Flow Diagram



Source: Author's construction based on Page et al. (2021)

## Efikasnost financijskih institucija: Sistematski pregled literature

Danijel Petrović<sup>1</sup>, Goran Karanović<sup>2</sup>

### Sažetak

U ovom istraživanju provodi se sistematski pregled literature utjecaja upravljanja rizicima na efikasnost financijskih institucija. Koristeći se PRISMA metodom, analizirano je 173 članaka objavljenih u razdoblju od 1990. do 2023. godine i to u časopisima rangiranim prema Akademskom vodiču časopisa objavljenom od strane Udruge poslovnih škola u 2021. godini. Rezultati pokazuju kako se parametarski i ne parametarski modeli podjednako koriste u procjeni efikasnosti financijskih institucija. Rezultati istraživanja ističu ograničenja spomenutih metodologija, kako i nedostatak konsenzusa u klasifikaciji varijabli. Rezultati također pokazuju kako se recentna empirijska istraživanja prvenstveno usmjeravaju na efekte spajanja i pripajanja, regulaciju i upravljanje rizicima na efikasnost banaka i osiguravajućih društava. Analizom recentnih empirijskih istraživanja ističe se trend razvijanja i uporabe kompozitnih indeksa u procjeni efikasnosti. Rezultati ovog istraživanja mogu biti od koristi akademikima, istraživačima, menadžerima financijskih institucija, regulatorima i kreatorima monetarne politike čiji je interes efikasnost financijskih institucija.

**Ključne riječi:** efikasnost, upravljanje rizicima, financijske institucije, kompozitni indeksi

**JEL klasifikacija:** C61, G21, G22

<sup>1</sup> Doktorand, Sveučilište u Rijeci, Fakultet za menadžment u turizmu i ugostiteljstvu, Primorska 46, Ika p.p. 97, 51410 Opatija, Hrvatska. Asistent, Sveučilište Jurja Dobrile u Puli, Fakultet ekonomije i turizma „Dr. Mijo Mirković“, Preradovićeve 1/1, 52100 Pula, Hrvatska. Znanstveni interes: upravljanje rizicima, osiguranje, efikasnost financijskih institucija. E-mail: dpetrovic@unipu.hr.

<sup>2</sup> Redoviti profesor, Sveučilište u Rijeci, Fakultet za menadžment u turizmu i ugostiteljstvu, Primorska 46, Ika p.p. 97, 51410 Opatija, Hrvatska. Znanstveni interes: korporativne financije, menadžment rizika, bihevioralne financije. E-mail: gorank@fthm.hr.

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## Institutions and economic growth in European post-transition economies\*

*Predrag Trpeski<sup>1</sup>, Gunter Merdzan<sup>2</sup>, Kristijan Kozeski<sup>3</sup>*

### **Abstract**

*This paper discusses the role of institutions in economic growth in selected European post-transition economies. During the 1990s, Central and Eastern European countries faced challenges adapting their political and economic systems to keep up with a rapidly changing global landscape. They needed new institutions like regulations, social norms, and organisations to support a capitalist economy. These institutions provide a framework for economic activity and guide individuals to act in ways that align with economic goals. They are crucial for creating a stable environment for economic growth, promoting investment and innovation, and reducing uncertainty, which is essential for economic success. To analyse this, we conduct an econometric analysis of 16 European post-transition countries from 1998-2019 using fixed-effect, Arellano and Bond's first difference GMM estimator, and the system GMM estimator. The results indicate that institutions significantly impact economic growth.*

**Keywords:** *institutions, economic growth, European post-transition countries*

**JEL classification:** *O17, O43, O47, O57*

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<sup>1</sup> *Full professor, Ss. Cyril and Methodius University in Skopje, Faculty of Economics – Skopje, Blvd. Goce Delcev 9-V, 1000 Skopje, Republic of North Macedonia. Scientific affiliation: economics, labour economics. E-mail: predrag.trpeski@eccf.ukim.edu.mk.*

<sup>2</sup> *Teaching and research assistant, Ss. Cyril and Methodius University in Skopje, Faculty of Economics – Skopje, Blvd. Goce Delcev 9-V, 1000 Skopje, Republic of North Macedonia. Scientific affiliation: economic development, institutional economics. E-mail: gjunter.merdzan@eccf.ukim.edu.mk.*

<sup>3</sup> *Teaching and research assistant, Ss. Cyril and Methodius University in Skopje, Faculty of Economics – Skopje, Blvd. Goce Delcev 9-V, 1000 Skopje, Republic of North Macedonia. Scientific affiliation: microeconomics, labor economics. E-mail: kozeski@eccf.ukim.edu.mk.*

## 1. Introduction

In endogenous growth theory, technological knowledge is included as a factor of production in the aggregate production function, alongside labour and physical capital. Unlike the traditional neoclassical model, growth in these models is driven primarily by accumulating knowledge, which has unique characteristics such as being a nonrival and partially exclusive good. Since it is an impure public good, it generates positive externalities that boost production efficiency, and production efficiency encourages growth. This leads to increased returns on the scale, resulting in growth in output per capita. However, accumulating knowledge alone is insufficient for quality economic growth. Converting knowledge into new goods and services is equally important. Healthy institutions facilitate this conversion and promote economic growth and development.

North and Thomas (1973) highlighted that factor accumulation and innovation are important for growth but only immediate factors. They believed that the primary explanation for comparative growth lies in institutional differences. North (1987; 1990) defined institutions as *the rules of the game in a society or, more formally, humanly devised constraints that shape human interaction*. Economic institutions, such as property rights and perfect markets, play a crucial role in economic growth. These institutions impact the structure of economic incentives in society and help allocate resources to their most efficient uses. On the other hand, political institutions determine the distribution of political power in a society and how individuals can exercise political power. Different political regimes encourage varying economic institutions and policies, leading to different economic outcomes.

Rodrik (2000; 2007) defines institutions as rules of behaviour designed by humans that govern and shape interactions. These rules help individuals form expectations about other people's actions. Rodrik also identifies five categories of economic institutions: property rights, regulatory institutions, macroeconomic stabilisation institutions, social security institutions, and conflict management institutions. In addition, he mentions two types of political institutions: participatory political institutions such as democracies and autocratic political institutions. Rodrik argues that political institutions are crucial in determining a country's regime.

Although there is not a clear agreement on why some countries have higher per capita income than others, most research suggests that institutional differences and property rights play a significant role. Countries with better institutions and more secure property rights tend to invest more in physical and human capital, using these resources more efficiently to increase their income levels (Acemoglu et al., 2014). Differences in institutions between countries are often explained by the endogenous nature of institutions, which means they are determined by society as a whole or individuals, depending on the distribution of political power in society, among other theories.

The CEE countries selected were formerly communist or socialist and have implemented political, economic, and institutional reforms over the past three decades. These reforms have allowed them to become more integrated into the global economy, leading to faster economic growth and improved living standards. As a result, this sample is ideal for analysing the role of institutions in their economic growth, as some countries have achieved higher levels of development than others. This difference in development can be attributed to the institutions in place in these countries, which have shaped their economic landscape. Furthermore, the CEE countries serve as a useful case study for other nations looking to replicate their success.

Using an econometric model, this paper tests the hypothesis that institutions play a significant role in the economic growth of 16 European post-transition countries. In addition to common variables for growth regression, we use economic freedom and governance indicators to proxy institutional quality. Our contribution is that while the importance of institutions for economic growth is widely recognised, research on the impact of institutions in the CEE region is relatively rare.

The introduction is followed by a review of the empirical literature, which provides an overview of relevant studies on the impact of institutions on economic growth. The literature will be categorised into several groups based on the influence of institutions on economic growth. The third part explains the methodology of the empirical research conducted. It describes the data and variables in the model and conducts a descriptive analysis. The fifth part presents the results and discusses their implications. The concluding observations summarise the key findings of the research and suggest potential areas for future study.

## **2. Literature review**

Numerous studies in literature have explored the relationship between institutions and economic growth. While there is no consensus on the exact nature of this interaction, most evidence suggests that institutions play a significant role in improving economic growth. For instance, research has found that soft factors such as property rights, freedom from corruption, and market freedom can explain differences in GDP per capita dynamics across countries. Additionally, institutional quality has been found to positively impact economic growth and mitigate competition brought about by trade openness (Cermakova et al., 2020). Studies also highlight the importance of improving institutions for sustained growth, particularly in developing economies. These findings suggest that countries should prioritise building better institutions to promote economic growth.

Nguyen et al. (2018) studied the impact of institutional quality on economic growth in 29 emerging economies. They find that institutional quality significantly

impacts economic growth and can mitigate the competition brought by trade openness. Human capital and reduced corruption are key measures for boosting growth. Experts recommend improving institutional transparency and building better institutions to promote economic growth in developing countries (Liaquat et al., 2018). Masuch et al. (2017) provide empirical evidence that the quality of institutions is an important determinant of long-term growth in European countries. They highlight the negative impact of high government debt coupled with low institutional quality on growth and the potential of good institutions to alleviate the debt problem. Asghar et al. (2020) investigate the impact of institutional quality on economic growth in developing economies of Asia. They find a positive impact of institutional quality on economic growth, with causality running from institutions to growth. Sumanjeet (2015) discusses the role of institutions in economic growth and emphasises the need for improved institutional transparency to reduce corruption and promote economic growth. Sarwar et al. (2013) examine the relationship between institutions and economic growth in South Asia. They find a significant positive effect of institutions on economic growth and suggest that countries should focus on building better institutions for development.

Some authors argue that institutional changes can negatively impact a country's economic growth. For instance, a study by Campos et al. (2019) on Brazil's history from 1870 to 2003 revealed that formal and informal political instability can negatively affect economic growth, with varying short-term and long-term effects. Another analysis by Akinlo (2016) examined data from sub-Saharan Africa and found that institutions may hinder growth, while human capital and money supply can have a positive influence. However, physical capital and interest rates may have a negative impact on economic growth.

Research has investigated the impact of economic institutions on the growth of post-transition economies in Europe. In a recent study by Javadov et al. (2022), the effect of economic institutions on the growth of selected post-Soviet countries was analysed. The findings suggest that economic institutions play a significant role in economic growth in these countries. The study revealed that factors such as corruption control, political globalisation, and the human development index positively impact growth. At the same time, trade openness, total natural resources rent, and foreign direct investment (FDI) contribute to the overall economic growth. A similar study by Piątek (2016) found that countries with poorer institutions before the financial crisis experienced faster economic growth. Still, this growth did not lead to changes in state institutions. Institutional aspects such as property rights, rules and regulations, good governance, and the state have been emphasised in both old and new institutional economics as alternative approaches to economic problems. In the case of transition economies, institutional aspects are even more critical for economic development. Therefore, it is crucial to consider the significance of institutions when building efficient institutions for long-term growth, as institutions matter.

Recent research suggests that the impact of institutions on economic growth is multidimensional, encompassing factors such as infrastructure, investments, remittances, and more. For example, a study by Zergawu et al. (2020) analysed panel data from 99 countries between 1980 and 2015 to examine the impact of infrastructure capital and institutional quality on economic growth. Through a simple growth model incorporating these factors and interaction terms, they found a positive and significant impact on economic growth. In particular, improving institutional quality is crucial for maximising returns from infrastructure capital. Similarly, Catrinescu et al. (2009) argue that remittances contribute more to long-term growth in countries with better political and economic institutions. Zghidi et al. (2018) also found strong evidence of a positive relationship between remittances and economic growth in a study of four North African countries. Additionally, Busse and Hefeker (2007) identified several significant determinants of foreign direct investment inflows, including government stability, internal and external conflicts, corruption and ethnic tensions, law and order, democratic government, and quality of bureaucracy.

### **3. Data and methodology**

In this section, we delve into the details of the data, variables, and methodology used to investigate the impact of institutions on economic growth in 16 Central and Eastern European countries. We introduce the data and variables employed for the empirical analysis, followed by a comprehensive overview of the methodology adopted for data analysis.

#### **3.1. Data and variables**

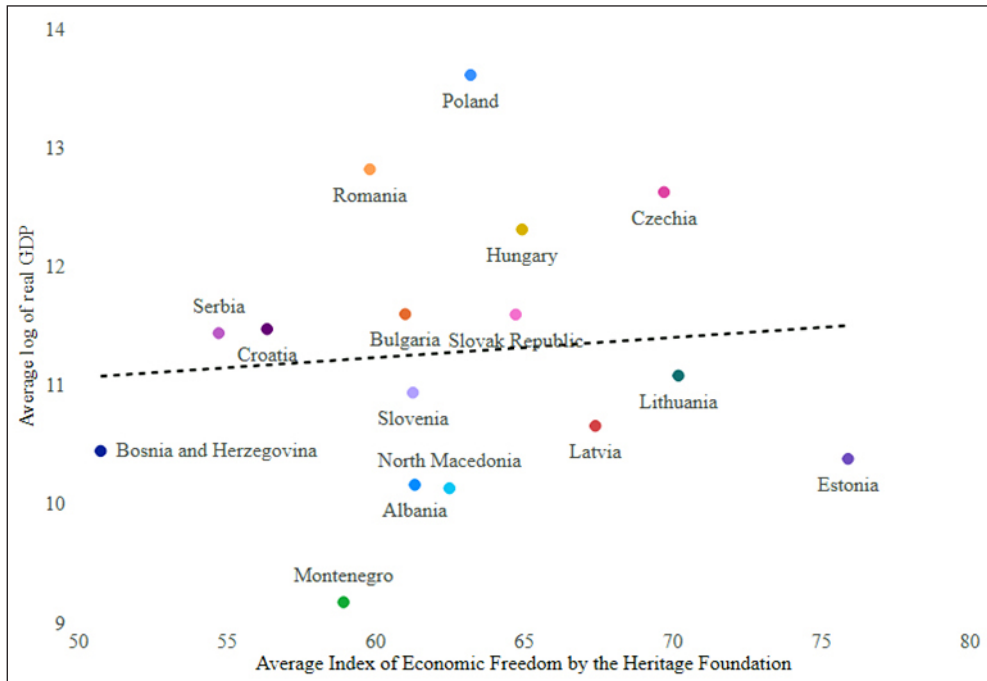
We examine the role of institutions in economic growth in selected 16 European post-transition countries in the period 1998-2019 by analysing a reliable set of economic indicators from reputable international organisations. The sample for analysis consists of 16 countries from Central and Eastern Europe. These countries are the following: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Montenegro North Macedonia, Poland, Romania, Serbia, Slovak Republic and Slovenia.

Our main measure of economic growth is Gross Domestic Product at constant 2017 national prices (in millions of 2017 US dollars) from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023). We use the Index of Economic Freedom from the Heritage Foundation (2021), Economic Freedom from the Fraser Institute (2021), World Governance Indicators from the World Bank (2023) and the Corruption Perception Index from Transparency International (2023) to assess the country's institutional quality. We use these measures because they are widely accepted as reliable indicators of economic growth and institutional quality.

The Index of Economic Freedom is a comprehensive measure used by the Heritage Foundation (2021) to assess the institutional quality of selected European post-transition countries. It is a comprehensive index that evaluates a country's economic freedom based on 12 quantitative and qualitative factors, including property rights, government integrity, and regulatory efficiency. The Index of Economic Freedom ranges from 0 to 100, with higher scores indicating greater economic freedom. The Heritage Foundation (2021), an American conservative think-tank, has been publishing the index annually since 1995, and it is widely recognised as a reliable source for assessing the institutional quality of a country.

The scatter chart below (Figure 1) depicts the relationship between the average Index of Economic Freedom from the Heritage Foundation (2021) and the average real GDP using a logarithmic scale for countries in the sample over the analysed period. The trend line reveals a positive correlation between economic freedom and real GDP, suggesting that policies fostering freedom can enhance economic performance. Nonetheless, it is essential to remember that correlation does not equate to causation, and other variables can also influence GDP.

Figure 1: Scatter chart of the average Index of Economic Freedom versus the average logarithm of real GDP in the period 1998-2019



Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023) and The Heritage Foundation (2021)

The positive correlation in the scatter chart implies that countries with greater economic freedom tend to enjoy higher economic prosperity. This association indicates that measures to bolster economic freedom, such as reducing regulatory burdens, safeguarding property rights, ensuring government integrity, and promoting free trade, can cultivate an environment conducive to economic expansion. When businesses operate with fewer constraints and secure rights over their assets, they are more inclined to invest, innovate, and expand. These actions, in turn, drive heightened productivity and growth, thereby contributing to an increased real GDP.

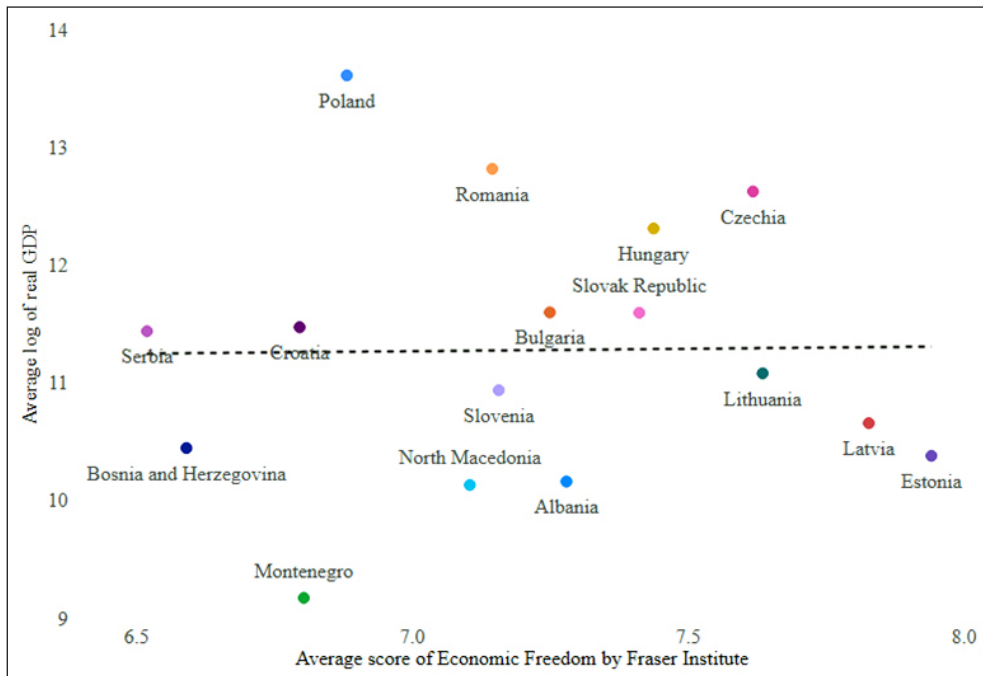
When evaluating institutional quality in European post-transition countries, the Economic Freedom score from the Fraser Institute (2021) is often used as a reliable measure. This score is based on five key economic freedom areas: the size of government, legal system and property rights, sound money, freedom to trade internationally, and regulation. The Economic Freedom score ranges from 0 to 10, where higher scores indicate greater economic freedom in a particular country. Similar to the Index of Economic Freedom from the Heritage Foundation, the Economic Freedom score from the Fraser Institute (2021) is widely accepted as a credible indicator of institutional quality.

Figure 2 shows the relationship between average economic freedom and average real GDP using a logarithmic scale for countries in the analysed sample period, using the Economic Freedom Index from the Fraser Institute (2021). The trend line indicates a positive correlation between economic freedom and real GDP, suggesting that policies promoting freedom can improve economic performance. In this chart, the positive correlation is still evident, although the trend seems more moderate compared to the previous chart using the Heritage Foundation's (2021) index. This implies that while economic freedom is still linked to higher economic prosperity, the strength of this relationship may vary depending on the specific measures of economic freedom used.

The more moderate trend in the Fraser Institute (2021) chart suggests that the impact of economic freedom on GDP may not be as strong as indicated by the Heritage Foundation's (2021) index. It could be due to differences in the components and weightings of each index. The Fraser Institute (2021) may consider additional factors or place varying emphasis on aspects of economic freedom, leading to a slightly less steep correlation. Comparing the two charts highlights the importance of understanding the methodologies behind different indices. The Heritage Foundation's (2021) index showed a stronger positive trend, suggesting a more direct link between economic freedom and GDP. In contrast, the Fraser Institute's (2021) index indicates that while the relationship is still positive, other factors might play a more significant role, or the impact of economic freedom is more nuanced.

These differences emphasise the need for policymakers to consider multiple perspectives when assessing economic conditions. Integrating insights from various economic freedom indices can achieve a more comprehensive and balanced understanding. This approach ensures that economic policies are well-informed and tailored to address a country’s specific needs and circumstances, ultimately promoting more sustainable economic growth.

Figure 2: Scatter chart of the average Economic Freedom score versus the average logarithm of real GDP in the period 1998-2019



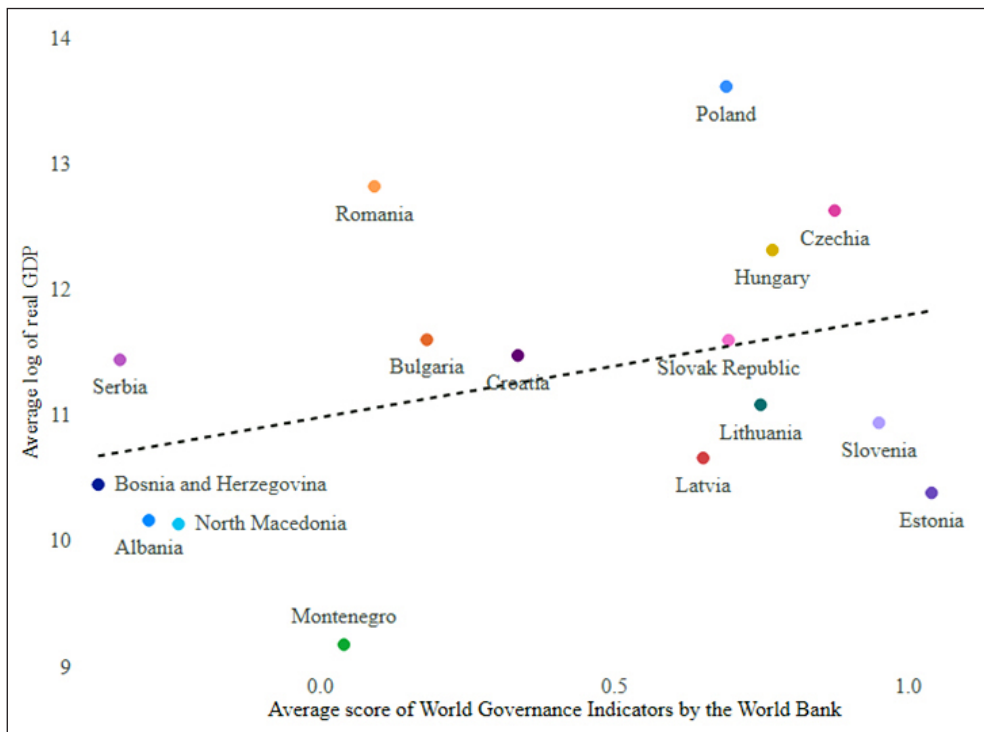
Source: Authors’ calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023) and The Fraser Institute (2021)

The World Governance Indicators evaluate a country’s institutions based on six categories: voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. We have averaged the six categories into one. The World Governance Indicators range from -2.5 to 2.5, with higher scores indicating better institutional quality.

The scatter chart below (Figure 3) illustrates the relationship between the average score of World Governance Indicators by the World Bank (2023) and the average real GDP, using a logarithmic scale for countries over the analysed period. The

trend line shows a positive correlation between governance quality and real GDP, suggesting that policies promoting good governance can enhance economic performance. This correlation indicates that improving governance quality, such as enhancing the rule of law, controlling corruption, ensuring regulatory quality, and maintaining political stability, can create an environment conducive to economic growth. Effective governance provides a stable and predictable environment for economic activities, encourages investment, and fosters sustainable development, leading to increased real GDP.

Figure 3: Scatter chart of the average World Governance Indicators score versus the average logarithm of real GDP in the period 1998-2019



Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023) and the World Bank (2023)

A comparison of the Economic Freedom Index from both the Heritage Foundation (2021) and the Fraser Institute (2021) reveals a stronger positive correlation between governance quality and real GDP. While economic freedom is crucial, effective governance appears to have a more substantial impact on economic prosperity. The trend line in this chart is steeper, indicating that improvements in governance quality are more closely linked to increases in GDP.

The Heritage Foundation's (2021) index showed a strong positive correlation between economic freedom and GDP, suggesting a direct link between economic policies that promote freedom and economic performance. However, the Fraser Institute's (2021) index displayed a more moderate trend, indicating that the impact of economic freedom on GDP might be less pronounced when measured by this index. In contrast, the World Governance Indicators (World Bank, 2023) chart shows the strongest positive correlation, implying that governance quality may be more critical in determining economic prosperity.

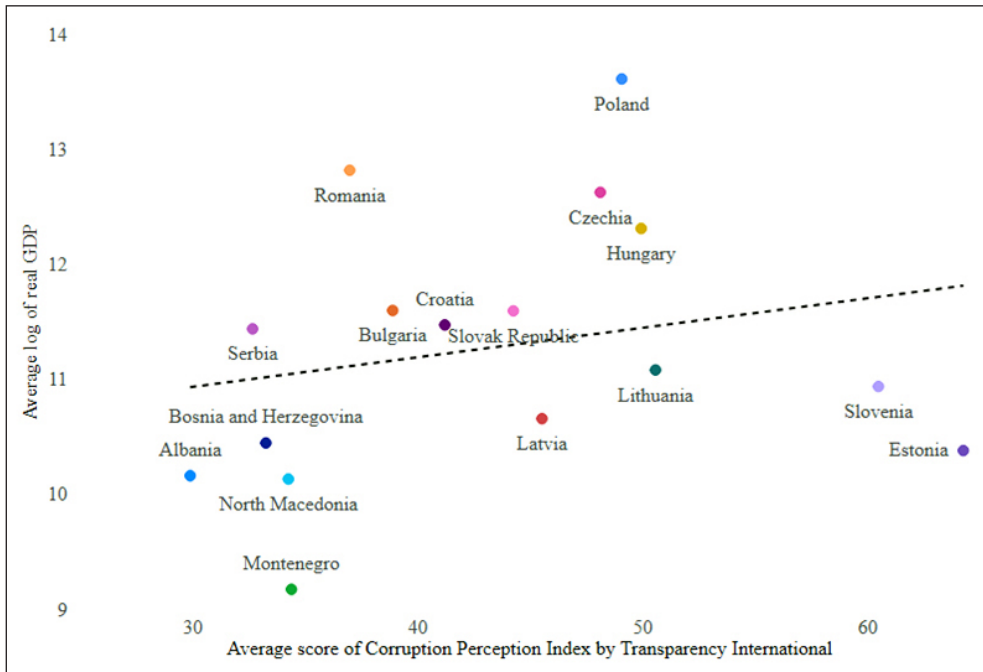
These comparisons highlight the multifaceted nature of economic growth. While economic freedom contributes significantly to economic performance, governance quality encompasses broader factors that provide a foundation for sustainable growth. Effective governance ensures a fair and predictable environment, reducing risks and uncertainties that can hinder economic activities.

For policymakers, these insights emphasise the need for a balanced approach considering economic freedom and governance quality. By improving governance alongside promoting economic freedom, countries can create a more robust environment for economic activities, fostering long-term growth and stability. Integrating insights from various indices, such as those from the Heritage Foundation (2021), Fraser Institute (2021), and World Bank (2023), provides a comprehensive understanding of the factors driving economic prosperity. This holistic approach is essential for designing well-informed policies that address multiple dimensions of development, ultimately leading to sustainable economic growth.

As mentioned earlier, the Corruption Perception Index from Transparency International (2023) is utilized to measure the quality of institutions in the selected European post-transition countries. This index evaluates the level of corruption in a country's public sector based on expert opinions and surveys. The CPI ranges from 0 to 100, where higher scores indicate lower levels of corruption. It is widely regarded as a reliable indicator of institutional quality, and many studies have examined its correlation with economic growth.

Figure 4 illustrates the connection between the average score of the Corruption Perception Index by Transparency International (2023) and the average real GDP, using a logarithmic scale for countries in the sample over the analysed period. The trend line demonstrates a positive correlation between the perception of lower corruption and real GDP, suggesting that reducing corruption can positively impact economic performance. This correlation indicates that reducing corruption, which enhances transparency and accountability, can create an environment conducive to economic growth. When corruption is perceived to be low, businesses encounter fewer obstacles, leading to increased investment and sustainable development. These actions drive higher productivity and growth, increasing real GDP.

Figure 4: Scatter chart of the average Corruption Perception Index versus the average logarithm of real GDP in the period 1998-2019



Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023) and The Transparency International (2023)

When comparing this chart with previous ones using the Economic Freedom Index from the Heritage Foundation (2021), the Fraser Institute (2021), and the World Governance Indicators (World Bank, 2023), it is clear that the positive correlation between lower corruption perception and GDP is significant. However, the trend is less pronounced than the World Governance Indicators (World Bank, 2023). The Heritage Foundation (2021) and Fraser Institute (2021) indices displayed varying strengths of positive correlation with GDP, with the World Governance Indicators (World Bank, 2023) showing the strongest correlation.

These comparisons highlight that while economic freedom and governance quality are crucial, the perception of corruption also plays a vital role in economic prosperity. Effective anti-corruption measures can enhance trust and stability, both essential for economic activities. Policymakers should consider integrating anti-corruption strategies with efforts to improve economic freedom and governance quality, creating a comprehensive approach that fosters a robust environment for economic growth. This holistic strategy ensures that economic policies are well-informed, addressing multiple facets of development to achieve sustainable economic prosperity.

It is important to acknowledge that while economic freedom, governance quality, and low corruption play significant roles in driving economic performance, they are not the only factors at play. Numerous other variables influence a country's economic outcomes. For instance, a country with high economic freedom but low political stability may struggle to attract investment or sustain growth. Likewise, strong infrastructure and a skilled workforce can enhance the benefits of economic freedom by boosting productivity and efficiency. In this context, we use regression analyses to test the relationship between institutional variables and economic growth, considering physical capital, human capital, population, trade, and inflation variables.

Given these complexities, policymakers need to adopt a comprehensive approach when developing economic policies. While increasing economic freedom is crucial, it must be accompanied by strategies that address other critical aspects of economic development. For instance, improving educational systems can create a more skilled labour force that drives innovation and economic growth. Additionally, investing in infrastructure can lower transaction costs and enhance market access, maximizing the benefits of economic freedom. Maintaining political stability and strengthening institutions can create a more predictable and secure environment for economic activities. This holistic approach ensures that the potential benefits of economic freedom are fully realised and sustained over the long term. Additionally, monitoring and evaluating policy impacts are essential for making data-driven adjustments and effectively responding to emerging challenges and opportunities.

The positive correlation between economic freedom, governance quality, low corruption, and real GDP highlighted in the previous scatter charts underscores the importance of policies that promote economic freedom. However, for these policies to be most effective, they must be part of a broader strategy that addresses various dimensions of economic development. By adopting a multifaceted approach, policymakers can establish a strong foundation for sustainable economic growth and prosperity.

Descriptive statistics for variables used in the full sample from 1998-2019 are presented in Table 1. We use the capital stock at constant 2017 national prices (in millions of 2017 US dollars) as a measure of capital. Effective employment is calculated by multiplying the number of people engaged in employment (in millions) with the human capital index. The human capital index is based on years of schooling and returns to education from the Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023). However, due to data scarcity in Bosnia and Herzegovina, Montenegro, and North Macedonia, the human capital index is calculated only based on gross enrollment in tertiary education. Missing data is calculated using the linear interpolation method. As other control variables, we use inflation measured by the annual percentage of consumer prices from the World Bank (2023) World Development Indicators as a measure of macroeconomic stability, trade openness as a sum of exports and imports as

a percentage of GDP from the World Bank (2023) database, and population in millions from the Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023).

Table 1: Descriptive statistics of the variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Real GDP (in millions of 2017 US dollars)	352	153,457.2	212,124.3	6,532.507	1,214,222
Capital (in millions of 2017 US dollars)	352	588,657.4	617,964.1	19,850.78	2,887,940
Employment (in millions)	352	3.125	3.836	0.176	16.212
Human capital	352	3.146	0.28	2.584	3.849
Index of Economic Freedom (HF)	352	62.682	7.994	29.4	79.1
Economic Freedom (FI)	352	7.213	0.573	5.281	8.22
World Governance Indicators (WB)	352	0.365	0.507	-1.214	1.234
Corruption Perception Index (TI)	352	43.378	11.737	13	74
Inflation	352	4.925	8.851	-1.584	95.005
Trade openness	352	106.229	32.700	22.492	189.804
Population (in millions)	352	7.641	9.311	0.613	38.568

Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023), The Heritage Foundation (2021), The Fraser Institute (2021), the World Bank (2023) and the Transparency International (2023)

Table 2 indicates the strength and direction of the relationships between the variables. The correlation coefficients range from -1 to 1, where -1 indicates a perfect negative correlation, 0 indicates no correlation, and 1 indicates a perfect positive correlation. As can be seen from the table, there is a positive and statistically significant correlation between real GDP and institutional quality measures, such as the Index of Economic Freedom, World Governance Indicators, and Corruption Perception Index. In addition, a positive and significant correlation exists between real GDP and capital, employment and human capital. This suggests that countries with better institutions and more physical and human capital have higher economic growth. This relationship is further supported by countries with higher economic growth, which tend to have better institutional quality and greater investments in capital, employment, and human capital.

On the one hand, there is a clear negative correlation between real GDP and inflation and trade openness. The negative correlation between real GDP and inflation is not surprising, as inflation reduces the value of money, which results in less money being available for consumer spending, ultimately leading to reduced economic growth. Concerning trade openness, the negative correlation can be explained by the gradual closure of economies following the global financial crisis in 2008.

Table 2: Correlation matrix of the variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Real GDP	1.00										
(2) Capital	0.88*	1.00									
(3) Employment	0.95*	0.82*	1.00								
(4) Human capital	0.28*	0.49*	0.17*	1.00							
(5) Index of Economic Freedom (HF)	0.12*	0.23*	0.01	0.59*	1.00						
(6) Economic Freedom (FI)	0.01	0.15*	-0.12*	0.55*	0.85*	1.00					
(7) World Governance Indicators (WB)	0.25*	0.38*	0.16*	0.71*	0.66*	0.59*	1.00				
(8) Corruption Perception Index (TI)	0.20*	0.27*	0.07	0.71*	0.69*	0.64*	0.84*	1.00			
(9) Inflation	-0.03	-0.03	0.14*	-0.24*	-0.36*	-0.45*	-0.27*	-0.31*	1.00		
(10) Trade openness	-0.11*	0.06	-0.24*	0.65*	0.59*	0.61*	0.63*	0.65*	-0.34*	1.00	
(11) Population	0.94*	0.78*	0.99*	0.12*	-0.04	-0.16*	0.12*	0.03	0.11*	-0.28*	1.00

Note: \* denotes significance level at 10%

Source: Authors’ calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023), The Heritage Foundation (2021), The Fraser Institute (2021), the World Bank (2023) and the Transparency International (2023)

The correlation matrix suggests that institutional quality, good governance, capital, employment efficiency and openness to trade play a crucial role in driving economic growth in European post-transition countries. However, further analysis is required to investigate the relationship between these factors and their impact on economic growth. The study aims to determine whether these factors have a significant statistical impact on economic growth and its direction.

### 3.2. Empirical methodology

We use the neoclassical Solow growth model (Solow, 1956) in the form of the Cobb-Dougllass production function to understand the role of institutions in economic growth in the selected 16 European post-transition countries from 1998 to 2019. The Solow growth model is a widely accepted economic theory that explains economic growth through the accumulation of capital and technological progress. The Cobb-Dougllass production function is a specific formulation of the Solow growth model that assumes constant returns to scale to capital and labour inputs. It is expressed as:

$$Y = A \times K^\alpha \times (hL)^{1-\alpha} \quad (1)$$

where Y is output, K is capital, hL is effective labour, A is total factor productivity, and  $\alpha$  is the share of capital in total income.

Using an extended growth model, we aim to examine how institutional quality affects economic growth. We expand upon the Solow model by introducing institutional quality and other control variables as explanatory variables to measure their impact on economic growth.

$$\ln y_{it} = C + \gamma \ln y_{it-1} + \delta \text{INST}_{it} + \lambda \ln X_{it} + \mu_i + \eta_t + u_{it} \quad (2)$$

where  $\ln y_{it}$  is the log value of real GDP,  $\ln y_{it-1}$  is lagged log value of GDP,  $\text{INST}_{it}$  is one of the institutional variables mentioned above,  $\ln X_{it}$  is log value of control variables used in the model in a concrete country i, in a certain period t.  $\mu_i$  is the country fixed effect and  $\eta_t$  is the period effect.

There are multiple methods to assess equation. The ordinary least squares method and fixed effect are the most straightforward and convenient techniques. But, because  $\ln y_{it-1}$  is correlated  $\mu_i$ , estimating the above equation with these methods produces a biased estimate. Using the difference between variables in the original data can be an alternative to solve this issue.

$$\Delta \ln y_{it} = \gamma \Delta \ln y_{it-1} + \delta \Delta \text{INST}_{it} + \lambda \Delta \ln X_{it} + \Delta \eta_t + \Delta u_{it} \quad (3)$$

To tackle the issue of endogeneity, this study employs the Arellano and Bond (1991) first difference GMM estimator and/or the system GMM estimator (Arellano and Bover, 1995; Blundell and Bond, 1998) to estimate the parameters.

## 4. Results and discussion

The table below (Table 3) displays the findings of our econometric analysis, where we used the Index of Economic Freedom by the Heritage Foundation (2021) to gauge the country's institutional quality. Our dependent variable is the logarithm of real GDP, and we have included all the independent and control variables. We used various estimation techniques, such as pooled OLS, fixed effect, Arellano and Bond first difference GMM, and system GMM, as mentioned earlier.

The Index of Economic Freedom coefficient is statistically significant at 1% in the fixed effect model. This suggests a positive relationship between economic freedom and real GDP growth. The coefficient value is 0.004, meaning that a one-unit increase in the index boosts real GDP by an average of 0.004% while holding all other variables constant. This finding aligns with the idea that greater economic

freedom creates a favourable environment for business operations, leading to increased productivity and growth. Empirical studies indicate that improvements in economic freedom, such as reduced government intervention and enhanced property rights, stimulate economic activities by promoting entrepreneurship and attracting foreign investment (de Haan and Sturm, 2000; Dawson, 2003).

Table 3: Results from the regression model using the Index of Economic Freedom by the Heritage Foundation (2021) as a measure of institutional quality

Dependent variable: RGDP (log)	Pooled OLS	Fixed effect	Difference GMM	System GMM
Real GDP (-1) (log)	-	-	0.009 (0.987)	0.066 (0.091)
Capital (log)	0.231*** (0.028)	0.328*** (0.038)	-0.08 (0.093)	-0.14*** (0.027)
Effective employment (log)	0.429*** (0.068)	0.479*** (0.071)	0.111* (0.063)	0.11** (0.046)
Index of Economic Freedom (HF)	0.003 (0.002)	0.004*** (0.001)	-0.001** (0.0004)	-0.001 (0.001)
Inflation	-0.007*** (0.001)	-0.003*** (0.0006)	0.0003*** (0.0001)	0.0002 (0.0001)
Trade openness	0.003*** (0.0004)	0.003*** (0.0003)	0.002*** (0.0003)	0.002*** (0.0003)
Population (log)	0.404*** (0.059)	-0.936*** (0.149)	0.745 (0.951)	0.065* (0.034)
Constant	6.454*** (0.323)	7.136*** (0.513)	-	1.382*** (0.286)
R-squared	0.971	0.869	-	-
F-test	1,949.85***	364.70***	-	-
AR (2) test	-	-	-1.99*	-2.073**
Sargan test	-	-	11.414	10.24

Note: \*, \*\*, \*\*\* denotes significance levels at 10%, 5% and 1%, respectively

Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023), The Heritage Foundation (2021), the World Bank (2023)

The pooled OLS model has a positive, but not statistically significant, coefficient of 0.003 for the Index of Economic Freedom. This suggests a potential positive relationship between economic freedom and GDP levels. However, the lack of statistical significance implies that this relationship might not be robust in this estimation method. The significant positive coefficient in the fixed effect model indicates that economic freedom consistently benefits GDP growth when accounting for unobserved heterogeneity.

The first difference in the GMM model shows a negative, yet statistically significant, coefficient of  $-0.001$ . The negative coefficient might indicate that while economic freedom is associated with higher GDP levels, its marginal effect on GDP growth diminishes over time, particularly in economically free and developed countries. This could reflect the saturation effect, where additional increments in economic freedom yield smaller growth benefits. Countries with a higher Index of Economic Freedom are typically more developed nations and tend to have lower economic growth rates (Knack and Keefer, 1995). The contrasting findings between different models might explain the varying sensitivity to short-term versus long-term effects of institutional quality on economic performance, as Acemoglu et al. (2001) discussed. While the fixed effect model captures the immediate benefits of economic freedom on GDP, the dynamic GMM models highlight the complexities of sustaining growth in mature economies where the marginal returns to improvements in economic freedom might diminish (Rodrik et al., 2004).

In the system GMM model, the Index of Economic Freedom coefficient is negative ( $-0.001$ ) and not statistically significant. This might suggest that in the context of dynamic panel data accounting for potential endogeneity, the direct impact of economic freedom on GDP growth is less clear-cut. The system GMM method addresses potential biases in the estimations by using lagged variables as instruments, providing a more robust analysis of the dynamic relationships. The mixed results across different models underscore the complexity of the relationship between institutional quality and economic performance, where short-term dynamics might obscure long-term benefits and vice versa.

Capital input significantly and positively affects real GDP growth in the pooled OLS and fixed effect models, indicating that increased capital investment is crucial for economic growth. The positive relationship underscores the importance of capital accumulation in enhancing production capacity and economic output (Mankiw et al., 1992). However, the negative coefficient in the system GMM model may reflect diminishing returns to capital or potential measurement issues in dynamic panel data settings. Effective employment consistently exhibits a positive and significant impact across all models, highlighting the critical role of labour force efficiency in driving economic growth. This suggests that better workforce utilisation, possibly through education and training, significantly contributes to higher GDP levels (Barro, 1991). Inflation shows mixed effects, with a negative and significant coefficient in the OLS and fixed effect models, aligning with the typical understanding that higher inflation hampers growth (Fischer, 1993). This negative impact of inflation on growth can be attributed to the uncertainty and reduced purchasing power it creates, deterring investment and consumption. Conversely, trade openness consistently has a positive influence on real GDP, demonstrating that greater integration into global markets fosters economic development by expanding

market opportunities and facilitating technology transfer (Edwards, 1998). Population effects are mixed, possibly reflecting the diverse impacts of demographic changes on different economies. While a larger population can provide a greater labour force and consumer base, it may also strain resources if not managed effectively (Bloom and Canning, 2001).

Table 4: Results from the regression model using the Economic Freedom score by the Fraser Institute (2021) as a measure of institutional quality

Dependent variable: RGDP (log)	Pooled OLS	Fixed effect	Difference GMM	System GMM
Real GDP(-1) (log)	-	-	0.157* (0.081)	0.063 (0.089)
Capital (log)	0.238*** (0.028)	0.328*** (0.034)	-0.054 (0.106)	-0.163*** (0.032)
Effective employment (log)	0.474*** (0.066)	0.453*** (0.07)	0.062 (0.069)	0.11*** (0.04)
Economic Freedom (FI)	-0.027 (0.028)	0.078*** (0.019)	0.013 (0.008)	0.016** (0.006)
Inflation	-0.008*** (0.001)	-0.002*** (0.001)	0.0002 (0.0002)	0.0003 (0.0002)
Trade openness	0.003*** (0.0004)	0.003*** (0.0003)	0.001*** (0.0001)	0.002*** (0.0002)
Population (log)	0.348*** (0.056)	-0.88*** (0.149)	1.06 (1.029)	0.088** (0.037)
Constant	6.802*** (0.341)	6.809*** (0.482)	-	1.488*** (0.309)
R-squared	0.971	0.872	-	-
F-test	1,944.21***	374.84***	-	-
AR (2) test	-	-	-1.654*	-2.059**
Sargan test	-	-	14.475	10.128

Note: \*, \*\*, \*\*\* denotes significance levels at 10%, 5% and 1%, respectively

Source: Authors' calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023), The Fraser Institute (2021), the World Bank (2023)

In the following regression analysis (Table 4), we used the Economic Freedom score from the Fraser Institute (2021) as a proxy for the country's institutional quality. In the fixed effect model, the Economic Freedom score from the Fraser Institute (2021) shows a statistically significant coefficient at 1%, indicating a positive relationship between economic freedom and real GDP growth. The coefficient value is 0.078, suggesting that a one-unit increase in the Economic Freedom score boosts real GDP by an average of 0.078%, holding all other variables constant. This

aligns with the notion that greater economic freedom, characterised by minimal government intervention and strong property rights, promotes a favourable business environment, enhancing productivity and economic growth. The pooled OLS model, however, shows a negative. However, there is no statistically significant coefficient of  $-0.027$  for the Economic Freedom score, suggesting a potential negative relationship that lacks robustness in this estimation method. The fixed effect model's significant positive coefficient underscores the consistent benefits of economic freedom on GDP growth when unobserved heterogeneity is accounted for.

The first difference in the GMM model presents a positive but not statistically significant coefficient of  $0.013$ . This indicates that while economic freedom is associated with higher GDP levels, its effect on GDP growth is less clear in this model, possibly due to the dynamic nature of economic freedom's impact over time. This could reflect the complexities of institutional quality affecting short-term versus long-term economic performance. Countries with higher Economic Freedom scores typically experience different growth dynamics, and the marginal effects might vary depending on their development stage. The varying results between different models might be explained by their sensitivity to short-term versus long-term effects, as Acemoglu et al. (2001) discuss. The fixed effect model captures immediate benefits, while dynamic GMM models highlight the nuanced and potentially diminishing returns in mature economies (Rodrik et al., 2004).

In the system GMM model, the Economic Freedom coefficient is positive and statistically significant at 5%, with a value of  $0.016$ . This indicates that, in a dynamic context accounting for potential endogeneity, an increase in the Economic Freedom score leads to an average increase of  $0.016\%$  in the real GDP growth rate. The system GMM method, by addressing biases using lagged variables as instruments, provides a robust analysis of the dynamic relationships between economic freedom and GDP growth. This model's positive and significant coefficient underscores the importance of institutional quality in fostering economic growth over time despite potential short-term complexities.

Regarding control variables, capital and effective employment consistently impact real GDP growth, similar to the previous model. Capital input significantly and positively affects real GDP growth in the pooled OLS and fixed effect models, while the system GMM model shows a negative coefficient. Effective employment consistently shows a positive and significant impact across all models. Inflation has mixed effects, with a negative and significant coefficient in the OLS and fixed effect models. Trade openness consistently positively influences real GDP across all models. Population effects are mixed, reflecting diverse impacts in different economies.

The World Governance Indicators have a significant impact on economic growth (Table 5). In the fixed-effect model, the World Governance Indicators (WGI) from the World Bank (2023) show a statistically significant coefficient at 1%, indicating a positive relationship between governance quality and real GDP growth. The coefficient value is 0.264, suggesting that a one-unit increase in the WGI boosts real GDP by an average of 0.264%, holding all other variables constant. This result supports the view that strong governance, characterised by effective government institutions, regulatory quality, and the rule of law, creates a stable environment conducive to economic growth (Kaufmann et al., 2009). The pooled OLS model also shows a positive and statistically significant coefficient of 0.252 for the WGI, further underscoring the positive impact of good governance on economic performance. The fixed-effect model’s significant positive coefficient highlights the consistent benefits of robust governance on GDP growth when accounting for unobserved heterogeneity.

Table 5: Results from the regression model using the World Governance Indicators from the World Bank (2023) as a measure of institutional quality

Dependent variable: RGDP (log)	Pooled OLS	Fixed effect	Difference GMM	System GMM
Real GDP(-1) (log)	-	-	0.102* (0.059)	0.056 (0.091)
Capital (log)	0.183*** (0.027)	0.385*** (0.028)	-0.145*** (0.043)	-0.157*** (0.026)
Effective employment (log)	0.309*** (0.063)	0.447*** (0.065)	0.132*** (0.033)	0.14*** (0.026)
World Governance Indicators (WB)	0.252*** (0.034)	0.264*** (0.03)	-0.03** (0.015)	-0.016 (0.022)
Inflation	-0.005*** (0.001)	-0.002*** (0.0006)	0.0002* (0.0001)	0.0001 (0.0001)
Trade openness	0.002*** (0.0004)	0.003*** (0.0003)	0.001*** (0.0002)	0.002*** (0.0002)
Population (log)	0.558*** (0.056)	-0.614*** (0.141)	-0.135 (0.398)	0.05 (0.032)
Constant	7.299*** (0.302)	6.155*** (0.448)	-	1.550*** (0.254)
R-squared	0.975	0.891	-	-
F-test	2,251.89***	449.30***	-	-
AR (2) test	-	-	-2.066**	-2.096**
Sargan test	-	-	13.598	12.063

Note: \*, \*\*, \*\*\* denotes significance levels at 10%, 5% and 1%, respectively

Source: Authors’ calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023), the World Bank (2023)

The first difference in the GMM model presents a negative, yet statistically significant, coefficient of -0.03. It suggests that while governance quality is associated with higher GDP levels, its marginal effect on GDP growth diminishes over time, particularly in well-governed and developed countries. It may indicate a saturation effect, where additional improvements in governance yield smaller growth benefits. The mixed results between different models might be explained by their sensitivity to short-term versus long-term effects of governance quality on economic performance (Rodrik et al., 2004). While the fixed-effect model captures the immediate benefits of good governance on GDP, the dynamic GMM models highlight the complexities of sustaining growth in mature economies where the marginal returns to improvements in governance might diminish.

The system GMM model's WGI coefficient is negative (-0.016) and not statistically significant. This suggests that in the context of dynamic panel data accounting for potential endogeneity, the direct impact of governance quality on GDP growth is less clear-cut. The system GMM method, by addressing biases using lagged variables as instruments, provides a robust analysis of the dynamic relationships between governance quality and GDP growth. The mixed results across different models underscore the complexity of the relationship between institutional quality and economic performance, where short-term dynamics might obscure long-term benefits.

Regarding control variables, capital and effective employment consistently impact real GDP growth, similar to the previous model. Capital input significantly and positively affects real GDP growth in the pooled OLS and fixed-effect models, while the system GMM model shows a negative coefficient. Effective employment consistently shows a positive and significant impact across all models. Inflation has mixed effects, with a negative and significant coefficient in the OLS and fixed-effect models. Trade openness consistently positively influences real GDP across all models. Population effects are mixed, reflecting diverse impacts in different economies.

The Corruption Perception Index has a positive and statistically significant impact on real GDP growth (Table 6). In the fixed-effect model, the Corruption Perception Index (CPI) from Transparency International (2023) demonstrates a statistically significant coefficient at 1%, indicating a positive relationship between corruption perception and real GDP growth. The coefficient value is 0.006, suggesting that a one-unit increase in the CPI boosts real GDP by an average of 0.006%, holding all other variables constant. This result supports the view that lower corruption levels (higher CPI scores) create a more conducive environment for economic growth by fostering trust in institutions and reducing transaction costs (Mauro, 1995). The pooled OLS model also shows a positive and statistically significant coefficient of 0.013 for the CPI, further underscoring the positive impact of lower corruption on economic performance. The fixed-effect model's significant positive coefficient highlights the consistent benefits of reducing corruption on GDP growth when accounting for unobserved heterogeneity.

Table 6: Results from the regression model using the Corruption Perception Index from Transparency International (2023) as a measure of institutional quality

Dependent variable: RGDP (log)	Pooled OLS	Fixed effect	Difference GMM	System GMM
Real GDP (-1) (log)	-	-	0.128 (0.089)	0.077 (0.11)
Capital (log)	0.191*** (0.025)	0.361*** (0.03)	-0.109* (0.063)	-0.142*** (0.027)
Effective employment (log)	0.3*** (0.058)	0.336*** (0.07)	0.112* (0.059)	0.121** (0.05)
Corruption Perception Index (TI)	0.013*** (0.001)	0.006*** (0.001)	-0.001 (0.001)	-0.001 (0.001)
Inflation	-0.005*** (0.001)	-0.002*** (0.001)	0.0003** (0.0001)	0.0001 (0.001)
Trade openness	0.002*** (0.0004)	0.003*** (0.0003)	0.001*** (0.0002)	0.002*** (0.0002)
Population (log)	0.571*** (0.05)	-0.693*** (0.147)	0.099 (0.630)	0.053 (0.039)
Constant	6.773*** (0.273)	6.612*** (0.462)	-	1.389*** (0.264)
R-squared	0.978	0.882	-	-
F-test	2,545.52***	409.92***	-	-
AR (2) test	-	-	-2.046**	-2.016**
Sargan test	-	-	14.167	10.51

\*, \*\*, \*\*\* denotes significance levels at 10%, 5% and 1%, respectively.

Source: Authors’ calculations based on data from Penn World Table (Feenstra et al., 2015; Groningen Growth and Development Centre, 2023), the World Bank (2023) and the Transparency International (2023)

The first difference in the GMM model presents a negative but not statistically significant coefficient of -0.001. This suggests that while lower corruption is associated with higher GDP levels, its marginal effect on GDP growth diminishes over time, particularly in already low-corruption and developed countries. This may indicate a saturation effect, where further reductions in corruption yield smaller growth benefits. The mixed results between different models might be explained by their sensitivity to short-term versus long-term effects of corruption reduction on economic performance (Treisman, 2000). While the fixed-effect model captures the immediate benefits of lower corruption on GDP, the dynamic GMM models highlight the complexities of sustaining growth in mature economies where the marginal returns to improvements in corruption perception might diminish.

In the system GMM model, the CPI coefficient is negative (-0.001) and not statistically significant. This suggests that in the context of dynamic panel data accounting for potential endogeneity, the direct impact of corruption perception on GDP growth is less clear-cut. The system GMM method, by addressing biases using lagged variables as instruments, provides a robust analysis of the dynamic relationships between corruption perception and GDP growth. The mixed results across different models underscore the complexity of the relationship between institutional quality and economic performance, where short-term dynamics might obscure long-term benefits.

Regarding control variables, capital and effective employment consistently impact real GDP growth, similar to the previous model. Capital input significantly and positively affects real GDP growth in the pooled OLS and fixed-effect models, while the system GMM model shows a negative coefficient. Effective employment consistently shows a positive and significant impact across all models. Inflation has mixed effects, with a negative and significant coefficient in the OLS and fixed-effect models. Trade openness consistently positively influences real GDP across all models. Population effects are mixed, reflecting diverse impacts in different economies.

Two specification tests are crucial to ensure the validity of the GMM estimation method. These are the Sargan test and the Arellano–Bond test. The Sargan test verifies that the instruments used in the estimation are not correlated with the error term. Meanwhile, the Arellano–Bond test detects the presence of second-order serial correlation in the error term. Results from both tests are presented in the lower section of all tables. The Hansen test has a p-value greater than 0.05 in all models or a statistically insignificant result, indicating the instruments' validity. The estimation results were not weakened by instrumental proliferation since the strategy Roodman (2009) suggested was followed. The p-value of the Arellano–Bond test shows different results. Tables 3 and 4 indicate that we cannot reject the null hypothesis of no second-order serial correlation in the difference GMM model at a 5% significance level, and the same applies to the system GMM model at a 1% significance level. Arellano-Bond tests for the difference and system GMM models from Tables 5 and 6 have p-values greater than 0.01, indicating that we cannot reject the null hypothesis at a 1% significance level. Overall, the results of the system GMM are satisfactory and robust.

The Index of Economic Freedom positively impacts real GDP growth, but the first difference in the GMM model suggests a negative coefficient. Institutional quality, estimated using the Economic Freedom score, positively impacts economic growth. The World Governance Indicators significantly impact economic growth, with a positive coefficient in the fixed effect model and a negative impact in the difference GMM model. The Corruption Perception Index also has a positive impact on real GDP growth. To sum up, the analysis emphasises the significance of institutional

factors in shaping economic growth, highlighting the intricate nature of these relationships. The reliability of the findings is reinforced by the consistency of results across models and the robustness of the GMM estimations.

The institution's quality, measured by different indicators, positively impacts economic growth in post transition countries (Buterin et al., 2017). In our case, all four institutional indicators positively and significantly impact real GDP growth. Except for the impact of World Governance Indicators, the strength of other institutional indicators is mild, but they impact positively and significantly. These countries underwent institutional reforms that varied in effectiveness at increasing transparency and accountability (Beck and Laeven, 2006). This led to improved rule of law, increased political stability, and more efficient regulatory environments, which attracted foreign investment and increased domestic entrepreneurship. After the financial crisis, the implementation of these reforms began to lag, and their effects were weakened. Therefore, it is necessary to maintain and further improve the quality of institutions to sustain economic growth in the long run (Moers, 1999).

It is important to sustain and improve institutional quality for long-term economic growth, as emphasised by (Moers, 1999). However, the impact of institutional indicators on post-transition countries' economies is complex. In our case, all four institutional indicators significantly influenced real GDP growth, highlighting the crucial role of effective institutional reforms. Though some indicators showed mild strength, their positive impact on economic growth indicates their contribution to transparency, accountability, and overall governance. The effectiveness of institutional reforms in enhancing transparency and accountability varies, as noted by Beck and Laeven (2006). Therefore, continuous efforts are needed to strengthen these foundations. Improvements in the rule of law, political stability, and regulatory environments have been instrumental in attracting foreign investment and promoting domestic entrepreneurship. However, the slowdown in implementing reforms post-financial crisis poses a challenge, which calls for a renewed commitment to maintain and advance institutional quality for sustained economic prosperity.

In the difference and system GMM models, we use the differences between variables to observe the negative impact of institutions. This is expected because, in these models, the dependent variable is different, and the results show the effect of institutions on the economy's growth rate. As economies grow over time, their growth rates become smaller (Tebaldi and Elmslie, 2008). Therefore, it is essential to consider this trend when analysing the effects of institutions on the economy's growth rate. By doing so, we can better understand how institutions impact economic growth and identify ways to improve economic performance over time.

## 5. Conclusion

Romer (1990) proposed that a nation's commitment to innovation can result in higher levels of prosperity. Meanwhile, North and Thomas (1973) argued that institutions, such as property rights and market structures, play a crucial role in the growth of economies. Societies with institutions supporting the accumulation of factors, innovation, and efficient allocation of resources tend to thrive. Different political regimes encourage diverse institutions and policies, leading to varying economic outcomes. This paper analyses the impact of institutions on economic growth in 16 European countries that have undergone a transition. The study applies econometric analysis to the data from 1998 to 2019, using fixed-effect, Arellano and Bond's first difference GMM estimator, and the system GMM estimator.

The scatter charts collectively illustrate the significant impact of economic freedom and governance quality on real GDP, with each factor making a distinct contribution to economic performance. The charts, using indices from the Heritage Foundation (2021) and the Fraser Institute (2021), indicate a positive correlation between economic freedom and GDP, with the Heritage Foundation's (2021) index showing a stronger relationship. This underscores the importance of policies that reduce regulatory burdens and promote free trade to drive economic prosperity. In contrast, the chart using the World Governance Indicators by the World Bank (2023) reveals the strongest positive correlation, suggesting that good governance, including the rule of law and control of corruption, is crucial for economic growth. Furthermore, the chart using the Corruption Perception Index by Transparency International (2023) highlights the significant role of reducing corruption in fostering economic growth. However, this trend is less pronounced than with governance quality. These findings emphasise the multifaceted nature of economic growth and advocate for a balanced approach that integrates efforts to improve economic freedom, governance quality, and anti-corruption measures to achieve sustainable economic development.

The econometric analysis uncovers a complex relationship between institutional quality and real GDP growth, as various indices measure. According to the Index of Economic Freedom by the Heritage Foundation (2021), there is a significant positive relationship between economic freedom and GDP growth in the fixed effect model. This indicates that policies promoting economic freedom can create a conducive environment for business operations and economic expansion. However, the first difference GMM model suggests that the benefits of economic freedom diminish over time, particularly in developed countries, suggesting a saturation effect. The Fraser Institute's (2021) Economic Freedom score also shows a positive relationship with GDP growth in the fixed effect model, but the mixed results in other models highlight the nuanced impacts of economic freedom on economic performance.

The World Governance Indicators demonstrate the strongest positive correlation with real GDP, emphasising the critical role of good governance in economic growth. Effective governance, characterised by the rule of law and regulatory quality, creates a stable environment that encourages investment and sustainable development. The Corruption Perception Index also indicates that lower corruption positively impacts GDP, underscoring the importance of transparency and accountability in fostering economic prosperity.

Across all models, capital input and effective employment consistently positively influence GDP growth, while inflation and trade openness have varying effects. The findings highlight the importance of a balanced approach integrating efforts to improve economic freedom, governance quality, and anti-corruption measures to achieve sustainable economic development. Maintaining and enhancing institutional quality remains crucial for long-term economic growth, especially in post-transition countries.

The paper has several limitations. One limitation is our use of proxies for institutions and governance, such as the Index of Economic Freedom by the Heritage Foundation (2021), the Economic Freedom Index by the Fraser Institute (2021), the World Governance Indicators by the World Bank (2023), and the Corruption Perception Index by Transparency International (2023). These measures are aggregate and based on perceptions and may not fully capture institutional quality and the nuanced nature of governance. The subjectivity of these indices, influenced by respondents' biases and external factors, could affect our results' accuracy and reliability. Another limitation is the potential endogeneity issue in our analysis, despite using advanced econometric techniques like the system GMM to address it. Endogeneity arises when explanatory variables are correlated with the error term, leading to biased and inconsistent estimates. Although the GMM method helps mitigate this issue by using lagged variables as instruments, it cannot eliminate the risk of endogeneity, especially in complex dynamic relationships between institutions and economic growth.

Additionally, the study focuses on a specific set of countries and periods, which may limit the generalizability of our findings. The economic and institutional contexts of the sampled countries might differ from those in other regions, affecting the applicability of the results to a broader global context. Moreover, data scarcity in these countries necessitated the use of interpolation techniques to fill gaps, which might introduce inaccuracies and affect the reliability of the results. Future research should consider a more diverse set of countries and extend the analysis over different time frames to enhance the robustness and applicability of the conclusions. Expanding the scope of the study to include a wider variety of countries with different economic structures and institutional backgrounds will provide a more comprehensive understanding of the relationship between institutional quality and economic growth. Additionally, employing more sophisticated data collection and

estimation techniques can help mitigate the limitations posed by data scarcity and improve the accuracy of the findings.

This research catalyses more advanced qualitative and quantitative research on the impact of institutions on economic growth in post-transition European countries. By expanding the study to include a wider range of countries and utilising more sophisticated data collection and estimation techniques, future research can provide a more detailed understanding of how institutional quality affects economic performance. These comprehensive research efforts will enhance academic discourse and provide valuable insights for policymakers seeking to improve institutional frameworks. Implementing these findings in academic and practical settings can significantly enhance the quality of institutions in post-transition countries, creating a more favourable environment for sustainable economic growth.

Enhancing the quality of institutions in these countries will significantly contribute to future economic growth. Stronger institutions can lead to improved governance, reduced corruption, and increased economic freedom, which is crucial for attracting investment, encouraging entrepreneurship, and enhancing overall productivity. As these countries develop, robust institutions will ensure political stability, economic resilience, and social progress. Therefore, these findings' ongoing research and practical application are essential for long-term economic development and prosperity in post-transition European countries.

The research findings suggest several practical policy implications for post-transition European countries. It is crucial to strengthen economic freedom by reducing regulatory burdens and promoting free trade to promote economic growth. Simplifying administrative procedures and streamlining regulatory processes can encourage entrepreneurship and attract foreign investment. Encouraging trade openness and reducing barriers will further integrate these countries into the global economy. Additionally, it is essential to focus on enhancing governance quality. This can be achieved by strengthening the rule of law through transparent and efficient judicial systems and improving regulatory quality, creating a stable business environment. Addressing corruption is equally important. Implementing robust anti-corruption measures, promoting transparent public procurement processes, and imposing strong penalties for corrupt practices can enhance transparency and accountability. Public participation and oversight in governance processes will further bolster anti-corruption efforts. To foster innovation and investment, support for research and development is crucial, along with attracting both domestic and foreign investment by ensuring political stability and protecting investor rights.

Moreover, investing in human capital development, particularly in education and healthcare, will help build a skilled and healthy workforce essential for economic productivity. Finally, addressing macroeconomic stability through effective monetary policies to control inflation and maintain fiscal discipline will create a

conducive economic planning and investment environment. By implementing these policy recommendations, post-transition European countries can establish a robust institutional framework that supports sustainable economic growth, social progress, and political stability, laying the foundation for long-term prosperity.

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## Institucije i gospodarski rast u europskim post-tranzicijskim gospodarstvima

*Predrag Trpeski<sup>1</sup>, Gunter Merdzan<sup>2</sup>, Kristijan Kozeski<sup>3</sup>*

### **Sažetak**

*U ovom radu raspravlja se o ulozi institucija na gospodarski rast u odabranim europskim post-tranzicijskim gospodarstvima. Tijekom 1990-ih godina, zemlje srednje i istočne Europe suočile su se s izazovima prilagođavanja svojih političkih i ekonomskih sustava kako bi održale korak s brzo promjenjivim globalnim okruženjem. Potrebne su im bile nove institucije poput propisa, društvenih normi i organizacija u cilju potpore kapitalističkom gospodarstvu. Te institucije pružaju okvir za gospodarsku aktivnost i usmjeravaju pojedince da djeluju u skladu s ekonomskim ciljevima. One su ključne za stvaranje stabilnog okruženja za gospodarski rast, promicanje ulaganja i inovacija te smanjenje neizvjesnosti, što je ključno za gospodarski uspjeh. Da bismo to istražili, proveli smo ekonometrijsku analizu 16 europskih post-tranzicijskih zemalja od 1998. do 2019. godine koristeći fiksni učinak, Arellanovu i Bondovu prvu razliku između GMM procjenitelja i sustavnog GMM procjenitelja. Rezultati pokazuju da institucije značajno utječu na gospodarski rast.*

**Ključne riječi:** *institucije, gospodarski rast, europske post-tranzicijske zemlje*

**JEL klasifikacija:** *O17, O43, O47, O57*

<sup>1</sup> *Redoviti profesor, Univerzitet Sv. Ćirila i Metodija u Skoplju, Ekonomski fakultet, Bul. Goce Delcev 9-V, 1000 Skoplje, Republika Sjeverna Makedonija. Znanstveni interes: ekonomija, ekonomija rada. E-mail: predrag.trpeski@eccf.ukim.edu.mk.*

<sup>2</sup> *Suradnik u nastavi i istraživanju, Univerzitet Sv. Ćirila i Metodija u Skoplju, Ekonomski fakultet, Bul. Goce Delcev 9-V, 1000 Skoplje, Republika Sjeverna Makedonija. Znanstveni interes: ekonomski razvoj, institucionalna ekonomija. E-mail: gjunter.merdzan@eccf.ukim.edu.mk.*

<sup>3</sup> *Suradnik u nastavi i istraživanju, Univerzitet Sv. Ćirila i Metoda u Skoplju, Ekonomski fakultet, Bul. Goce Delcev 9-V, 1000 Skoplje, Republika Sjeverna Makedonija. Znanstveni interes: mikroekonomija, ekonomija rada. E-mail: kozeski@eccf.ukim.edu.mk.*

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# Navigating the landscape: Unveiling the reflection of AI in the sharing economy through bibliometric-based approach<sup>\*1</sup>

Veljko Uskoković<sup>2</sup>, Milica Maričić<sup>3</sup>, Aleksandra Dacić-Pilčević<sup>4</sup>,  
Veljko Jeremić<sup>5</sup>

## Abstract

*Recent scholarly attention has surged in integrating artificial intelligence (AI) across various scientific domains, prompting a closer examination of AI's pervasive influence on economic paradigms like the sharing economy (SE). This study delves into the multifaceted intersections of AI within the SE, employing a bibliometric-based analytical framework. By establishing a terminological grounding in AI, the study surveys a broad spectrum of AI applications in the SE, culminating in a bibliometric analysis that identifies emerging themes and trends. Analysing literature metadata from the Web of Science database over the past eight years, the focus is on citation topics within the SE. In-depth analyses, facilitated by the Bibliometrix R package, are applied to a curated selection of*

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<sup>2</sup> Teaching Associate, University of Belgrade, Faculty of Organizational Sciences, Jove Ilića 154, 11000 Belgrade. Scientific affiliation: applied statistics, biostatistics, scientometrics. E-mail: [veljko.uskokovic@fon.bg.ac.rs](mailto:veljko.uskokovic@fon.bg.ac.rs).

<sup>3</sup> Assistant professor, University of Belgrade, Faculty of Organizational Sciences, Jove Ilića 154, 11000 Belgrade. Scientific affiliation: applied statistics, SEM analysis, multivariate statistical analysis. E-mail: [milica.maricic@fon.bg.ac.rs](mailto:milica.maricic@fon.bg.ac.rs).

<sup>4</sup> European Medicines Agency, Domenico Scarlattilaan 6, 1083 HS Amsterdam, The Netherlands. Scientific affiliation: ICT & AI in health, Project Management in ICT. E-mail: [aleksandra.dacicpilcevic@ema.europa.eu](mailto:aleksandra.dacicpilcevic@ema.europa.eu).

<sup>5</sup> Full professor, University of Belgrade, Faculty of Organizational Sciences, Jove Ilića 154, 11000 Belgrade. Scientific affiliation: applied statistics, scientometrics, quantitative methods. E-mail: [veljko.jeremic@fon.bg.ac.rs](mailto:veljko.jeremic@fon.bg.ac.rs).

*papers. The findings reveal key insights, such as how AI-driven text analytics significantly enhance customer satisfaction through user-generated reviews. Additionally, AI plays a crucial role in promoting energy-efficient behaviour in smart accommodations, while algorithmic oversight is increasingly integrated into digital labour platforms to balance automation with human dignity. Furthermore, AI optimizes resource allocation and improves matching algorithms on online labour platforms, thereby boosting platform efficiency. The study suggests future research avenues, advocating for broader exploration of AI's role in digital economic models and greater governmental involvement.*

**Keywords:** *artificial intelligence, sharing economy, bibliometric analysis*

**JEL classification:** *D16, O35, O57*

## 1. Introduction

The expansion of diverse scientific multidisciplinary fields has yielded a plausible number of crisp practices in business, which have gained the potential and capabilities to change the world prosperously. One is the business model of the sharing economy (SE), characterised by sharing resources among peers via platforms, which has significantly impacted modern business and society (Daglis, 2022). It has blurred traditional roles and introduced innovative models of co-functioning (Maurer et al., 2020), improved the level of life satisfaction, introduced holistic social incorporation in local communities (Szymańska, 2021), and fostered sustainability through technology-mediated interactions (Carrigan et al., 2020). However, its societal implications are not thoroughly analysed (Mont et al., 2020). Therefore, it is beneficial for both academia and policymakers to acknowledge modern tendencies of the sharing economy development towards sustainable functioning societies and business models (Sigler and Corcoran, 2021). Future ameliorations in the field might inevitably be fostered by integrating other modern technologies, such as artificial intelligence (AI), with its corresponding capacities, tools and opportunities. Understanding modern businesses might be equally important as understanding the possibilities of embedding technological breakthroughs. Notably, AI is of critical importance in contemporary business and society, driving transformation and innovation across various sectors (Sadiku et al., 2020; Dwivedi et al., 2021). AI enhances productivity, competitiveness, and customer experience (Njeru, 2023; Pendy, 2023). The rise of the application of AI in business and industry has led to improved collaboration and new business interactions (Bharadiya et al., 2023). AI is also a leading representative of transformative business innovation models, particularly in the digital economy (Maslak et al., 2021). Nevertheless, the ubiquitous utilisation of AI also engenders apprehensions regarding transparency and plausible risks (Khamis et al., 2019). Gradually, an issue of interconnection between SE and AI might be perceived as particularly important in navigating the landscape of their joint holistic-oriented impact on society. Spanning

from entanglements in transparency, privacy and security matters that are unequivocally essential topics in terms of acknowledging the application of AI in any industry to various unidentified opportunities for scaling up a business based in digital environments like sharing economy platforms, an enhanced understanding of interconnectedness between SE and AI is constructive.

Firstly, a fusion of two distinct modern phenomena, SE and AI, might be recognised as a firm act of innovation, considering the unfamiliar and unexamined potential of such a compatible grouping. Also, the work of Cockburn et al. (2019) broadened the horizon of the positive impacts of artificial intelligence on economic activities as a whole while highlighting the importance of policies promoting transparency and data sharing for stimulating research productivity and innovation-oriented competition. AI-based tools and technologies might significantly increase efficiency related to current economic tendencies, especially in the SE. Secondly, there have been studious implications stating that AI plays a crucial role in the SE, particularly in enhancing belief, matching assets, and apprehending participants' perspectives and opinions (Chen et al., 2022). Apart from strengthening day-to-day customer-related services and affairs, a combination of AI and SE has found its crucial role in solving persistent global medicine-oriented issues. Amongst many substantial intricacies in modern medicine, healthcare as a holistic concept has thrived, drawing particular attention from academia lately (Groenewoud et al., 2015; Taylor et al., 2020). More to the point, a procedure towards alleviating the scarcity of healthcare resources includes setting up a sharing economy model for the healthcare industry by implementing robust AI technologies and tools as a supportive background of the model (Wu et al., 2019). Thirdly, there is evidence regarding the successful effectuation of AI-related methods in optimising processes in the sharing economy business models. From utilising AI in assessing user routes in shared mobility systems (Kubik, 2023), recognising patterns of consumers' trust issues over the sharing economy platforms (Wu et al., 2017) to assessing distinguishable user profiles on accommodation sharing platforms (Ma et al., 2017). All presented above leads to the conclusion that an in-depth analysis of the connectedness of AI and SE is needed.

This study endeavours to explore and delineate the manifold intersections of AI within the sharing economy, employing a bibliometric-based analytical framework. Adopting a terminological grounding of AI, a comprehensive array of AI-related applications in the sharing economy is surveyed, culminating in a bibliometric-oriented analysis aimed at identifying emergent themes and trends. To accomplish the latter, a thorough bibliometric analysis has been conducted following the representative guidelines (Zupic and Čater, 2015; Funko et al., 2023). Resulting with a suggestion on future research avenues of the topic, the paper outlines the potential implications of the body of knowledge examined towards practitioners and policymakers. Given the paper's objective to furnish a

delineation of the subject matter, it may be beneficial to address the subsequent research questions:

RQ1: What constitutes the intellectual framework underpinning the body of knowledge investigating the interrelationship between the sharing economy and artificial intelligence?

RQ2: What does the landscape of potential future research avenues of the topic consist of?

In general, the paper might enrich the domain of current research tendencies covering both SE and AI in a way that may outline their joint prosperous capacities rather than shedding light on their prominent capabilities. The main body of the paper is systematised as follows. The second chapter underlines major findings while considering the topics of interest in the research. Then, in the third chapter, the methodological background of the paper is presented. In the fourth chapter, a grasp of the most beneficial results is summarised. The fifth chapter consists of a delineation of major bibliometric and qualitative findings. The final chapter presents a holistic overview of an endeavour to encircle the research outcome.

## **2. Literature review**

To comprehensively examine the topic and its associated research domain, this study presents a succinct yet thorough overview of existing scholarship. Divided into three segments, the chapter initially explores critical elements of the SE, followed by an analysis of the core components of AI. Finally, recent academic interests and emerging trends within AI and SE are discussed, laying the groundwork for future research in this dynamic field and guiding scholarly endeavours toward innovative advancements.

### **2.1. The SE as a contemporary business model**

In recent decades, extensive literature reviews have been done to scrutinise and better understand the business model of the sharing economy. Since it is heterogeneous and spans various fields of consumer studies and modern business models, the overview herein focuses on multiple applicational aspects of the sharing economy.

A plethora of academic viewpoints unfolds in the discourse surrounding the sharing economy as researchers attempt to grasp its multifaceted nature (Česnuitė et al., 2022). Central to this discussion is the conception of the sharing economy as a transformative socio-cultural phenomenon, wherein ownership of goods and

services transitions to a framework of sharing and renting, a concept underscored by Avram et al. (2017). Furthermore, Frenken and Schor (2019) delve deeper into the interpersonal dynamics inherent in this economy, characterising it as a mutual guarantee between parties, often motivated by financial incentives. Meanwhile, Martos-Carrión and Miguel (2022) shed light on its positive ramifications, elucidating how it empowers consumers to manage resources more efficiently while opening new avenues for profit for service providers. In a contrasting view, Česnuitytė et al. (2022) highlight the SE's divergence from traditional business models, pointing out its propensity for hyper-consumption and the presence of ambiguous legal frameworks. Expanding on these perspectives, Manuel et al. (2012) propose a broader conceptualisation, framing the SE not merely as a monetary and commercial sector but as a societal ethos grounded in fundamental moral values. Thus, the discourse surrounding the sharing economy encompasses a rich tapestry of insights that span sociocultural, economic, and ethical dimensions, especially entangling trust issues on platform-based businesses (Köbis et al., 2021).

Consequently, SE encompasses several related concepts, functioning as an umbrella term (Lampinen, 2021). Two essential notions generalised under this concept are the face-to-face exchange of goods and demand-based work. Interestingly, intercultural differences exist in understanding this concept across different continents (Majima et al., 2021). In Japan, efficiency in achieving economic effects dominates perceptions, while in Sweden, the focus is on the eco-sustainable significance of sharing economy effects. As per means of this paper, identified subtypes of the SE include the gig economy, collaborative economy, on-demand economy, mesh economy, access-based economy, collaborative consumption, crowd-based capitalism, peer-to-peer economy and digital matching firms (Bojković et al., 2022). A collaborative economy closely resembles a sharing economy, but it involves precisely three actors and an abstract administrative sense of resource sharing (Richardson, 2015). Collaborative consumption pertains to practical sharing applications without strict ownership regulations (Hamari et al., 2016). An on-demand economy connects supply and demand for resources based on explicit demand initiation (Maselli et al., 2016). A mesh economy emphasises optimal resource utilisation through direct communication, often without intermediaries (Turi et al., 2017). An access-based economy prioritises resource access while minimising ownership complications (Acquier et al., 2017). The gig economy revolves around freelance work arrangements (Vallas and Schor, 2020). The peer-to-peer economy involves direct communication between parties without intermediaries (Selloni, 2017). Crowd-based capitalism encompasses the societal impacts of the sharing economy, reflecting its global and decentralised nature (Kaushal, 2017). Digital matching firms facilitate resource sharing through software platforms (Zhou and Wan, 2022). Each subtype uniquely contributes to the sharing economy's multifaceted landscape, highlighting diverse socio-economic dynamics.

## **2.2. The essence of AI**

Defining artificial intelligence is a second-to-none process for expressing the difficulty of providing an exact, precise, and concise answer. Probably the finest way to discuss the latter is to state that there is no widely accepted definition of the topic, resulting from a deeper philosophical issue of explaining what intelligence is (Devedzic, 2022). However, a notable attempt to accomplish this perplexing problem is hidden under the assumption that AI is a theory of applicational advances of computer science which strive to perform tasks and activities demanding raw human intelligence occupying various processes from speech recognition to decision-making (Oxford Reference, 2024). Furthermore, researchers are tirelessly trying to encompass the essential parts of explaining AI. According to Morandín-Ahuerma (2022), it epitomises the computational prowess enabling machines or computer systems to undertake activities traditionally aligned with human cognitive faculties, notably encompassing logical inference, adaptive learning, and intricate problem-solving. This capability relies on machine learning paradigms and technologies, with classifications based on cognitive capacity and autonomy. Additionally, within specific contexts, AI is denoted as augmented intelligence (Pashkov et al., 2020).

On the one hand, AI offers numerous benefits in contemporary business models, including improved decision-making and task automation (Jelonek et al., 2020). It may create new business value streams (Perifanis and Kitsios, 2023) and drive business model innovation (Neuhüttler et al., 2020). However, its practical implementation and strategic usage pose challenges (Kitsios and Kamariotou, 2021). Nevertheless, AI's potential to enhance collaboration between humans and machines is also noteworthy (Verhezen, 2020). Moreover, incorporating AI into business paradigms presents an avenue for adeptly navigating and mitigating digital vulnerabilities inherent in global markets (Buntić et al., 2021). On the other hand, concerns about biased algorithms, privacy, and cyber threats need to be addressed (Verhezen, 2020; Zubalj et al., 2021). Also, the impact of AI on businesses, including potential job loss and the need for retraining, is a crucial consideration (Geisel, 2018). Finally, when embedding its capacities and capabilities into systems of the utmost importance to society, e.g. healthcare, it raises complex issues related to safety, efficiency, privacy, and liability (Pashkov et al., 2020).

## **2.3. The nexus of SE and AI**

Considering the implicit interconnectedness between the two topics, which might also be noted as explicit by gradually understanding the foundation mentioned above of both SE and AI, an issue of in-depth scrutinisation of such a connection between them arises. More to the point, exploring how

complementary applications of SE and AI might find their beneficial role in developing and maintaining contemporary business models is a perplexing issue which goes beyond the research questions at stake. Therefore, a straightforward understanding should establish a pathway leading to comprehensive solutions. An initial idea for achieving the latter might be recognised in research trends suggesting the importance of quantitative and qualitative estimation of the digital competitiveness of countries (Stankovic et al., 2021), as well as general consumers' attitudes towards the sharing economy, e.g. perception of young generations (Martinović et al., 2023). Indicatively, AI tools might be utilised to elicit business value streams following strategic sustainable goals established by policymakers. Meaningfully, this broadens the horizon of advancements of businesses related to the sharing economy, which, in turn, might promote social and economic development both locally and globally (Cui et al., 2021; Gao et al., 2022). Eventually, the following examination of the body of knowledge focuses on empirical findings in relevant literature referencing or proving the feasibility of combining AI tools and methods with the sharing economy platforms and business models.

### **3. Research methodology**

A bibliometric analysis with relevant techniques is used to pursue a thorough methodological framework for navigating the landscape of AI's presence in the sharing economy. Prior to conducting the analysis, a careful paper selection is undertaken. In general, a concise overview of the methodology applied in the paper might be summarised in the following manner. The research's setup suggests using bibliometric analysis as a critical component with a two-fold rationale. Firstly, bibliometric methods, including performance analysis and science mapping, are crucial for understanding scientific knowledge and recognising potential deficiencies in research gaps and trends (José de Oliveira et al., 2019). To accomplish the latter, an efficient literature selection process precedes. Secondly, the analysis should be conducted using specific software tools designed to enhance the overall results and emphasise the output. Notably, various scientific metrics and visualisation tools are available for bibliometric and scientometric studies, each with strengths and limitations (Moral-Munoz et al., 2019).

A general research process workflow follows the guidelines Zupic and Čater (2015), which consists of five stages: establishing the research design, data acquisition, a particular analysis, visualisation of the results, discussion and possible implications. Since the research design is already stated, a data acquisition process is described in Figure 1.

Figure 1: Sequence of Web of Science queries executed for data collection

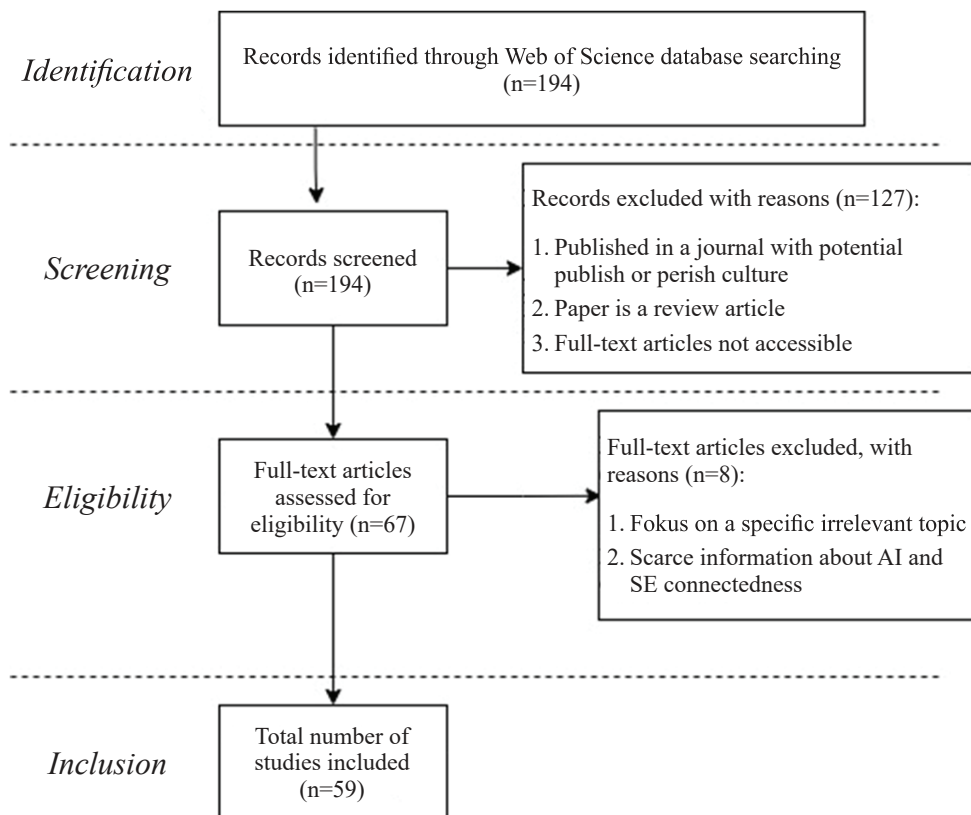
Query 1:	<ul style="list-style-type: none"> <li>• topic: artificial intelligence OR (AI related terms)</li> <li>• time span: 2016-2023</li> <li>• Indexes: SSCI, SCIE, ESCI and ASCI</li> <li>• n = 104,353</li> </ul>
Query 2:	<ul style="list-style-type: none"> <li>• topic: sharing economy</li> <li>• time span: 2016-2023</li> <li>• Indexes: SSCI, SCIE, ESCI and ASCI</li> <li>• n = 4,047</li> </ul>
Query 3:	<ul style="list-style-type: none"> <li>• (Query 1) AND (Query 2)</li> <li>• n = 849</li> </ul>
Query 4:	<ul style="list-style-type: none"> <li>• (Query 3) AND (sharing economy related terms)</li> <li>• n = 204</li> </ul>
Query 5:	<ul style="list-style-type: none"> <li>• (Query 4) refined by (paper-type)</li> <li>• Articles and Review articles only</li> <li>• n = 197</li> </ul>
Query 6:	<ul style="list-style-type: none"> <li>• (Query 5) refined by Language (English)</li> <li>• n = 194</li> </ul>

Source: Authors' construction

Web of Science is a database used for study due to its recognition as an authoritative source for bibliometric and scientometric works. On 18th March 2024, a specific sequence of queries executed over the database was conducted. A Bibliometric package embedded in the statistical program language R was used to run the bibliometric analysis for the data acquired. The analysis's output is presented through several visualisations in Chapter 4, including citation topics, co-words, and trending topics analysis.

Furthermore, selected papers have undergone additional scrutiny to enable the effective creation of a knowledge pool encompassing the research interest of this paper in terms of suggesting future research avenues and implications for policymakers. As an exemplary work following the research context, a paper by Xiao and Watson (2019) demonstrates the idea of choosing an adequate number of representative papers for a systematic literature review. Therefore, a semi-customised approach is used to specify papers of specific research interest that outline the future research agenda while providing evidence of AI's prospective role in SE (Figure 2).

Figure 2: Fine-grained assortment of studies for additional scrutiny



Source: Authors' construction

Essentially, the initial compilation of acquired scientific literature is the basis for bibliometric scrutiny. Subsequently, a secondary set of meticulously examined papers is employed to elucidate qualitative nuances pertaining to potential implications for stakeholders and future research trajectories. This dual approach facilitates the execution of both bibliometric and qualitative analyses, leveraging a comprehensive dataset for the former and a more focused dataset for the latter.

#### 4. Empirical data and analysis

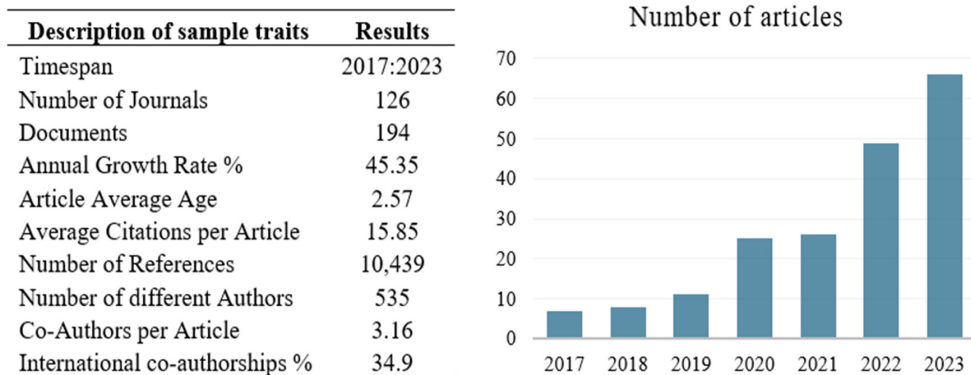
As the third chapter outlines, the research methodology consists of two consecutive phases. In the first phase, 194 scientific papers were selected from the Web of Science database (Figure 1) through a systematic search. These papers are analysed in the first part of the study and presented in subchapter 4.1, which focuses on bibliometric analysis. In the second phase, further scrutiny narrowed the selection to 59 papers

(Figure 2), most relevant to the research area examining the intersection of AI and SE. These 59 papers are used in subchapter 4.2, where implications for various stakeholders within the ecosystem are discussed. This phase sets the groundwork for developing a landscape of qualitative insights that provide various implications for participants in the ecosystem surrounding the AI and SE interrelation.

### 4.1. Bibliometric analysis

Initiating with an exposition of the bibliometric analysis findings, a concise overview of the fundamental insights gleaned from the sampled dataset is presented in Figure 3. As it suggests, there is a notable occurrence of international co-authorship where more than a third of all included papers are created in multinational cooperation. Also, a reminder following the initial queries executed over the chosen database states that the period is from 2016 to 2023. However, it is evident that no papers from 2016 satisfied the agglomerative conditions that followed in other queries. Additionally, a descriptive briefing might be encircled with information that affiliations leading in scientific production on this topic are those from China, Spain, the USA, and the UK, acknowledging that researchers from these countries are also production leaders.

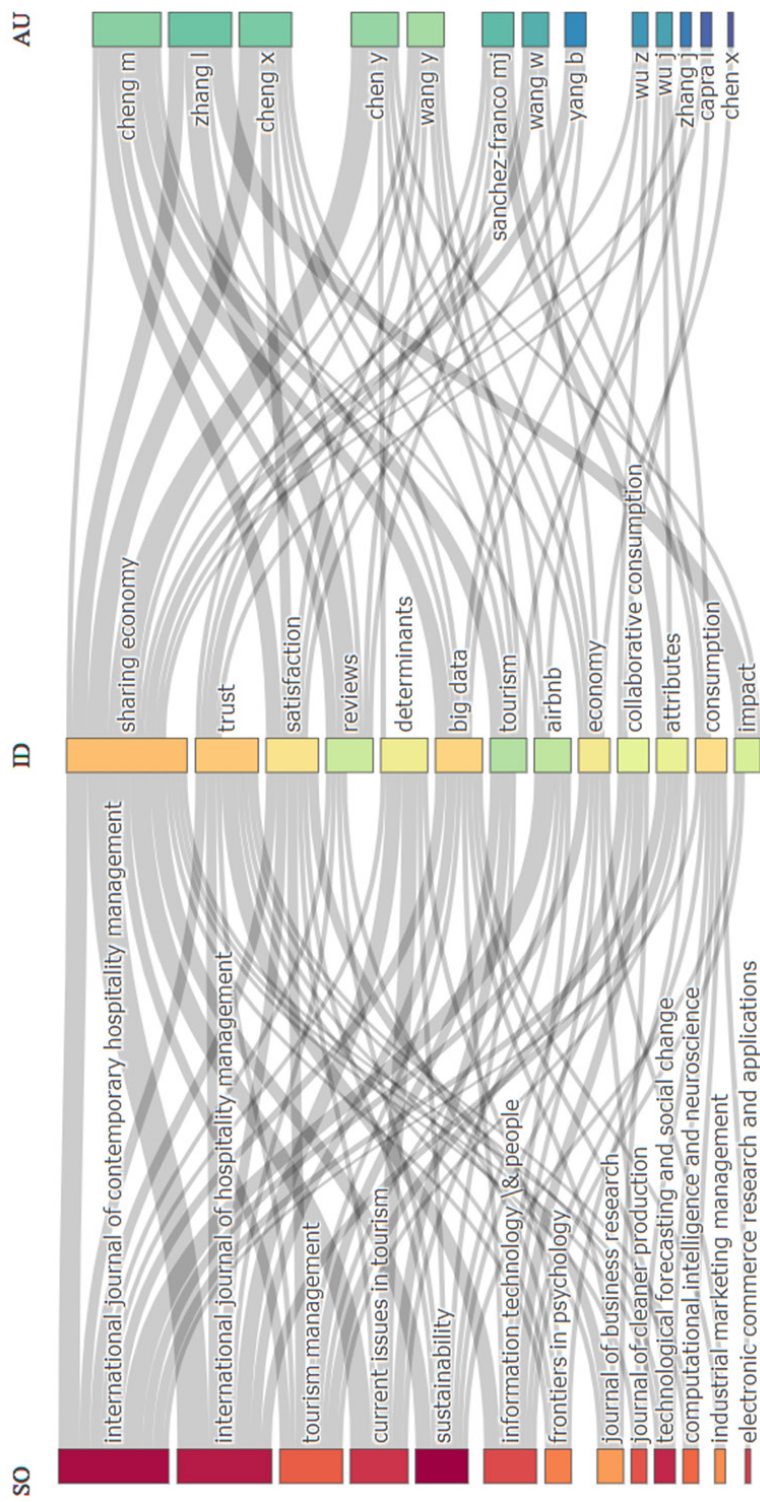
Figure 3: Overview of general sample traits



Source: Authors’ construction

A three-field plot diagram offers valuable insights into the interrelations among different bibliographic entities, connecting scientific journals (left), author keywords (middle), and authors (right), as seen in Figure 4. The size of each element reflects its fractional frequency within its column. This Sankey diagram presents the intricate relationships between journals, topics, and authors in sharing economy (SE) research.

Figure 4: Sankey's diagram – A three-field-plot representing a connection between journals, authors' keywords and authors



Source: Authors' construction

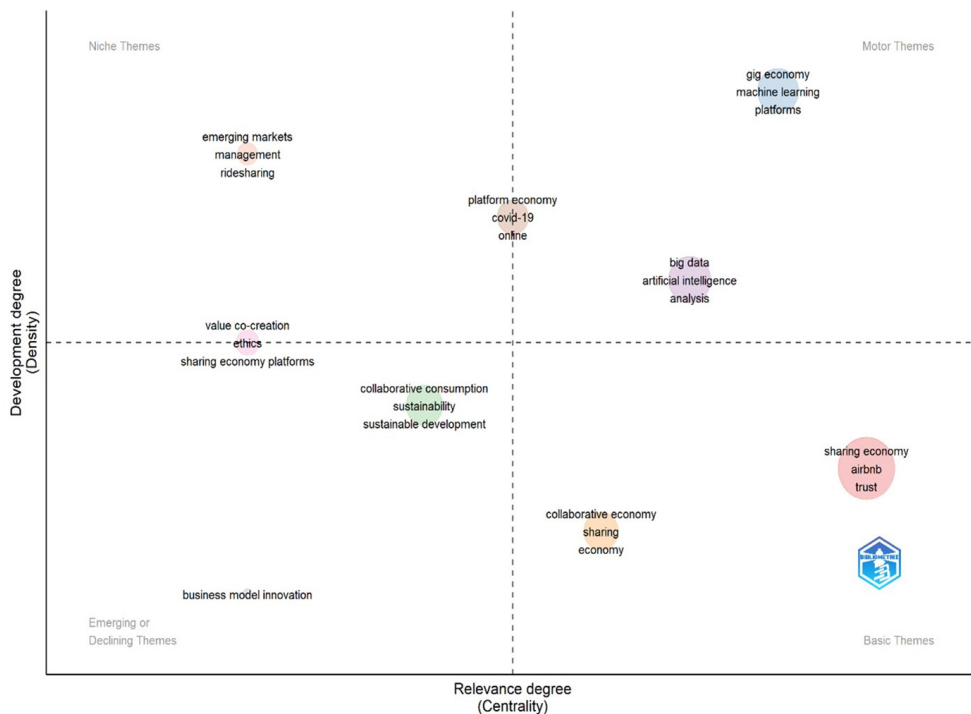
Journals such as International Journal of Contemporary Hospitality Management, Sustainability, and Tourism Management publish on various topics, including the sharing economy, trust, satisfaction, and big data, indicating their broad influence. In contrast, specialised journals like Current Issues in Tourism focus on narrower topics, such as tourism and platform management. Authors like Cheng M, Zhang L, and Chen Y contribute across a variety of SE topics, while others, like Capra L, focus on specific themes such as collaborative consumption and trust. Key topics like trust and satisfaction connect versatile and specialised contributors, underscoring their significance in SE research. The prominence of big data and reviews signals an increasing shift towards data-driven decision-making and platform optimisation. This balance between consumer behaviour and operational themes reflects a holistic approach to SE research and illustrates how AI and technology reshape SE ecosystems. Moreover, the diagram highlights how multidisciplinary collaboration between diverse fields is essential to addressing emerging challenges. Ultimately, these findings underscore the importance of integrating behavioural and technological perspectives in future SE research, paving the way for more adaptive and resilient SE models.

The authors chose co-word analysis combined with thematic maps, provided by the Bibliometrix R package, to emphasise the topics and content of the studied papers, thereby enhancing understanding of the intellectual capital and establishing a solid foundation for future research directions. As a result of co-word analysis, it is possible to amplify the phrases constructed with one (unigrams), two (bigrams) or three words (trigrams) whose co-occurrence in different articles suggests that there exists some interrelation among them in terms of specific topic a paper investigates. Moreover, when examining the most occurring trigrams in abstracts of the scientific papers included in the study, the top trigram is sharing economy platforms, whose number of occurrences is more than two times higher than the second one (*risk prevention models*). Additionally, the titles of these scientific papers unveil that the most frequent trigram is *peer-to-peer accommodation experience* followed by *text mining approaches* and *accommodation rental services*. In sum, terms exhibiting pronounced frequency of occurrence may be construed as constituting a cluster of pivotal topics encapsulating the phenomenon of servitisation within contemporary business models operating on digital platforms within the realm of the sharing economy. Also, the remarkable prevalence of expressions and labels delineating sharing economy platforms and machine learning methods utilised for communication optimisation over these platforms is noteworthy.

Gradually, an analysis which illustrates the bare intellectual context of the body of knowledge occupying the interconnectedness of AI and SE is thematic map analysis. The analysis inclines to adequately visualise the conceptual structure of the specific research field at stake herein. More to the point, key topics are identified as segmented, following their influential character in the development of the whole scientific topic and field being examined. A thematic map plots the identified topics in different graph quadrants as a means of two-dimensional visualisation, directly

appointing topics to their relevant influential character. Considering the cumulative presence of the topic, its interrelations over the years and other factors, every topic is segmented in the part of the thematic map that possibly describes the topics' influential character the best. The map has four main parts (quadrants): *motor themes*, *niche themes*, *emerging or declining themes* and *basic themes*. Thematic map visualisation of the terms identified in this study is portrayed in Figure 5.

Figure 5: Thematic map of authors' keywords



Source: Authors' construction

Before labelling each class mentioned above themes in the thematic map, it is beneficial to designate the method that runs the analysis. Briefly, several clustering algorithms may be utilised to create the *theme clusters* with various hyperparameters to be optimised. In contrast, the minimum cluster frequency of each topic (per thousand documents) was set to six, the number of labels presented in each cluster was limited to three and the most comprehensive solution was acquired using the Leiden clustering algorithm. Progressively, the thematic map is plotted, and the *gig economy*, *machine learning* and *platforms* lead the group of motor themes. These identified keywords are part of the quadrant that occupies both well-established and vital themes that are expected to trace the future itinerary of the field's development. Conversely, in the low-left quadrant, the topics occupied

by collaborative consumption, sustainability, and sustainable development are either emerging or declining in terms of academic interest. A noteworthy quadrant with a marginal influence on the current state of the scientific field but with steady and innovative progress in scientific production is *niche themes*. Herein, the latter comprises *emerging markets*, *management in general* and *ridesharing*. On the contrary, a low-right quadrant depicts *basic themes*. These are the ones with established reputations in the field and are unequivocally crucial for the field; sharing economy, Airbnb, and *trust* are the keywords that determine this theme.

Findings underpinned in the chapter betoken the necessity of apprehending the diverse range of applications of AI in contemporary business models in the sharing economy. A suitable way to understand the latter's importance is to suggest the evidence provided in the selection of papers scrutinised previously. For illustrative purposes, Ranjbari et al. (2020) take advantage of advanced data-mining methods to analyse online review comments from Airbnb guests in Western Australia to extract service attributes without relying on literature. The study employs unsupervised and supervised learning processes to identify patterns and merge concepts, ultimately creating a conceptual map of service attributes. Herein, AI technology is used to elicit attributes directly from customer comments, providing a unique insight into the service quality of Airbnb. Additionally, Newlands (2021) investigates the ramifications of algorithmic surveillance on labourers within the platform-mediated food-delivery sector, accentuating the dialectic between immaterial and material aspects of surveillance and deliberating potential avenues for labourer resistance. Within this context, the employment of AI pertains to the deployment of algorithmic surveillance within platform-mediated enterprises operating within the gig economy, leveraging digital cartography to translate physical space and movement into digital representations, albeit overlooking labourers' subjective perceptions and experiential domains.

## 4.2. Implications for participants in the ecosystem

To address qualitative findings related to the research topic and acquired scientific papers related to it, it may be beneficial to acknowledge and silhouette implications for wider audiences generated in the selected papers. Therefore, cross-examination of the main findings of selected papers enables a structural output of possible implications for participants in the ecosystem of interconnectedness between AI and SE. For this purpose, the initial number of 194 papers is narrowed to 59 papers according to the procedure presented in Figure 2. Prior to enlisting the key takeaways concerning different interested parties, authors have foreseen the issue of an overwhelming number of possible implications. Therefore, only those implications found to be straightforward and concise are included in the final output of this in-depth analysis.

It goes without saying that perplexing peculiarities in the research field might be adequately addressed with careful consideration of issues arising from dynamic fluctuations in sharing economy models from as many different aspects as possible.

Puzzling concern about the ethical aspects of utilising AI in the sharing economy is a topic of industry-agnostic debate, speaking of which SE should be a proponent of crisp and suitable solutions. Moreover, multitudinous use cases from business practice might foster the nurturing of niche themes in academic research, which is confronting entanglements considering research novelty (Lyaskovskaya and Khudyakova, 2021; Wojcik-Jurkiewicz et al., 2021). Finally, a three-way perspective is provided, aiming to underpin all-important elements of attainable implications, given in Figure 6.

Figure 6: Overview of implications proposed to academia, practitioners and policy-makers



Source: Authors' construction

However, additional information about each paper used to create an aggregated overview of the implications may be found in the Appendix in Table 1.

## 5. Discussion

Nevertheless, a prudent commentary may inquire about additional bibliometric analyses backing up the aforementioned statements about the interrelations of AI and SE in the previous terms. Firstly, a moderate answer might be found using extra bibliometric methods comprising co-reference, co-citation analysis, and bibliographic coupling accompanied by historiography tracking. However, that kind of remedy might create an urge to scrutinise the topic more deeply, which could significantly diverge from the scope of this paper and its research interest. Therefore, a firm sufficiency of previously described analysis was conceived as a tool for forming a direction toward identifying intellectual capital in the sense of the research topic in the paper. Secondly, a continuous effort to establish a distinctive representation of AI technologies, methods and tools applied to the sharing economy models in business and practice would be a tireless endeavour with an inclination to diverge in terms of the final output. Therefore, the idea is to summarise key takeaways from bibliometric analysis as follows.

Intellectual capital of the interrelation between AI and SE is established through careful bibliometric analysis of the selected papers in the study. As per the research interest of this paper, the central element defining intellectual capital is the interrelation between authors' keywords used in titles, abstracts and other parts of scientific papers. Notably, it is possible to include a broader area of bibliometric insights such as bibliographic coupling, co-citation analysis and co-reference analysis among authors (Chang and Huang, 2012; Biscaro and Giupponi, 2014; Marzi et al., 2020; Dabić et al., 2021). Over time, bibliometric scrutiny of the research subject intimates a meticulous utilisation of AI technology aimed at comprehending consumers' behavioural patterns on sharing economy platforms, coupled with extensive big data analytics endeavours geared towards cultivating comprehensive insights necessitating policy adaptations amidst the swift transformations within industry dynamics. Specifically, the emergence of the implementation of AI in the healthcare system is of particular interest to both academia and practitioners, and it has manifested in higher scientific production lately.

Furthermore, as previously addressed in Figure 2, a thorough selection of papers is undertaken for high-impact paper extraction. Consequently, 59 papers are used to map a trajectory of future research avenues that encompass the association between AI and SE. Some of these papers are presented in Appendix Table 2, with their overall summary and potential research areas for the future. Following the essence

of each paper's remark related to future research identified research directions might be categorised into governance, business-related, and behavioural aspects of future research. However, it is beneficial to outline which paper may be appropriate for which category. The governance category, addressed by Ferreri and Sanyal (2018), calls for examining how AI can reconcile the pursuit of short-term economic gains with the need to uphold the public good in digital platform economies. This research area underscores AI's potential to enable a more equitable balance between economic development and societal well-being within the sharing economy. In the business domain, Papagiannidis and Davlembayeva (2022) suggest evaluating AI's influence on renter behaviour, particularly in relation to sustainability features in smart accommodations. This highlights AI's role in fostering environmentally sustainable practices while improving the overall user experience. Meanwhile, the social-cultural and behavioural category, as outlined by Komarraju, Arora, and Raman (2022), emphasizes investigating AI's implementation in ways that preserve social dignity and ensure human autonomy. This area of research aims to ensure that AI systems operate ethically, respecting human agency while supporting oversight within the sharing economy. Each category identifies a specific trajectory for future research, situating AI as a powerhouse tool in managing governance, advancing sustainable business practices, and safeguarding human dignity in the evolving sharing economy landscape.

## **6. Conclusion**

The intersection of AI and SE has been the subject of several studies, yet these often provide fragmented insights, lacking a comprehensive understanding of their interrelationship. This research addresses this gap by offering a more integrated perspective on how AI is deployed within SE, the roles it plays, and its potential to influence future trajectories. Through the articulation of a future research agenda, combined with implications for various stakeholders and bibliometric analysis, this study advances the current comprehension of the confluence between AI and SE, providing a structured framework for future inquiry.

A systematic examination of the intellectual framework underpinning the interrelationship between AI and SE (RQ1) establishes a broad synopsis of the extant body of knowledge. The bibliometric analysis demonstrates how AI is harnessed to analyse consumer behaviour on peer-to-peer platforms while also highlighting opportunities for AI-driven services and addressing critical challenges such as consumer trust within gig economy ecosystems. To further explore the landscape of future research directions (RQ2), an in-depth analysis provides actionable insights for stakeholders, identifying three pivotal areas of focus: the integration of AI into healthcare systems and innovative digital platforms within SE, greater governmental involvement, and the alignment of platform operations

with public values, particularly in addressing urban-rural disparities. Additionally, notable insights emerge from specific intersections of AI and SE. For instance, AI's ability to optimise resource allocation and refine matching algorithms on online labour platforms has illustrated how digital ecosystems can be enhanced for both workers and employers. Furthermore, AI's integration into smart accommodation settings has enabled dynamic, personalised services that augment functional value and enhance user experiences. Other insights include AI-driven text analytics improving customer satisfaction through user reviews, AI's role in promoting energy-efficient behaviour within smart accommodations, and the integration of algorithmic oversight in digital labour platforms to balance automation with human dignity. These findings present valuable perspectives on the broader ramifications of AI in various SE domains.

Nevertheless, several limitations of this study must be acknowledged. The exclusive reliance on bibliometric methods may not fully capture the qualitative richness of the literature, and the use of a restricted range of databases may have excluded significant research. Future studies are encouraged to expand the scope by incorporating additional databases, such as Scopus or Google Scholar, considering non-English literature, and exploring AI's role in other innovative digital economic models beyond SE to provide a more comprehensive understanding.

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## Appendix

Table 1: Papers, meticulously selected from a cohort of 59 chosen papers, used for a systematic overview of multiversity implications for stakeholders

Authors	Paper summary	Confluence of SE and AI
Ferreri and Sanyal (2018)	This paper investigates the influence of the SE, focusing on Airbnb in London, on urban governance and challenges in enforcing policies and acquiring data from digital platforms. It further examines the implications of corporate-led sharing economies on urban regulation.	This study explores how SE and AI intersect through algorithms and big data in urban governance. AI can mine real-time data to regulate sharing platforms like Airbnb, enhancing governance and raising concerns about corporatisation and regulatory power shifts.
Abdar and Yen (2017)	The paper explores the SE, presents a model to analyse user behaviour, and emphasises the importance of internal and external factors in understanding preferences.	This research examines how AI and the SE intersect, using machine learning to analyse data from platforms like Airbnb. The DKDAR model shows how AI can enhance service quality by analysing user behaviours and considering internal and external influences.
Xu et al. (2019)	This article utilises Herzberg's two-factor theory to analyse 33,892 Airbnb reviews. It identifies that apartment facilities function as hygiene factors, while home experiences serve as key motivators for guest satisfaction.	This paper highlights the integration of AI and SE through AI-driven text analytics applied to user-generated Airbnb reviews. The AI techniques enable a deeper comprehension of customer satisfaction and experiences, demonstrating how AI can analyse large data sets and extract insights, thereby improving decision-making in the SE.
Geissingner, Laurell and Sandström (2020)	The paper discusses the expansion of the SE into various sectors beyond transportation, highlighting abundance, scalability, and the tensions it creates.	Though AI is not explicitly discussed, the paper focuses on SE-enabled ICT platforms. AI could optimise resource allocation and enhance user experience on these platforms, suggesting potential future integration.
Papagiannidis and Davlembayeva (2022)	This study examines the functional and emotional value of smart accommodations, considers the role of innovative technologies in business recovery post-pandemic, and offers practical recommendations for adopting smart technologies in the hospitality industry.	The study explores the intersection between SE and AI, particularly through smart home technologies integrated into peer-to-peer accommodations. This integration enhances both functional and emotional service value. AI applications in this context include service personalisation, automation, and monitoring, contributing to improved guest experiences and increased demand for smart accommodations.

Table 1: Papers, meticulously selected from a cohort of 59 chosen papers, used for a systematic overview of multiversity implications for stakeholders

Authors	Paper summary	Confluence of SE and AI
Komaraju, Arora and Raman (2022)	The study discusses the impact of digital labour platforms on worker dignity, focusing on algorithmic surveillance and how gendered labour is transformed within the on-demand platform economy.	The research illustrates how AI is employed within the SE, particularly through platforms like Urban Company, which integrates AI for automated supervision and worker discipline. The term blended automation is introduced, combining traditional supervision methods with algorithmic oversight, exemplifying the evolving relationship between AI and human practices in the SE.
Braesemann, Lehdonvirta and Kässi (2022)	The article investigates economic opportunities in rural areas, analyses the role of online labour platforms in counteracting the urban-rural divide, and discusses the implications for regional economic development based on rural workers' participation in online labour markets.	Although AI is not directly addressed, the paper touches on online labour platforms within the SE, which facilitate remote work by connecting workers and clients. AI could optimise these platforms by improving matching algorithms, automating processes, and analysing large datasets to enhance operational efficiency, thus contributing to regional economic development.
Ranchordás and Goanta (2020)	This paper examines technocratic discourses in the SE and advocates for a framework that balances platform-driven and local values in public interest governance.	The study highlights how AI technologies, like machine learning, in the SE shape smart cities and influence decision-making. While AI enhances service delivery, it also raises concerns about conflicts between platform and public values, requiring careful governance.
Aspara and Wittkowski (2019)	This study explores the relationship between consumer intelligence and preferences for social exchange-based access modes, such as co-ownership and leasing. It suggests that higher intelligence correlates with increased trust and preference for these modes.	While the paper does not specifically mention AI, it discusses the SE about social exchange-based access models like leasing and co-ownership. AI could optimise resource allocation and improve matchmaking on sharing platforms, suggesting potential future applications of AI within these access modes.
Ranjbari, Shams Esfandabadi and Scagnelli (2020)	The paper provides insights into Airbnb's service quality attributes using an Importance-Performance Analysis (IPA) matrix and proposes strategies to enhance service offerings in short-stay accommodations.	This research demonstrates the application of AI in the SE through tools like Leximancer, which analyses large datasets of user-generated content, identifying key service quality attributes. AI enables the processing and analysis of big data, enhancing the understanding of customer feedback and enabling the prediction of trends, thus improving service delivery in the SE.

Source: Authors' construction

Table 2: Overview of selected papers that are setting capacities for establishing future research areas

Authors	Paper summary	Narrative for future research
Ferreri and Sanyal (2018)	The paper underlines the impact of the sharing economy, focusing on Airbnb in London, on urban governance, planning regulations, and the challenges faced by local councils in enforcing regulations and obtaining data from digital platforms. It also discusses the implications of the corporate-led sharing economy on urban governance and regulation.	1) Exploring the use of algorithms and big data for urban governance in the context of the sharing economy; 2) Investigating how AI can help balance short-term economic gains with the wider public good within digital platform economies; 3) Developing a ‘light-touch framework’ that utilises real-time data mining through algorithms for regulatory practices
Papagiannidis and Davlembayeva (2022)	The study amplifies the perceived functional and emotional value of smart accommodation and the implications of innovative technologies for business recovery post-pandemic. It provides practical implications for adopting smart technologies in the hospitality sector.	1) Examining AI-driven technology-user interaction patterns to address surveillance concerns in smart accommodations; 2) Exploring AI’s role in influencing renters’ behaviours and attitudes towards sustainability features in smart accommodations; 3) Investigating AI applications for analysing and promoting energy-efficient consumption behaviours in rented accommodations.
Komaraju, Arora and Raman (2022)	The article explores the impact of digital labour platforms on worker dignity, the role of algorithmic surveillance, and the transformation of gendered work through the on-demand platform economy.	1) Explore the concept of blended cultures and how AI and human cultures interact and reshape each other within the sharing economy; 2) Examining how AI can be implemented in an inclusive way and respects social dignity, as well as how human agency is preserved in the face of algorithmic control.
Sengupta et al. (2021)	The paper discusses Airbnb’s significance in the sharing economy, the unique features of Airbnb homes, the lack of bookings for some homes, and the proposed text-mining framework to address this issue.	1) Incorporating seasonality, economic shocks, and other externalities using AI to predict successful Airbnb reservations; 2) Exploring the effects of cultural dimensions using AI to analyse cultural data and its impact on consumer behaviour in the sharing economy.
Leoni and Nilsson (2021)	The study investigates the impact of intertemporal price discrimination on Airbnb hosts’ revenues using a causal machine learning technique. It sheds light on the dimensions of listings that make price surges detrimental to revenues, contributing to the literature on dynamic pricing strategies and the estimation of heterogeneous treatment effects.	1) Developing AI analytical techniques to determine optimal pricing policies, including when and by how much prices should be changed; 2) Exploring AI methods to obtain and analyse detailed price trajectory data, considering factors such as seasonality and demand spikes; 3) Investigating AI tools that can estimate price variability and discern the direction of pricing strategies, even with limited information.

Source: Authors’ construction

## Navigacija krajolikom: otkrivanje odraza umjetne inteligencije u ekonomiji dijeljenja putem bibliometrijskog pristupa

Veljko Uskoković<sup>1</sup>, Milica Maričić<sup>2</sup>, Aleksandra Dacić-Pilčević<sup>3</sup>, Veljko Jeremić<sup>4</sup>

### Sažetak

Recentna znanstvena pozornost porasla je u svezi integracije umjetne inteligencije (AI) u različitim znanstvenim područjima, što je potaknulo pomnije ispitivanje sveprisutnog utjecaja AI-a na ekonomske paradigme poput ekonomije dijeljenja (SE). Ova se studija bavi višestrukim sjecištima umjetne inteligencije unutar SE-a, koristeći bibliometrijski analitički okvir. Uspostavljanjem terminološke osnove u umjetnoj inteligenciji, studija istražuje široki spektar primjena umjetne inteligencije u SE-u, što kulminira bibliometrijskom analizom koja identificira nove teme i trendove. Analizirajući meta-podatke literature iz baze podataka Web of Science tijekom proteklih osam godina, fokus je na citiranim temama unutar SE-a. Dubinske analize, koje omogućuje Bibliometrix R paket, primjenjuju se na odabrani izbor radova. Rezultati otkrivaju ključne uvide, poput toga kako tekstualna analitika vođena umjetnom inteligencijom značajno povećava zadovoljstvo korisnika putem recenzija koje generiraju korisnici. Osim toga, umjetna inteligencija igra ključnu ulogu u promicanju energetski učinkovitih ponašanja u pametnim smještajima, dok se algoritamski nadzor sve više integrira u digitalne platforme rada kako bi se uravnotežila automatizacija s ljudskim dostojanstvom. Nadalje, umjetna inteligencija optimizira raspodjelu resursa i poboljšava algoritme usklađivanja na mrežnim platformama rada, čime se povećava učinkovitost platforme. Studija predlaže buduće istraživačke puteve, zagovarajući šire istraživanje uloge umjetne inteligencije u digitalnim ekonomskim modelima i veću uključenost vlade.

**Ključne riječi:** umjetna inteligencija, ekonomija dijeljenja, bibliometrijska analiza

**JEL klasifikacija:** D16, O35, O57

<sup>1</sup> Asistent, Univerzitet u Beogradu, Fakultet organizacijskih nauka, Jove Ilića 154, 11000 Beograd, Srbija. Znanstveni interes: primijenjena statistika, biostatistika, scijentometrija. E-mail: veljko.uskokovic@fon.bg.ac.rs.

<sup>2</sup> Docent, Univerzitet u Beogradu, Fakultet organizacijskih nauka, Jove Ilića 154, 11000 Beograd, Srbija. Znanstveni interes: primijenjena statistika, SEM analiza, multivarijatna statistička analiza. E-mail: milica.maricic@fon.bg.ac.rs.

<sup>3</sup> Europska agencija za lijekove, Domenico Scarlattilaan 6, 1083 HS Amsterdam, Nizozemska. Znanstveni interes: ICT & AI in health, Project Management in ICT. E-mail: aleksandra.dacicpilcevic@ema.europa.eu.

<sup>4</sup> Redoviti profesor, Univerzitet u Beogradu, Fakultet organizacijskih nauka, Jove Ilića 154, 11000 Beograd, Srbija. Znanstveni interes: primijenjena statistika, scijentometrija, kvantitativne metode. E-mail: veljko.jeremic@fon.bg.ac.rs.



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# How accounting for investment subsidies influences financial performance: an empirical analysis of IAS 20 and Czech accounting legislation\*

Radek Zdeněk<sup>1</sup>, Jana Lososová<sup>2</sup>, Jaroslav Svoboda<sup>3</sup>

## Abstract

*Our paper focuses on investment subsidies and the impact of accounting methods on financial ratios. Accounting for investment subsidies in Czechia is subject to national legislation and international accounting standards, such as the IAS20. This standard offers two options for capturing subsidies on assets – as deferred income or by reducing the book value. Czech accounting legislation allows only the second method mentioned. The essence of our article is to evaluate to what extent the alternative accounting of investment subsidies using accruals would be reflected in the financial ratios. The dataset consists of 277 enterprises that received an investment subsidy. Enterprises are from the agricultural sector that is subsidised for many reasons. The analysis is focused on testing the differences in the financial ratios according to financial statements compiled according to Czech accounting legislation and based on accounting allowed by IAS 20. The results indicate a higher significance of the subsidy for smaller companies. The impact of the change in the accounting procedure on financial ratios was statistically significant; on average, their values decreased by 2.8%. For the smallest businesses, the transition to accounting for subsidies using deferred income would be the most significant, with an average reduction of 5.5%.*

**Keywords:** accounting, subsidies, assets, IFRS, IAS20

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<sup>1</sup> Associate Professor, Faculty of Economics, University of South Bohemia, Studentská 13, České Budějovice, Czech Republic. Scientific affiliation: corporate finances, company analysis. E-mail: [zdenek@ef.jcu.cz](mailto:zdenek@ef.jcu.cz).

<sup>2</sup> Research Assistant, Faculty of Economics, University of South Bohemia, Studentská 13, České Budějovice, Czech Republic. Scientific affiliation: agricultural economics. E-mail: [lososova@ef.jcu.cz](mailto:lososova@ef.jcu.cz).

<sup>3</sup> Assistant Professor, Faculty of Economics, University of South Bohemia, Studentská 13, České Budějovice, Czech Republic. Scientific affiliation: financial accounting, IFRS. E-mail: [svoboda@ef.jcu.cz](mailto:svoboda@ef.jcu.cz).

## 1. Introduction

Investment subsidies are funds provided to investors to finance their investment projects. These grants can come from various entities, including governments, foundations, international organizations, and private investors. Accounting for investment grants includes accounting records and reporting of financial flows within the investment project. Investment subsidies can finance the costs of purchasing assets and buildings, modernizing technologies, or operating an investment project. Investment subsidies can be provided through direct payments, interest, or tax credits.

The strategic importance of agriculture, the specific nature of agricultural business, and its non-production effects on the environment justify subsidies in agriculture. The question of investment in agriculture is important because current agricultural output is a function of several inputs, including the current level of capital, which depends on past investment decisions. Investment decisions affect current and future production, so any policy that increases investment will affect agricultural production for several years ahead (Sckokai and Moro, 2009). Investment support represents not only the possibility of expanding new assets but especially in post-transforming countries, where the growth rate of investment subsidies is the highest, as well as the renewal of long-depreciated assets (Svoboda et al., 2016).

Accounting records of investment subsidies are essential for monitoring the investment project's effectiveness and providing information to the investors who finance the project. Investors and grant providers want to see that the investment grants are used efficiently and that the project generates enough income to repay the loan or ensure a return on investment (Kállay and Takács, 2023).

The accounting reporting of investment subsidies is essential, as they can affect the profit and loss statements, balance sheet and cash flow of the investment project and the entire company. Countries and regions use different approaches to accounting for investment subsidies because national accounting and tax regulations differ (Jermakowicz, 2004; Lantto and Sahlström, 2009; Stadler and Nobes 2018).

Accounting for investment subsidies in the Czech Republic is subject to national accounting legislation and international accounting standards, such as International Accounting Standard IAS 20 – Accounting for Government Grants and Disclosure of Government Assistance. This standard defines how to account for government subsidies to ensure they are correctly recorded and presented in the financial statements. IAS 20 offers two options for capturing grants on assets. The first method reports the subsidy as accruals, and the second method subtracts the subsidy when calculating the asset's book value (IFRS, 2024). Czech accounting legislation allows only the second method mentioned. From the above, the research question arises to what extent the alternative accounting of investment subsidies (i.e., the first method) would be reflected in companies' financial statements and whether

it would significantly affect the values of financial ratios and synthetic models for evaluating companies. Our research aims to answer this research question. This article contributes to the literature on the economic consequences of partial IFRS/IAS adoption by examining the impact of this adoption on key financial indicators. The conclusions of this study can be used by authorities that define the legal framework of accounting.

The structure of the subsequent text is as follows. In the Previous research chapter, we focus on the context of accounting in the Czech Republic, the accounting and reporting of subsidies, the impact of international accounting standards, and the importance of subsidies in agriculture. The Data and Methods chapter presents the sample file on which the analysis is processed, the modifications made to the financial statements, and the evaluated financial indicators. The Results chapter provides information on the importance of investment subsidies and the impact of alternative accounting on financial ratios. Discussion and Conclusion chapters follow.

## **2. Previous research**

In this chapter, we focus on four areas of existing research. First, we present the context of Czech accounting, followed by information on the accounting and reporting of subsidies, the impact of IFRS, and the importance of subsidies in agriculture.

### **2.1. The context of accounting in the Czech Republic**

After 1989, Czechoslovakia transformed from a centrally planned economy towards a market-oriented economy. Legislation has been modified to conform to Western standards. Under the influence of the Austrian roots of the old commercial code and modelled after German commercial law, several legal regulations related to business were introduced. This legislation also includes requirements for annual financial statements. In the following years, it was significantly amended, primarily to bring Czech accounting closer to IFRS (Choi and Meek, 2008). Accounting in the Czech Republic is thus influenced by the Accounting Act (Parliament of the Czech Republic, 2024), Czech accounting standards, decrees of the Ministry of Finance and other legal regulations (e.g. the Business Corporations Act and other tax laws). Financial statement audits are required for large, medium and some small companies. The audit aims to ensure that the accounts are kept by applicable laws and regulations and that the financial statements provide a true and fair view of the company's financial situation and results. The financial statements must include a balance sheet, a profit and loss statement, and an appendix to the financial statements. Depending on the size of the accounting unit, the financial statement also includes a cash flow statement and a statement of changes in equity. Small

companies that are not subject to audit have reduced disclosure requirements (Parliament of the Czech Republic, 2024; Ryneš, 2023). The Accounting Act requires an accounting entity that is a trading company and is an issuer of investment securities accepted for trading on a European-regulated market to use international accounting standards regulated by European Union law (Parliament of the Czech Republic, 2024) for accounting and drawing up financial statements.

## **2.2. Accounting and reporting of subsidies from public budgets**

Within the framework of international accounting standards, the issue of reporting subsidies from public budgets is addressed by standard IAS 20 – Accounting for Government Grants and Disclosure of Government Assistance (IFRS, 2024). Stadler and Nobes (2018) state that IAS 20 was based on the British standard SSAP 4 (Accounting for Government Grants) of 1974. This standard required the grant to be recognized as revenue over the asset's life and allowed the choice of either showing the grant as deferred income or deducting the subsidy from the asset's value.

There are two alternatives to the accounting treatment of state subsidies according to IAS 20. The first method (income approach) recognizes the grant as deferred income that is recognized in profit/loss on a systematic basis over the life of the asset. The second method (capital approach) subtracts the subsidy when calculating the asset's book value. The subsidy is recognized in profit/loss over the entire useful life of the depreciable asset as a reduced depreciation expense. IAS 20 in section 32 (IFRS, 2024) regulates the return of the subsidy from the point of view of both approaches.

The IAS 20 standard (IFRS, 2024, par. 14) also lists the arguments for individual approaches. Proponents of the capital approach argue as follows:

“(a) government grants are a financing device and should be dealt with as such in the statement of financial position rather than be recognised in profit or loss to offset the items of expense that they finance. Because no repayment is expected, such grants should be recognised outside profit or loss.

(b) it is inappropriate to recognise government grants in profit or loss, because they are not earned but represent an incentive provided by government without related costs.”

On the contrary, the arguments supporting the income approach are as follows (IFRS, 2024, par. 15):

“(a) because government grants are receipts from a source other than shareholders, they should not be recognised directly in equity but should be recognised in profit or loss in appropriate periods.

(b) government grants are rarely gratuitous. The entity earns them through compliance with their conditions and meeting the envisaged obligations. They should therefore be recognised in profit or loss over the periods in which the entity recognises as expenses the related costs for which the grant is intended to compensate.

(c) because income and other taxes are expenses, it is logical to also deal with government grants, which are an extension of fiscal policies, in profit or loss.”

Stadler and Nobes (2018) state that these two options are generally equally popular (52% of firms chose to present asset grants as deferred income). However, the choice is strongly linked to the country of the company’s headquarters (i.e. the obligation to report according to national regulations). Nevertheless, for example, Martínez et al. (2011), for their sample of companies, state that 54 of them present the grant as a deferred income and 8 deducted from the asset. In contrast to IFRS, the requirements of the Czech accounting legislation in this area do not give the accounting entity a choice. Subsidies for the acquisition of fixed assets are only accounted for as a reduction in the book value of the given asset (i.e., the second method mentioned above). It is, therefore, necessary to reduce the property’s purchase price by the subsidy provided, and depreciation is calculated from the reduced purchase price (Ryneš, 2023). E.g., accounting legislation in Slovakia (which, like in the Czech Republic, transformed in 1989) uses the above-mentioned first method (Ministry of Finances, 2024).

### **2.3. Impacts of IFRS and IAS**

The number of research papers focused on the evaluation of the transition to International Financial Reporting Standards (IFRS) and its impacts in various areas is comprehensive and still growing, and it is possible to divide them into several directions (Kubičková and Jindřichovská, 2012). One line of research deals with the effects of the adoption of individual IFRS standards (Lantto and Sahlström, 2009; Erin and Oduwale, 2019; Kabir and Su, 2022; López-Espinosa and Penalva, 2023); others focus on connections with capital market effects (Golubeva, 2020; Bessler et al., 2023); another focuses on the impact of the widespread adoption of IFRS, especially on the quality and comparability of accounting information (Jermakowicz, 2004; Martínez et al., 2011; Lueg et al., 2014; Adhikari et al., 2021; Nurunnabi et al., 2022; Wakil and Petruska, 2022; Lam et al., 2023), especially with regard to the national environment, existing accounting practices and the current form of accounting regulations. Other lines of research focus on the willingness of companies to implement IFRS and the effects of voluntary implementation (Jermakowicz and Gornik-Tomaszewski, 2006; Bertrand et al., 2022; Nguyen et al., 2023) or on the influence of experience with IFRS on the accuracy and timeliness of predictions (Barniv et al., 2022).

## **2.4. Importance of investment in agriculture**

Investments in agriculture are crucial in ensuring food security and sustainability of the food sector. Investments in agriculture can bring many benefits (Bojnec and Latruffe, 2011), such as increasing yields and productivity, improving soil quality and protecting natural resources. According to the World Bank (World Bank, 2010), investment in agriculture can lead to significant poverty reduction in developing countries, as the poorest people in these countries depend on agriculture as their primary source of livelihood. The economies of post-transforming countries can have difficulties catching up with more developed economies and ensuring sustainable economic and rural development without investment support (Bojnec and Fertő, 2016).

The provision of investment subsidies in agriculture affects not only the competitiveness of the company (Fertő et al., 2021), but the main goal is sustainable agriculture and the production of safe food. Using new and precise technologies contributes to ecological food production, energy savings, careful water management, the transition to a zero-waste economy, and improves welfare and working conditions. It means that the goal of the Common Agricultural Policy is no longer to maximize productivity but, above all, to support and optimize across production, rural development, environmental, social justice and food consumption outcomes (Pretty et al., 2010). It should reward positive externalities associated with agricultural activity, stabilize the highly volatile incomes of farms, and contribute to the EU's food self-sufficiency (Frýd and Sokol, 2021). Farm investment decisions result from the combined influence of exogenous and endogenous factors (Minviel and Latruffe, 2016). Investments co-financed with EU funds are essential to supporting the farms' participation in the EU single market.

The support was intended to make farms more competitive through technical upgrades, the implementation of new technologies that may contribute to farming efficiency, and the better utilization of inputs (Sadowski et al., 2021).

However, investing in agriculture also brings certain risks such as market volatility, unpredictable climatic conditions and imbalances in supply and demand. According to the OECD (2009), the risks associated with investments in agriculture are high and include various factors such as political risk, volatile commodity prices, high market entry and exit costs, and climate risk. These factors can lead to large swings in investment returns that are difficult to predict. The development of technology has an increasing influence on the agricultural sector as well. Among other benefits, technology can help improve food production and reduce costs, leading to the increased profitability of agricultural investments (McFadden et al., 2022).

### 3. Data and methods

The analysis is carried out on a sample of agricultural enterprises, and its selection procedure is described below. Furthermore, the chapter describes adjustments to the accounting statements and financial ratios used.

#### 3.1. Characteristics of the subsidy title

The selected subsidy title for investments was provided as part of the Rural Development Program 2014-2020, measure *M04 Investment in tangible assets*. The measure was aimed at increasing the competitiveness of small and medium-sized agricultural enterprises to contribute to the achievement of competitive agriculture, food and forestry, as well as to the achievement of sustainable management of natural resources (Ministry of Agriculture, 2015). As part of measure M04, operation 4.1.1-Investment in agricultural enterprises was selected, which includes investments in animal and plant production leading to the reduction of production costs, modernization or improvement of the quality of manufactured products, an increase in the efficiency of the use of production factors and easier access to new technologies with significant innovation potential where renewal is essential for further activity. The applicant for the subsidy could be an agricultural entrepreneur (i.e., an entity engaged in agricultural production under Act No. 252/1997 Coll., on agriculture).

The subsidies concerned, for example, stables and breeding facilities, storage capacities for plant production products, fodder, bedding or secondary products of animal production, investment in support structures for permanent crops, investment in buildings for horticulture, and the acquisition of mobile machinery. It is a direct, non-refundable subsidy of 40% of eligible expenses. This support rate could be increased by 10% for young beginning farmers and 10% for areas facing natural and other special constraints. The support rate could therefore reach a maximum of 60% of eligible expenditure. The amount of expenses from which the subsidy was determined was a minimum of CZK 100,000 and a maximum of CZK 150,000,000 per project (State Agricultural Intervention Fund, 2016). That is 3.9 to 585 thousand EUR.

#### 3.2. Sample selection

Sample selection was divided into two steps:

1. The selection of enterprises is based on the allocated subsidies of the Rural Development Program 2014 – 2020: Operation 4.1.1 – Investments in agricultural enterprises. The highest number of companies (legal entities) that received this support and published their financial statements simultaneously was in 2018 (N = 277). Subsidies were provided based on the approved

applications submitted in the third round (receipt of subsidy applications from 11/10/2016 to 31/10/2016) and partly in the first round (reception of applications from 29/09/2015 to 12/10/2015).

- In the next step, a manual search was done for the specific type of acquired property in the annex to the financial statements and in the text of the contract with the State Agricultural Intervention Fund, published on the *hlidacstatu.cz* portal. The reason is to determine the depreciation group of the acquired property. This data was obtained for  $N = 274$  enterprises.

### 3.3. Sample description

Regarding legal form, 41.6% of these 274 enterprises are joint-stock companies, 27% are cooperatives, and 31.4% are limited liability companies. According to the CZSO (2021), there are 4,261 legal entities in Czech agriculture, of which 67.5% are limited liability companies, 15.6% are joint-stock companies, and 11.5% are cooperatives. From the point of view of size classification (based only on assets and turnover), the sample consists of 13.5% of micro companies, 73% of small companies and 13.5% of medium-sized companies. In terms of belonging to Areas with Natural Constraints (ANC), 60.2% of companies farm in these areas (for a rough comparison, according to the Ministry of Agriculture (2019), in the Czech Republic, 56.5% of agricultural land is in an ANC).

The primary statistical characteristics of the sample are presented in Table 1. The area of agricultural land was calculated based on received SAPS subsidies and their hectare rate. The table shows the high variability of all indicators.

Table 1: Basic characteristics of sample

Indicator	Mean	Std. Dev.	Minimum	Lower quartile	Median	Upper quartile	Maximum
Agricultural land [hectares]	1,479	1,349	0	564	1,213	1,966	9,086
Total assets	8,429	8,836	72	2,950	6,419	11,246	80,279
Long-term assets	5,505	6,020	12	1,842	3,844	7,105	63,650
Tangible long-term assets	5,199	4,974	12	1,804	3,754	7,067	40,045
Sales from products and services	3,510	4,915	2	1,065	2,455	4,300	61,162
Total revenues	4,804	6,024	30	1,584	3,447	6,287	66,994

Note: financial indicators in 1,000 EUR

Source: Author's calculations

In the analytical part, the results will be processed for the entire set and divided into four quartiles according to the volume of assets. The arrangement of objects according to assets is almost identical to the alternative measurement of the size of enterprises according to total revenues, where  $r = 0.92$ .

### **3.4. Adjustments made to financial statements**

Answering the research question, i.e., to what extent the alternative accounting of investment subsidies (by income method) would be reflected in the financial statements of companies and whether it would have a significant effect on the values of ratios of financial analysis and synthetic models for evaluating companies, requires making several adjustments in the balance sheet and profit/loss statement. Specifically, the following adjustments are made:

- The investment subsidy is added to the value of long-term tangible assets and the deferred income, i.e., the balance amount will be increased by the amount of the investment subsidy.
- A depreciation group is designated for property acquired with subsidy support, and a proportional part of the subsidy is added to depreciation and to other operating revenue (where it represents the annual settlement of deferred income), i.e., the proportional amount is added to both costs and revenues without affecting profit/loss. When determining depreciation, we followed the Czech tax legislation, which includes most machines, trucks and tractors in the second depreciation group with a depreciation period of 5 years and buildings for agriculture in the fifth depreciation group with a depreciation period of 30 years. The State Agricultural Intervention Fund indicates only the total amount of the subsidy for the given measure. In order to find out what type of property it is specifically, it was necessary to find the data in the appendices to the financial statements or in the subsidy agreement. If the subsidy was provided for buildings and movable property, we work with both groups simultaneously. Although this is the depreciation period for tax purposes, and the actual depreciation period of the purchased property may vary between companies, we still use it as the most accurate possible estimate of accounting depreciation. The amount by which the annual depreciation and other operating revenue are increased is calculated as an investment subsidy for movable property divided by 5 and an investment subsidy for buildings divided by 30.
- The value of the property and the deferred income were adjusted (reduced) by annual depreciation.

The adjustments to the financial statement items described above will, therefore, be reflected in the financial statements:

- Balance sheet – assets: the value of long-term tangible assets (buildings or movable property) and total assets (and therefore the change in asset structure).
- Balance sheet – equity and liabilities: the value of accruals (deferred income) and the total equity and liabilities (and thus the change in the structure of liabilities).
- Profit and loss statement: the value of depreciation, other operating revenues, total costs and total revenues.

Czech companies keep accounts in the national currency (Czech crown), and the results are converted to euros at the average exchange rate of 2018, i.e., 1 EUR = 25.643 CZK (CNB, 2024).

The analytical part of the text is focused on testing the differences in the values of the ratios determined based on financial statements compiled according to Czech accounting legislation and based on alternative accounting allowed by IAS 20. These are the following financial ratio indicators. From a large set of financial ratios (e.g., Marek, 2009), we focused on those related to assets, subsidies and their accounting.

- Profitability (profit/loss is unaffected, total capital is affected)
  - Return on Assets = Profit before interest and taxes / Total Assets
  - Long-term profitability = Retained Profit / Total Assets
- Turnover ratios (assets and total revenues are affected, sales for products are not)
  - Total Assets Turnover<sub>R</sub> = Total Revenues / Total Assets
  - Total Assets Turnover<sub>S</sub> = Sales from Goods, Products and Services / Total Assets
  - Fixed Assets Turnover<sub>R</sub> = Total Revenues / Fixed Assets
  - Fixed Assets Turnover<sub>S</sub> = Sales from Goods, Products and Services / Fixed Assets
- Liquidity. If liquidity is measured using Current, Quick or Cash ratio indicators, its value is unaffected.
  - Net Working Capital-to-Assets = Net Working Capital / Total Assets
- Indebtedness – changes in equity and debt structure (increasing of deferred income and total equity and debt)
  - Debt ratio = Total Debt / Total Assets
  - Equity-to-Debt ratio = Equity / Total Debt

- Assets and capital structure:
  - Share of Fixed Assets = Fixed Assets / Total Assets
  - Long-term coverage of Fixed Assets = (Equity + Long-term Debt) / Fixed Assets
- Depreciation-to-Revenues ratio = Depreciation / Total Revenues
- Prediction models:
  - Altman's Revised Z-Score model (Altman, 2002)
  - G-index – this is a model focused on the financial situation of agricultural enterprises (Gurčík, 2002)

The influence of alternative accounting of investment subsidies on the values of financial ratios and synthetic models is assessed in terms of pretest (actual values of indicators,  $O$ ) – post-test (values of indicators based on alternative accounting,  $A$ ) using a paired  $t$ -test, where for each indicator it is tested hypothesis

$$H_0: \mu_O - \mu_A = 0. \quad (1)$$

## 4. Results

Subsidies for the acquisition of assets are important for some companies; for others, they are of relatively minor importance. In a sample of 274 farms, the investment subsidy ranged from EUR 2.8 thousand to EUR 1.95 million, with an average of EUR 181 thousand and a median of EUR 75.1 thousand. Most often, the subsidy ranges from EUR 0 to 50,000 (36%) and EUR 50,000 to 100,000 (27%).

165 enterprises were given subsidies for construction (reconstruction or new construction), and 125 enterprises were given subsidies for purchasing machines (16 enterprises both). Subsidies for buildings are higher than subsidies for machinery (average 248.6 versus 68.7 thousand EUR; median 100.5 versus 38.2 thousand EUR).

### 4.1. Significance of the investment subsidy for the company

The importance of the subsidy for the company must be assessed relatively, i.e., concerning, for example, total assets, fixed assets or equity. The median subsidy to assets was 1.6%, to tangible fixed assets 2.6%, and to equity 2.3%. Subsidies for buildings were more significant than for machines (Table 2). Table 2 shows the medians due to the skewness of the values. From the point of view of the distribution of the subsidy on assets, the value was most often under 1% (35.8% of enterprises). Stadler and Nobes (2018) examined how subsidies are accounted for in

15 countries, with an average subsidy to equity of 3.5% and significant differences across sectors.

Table 2 also shows the significance of the subsidy in 4 size groups. It can be seen that the value of the subsidy relative to assets or fixed assets or equity is the highest for small businesses (1st quartile).

Table 2: Medians of relative value of subsidy (in %)

Subsidized assets	Subsidy to														
	Tangible fixed assets					Assets					Equity				
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
Buildings	3.51	7.85	3.57	3.65	1.75	2.16	4.92	2.13	2.45	0.99	3.21	12.03	2.87	3.33	1.45
Machineries	1.45	5.51	1.74	0.97	0.73	0.91	3.08	1.05	0.57	0.44	1.46	7.89	1.57	0.87	0.56
Both	3.23	7.90	2.53	0.76	3.93	1.91	5.07	1.59	0.45	2.60	2.93	9.20	2.57	0.67	3.83
Total	2.59	6.53	2.80	1.88	1.30	1.60	3.85	1.64	1.06	0.69	2.32	9.20	2.61	1.98	0.99

Note: *Italics* = less frequent data

Source: Author's calculations on dataset

## 4.2. Impacts of alternative accounting for investment subsidies

In Table 3, we can find the results obtained when the enterprises were not analysed in detail. In summary, there were statistically significant differences in the values of the indicators when they were calculated using the previous subsidy accounting (pretest) and the potential income method (post-test). Out of the 14 indicators evaluated, only three showed an increase: the debt ratio by 3.7%, depreciation-to-revenues ratio by 3% and share of fixed assets by 1.6%. For the other indicators, a decrease was observed, which was the highest for equity/debt with almost -11% and for the turnover of fixed assets -6.1% (for the ratio working with revenues) and -5.6% with sales (the higher value of assets in the denominator). Synthetic models also showed a decrease in value, with G-index down -3.1% and Z-score down -7.3%. The relative differences between pretest and post-test values averaged -2.8%.

Table 3: Pretest a post-test values of financial ratios

Indicator	Mean Pretest	Mean Post-test	Difference	<i>t</i>	<i>p</i> -level
Return on Assets	0.0424	0.0413	-0.00109	-7.29	0.000
Long-term profitability	0.3875	0.3787	-0.00882	-11.80	0.000
Total Assets Turnover <sub>R</sub>	0.4171	0.4056	-0.01156	-10.80	0.000
Total Assets Turnover <sub>S</sub>	0.5701	0.5565	-0.01359	-10.84	0.000
Fixed Assets Turnover <sub>R</sub>	0.7594	0.7132	-0.04614	-3.42	0.000
Fixed Assets Turnover <sub>S</sub>	1.0187	0.9616	-0.05710	-3.52	0.000
Net Working Capital-to-Assets	0.1942	0.1897	-0.00452	-6.54	0.000
Debt ratio	0.3942	0.4088	0.01456	13.52	0.000
Equity-to-Debt	3.0671	2.7302	-0.33702	-5.35	0.000
Share of Fixed Assets	0.6266	0.6365	0.00985	12.35	0.000
Long-term coverage of Fixed Assets	1.4133	1.3877	-0.02567	-3.33	0.001
Depreciation-to-Revenues	0.1393	0.1434	0.00416	9.69	0.000
Z-score	2.3038	2.1366	-0.16718	-6.24	0.000
G-index	1.3031	1.2634	-0.03976	-11.22	0.000

Note: N = 274 for each indicator

Source: Author’s calculations on dataset

Based on the results in Table 3, it is clear that the subsidy has a greater impact on companies with fewer assets. To provide more details on how this affects financial ratios, we have included a breakdown for individual groups of companies in Table 4. The data confirms that the transition to the new subsidy accounting method would have the most significant impact on companies in the Q1 group (i.e., those with the smallest amount of assets), with average indicator values being 5.5% lower. On the other hand, the Q4 group (with the highest volume of assets) shows an average decrease in indicators of 1.4%. Except for the debt ratio (with the highest relative difference in Q2), the inverse relationship applies to all examined indicators, where the most significant impact was for the smallest enterprises. Detailed results of the relative difference between the pretest and post-test values are shown in Figure 1.

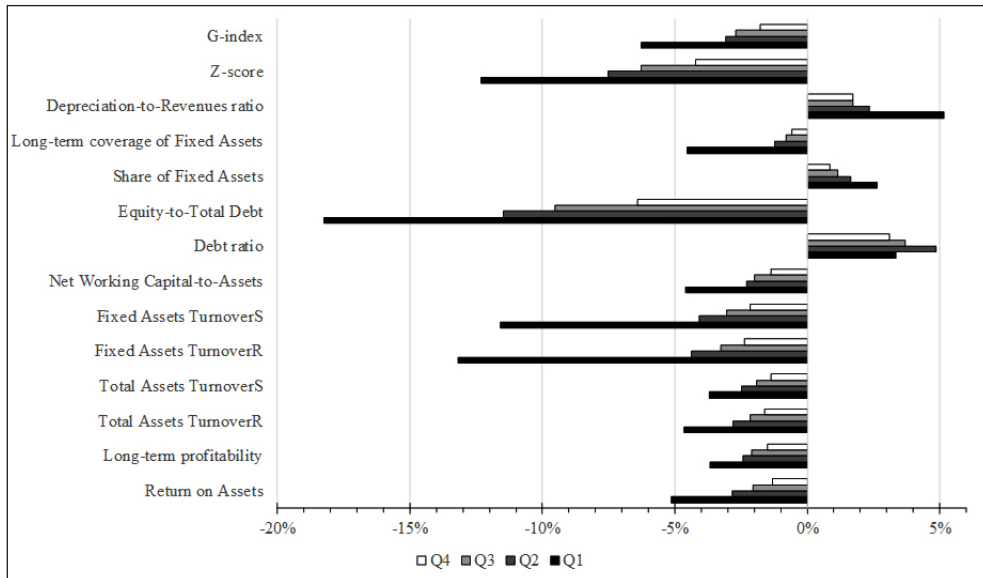
Table 4: Pretest and post-test values of financial ratios detailed by company size

Indicator	Q1			Q2			Q3			Q4		
	Mean Pretest	Mean Post-test	Difference and <i>p</i> -level	Mean Pretest	Mean Post-test	Difference and <i>p</i> -level	Mean Pretest	Mean Post-test	Difference and <i>p</i> -level	Mean Pretest	Mean Post-test	Difference and <i>p</i> -level
Return on Assets	0.0295	0.0280	-0.0015**	0.0455	0.0442	-0.0013***	0.0436	0.0427	-0.0009***	0.0511	0.0505	-0.0007***
Long-term profitability	0.2522	0.2430	-0.0092***	0.4303	0.4199	-0.0105***	0.4284	0.4194	-0.0090***	0.4402	0.4336	-0.0066***
Total Assets Turnover <sub>R</sub>	0.3789	0.3613	-0.0176***	0.4756	0.4623	-0.0133***	0.3954	0.3868	-0.0085***	0.4191	0.4124	-0.0067***
Total Assets Turnover <sub>S</sub>	0.5725	0.5514	-0.0211***	0.6248	0.6093	-0.0155***	0.5329	0.5227	-0.0102***	0.5505	0.5430	-0.0075***
Fixed Assets Turnover <sub>R</sub>	0.8268	0.7179	-0.1089*	0.8342	0.7976	-0.0366***	0.6551	0.6337	-0.0214***	0.7209	0.7038	-0.0171***
Fixed Assets Turnover <sub>S</sub>	1.1804	1.0437	-0.1367*	1.0869	1.0426	-0.0443***	0.8735	0.8469	-0.0266***	0.9329	0.9127	-0.0202***
Net Working Capital-to-Assets	0.1209	0.1153	-0.0055*	0.2528	0.2470	-0.0058***	0.2000	0.1961	-0.0040***	0.2042	0.2014	-0.0028***
Debt ratio	0.5517	0.5701	0.0184***	0.3340	0.3503	0.0163***	0.3632	0.3766	0.0134***	0.3268	0.3369	0.0101***
Equity-to-Debt	2.4276	1.9843	-0.4433*	3.4329	3.0568	-0.3961***	3.1776	2.8749	-0.3027**	3.2178	3.0114	-0.2064***
Share of Fixed Assets	0.6259	0.6425	0.0166***	0.6098	0.6199	0.0100***	0.6409	0.6484	0.0074***	0.6298	0.6351	0.0053***
Long-term coverage of Fixed Assets	1.4341	1.3691	-0.0651*	1.4903	1.4717	-0.0186***	1.3531	1.3424	-0.0107***	1.3762	1.3681	-0.0080***
Depreciation-to-Revenues	0.1823	0.1917	0.0094***	0.1264	0.1293	0.0030***	0.1336	0.1359	0.0023***	0.1146	0.1165	0.0020***
Z-score	1.7896	1.5693	-0.2203*	2.6121	2.4154	-0.1967***	2.3710	2.2221	-0.1489***	2.4479	2.3448	-0.1031***
G-index	0.7543	0.7069	-0.0474***	1.4939	1.4479	-0.0459***	1.4108	1.3728	-0.0380***	1.5579	1.5301	-0.0278***

Note: \*\*\* is *p*-level < 0.001, \*\* is *p*-level < 0.01, \* is *p*-level < 0.05

Source: Author's calculations on dataset

Figure 1: Relative difference between pretest and post-test values



Source: Own calculations on dataset

## 5. Discussion

Subsidies are financial resources provided to entities from public sources to support their activities. In the case of businesses, subsidies are often used to finance investment projects, research and development, employee training, or to support employment. Research deals with the effects of subsidies on the financial health of businesses and its components. These studies mainly examine the effect of subsidies on companies' growth, productivity, profitability, and the level of indebtedness. One of the significant findings is that subsidies can have a significant positive and negative impact on the growth of businesses (Bernini and Pellegrini, 2011; Kállay and Takács, 2023; Takahashi and Hashimoto, 2023). Businesses that receive subsidies often have better financial results than those that do not receive support. However, even companies with a relatively poor performance apply for subsidies, gaining a competitive advantage against non-subsidized companies (Kállay and Takács, 2023). Subsidies can help businesses remove financial constraints that bind their investment activities. Subsidies thus enable companies to finance projects that they would otherwise not be able to implement, thus increasing their competitiveness in the market (Colombo et al., 2013; Svoboda et al., 2016). Obtaining subsidies can allow businesses to diversify their business and enter new areas, which can lead to greater profitability (Blažková, 2016; Lososová and Zdeněk, 2023-a; Kumbhakar et al., 2023). However, subsidies can also be associated with negative impacts. Businesses that depend on subsidies

may lose motivation to improve their results and innovate. If a business cannot be competitive without subsidies, it may find itself in financial trouble after the flow of funds from the subsidy ends. Atzeni and Carboni (2006) concluded that small firms make the best use of grants, while subsidies for medium and large firms seem to be only substitutes for more expensive sources of financing. It follows that the effects of subsidies on corporate finances depend on many factors, such as the size of the subsidy, the area in which the businesses operate, and how dependent businesses are on subsidies. However, most research shows that subsidies can help businesses grow and improve their performance if they are correctly targeted, and businesses can maintain their performance after the subsidies end.

For projects whose eligible expenses exceeded CZK 1,000,000 (Ministry of Agriculture, 2017; approximately EUR 39,000), the application for a subsidy included an assessment of the company's financial health based on the State Agricultural Intervention Fund methodology (State Agricultural Intervention Fund, 2018). Three companies in our sample have negative equity, i.e., they are over-indebted companies whose liabilities exceed the value of total assets. Their eligible expenses exceeded the limit and were subject to a financial health assessment. However, in the Lososová and Zdeněk (2023-b) study, this model provides the most favourable assessment of enterprises compared to alternative models. As a possible solution, it is proposed to regularly update the financial health assessment model and assess the financial health of applicants even for smaller projects (the administrative burden of financial health assessment is very low).

Financial statement disclosure practices are generally insufficient to allow investors and analysts to compile comparable financial statements (Stadler and Nobes, 2018), which is true not only at the national but also at the international level. Czech financial reporting is strongly influenced by tax legislation, which reduces the usefulness of financial statements for external users' decision-making. Entities reporting according to local accounting standards then remove these deficiencies at the level of managerial accounting so that they can prepare the information needed for internal management and decision-making (Procházka, 2010). Czech accounting legislation is oriented towards creditors/stakeholders and is based on the accounting model of historical prices, while IAS is shareholder-oriented and generally perceived as a fair-value accounting model that emphasizes balance sheet valuation (Hung and Subramanyam, 2007). The adoption of international standards is perceived as improving financial transparency and comparability of financial statements among European firms (Lantto and Sahlström, 2009). The method of reporting government subsidies, according to IAS20, then depends primarily on the method of reporting according to national standards in a given country (Stadler and Nobes, 2018).

Our findings revealed a statistically significant impact of simulated variant accounting on ratios of profitability, turnover, indebtedness and synthetic models. The majority (11 out of 14) of the monitored ratios' values were reduced (on

average by almost 3%) when the income method was applied. When classifying the examined sample in more detail, the smallest enterprises are the most sensitive to the transition to the income method of accounting for capital subsidies.

These results differ from previous studies such as Erin and Oduwole (2019) or Perramon and Amant (2006), where the introduction of IFRS did not significantly impact profit or profitability indicators. Pereira et al. (2015) investigated the effects of changing the accounting of the subsidy (originally as an accrual account, after the transition to the new standards, subsidies are reported in equity) on financial stability with mixed results. In the study by Kubičková (2011), most companies showed lower Z-score values based on financial statements according to IFRS compared to national accounting legislation.

Perramon and Amat (2006) discuss the harmonization and standardization of accounting. They define accounting harmonization as a process that increases the comparability of financial statements in different dimensions, i.e., across time and countries, while standardization imposes stricter and narrower accounting rules (associated with a lower number of available accounting methods). In the context of standardization, Stadler and Nobes (2018) concluded that the choice of accounting method should be removed from IAS 20 because international differences and poor disclosures have an adverse impact on international comparability. Our results can help estimate the effects of cancellation of the option of accounting for received capital subsidies.

In reality, the chosen depreciation method (linear, progressive or degressive methods) plays an important role here, which, in the case of the income method of accounting for subsidies, has a depreciation base of the total input price. The amount of depreciation is higher compared to the original method of accounting for subsidies (by reducing the input price), and to a large extent, it is thus possible to optimize profit/loss according to the current needs of management.

The results of this study should be treated with caution as they are subject to several limitations. In our study, we focused only on depreciable assets. It resulted from selecting a subsidy title, which was mainly focused on acquiring equipment, technologies and buildings for animal and plant production of agricultural enterprises. There is another limitation associated with this, which results from the focus only on agricultural enterprises. However, focusing on the subsidy title for agricultural enterprises allowed for the compiling of a sufficiently large data set. Nevertheless, our results may be generalizable to other industries with a similar share of investment subsidies. Thus, further research with a similar methodology could focus on verifying the validity of our conclusions for different types of subsidy titles as well as other sectors (e.g., manufacturing). Another follow-up research can assess the connection between the method of reporting subsidies and its effect on the effectiveness of investments.

## 6. Conclusion

Investment subsidies are an essential source of financing for investment projects (not only) in agriculture, and their correct accounting and reporting are crucial for monitoring the financial health of the project and the enterprise and providing information to investors and other interested parties.

The agricultural sector plays an irreplaceable role in food production. Efforts to continuously adjust the Common Agricultural Policy within the EU lead to the distribution of funds to ensure food security and fulfil other objectives. If agricultural enterprises did not receive subsidies, they would be unable to invest in modern technologies, they would find themselves at a loss, and food production would be threatened. Concerning our results, in this sector, our study demonstrated the impacts of accounting methods on financial analysis indicators that are both statistically and economically significant – changes in selected financial ratios reduced values by almost 3%. When broken down in more detail, the impacts were most pronounced for companies with the smallest volume of assets, where the relative decrease in ratios was 5.5% on average.

The effects of subsidies on the financial health of businesses depend on many factors, such as the size of the subsidy, the area in which the business operates, and how dependent the business is on subsidies. Subsidies can help businesses grow and improve their performance, but they can also lead to dependency and reduce the incentive to innovate. If subsidies are appropriately targeted and used correctly, they can significantly contribute to businesses' financial health and growth.

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## Kako računovodstvo investicijskih subvencija utječe na financijski učinak: empirijska analiza MRS-a 20 i češkog računovodstvenog zakonodavstva

Radek Zdeněk<sup>1</sup>, Jana Lososová<sup>2</sup>, Jaroslav Svoboda<sup>3</sup>

### Sažetak

Fokus našeg rada su investicijske subvencije i utjecaj računovodstvenih metoda na financijske pokazatelje. Računovodstvo investicijskih subvencija u Češkoj podliježe nacionalnom zakonodavstvu i međunarodnim računovodstvenim standardima (MRS), kao što je MRS20. Ovaj standard nudi dvije mogućnosti za uključivanje subvencija na imovinu – kao odgođeni prihod ili smanjenje knjigovodstvene vrijednosti. Češko računovodstveno zakonodavstvo dopušta samo drugu spomenutu metodu. Središnja tema našeg članka je procijeniti u kojoj bi se mjeri alternativno računovodstvo investicijskih subvencija korištenjem obračunskih razdoblja odrazilo na financijske pokazatelje. Skup podataka sastoji se od 277 poduzeća koja su primila investicijsku subvenciju. Poduzeća su iz poljoprivrednog sektora koji je subvencioniran iz više razloga. Analiza je usmjerena na testiranje razlika u financijskim pokazateljima prema financijskim izvještajima sastavljenim u skladu s češkim računovodstvenim zakonodavstvom i na temelju računovodstva dopuštenog MRS-om 20. Rezultati istraživanja ukazuju na veći značaj subvencije za manja poduzeća. Utjecaj promjene računovodstvenog postupka na financijske pokazatelje bio je statistički značajan; u prosjeku su im se vrijednosti smanjile za 2,8%. Za najmanja poduzeća prelazak na računovodstveno obračunavanje subvencija korištenjem odgođenog prihoda bio bi najznačajniji, uz prosječno smanjenje od 5,5%.

**Ključne riječi:** računovodstvo, subvencije, imovina, MSFI, MRS20

**JEL klasifikacija:** M41, Q14, H25

<sup>1</sup> Izvanredni profesor, Faculty of Economics, University of South Bohemia, Studentská 13, České Budějovice, Češka. Znanstveni interes: korporativne financije, analiza poduzeća. E-mail: zdenek@ef.jcu.cz.

<sup>2</sup> Asistent, Faculty of Economics, University of South Bohemia, Studentská 13, České Budějovice, Češka. Znanstveni interes: ekonomika poljoprivrede. E-mail: lososova@ef.jcu.cz.

<sup>3</sup> Docent, Faculty of Economics, University of South Bohemia, Studentská 13, České Budějovice, Češka. Znanstveni interes: financijsko računovodstvo, MSFI. E-mail: svoboda@ef.jcu.cz.

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# Institutional impacts on diversity, equality and inclusion practices: Case Study of Western multinationals and their emerging economy subsidiaries\*

Emil Velinov<sup>1</sup>, Andreas Hilger<sup>2</sup>, Pawel Dobrzanski<sup>3</sup>

## Abstract

*This study examines the contextual impacts on the transfer of equality, diversity, and inclusion (EDI) practices from Western multinational corporations (MNCs) to their subsidiaries in emerging economies. The transfer of EDI practices within MNCs has gained significance due to the need to reconcile theory and context while addressing social and managerial tensions associated with EDI. The research aims to answer questions about why and how EDI practices are transferred within MNCs, with a specific focus on the influence of institutional duality on the transfer process. Institutional theory serves as the theoretical foundation, suggesting that the fit between practices and the institutional environment is crucial for their legitimacy and acceptance. The interaction of host and home country factors, shaped by institutional duality, plays a significant role in shaping the transfer and implementation of EDI practices within MNCs. By considering the contextual differences between headquarters and subsidiary*

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<sup>1</sup> Research Associate, Skoda Auto University, Department of Marketing and Management, Na Karmeli 1457, Mlada Boleslav 29301, Czech Republic and RISEBA University of Applied Sciences, Department of Business Studies, str. Meza 3, Riga 1048, Latvia. Scientific affiliation: diversity management, international business and international management. E-mail: emil.velinov@savs.cz.

<sup>2</sup> Assistant Professor, University of Regensburg, Department of Leadership and Organization, Universitätsstraße 31, D-93053 Regensburg, Germany. Scientific affiliation: diversity management and human resource management. E-mail: andreas.hilger@wiwi.uni-regensburg.de.

<sup>3</sup> Associate Professor, Wrocław University of Economics and Business, Mathematical Economics, str. Komandorska 118/120, 53-345 Wrocław, Poland and Visiting Scholar 2023-2024, Minda de Gunzburg Center for European Studies, Harvard University, Adolphus Busch Hall, 27 Kirkland Street, Cambridge, MA 02138, USA. Scientific affiliation: macroeconomics and microeconomics. E-mail: pawel.dobrzanski@ue.wroc.pl.

*institutional environments, this research aims to enhance our understanding of the complexities and challenges associated with transferring EDI practices in suggesting distinct subsidiary identities and agendas. The findings of this study contribute to the literature by shedding light on the contextual factors, and effects of transferring EDI practices within MNCs.*

**Keywords:** *equality diversity and inclusion; institutions, practice transfer; emerging economies; multinational companies*

**JEL classification:** *F23, M14, O15*

## 1. Introduction

Multinational companies (MNCs) play a crucial role in disseminating their perceived best practices across their global network. They serve as vehicles for transferring knowledge, policies, and procedures from their headquarters or parent companies to their subsidiaries in various countries. This transfer process often aims to replicate successful practices implemented in the home country or headquarters and adapt them to the specific local contexts of subsidiary operations. The transfer of practices across countries through multinational corporations (MNCs) has long been recognized as a significant mechanism for the global dissemination of best practices (Mellahi et al., 2016). Among the areas of both social and managerial tension is the implementation of equality, diversity, and inclusion (EDI) practices (Konrad et al., 2016). In this study, we investigate the transfer of EDI practices within a Western automotive multinational, specifically focusing on the transfer process from the German headquarters to its subsidiaries in the emerging economies of the Czech Republic, Russia, India, and South Africa.

However, the transfer of EDI practices presents unique challenges and complexities due to the intricate interplay between social dynamics and managerial considerations. EDI practices encompass a broad spectrum of initiatives and policies aimed at promoting equal opportunities, embracing diversity, and creating inclusive work environments. These practices are influenced by institutional factors that vary across countries and regions. Through that, EDI in emerging economies presents unique challenges that lack research (Tatli and Özbilgin, 2012; Cooke et al., 2019; Erdur, 2020; Bader et al., 2022).

The primary objective of our research is to address fundamental questions regarding the transfer of EDI practices within automotive MNCs. Our research question is to understand how contextual factors affect automotive MNCs operating in emerging economies by examining the influence of institutional duality on the transfer of EDI practices. To achieve these objectives, we adopt a methodology inspired by Yin (2009), combining a qualitative case study approach with content analysis.

By conducting our research within a large Western automotive multinational and examining its subsidiaries in emerging economies, we aim to shed light on

institutional and cultural aspects behind the transfer of EDI practices. We seek to uncover the underlying factors driving MNCs to transfer these practices, the strategies employed in the transfer process, and the impact of institutional duality on the EDI practices implementation in different contexts.

To ensure the rigour and depth of our research, we employ a methodology based on Yin (2009), which emphasizes the holistic exploration of a phenomenon through in-depth qualitative analysis. Our approach combines a qualitative case study framework with content analysis, allowing us to capture the multifaceted nature of the transfer of EDI practices within MNCs.

By examining the specific context of the automotive industry and analyzing the subsidiaries in the Czech Republic, Russia, India, and South Africa, we aim to provide valuable insights into the complexities and dynamics of the transfer process. Additionally, we pay particular attention to the influence of institutional duality, which refers to the coexistence of home and host country institutions and their impact on organizational practices. The goal of the paper is to develop the theoretical propositions (see below propositions 1 to 4) regarding the normative and regulative impacts on the transfer of Western EDI practices to emerging economy subsidiaries within Western MNCs:

Proposition 1: Local normative and regulative institutions impact EDI practices in emerging economies subsidiaries (EESs).

Proposition 2: EESs address Western (etic) dimensions of diversity-supporting convergence.

Proposition 3: Western MNCs intend to standardize towards dominant practices but are forced to localize their EDI practices.

Proposition 4: EESs do not attempt to reverse EDI transfer.

By investigating how institutional duality influences the transfer of EDI practices, we aim to contribute to the body of knowledge in international management and shed light on the complexities and challenges associated with implementing EDI practices across different institutional contexts.

The purpose of this research is to answer critical questions regarding the transfer of EDI practices within MNCs. We seek to understand why these practices are transferred and how the transfer process unfolds in the context of institutional duality. Additionally, we aim to investigate the impact of contextual differences between headquarters and subsidiary institutional environments on the transfer and implementation of EDI practices. By examining the specific case of a large Western automotive multinational and its subsidiaries in emerging economies, we strive to provide valuable insights into the contextual factors such as institutions, public perceptions (cultural values) and effects of the transfer of EDI practices.

Ultimately, this research aims to enhance our understanding of the challenges and opportunities associated with transferring EDI practices within MNCs. The findings will not only contribute to academic knowledge but also provide practical implications for organizations seeking to implement effective EDI practices in diverse international settings. By recognizing the importance of institutional factors and tailoring practices to specific institutional contexts, MNCs can enhance their ability to create inclusive and equitable work environments across their global operations.

In summary, this study delves into the transfer of EDI practices within a Western automotive multinational, investigating the institutional and cultural factors, and effects of this transfer process. Our methodology is based on Yin (2009) and integrates the content analysis within a qualitative case study approach.

## 2. Literature review

As multinational enterprises (MNEs) operate across diverse cultural contexts, the transfer of diversity and inclusion (D&I) practices becomes crucial for fostering inclusive workplaces across the organisation.

Within the field of International Human Resource Management, it is imperative to consider contextual differences between the headquarters and subsidiary institutional environments (Hennekam et al., 2017). Consequently, the transfer and application of EDI practices can be significantly influenced by the direction and hierarchies of countries involved in the transfer (Bader et al., 2022). However, despite its importance, the institutional influences on EDI practices within globally dispersed MNCs remain relatively under-researched (Cooke et al., 2019).

Institutional theory suggests that the fit between practices and the institutional environment is crucial for their legitimacy and acceptance and forces mimetic or isomorphic processes within subsidiaries of MNCs (Kostova and Roth, 2002). Therefore, understanding how differences in practice transfer and implementation in subsidiaries arise from the interaction of host and home country factors in response to institutional duality is essential (Kostova and Roth, 2002). For instance, a notable instance involves an examination of MNEs operating within the contexts of Taiwan and Thailand. The investigation revealed that the anti-discrimination legislation prevailing in the MNEs' home country acted as a constraining force on gender- and age-based discrimination even in subsidiary nations where comparable anti-discrimination laws were absent (Heymann et al., 2023). Another study conducted by Ferner et al. (2012) delved into the experiences of six US-based MNEs striving to implement their diversity policies within their UK subsidiaries. The study unveiled a consistent pattern of incomplete policy transfers. The researchers attributed this phenomenon to the complex institutional milieu marked

by dual challenges in the realm of diversity. These challenges were twofold: the variations in diversity frameworks across distinct countries and the contentious nature of diversity during that particular period, even within the United States.

Further insights underscored the influence of broader country-level institutional contexts, which may not be directly linked to EDI concerns. An illustrative case is found in the work of Hong (2024), where it was observed that factors such as the degree of protection afforded to property rights within a given nation also exerted an impact on the outcomes of EDI initiatives.

EDI are crucial in the automotive industry worldwide for several reasons. Firstly, the automotive sector serves a diverse global customer base, comprising individuals from different backgrounds, cultures, and demographics. Embracing diversity ensures that products and services are tailored to meet the needs and preferences of these varied consumers, enhancing market competitiveness and driving innovation (Velinov and Štrach, 2022).

Secondly, fostering diversity within the workforce promotes a culture of creativity and problem-solving. Diverse teams bring together unique perspectives, experiences, and skills, leading to more innovative solutions and products. In an industry driven by technological advancements and evolving consumer demands, this diversity of thought is invaluable for staying ahead of the curve (Bai, 2021).

Moreover, promoting equity and inclusion in the automotive workforce ensures fair access to opportunities and resources for all individuals, irrespective of their gender, race, ethnicity, or background. By creating an inclusive workplace environment where every employee feels valued, respected, and empowered, organizations can boost employee morale, productivity, and retention.

Additionally, prioritizing EDI initiatives helps the automotive industry address systemic inequalities and biases that may exist within its structures. By actively working towards greater EDI, companies can contribute to building a more equitable and just society while also driving sustainable business growth and success in the global marketplace (Velinov and Štrach, 2022).

The resistance paradigm propounds that organizations maintain the status quo in the absence of pressure to increase diversity (Dass and Parker, 2007). It has been established that an organization's approach to diversity depends on the degree of pressure to diversity, the type, and managerial attitudes (Dass and Parker 2007; Šušak et al., 2023) and that Human Resource Management (HRM) and EDI are specific to the local social context (Hennekam et al., 2017; Bader et al., 2022).

According to institutional theory, common contexts create pressures on organisations which result in the isomorphism of organisational practises and routines to correspond to institutionalized expectations to ensure their survival

(DiMaggio and Powell, 2000; Scott, 2001). In addition to home country pressures, each host country of MNEs presents unique institutional conditions that may differ drastically from the home country (Kostova and Roth, 2002). Diversity management (DM) as well as research on DM consequently needs to be context-sensitive (DiTomaso, 2021).

Scott (2021) defined institutions as supra-individual social entities that cause social as well as organisational phenomena through a combination of cultural-cognitive, normative, and regulative context factors. According to Scott (2021), regulative institutions create coercive pressure to conform in the form of rules and corresponding sanctions. Normative institutions create pressure in the form of social obligations, binding expectations, and the need for appropriateness of action. Lastly, cultural-cognitive institutions drive mimetic processes through shared understandings and actions as well as common beliefs.

DM research has primarily focused on the influence of government regulation and legislation, whereas knowledge about the interplay of cultural and normative antecedents as well as a combination of all of them is missing (Küskü et al., 2021). However, in the wake of globalization, companies are increasingly urged to develop global strategies, resulting in the coordinated internationalization of HRM as well as a global convergence of HRM practices (Pudelko and Harzing, 2007).

Bader et al. (2022) investigate gender diversity management in foreign subsidiaries of MNEs in Germany and Japan. Their study highlights the challenges in transferring diversity and inclusion (D&I) practices, such as cultural differences and gender role expectations. The findings suggest that adapting practices to local contexts and promoting diversity dialogue among employees are crucial strategies for successful transfer. Host countries with gender inequality and less institutional diversity pressure implement EDI practices difficult (Cooke et al., 2019; Bader et al., 2022).

The literature focuses on the transfer of D&I practices primarily in terms of gender diversity (Bader et al., 2022; Krzywdzinski and Jo, 2022) there is a research gap in exploring the transfer process and outcomes concerning other dimensions of diversity, such as race, ethnicity, age, sexual orientation, and disability. Investigating how multiple dimensions of diversity interact and influence the transfer of D&I.

Krzywdzinski and Jo (2022) examine skill formation, automation, and governance practices in German and Korean automotive manufacturers in Central-Eastern Europe. While their study does not explicitly focus on D&I, it sheds light on the transfer of HR practices within MNEs. The findings underscore the significance of contextual factors, such as labour market institutions and local management practices, in shaping the transfer process.

Further studies by Dasgupta et al. (2022) discuss the challenges associated with managing HRM practices in MNEs. They highlight the importance of balancing

global integration and local adaptation when transferring D&I practices. The authors emphasize the need for effective communication, cultural sensitivity, and support from top management to overcome challenges and ensure a successful transfer. Miah et al. (2022) explore HRM practices of foreign manufacturing companies in Bangladesh. While not specifically focusing on D&I, their study provides insights into the transfer of HR practices within emerging economies. The findings suggest that adapting practices to local norms, investing in employee development, and fostering local talent can enhance the transfer and effectiveness of D&I practices.

Haipeter and Jo (2021) examine varieties of capitalism in multinational companies through a comparative study of Volkswagen Slovakia and Kia Motors Slovakia. While their research does not directly address D&I, it underscores the influence of institutional factors on the transfer of HR practices. The study highlights that national institutional differences can shape the implementation and outcomes of D&I practices within MNE subsidiaries.

Vogelsang and Pilz (2021) explore conditional factors for training activities in Chinese, Indian, and Mexican subsidiaries of German companies. Although not specifically focused on D&I, their study reveals the importance of cultural adaptation and localization of HR practices in facilitating successful transfer. They emphasize the significance of considering cultural values, national regulations, and local management practices to achieve positive outcomes.

The reviewed studies highlight the complexities involved in the transfer of D&I practices within MNEs. Key strategies for successful transfer include cultural adaptation, contextual sensitivity, effective communication, and leadership support. The findings also emphasize the influence of institutional factors and local management practices on the outcomes of D&I initiatives. By considering these insights, MNEs can enhance their ability to transfer D&I practices effectively and create inclusive workplaces across diverse cultural contexts. Further research is warranted to explore additional aspects of the transfer process and its impact on organizational outcomes within MNEs. However, recent findings point out that emerging market multinationals converge towards Western ideals in EDI (Hilger et al. 2023).

Previous research has provided insights into the challenges, strategies, and outcomes of transferring D&I practices within multinational enterprises (MNEs) (Bader et al., 2022; Krzywdzinski and Jo, 2022). However, there is a research gap regarding a comprehensive understanding of the transfer process itself (Kostova and Roth, 2002).

While cross-sectional studies have offered valuable insights into the transfer of D&I practices in MNEs (Bader et al., 2022), there is a research gap regarding the long-

term effects and evolution of these practices. Longitudinal research that follows the transfer process over an extended period is needed to gain a deeper understanding of how D&I practices evolve, adapt, and impact organizational outcomes in different cultural settings (Geppert et al., 2003).

The reviewed studies primarily focus on the transfer of D&I practices in developed countries or within subsidiaries of MNEs based in developed countries (Bader et al., 2022; Krzywdzinski and Jo, 2022). This leaves a research gap regarding the transfer process and outcomes in emerging market contexts. Future research could explore the unique challenges, strategies, and outcomes associated with transferring D&I practices in emerging markets (Marano and Kostova, 2016).

While individual studies have provided insights into the transfer of D&I practices in different cultural contexts (Bader et al., 2022; Krzywdzinski and Jo, 2022), there is a research gap in terms of comparative studies that directly compare the transfer of D&I practices between multiple countries or regions. Comparative research would enable a deeper understanding of the similarities, differences, and contextual nuances of the transfer process, contributing to more robust theoretical frameworks and practical guidelines (Geppert and Dörrenbächer, 2011).

### **3. Methodology**

We adopted an explanatory case study approach to provide in-depth explanations of the phenomenon this approach allows us to test the literature-based propositions and address our research questions (Yin, 2009). To ensure the credibility and confirmability of our study, we employed multiple data collection methods, including semi-structured interviews and document analysis, while also utilizing various data sources (Hsieh and Shannon, 2005). We have studied 22 documents, which included annual reports, diversity reports, corporate social responsibility reports, corporate governance reports, human resource reports, corporate websites, interviews with human resource and diversity officers and other documents from media outlets from Germany, Czechia, Russia, India and South Africa related to German automotive firms for the period 2020-2021. The rationale behind the selection of the countries for the case study is the fact that many Western automotive firms have subsidiaries in Russia, India and South Africa, as these countries represent big car markets in terms of volume, market growth and internationalization.

For the content analysis, we employed a directive approach, utilizing deductive categorization based on seven deductive categories derived from Hilger et al. (2023) internal dimensions of organizational diversity. These categories align with the German Diversity Charter, to which the target multinational company is a subscriber. The usage of an established diversity concept for coding supports the credibility and confirmability of our study (Sinkovics et al., 2008) and enhances the transferability of

our method to other cases and contexts (Tracy, 2010). The seven dimensions include Gender, Age, Ethnicity, Ability, Sexuality, Spirituality, and Status.

To examine macro-level impacts on DM at the meso-level reported by the sample companies, we collected data on Scott's (2001) institutional pillars in the relevant home and host countries, namely Germany, the Czech Republic, Russia, India, and South Africa. For the analysis of domestic normative pressures, we analyzed national diversity charters, voluntary initiatives that encourage organizations to implement and develop DM practices. We applied deductive categorization to charter contents based on Initial Funding, addressed etic Diversity Dimensions, and the number of Oil and Gas Signatories to determine the pro-diversity pressure (Mayring, 2014).

The regulative context of each home country was examined through directed deductive content analysis of the national constitution and labour legislation regarding the etic dimensions of diversity. The content was coded based on seven deductive categories aligned with Loden and Rosener's (1991) diversity dimensions.

Through these data collection and analysis methods, we aim to provide comprehensive insights into the transfer and implementation of diversity management practices within the target multinational company and its subsidiaries in different countries. By considering the legal, and normative contexts, we can examine the impact of institutional factors on DM practices and their congruence with the dimensions of diversity across various organizational and societal levels.

Normative regulations on equity, diversity, and inclusion (EDI) can vary across different countries, reflecting the unique socio-cultural, political, and historical contexts. Here is an overview of the normative regulations on EDI in Russia, India, South Africa, and the Czech Republic.

## **4. Findings and discussion**

Between the normative frameworks of the selected emerging economies, there is a contrast in the approach to EDI. These differences highlight the varying levels of formalization and enforcement of EDI practices across different institutional contexts.

### **4.1. Institutional context**

In Russia, the normative regulations specifically focused on EDI are relatively limited compared to other countries. While the Constitution of Russia guarantees equality before the law, there is no specific legislation or national diversity charter that comprehensively addresses EDI (Smith, 2013). The absence of explicit

regulations on EDI may indicate a less formalized approach to promoting diversity and inclusion in the country.

India has a more extensive framework of normative regulations on EDI. The Constitution of India includes provisions for equality before the law and prohibits discrimination on grounds of religion, race, caste, sex, or place of birth. Additionally, India has implemented various laws and policies to address historical inequalities and promote social inclusion. These include affirmative action measures, such as reservations for socially and educationally backward classes, scheduled castes, and scheduled tribes in educational institutions and public employment. The Companies Act of 2013 also requires certain companies to spend a portion of their profits on corporate social responsibility activities, which may encompass EDI initiatives (Fahad and Busru, 2021). The Constitution of India, with its provisions on equality and non-discrimination, plays a significant role in shaping the EDI practices of automotive subsidiaries in India. The constitutional guarantees of equality before the law (Article 14) and the prohibition of discrimination (Article 15) provide a foundation for promoting diversity and preventing discriminatory practices within organizations.

Automotive subsidiaries operating in India are obligated to adhere to constitutional principles and ensure equal treatment and opportunities for all employees, regardless of factors such as religion, race, caste, sex, or place of birth. These constitutional provisions align with the core principles of EDI, emphasizing the importance of creating an inclusive work environment that embraces diversity and rejects discriminatory practices. In the context of automotive subsidiaries, EDI practices go beyond legal compliance and encompass initiatives aimed at fostering diversity, ensuring equal representation, and promoting inclusion at all levels of the organization. The constitutional framework encourages companies to develop policies and practices that address the unique challenges and opportunities presented by India's diverse workforce. For instance, EDI practices in automotive subsidiaries in India may include affirmative action programs to promote the advancement of socially and educationally backward classes, Scheduled Castes, and Scheduled Tribes, as allowed by Article 15(4). These practices aim to provide equal opportunities for historically disadvantaged groups and bridge the gaps in representation and opportunities within the organization. Additionally, Article 15(3) allows for special provisions for women and children. This constitutional provision may influence the implementation of gender diversity and inclusion initiatives within automotive subsidiaries, promoting gender equality and creating a supportive work environment for women employees. The principles enshrined in Article 39 of the Constitution, emphasizing equal pay, protection of workers' health and well-being, and opportunities for children, also resonate with the broader objectives of EDI practices. Automotive subsidiaries in India can draw upon these principles to develop policies and programs that address workplace safety, work-life

balance, and child welfare, contributing to a more inclusive and supportive work environment. By aligning their EDI practices with the constitutional principles of equality, non-discrimination, and social justice, automotive subsidiaries operating in India can not only comply with legal requirements but also foster a culture of inclusivity, respect, and equal opportunities for all employees. This integration of constitutional values and EDI practices can create a positive impact on the overall organizational climate, employee morale, and productivity, while also contributing to the broader social and economic goals of India.

South Africa has a robust set of normative regulations aimed at promoting EDI, particularly due to its history of apartheid and racial discrimination. The Constitution of South Africa prohibits unfair discrimination and guarantees equal protection under the law. The country has implemented various legislative measures, such as the Broad-Based Black Economic Empowerment (BBBEE) Act and Codes of Good Practice, to address historical imbalances and promote economic participation, ownership, and employment equity for previously disadvantaged groups. The BBBEE Act establishes requirements for companies to prioritize EDI in their operations and procurement processes.

In the Czech Republic, the normative regulations on EDI are relatively less extensive compared to countries like India or South Africa. While the Czech Republic does not have specific legislation addressing EDI, it has made efforts to promote equality and combat discrimination through broader anti-discrimination laws. The Czech Republic has also signed international agreements and conventions that emphasize the principles of equality and non-discrimination. However, the absence of a national diversity charter or comprehensive EDI-specific legislation suggests that formalized regulations on EDI may be relatively limited in the country.

Based on the information provided in Table 1, it can be observed that Germany has taken a comprehensive approach to addressing EDI through its national diversity charters. Germany focuses on multiple diversity dimensions including gender, ethnicity, nationality, religion, disability, age, and sexual orientation. This highlights the country's commitment to promoting inclusivity and combating discrimination across various aspects of diversity.

Moreover, Germany's normative aspects related to EDI indicate that there is no specific information available regarding initial funding, launch date, signatories in 2021, and field signatories. Further research is required to explore these aspects in greater detail.

It is important to note that the overview provided above is a general summary and may not capture all the intricacies and specific regulations related to EDI in each country. Detailed examination of specific laws, policies, and regulatory frameworks would provide a more comprehensive understanding of the normative regulations on EDI in Russia, India, South Africa, and the Czech Republic.

Table 1: Normative aspects by country on EDI

Diversity Charters	Germany	Russia	Czech Republic	India	South Africa
Funding	Public-private Partnership	N/A	Public-private Partnership	N/A	Private
Launch date	2006	N/A	2014	0	2018
Signatories 2023	4,500	N/A	80	N/A	23
Field Signatories	50	N/A	5	N/A	0
Diversity Dimensions	Gender, Ethnicity, Nationality, Religion, Disability, Age, Sexual Orientation	N/A	Gender, Ethnicity, Nationality, Religion, Disability, Age, Sexual Orientation		Gender
Isomorphic pressure	High	None	Medium-High	None	Low

Source: Author’s elaboration

Table 1 provides an overview of normative aspects related to EDI in different countries, specifically focusing on the presence of national diversity charters, their launch dates, signatories, and the diversity dimensions covered. The table also mentions the existence of isomorphic pressure, which refers to the external pressures that influence organizations to adopt similar practices. The German headquarter is a German Diversity Charter signatory and reports on all 7 dimensions.

Table 2 depicts the societal perception on homosexuality, religion and level of diverse nations by Pew Research Center (2020), which represents the public aspects of EDI in the selected countries of our study.

Table 2: Public perceptions on EDI for selected countries

Diversity Charters	Germany	Russia	Czech Republic	India	South Africa
Acceptance of Homosexuality	80	14	40	37	54
% of people, who say Religion is very important in their lives	10	16	10	80	75
% of people, who say their nation is more Diverse	84	60	N/A	44	39

Source: Pew Research Center (2020)

The table includes the following key dimensions of public perception:

*Acceptance of Homosexuality:* This dimension gauges the level of societal acceptance of homosexuality within each country. The percentages presented indicate the proportion of respondents within each nation who express acceptance of homosexuality. Notably, Germany records a substantially higher percentage of acceptance (80%), in contrast to Russia (14%), Czech Republic (40%), India (37%), and South Africa (54%).

*% of people, who say Religion is very important in their lives:* This metric reflects the degree of significance attributed to religion in the lives of individuals within each respective country. The percentages provided represent the portion of respondents who identify religion as being of high importance in their daily lives. Among the countries considered, India stands out with a notable percentage of 80%, while the values for Germany (10%), Russia (16%), Czech Republic (10%), and South Africa (75%) vary considerably.

*% of people, who say their nation is more Diverse:* This dimension assesses the perception of the diversity present within each nation. The presented percentages denote the fraction of respondents who believe that their country is relatively diverse. Germany and South Africa exhibit comparatively high percentages in this regard, with 84% and 39% respectively, whereas Russia (60%) and India (44%) fall in the intermediate range. The data in Table 2 underscores the varying degrees of public perception with regards to EDI-related aspects across these selected countries, shedding light on differences in acceptance of diversity, attitudes toward homosexuality, and the significance of religion within their respective societies. The information presented provides valuable insights into the nuanced perspectives on EDI in these nations during the specified year.

## 4.2. EDI Practice Findings

### *EDI Practices and Regulative Frameworks*

The German Headquarters brand themselves like this: “*We live diversity*“. In this slogan they emphasize they offer equal opportunities for everyone and reject all forms of discrimination. Emphasizing that “*This applies in particular to unequal treatment due to ethnic or social origin, skin color, biological sex, nationality, language, religion, ideology, age, physical or mental disabilities, gender identity, sexual orientation, political views, or any other characteristics protected by law.*” (Volkswagen Group, 2024: 12).

In Russia, there is no mention of a national diversity charter, indicating a limited formalized commitment to EDI at the national level. The absence of initial funding and a launch date suggests that EDI initiatives may be less prominent or organized

in Russia compared to other countries in the table. Additionally, the lack of isomorphic pressure implies that external influences for standardizing EDI practices may be relatively minimal.

The Czech Republic, on the other hand, has a national diversity charter supported by national funding. The existence of 80 signatories demonstrates a higher level of engagement and commitment to EDI in the country. The inclusion of gender as a diversity dimension reflects the recognition of gender disparities and the need to address them. The presence of isomorphic pressure is not explicitly mentioned, suggesting that external influences for standardization may be less prominent in this context.

India's EDI efforts are characterized by the absence of initial funding, but the launch of specific initiatives, such as the Broad-based Black Economic Empowerment (BBBEE) Code of Good Practice in South Africa, demonstrates a targeted approach to addressing historical inequalities (Dreyer et al., 2021). In India, diversity dimensions covered include ethnicity, nationality, religion, disability, age, and sexual orientation, indicating a broader scope of diversity considerations. The presence of isomorphic pressure is not mentioned, suggesting that external pressures for standardizing EDI practices may be relatively limited.

South Africa stands out through their BBBEE Code of Good Practice as the initial funding mechanism for EDI initiatives. The launch date of 2007 indicates a relatively early focus on addressing equality, diversity, and inclusion. The requirement for everyone to comply, potentially through a scoring system, emphasizes the significance placed on EDI practices in the country. Diversity dimensions covered in South Africa include religion, culture, and ethnicity, which align with the country's history and ongoing efforts to redress racial inequalities. Isomorphic pressure is not explicitly mentioned, leaving the extent of external influences for standardization unclear.

Table 1 highlights the variations in normative aspects of EDI across different countries. It underscores the importance of considering country-specific factors, historical contexts, and cultural nuances when implementing EDI practices. The presence or absence of national diversity charters, funding mechanisms, launch dates, signatories, diversity dimensions, and isomorphic pressure collectively shape the landscape of EDI initiatives in each country and influence their effectiveness in promoting equality, diversity, and inclusion.

The absence of a national diversity charter and signatories in Russia suggests a limited formalized commitment to EDI at the national level. This aligns with studies highlighting the challenges and slow progress in promoting diversity and inclusion in the Russian context (Petrañtsova, 2020). The lack of isomorphic pressure may indicate a lower degree of external influence on organizational EDI practices in the country.

In contrast, the presence of a national diversity charter with a substantial number of signatories in the Czech Republic indicates a stronger emphasis on EDI. This suggests that organizations in the Czech Republic have recognized the importance of promoting diversity and inclusion and have actively committed to supporting these principles. The higher number of signatories reflects a higher level of engagement and awareness among Czech organizations regarding EDI (Velinov and Štrach, 2022).

In India, the absence of initial funding and a launch date for the national diversity charter suggests that formalized initiatives specific to EDI may be less prominent. However, the mention of the Broad-based Black Economic Empowerment (BBBEE) Code of Good Practice in South Africa highlights the country's efforts to address historical inequalities and promote economic empowerment for previously disadvantaged groups (Roberts-Lombard et al., 2019). The presence of a specific code and its focus on broad-based black economic empowerment indicates a targeted approach to EDI in the South African context.

The diversity dimensions covered in each country's national diversity charter reflect the specific concerns and priorities within their respective contexts. In Russia and the Czech Republic, gender is explicitly mentioned, indicating the recognition of gender disparities and the need to address them (Kudrnáč, 2017). India focuses on multiple dimensions, such as ethnicity, nationality, religion, disability, age, and sexual orientation, which highlights the broader scope of diversity considerations in the country (Mehrotra and Wagner, 2018). South Africa's emphasis on ethnicity aligns with its history of apartheid and the ongoing efforts to redress racial inequalities (Adam et al., 2023).

The mention of isomorphic pressure as *none* suggests that external pressures for standardization and conformity to EDI practices may not be as influential in these countries.

In summary, Table 1 reflects the diverse landscape of normative aspects of EDI in different countries. The variations in national diversity charters, signatories, diversity dimensions, and the presence or absence of isomorphic pressure highlight the unique contexts in which EDI initiatives operate. These findings underscore the importance of considering country-specific factors and tailoring EDI practices to address the specific challenges and opportunities present in each country.

The findings presented in Table 2 align with previous research on the cognitive aspects of EDI in different countries. Studies have consistently shown that attitudes and perceptions towards EDI can vary significantly across cultures and societies.

Regarding Sexual Orientation, the higher percentage of people in Russia expressing reluctance to have homosexuals as neighbours is consistent with studies that highlight the prevalence of homophobia and LGBTQ+ discrimination in Russian

society (Ferrer and Muray, 2019). Conversely, the lower percentage in the Czech Republic suggests a more accepting and inclusive environment for sexual minorities (Kudrnáč, 2017).

In terms of Gender and Identity, the traditional gender role perceptions observed in Russia and the Czech Republic reflect societal norms deeply rooted in patriarchal systems (Kulikova et al., 2017). Similar findings have been reported in other countries as well, indicating persistent gender inequalities and stereotypes (Brescoll and Uhlmann, 2008).

The higher levels of concern for the living conditions of sick and disabled individuals in the Czech Republic align with research that highlights greater attention to disability rights and social inclusion in European countries (Bratan et al., 2020). In contrast, the lower levels in Russia may reflect limited awareness and support for disability-related issues (Toepler and Fröhlich, 2020). Attitudes towards immigrants and ethnic diversity, as evident from the opinion on job competition, demonstrate the prevalence of xenophobic sentiments in Russia and the Czech Republic (Santi Amantini, 2020). These findings are consistent with studies on ethnic tensions and anti-immigrant attitudes in these regions. While Table 2 does not provide data for South Africa and India on specific dimensions, existing literature highlights the complexities of diversity in these countries. South Africa has a history of racial segregation and ongoing challenges related to race and ethnicity (Durrheim, 2017). India, with its diverse cultural and religious landscape, grapples with issues of caste, religion, and gender (Kaul, 2015). These countries have unique socio-cultural contexts that shape their EDI landscape. The variations in cognitive aspects of EDI across different countries emphasize the importance of considering cultural and societal factors in implementing inclusive practices. It highlights the need for context-specific strategies that address local attitudes, perceptions, and historical legacies of discrimination (Thomas and Ely, 1996). In conclusion, the findings from Table 2 are consistent with existing literature on EDI, underscoring the influence of cultural, social, and historical contexts on attitudes and perceptions towards diversity and inclusion. Understanding these cognitive aspects is crucial for designing effective EDI practices and interventions that are sensitive to the specific needs and challenges of each country or region.

Table 3: Diversity practices adopted by German HQ and its subsidiaries.

	Age	Gender and identity	Ethnicity	Social background or class	Religion or world-views	Sexual orientation	Physical and mental abilities	Localization
DE	Age management is very important	top management composition	top management composition	top management composition	top management composition	LGBTIQ+	N/A	N/A
CZ	Age Management awareness	Focus is on the first female in the TMT and females,	Internationalization in SA from perspective of nationalities and ethnicities	Unconscious bias reduction	N/A	LGBT+, gender identity and sexual orientation	Mental health and well-being programs	Collective Agreement, Code of Conduct development
IN		Automotive firms in India focus on women	N/A	Social background checks	N/A	N/A	N/A	Local campaigns for women to obtain driving license
RU	Age	Gender	N/A	N/A	Religion	Supporting all sexual orientations	Well-being and mental health	N/A
SA	N/A	N/A	Anti-Racism Initiative	Social Rights	N/A	N/A	N/A	Anti-racism initiatives

Source: Author’s elaboration based on annual reports, diversity reports, code of conducts, corporate governance reports, ethical codex and other company reports in German automotive HQ and its selected subsidiaries

The findings from the Table 3 indicate that German subsidiaries in different countries prioritize different diversity dimensions and practices based on their local contexts. For instance, in Germany (DE), the headquarters focus on gender and nationality. They implement gender quotas in the top management team (TMT) and promote more females in executive and IT positions. They also participate in the Global Compact initiative for Gender Equality by the United Nations. They have developed initiatives for hiring females in senior management positions and have signed the Diversity Charter in Germany. Furthermore, the headquarter (HQ) emphasizes mandatory diversity training. for managers at various levels. They aimed to train 75% of their managers across the group by December 31, 2021 and

have surpassed this target, achieving a ratio of 83%. The case company established a Diversity index and by doing so not only aims at establishing processes geared to equal opportunities but also aims to set targets for measures and programs at all levels of management. Their diversity approach centres around quotas for women in managerial positions and targets for the internationality of the top management. These two figures are combined in their diversity index, which has been in force since January 1, 2017 (Volkswagen Group, 2021).

The subsidiary in the Czech Republic (CZ), focuses on age management awareness and is the first female in the TMT, along with females in general. They also prioritize internationalization from the perspective of nationalities and ethnicities. The Czech subsidiary emphasizes unconscious bias training, LGBT+ inclusion, gender identity and sexual orientation, and mental health and well-being programs. The Czech subsidiary also develops collective agreements and codes of conduct for diversity-related initiatives. Furthermore, the Czech subsidiary has included Pride Business Forum as a part of its diversity and inclusion strategy, which is a part of the best managerial practices transferred from the HQ in Germany.

In India (IN), the subsidiary places a particular focus on promoting women in their TMT. They have local campaigns to encourage women in India to obtain a driving license. Additionally, they have their own initiative to empower women in the organization. They also align with the corporate global diversity programme.

In Russia (RU) age and gender diversity, along with well-being and mental health initiatives are emphasized. They adopt the Code of Conduct and Corporate Principles from the headquarters to guide their diversity practices. They also participate in the corporate global diversity programme.

In South Africa (SA), the subsidiaries focus on anti-racism and social rights. They provide training on human rights based on International Labour Organization standards and adopt the Declaration on Social Rights from headquarters. They also have initiatives to combat racism and adopt the Code of Conduct of the headquarters. They align with the corporate global diversity programme.

The findings from the table align with previous literature that highlights the importance of diversity and inclusion practices in multinational companies (Derven, 2014). Research suggests that implementing diverse and inclusive practices can lead to improved organizational performance, innovation, and better decision-making processes. The literature emphasizes the need for tailored approaches to diversity management based on the local context and the importance of strong leadership support and commitment (Wolfgruber et al., 2022).

The subsidiaries in different countries prioritize and implement diversity dimensions and practices. It demonstrates the diverse approaches taken to address local diversity challenges and align with global diversity programs. The findings

highlight the significance of considering local contexts and tailoring diversity initiatives to enhance organizational performance and create inclusive work environments.

Germany provides high levels of education and income (Carey, 2008, well-established HRM practices (Bader et al., 2022), and rapid demographic changes, while the subsidiaries present vastly different institutional and social settings, which impact etc EDI implementation to varying degrees. While the Russian institutional context hampers EDI implementation, the Czech, Indian, and South African context requires certain EDI practices, e.g. regarding ethnicity, while discouraging others (e.g. sexuality). The paper provides evidence of the failing dispersion of diversity and inclusion best practices in multinational firms' subsidiaries due to isomorphic pressures and the necessity of embeddedness into the local managerial practices and much wider social and institutional context. We show that the importance of diversity and inclusion practices localization and thus a strongly reduced transfer of EDI is essential for conflict reduction also driven by institutional pressures motivated by customer satisfaction in emerging economies to avoid institutional clashes.

## **5. Conclusion**

The transfer of equality, diversity, and inclusion (EDI) practices by Western multinationals to their emerging economy subsidiaries presents both theoretical and practical implications. The findings of this study shed light on the complexities and challenges associated with the transfer process, particularly in the context of institutional duality and the diversity of emerging markets.

### ***Theoretical Implications***

The study highlights the significance of institutional duality in shaping the transfer of EDI practices. The need to consider the institutional context and local social tensions adds a layer of complexity to the transfer process, challenging the assumption of global convergence and dominance effects of EDI practices. The findings emphasize the importance of adapting and localizing practices to suit the specific institutional contexts of subsidiaries.

The research uncovers that Western EDI approaches often fail to address the diversity dynamics present in emerging markets such as South Africa and India. These markets have a long history of grappling with diversity issues, and their unique context necessitates a more nuanced and culturally sensitive approach. This highlights the need to move beyond ethnocentric perspectives and embrace emic perspectives that consider local values, norms, and experiences of diversity.

### ***Practical Implications***

From the subsidiary side, the adoption of Western diversity actions may strengthen the HQ-subsidiary relationship. However, the study also highlights the importance of tailoring EDI practices to the specific context of each subsidiary. Multinational corporations should not assume that a one-size-fits-all approach will be effective in promoting EDI. Instead, they should engage in localization efforts that align with the local institutional environment, cultural nuances, and diversity dynamics of the subsidiary.

The reluctance observed in subsidiaries when enforcing etic EDI practices as they are torn between Western demands and local circumstances underscores the need for a better understanding of emic institutional accordance. Western multinationals must consider and respect the existing institutional frameworks and social dynamics of each subsidiary, fostering a collaborative approach that values local perspectives and encourages meaningful participation.

By recognizing the pitfalls associated with the transfer of EDI practices and addressing the implications highlighted in this study, Western multinationals can enhance their effectiveness in promoting equality, diversity, and inclusion across their global operations. This includes embracing localization, adapting to the specific institutional contexts, and incorporating emic perspectives to ensure that EDI practices are more inclusive, culturally sensitive, and responsive to the needs of subsidiaries in emerging markets, especially since the subsidiaries surpass the HQ demands in certain dimensions and a reverse transfer may be possible.

### ***Future research***

Future research should delve deeper into the dynamics of reverse transfer of EDI practices from subsidiaries to the headquarters (HQ) or across subsidiaries in emerging markets. Exploring how subsidiaries contribute to the evolution of global EDI frameworks and whether they influence the HQ's approach could provide valuable insights into the bidirectional nature of EDI transfer. Overall, future research should aim to enrich our understanding of the nuanced interplay between global EDI frameworks and local contextual factors, guiding multinational corporations in fostering inclusive and culturally sensitive practices worldwide.

### ***Research Limitations***

This study's primary limitation is its focus on the EDI practices transfer in a limited number of emerging markets, which may not fully represent the diversity and complexity of such contexts globally. Additionally, the study does not account for potential reverse transfer of practices from subsidiaries to headquarters.

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Institucionalni utjecaji na raznolikost, jednakost i prakse uključivanja:  
Studija slučaja zapadnih multinacionalnih kompanija i njihovih podružnica  
u gospodarstvu u razvoju

Emil Velinov<sup>1</sup>, Andreas Hilger<sup>2</sup>, Pawel Dobrzanski<sup>3</sup>

**Sažetak**

Ovaj rad istražuje kontekstualne utjecaje na prijenos praksi jednakosti, raznolikosti i uključenosti (EDI) iz zapadnih multinacionalnih korporacija (MNC) u njihove podružnice u gospodarstvima u razvoju. Prijenos EDI praksi unutar MNC-a dobio je na značaju zbog potrebe za pomirenjem teorije i konteksta uz rješavanje društvenih i menadžerskih napetosti povezanih s EDI-jem. Cilj ovog istraživanja je odgovoriti na pitanja o tome zašto i kako se EDI prakse prenose unutar multinacionalnih kompanija, s posebnim naglaskom na utjecaj institucionalne dualnosti na proces prijenosa. Institucionalna teorija služi kao teorijski temelj, sugerirajući da je usklađenost između praksi i institucionalnog okruženja presudna za njihovu legitimnost i prihvaćanje. Interakcija čimbenika domaćina i matične zemlje, oblikovana institucionalnom dualnošću, igra značajnu ulogu u oblikovanju prijenosa i provedbe EDI praksi unutar multinacionalnih kompanija. Razmatrajući kontekstualne razlike između sjedišta i institucionalnih okruženja podružnica, ovo istraživanje ima za cilj unaprijediti naše razumijevanje složenosti i izazova povezanih s prijenosom EDI praksi u predlaganju različitih identiteta podružnica i agendi. Rezultati ovog istraživanja rasvjetljavaju kontekstualne čimbenike i učinke prijenosa EDI praksi unutar multinacionalnih kompanija i time doprinose znanstvenoj literaturi.

**Ključne riječi:** jednakost, raznolikost i uključenost; institucije, prijenos prakse; ekonomije u nastajanju; multinacionalne tvrtke

**JEL klasifikacija:** F23, M14, O15

<sup>1</sup> Znanstveni suradnik, Skoda Auto University, Department of Marketing and Management, Na Karmeli 1457, Mlada Boleslav 29301, Češka i Sveučilište primijenjenih znanosti RISEBA, Odsjek za poslovne studije, Meza 3, Riga 1048, Latvija. Znanstveni interes: upravljanje raznolikošću, međunarodno poslovanje i međunarodni menadžment. E-mail: email.velinov@savs.cz.

<sup>2</sup> Docent, University of Regensburg, Department of Leadership and Organization, Universitätsstraße 31, D-93053 Regensburg, Njemačka. Znanstveni interes: upravljanje raznolikošću i upravljanje ljudskim resursima. E-mail: andreas.hilger@wiwi.uni-regensburg.de.

<sup>3</sup> Izvanredni profesor, Wrocław University of Economics and Business, Mathematical Economics, Komandorska 118/120, 53-345 Wrocław, Poljska i gostujući znanstvenik 2023.-2024., Minda de Gunzburg Centar za europske studije, Sveučilište Havrward, Adolphus Busch Hall, 27 Kirkland Street, Cambridge, MA 02138, SAD. Znanstveni interes: makroekonomija i mikroekonomija. E-mail: pawel.dobrzanski@ue.wroc.pl.

GUIDELINES FOR AUTHORS  
– UPUTE AUTORIMA



*Authors are kindly requested  
to read carefully the Guidelines  
amended with detailed methodological instructions*

## GUIDELINES FOR AUTHORS

*Zbornik radova Ekonomskog fakulteta u Rijeci: časopis za ekonomsku teoriju i praksu/Proceedings of Rijeka Faculty of Economics: Journal of Economics and Business* is an international peer reviewed journal open to scientists from all over the world in different fields of economic theory, economic policy and related research. As a rule, papers are published in English. However, the Journal may publish articles in other world languages.

### Editorial procedure

The Editorial Board receives all manuscripts. After reviewing and accepting the manuscripts, Editor-in-Chief subjects them to the members of the Editorial Board for the assessment process, and in case of the specific content of the text, to external experts as well. After evaluation, Editor-in-Chief proposes Editorial decisions for further action including: (a) which manuscript, if necessary, should be returned to the author with suggestions, comments and recommendations for improvement, primarily methodological presentation of research materials, (b) which manuscripts could be sent to peer-review process, (c) which manuscripts should be rejected because of the reasons as follows:

- the subject matter does not meet the required scientific level,
- the article with a similar topic has already been published by the same author,
- the subject matter does not meet the criteria of the Journal, especially if:
  - the content is beyond the concept of scientific publishing orientation of the Journal (distinguished by the relevant databases), and
  - does not meet international scientific and methodological standards that the Journal must comply with.

If an article is not accepted, the Editorial Board sends a notification to the author, but the manuscript is not returned.

If the manuscript is improved adequately, it is sent to two reviewers for extramural review.

If the manuscript is considered for publishing, the author will receive the Authorship Statement (*Copyright Assignment Form*), which should be filled in, signed and returned to the editor. In this way the authors confirm the originality of the article and validity of authorship.

In order to avoid withdrawing the paper until it is published or rejected, by signing the Authorship Statement, the authors assert compliance with the review process.

Book reviews, reviews on doctoral dissertations, as well as reviews on international conferences and seminars are not submitted to extramural reviews. They are accepted or rejected by the Editor and co-editors.

## Review process

All scientific articles submitted for publication in *Zbornik radova Ekonomskog fakulteta u Rijeci: časopis za ekonomsku teoriju i praksu/Proceedings of Rijeka Faculty of Economics: Journal of Economics and Business* are double-blind peer review by two academics appointed by the Editorial board: one from Croatia and one from abroad. Reviewers stay anonymous for the authors and so do the authors for the reviewers. The reviewers are asked to apply highest international standards in their assessment of the submitted work. Reviewers receive an article and a *Reviewer Evaluation Form* with instructions how to fill it in. If the article does not fulfill the primary criteria of originality and relevance to the subject, it should not be accepted.

The categories in which articles, if judged positively, might be classified are:

*Original scientific paper* is a scientific paper that includes new results based on the research. The information given in the article can be verified by:

- a) reproducing methodological procedure and obtain the same/similar results or with tolerable degree of mistakes as estimated by the author himself, or
- b) repeating the author's observations and judge his analyses, or
- c) checking the author's analyses and deduction on which the author's analyses are based.

*Preliminary communication* is an article that includes at least one or more pieces of scientific information, but does not include the necessary details to check the scientific cognition.

*Conference paper* is an article that deals with the author's presentation at a conference, and has not been previously published as a full text.

*Review article* is an article that analyses a special scientific problem already dealt with in published scientific works, but his approach is original and new.

*Professional paper* is an article that deals with specific problems in some professional areas.

After receiving the reviews, the Editorial Board will give clear general instructions to the author for further work on the manuscript. The comments and suggestions made by the reviewers should be addressed and closely followed by the author prior to final recommendation on acceptance or rejection made by the Editorial Board.

Only manuscripts with two positive reviews are published.

After completion of peer review and amendment of the text of the accepted articles by the authors and editors, Editor-in-Chief, proposes the sequence of accepted papers in the table of contents.

Criteria for the order are:

- (1) categorization according to the degree of scientific excellence,
- (2) in case of two different levels of categorization of a particular article by reviewers, Editor-in-Chief proposes a decision to the Editorial Board, and as a rule, in favour of the author, i.e. a higher category,
- (3) appreciation of topical issues, authors and common interest of the Journal taking into account the competitiveness at the same level of scientific excellence (category).

To increase the quality and number of papers published, the Editorial Board strives to fasten the publishing process by informing the authors on the status of their articles within ten working days of the submission. Provisional deadline for finishing the reviewing process, technical revisions, and online publication of the paper shall last no longer than two months. Moreover, as of 2018, the forthcoming articles, included within the regular biannual issues, are initially published on our Journal's website.

Besides the traditional focus on empirical papers, the Journal invites authors to submit theoretical papers which should cover the gap of lack of more fundamental research and meta-analysis of literature aiming at providing the basis for more sound empirical research as well as advancements of new ideas and insights in economic theory and practice. We particularly welcome papers which are theoretically well-based (but for most people understandable) papers with clear policy- and future-oriented analysis/messages/recommendations; research focusing on the interdependence of various, particularly current, economic developments; studies focusing on the transdisciplinary and interdisciplinary character of economic analyses (technical, legal, social, economic and other fields).

The journal draws methodology for theoretical papers from the Journal of Economic Perspectives (<https://www.aeaweb.org/journals/jep>), with similar goals: to synthesize and integrate lessons learned from the most relevant fields and dilemmas of contemporary economic theory and practice; to provide the economic analysis of public policy issues; to encourage cross-fertilization of ideas among the scientific areas of thinking; to offer readers an accessible source for state-of-the-art economic thoughts and to suggest directions for future research. The focus of theoretical articles should be on understanding the central economic ideas of a question, what is fundamentally at issue, why the question particularly important, what the latest advances are, and what facets remain to be examined.

In case of submission of theoretical paper instead of section *Empirical data and analysis*, authors should include the one on *Theoretical/conceptual analysis*, where the authors should provide argumentation based on their proposed methodology/concept of research. In this section, authors should provide a novel analysis of the field/topic, provide theoretical argumentation, which proves their hypothesis by using different available tools such as mathematical, graphical, or any other that present and reveal economic relationships in regards to the specific scientific area.

## Organization of the manuscript

The manuscript should include the research aim and tasks, with detailed methodology, the research objective, achieved results and findings, conclusions and a list of references.

The authors of the manuscript should conform to the format and documentation requirements that are given below:

*The separate page should contain:* the article title, the author's full name, academic affiliation (title, institution, scientific field) and e-mail address. If there are more authors than one, full names, respective affiliations and addresses of co-authors should be clearly stated. Authors' academic affiliation should be:

- in the language of the article,
- in Croatian language,
- in English if the original language of the article is other than English.

*The first page should contain:* the article title, abstract, JEL classification and key words in the language of the article. At the end of the article all data should be also:

- in Croatian language,
- in English if the original language of the article is other than English.

*Main body of the text* should contain: introduction, headings, footnotes, references in the text, tables, figures, conclusions and references.

## Technical requirements

The manuscript submitted for publication should be in Microsoft Office Word (Ver. 95+), with maximum length up to **8,000** words in length (16-20 A4 size pages), printed in font style Times New Roman (12 point), single-spaced, justified and without any special styling. Should a word, a phrase or a sentence be highlighted, italic font style can be used and never bold. Paragraphs are divided by double spacing and all margins are at 2.5 cm. In case the paper exceeds the normal length, the Editors' consent for its publication is needed.

*JEL classification* should be suggested by the authors themselves according to the classification available on the Journal of Economic Literature website: [http://www.aeaweb.org/journal/jel\\_class\\_system.html](http://www.aeaweb.org/journal/jel_class_system.html).

*Footnotes* could be used only as an additional explanatory section of the text and should be numbered consecutively in Arabic numerals.

*Section headings* (from Introduction to Conclusions) must be short, clearly defined and bear Arabic numerals. If there are subsection headings they are outline numbered (e.g. 1; 1.1.; 2.; 2.1.; 2.1.1. etc.)

All *tables and figures* should bear Arabic numerals and must have captions. Tables set in MS Word may be included in the text.

*Note:* If MS Excel or other programs are used for tables, figures or illustrations, make sure to enclose them as a separate file on disk, separately from the text.

Before submission of the manuscript, the authors of the manuscript are advised to conform to the format and documentation requirements.

## **Text organization and style**

Authors should apply scientific methodology in presenting the contents of their papers complying with the standards of scientific publications (“Harvard style”). This implies the procedure as follows:

### **(1) Title and the content of the paper:**

The title is the most important summary of a scientific article, which reflects the scope of investigation and the type of study. Therefore, the title should not contain words such as “analysis”, “methods” and similar.

The content of the paper consists of:

- *Abstract* – below the title
- *Key words*
- *JEL classification*.

It is followed by the main body of the paper divided into sections. The section headings are as follows:

- *Introduction*
- *Literature review*
- *Methodology/method/model/conception of analysis* (the third section)
- *Empirical data (documentation background) and analysis* (the fourth section)
- *Results and discussion* (the fifth section)
- *Conclusions* (the sixth section).

### **(2) The content of some parts of the material presented:**

#### **a. Abstract** – up to 100-250 words must contain:

- purpose and research objective,
- methodology/method/model/conception of analysis,
- main findings and results of research (analysis),
- the underlined conclusion of research.

The abstract should not be written in paragraphs!

#### **b. Key words** should disclose the essence of the article (up to 5 key words).

#### **c. JEL classification** – the author should classify the subject matter of the article according to the code of The Journal of Economic Literature (JEL).

- d. Introduction** – defines the problem and the subject matter of the research referring to recent bibliography and findings. However, these can more specifically be dealt with in the second section *Literature review*. The last part of the introduction is reserved for setting the hypothesis of the research that will be later on analyzed at the beginning of the conclusions. Finally, Introduction ends up by giving clues of the organization of the text.
- e. Literature review** – precedes a research section providing readers with a cutting-edge context of the referential literature dealing with crucial points of current knowledge based on the relevant results of the current research. Literature review should be a synthesis of previous research, justifying the theoretical and empirical contributions of the respective paper, a not a simple listing of previous scientific contributions.
- f. Methodology/method/model/conception of analysis** – usually in the third section of the paper, methodology/method/model/conception of the analysis should be transparently presented and pointed out in case of the research results being subjected to re-testing by interested researchers (it is one of the fundamental principles of the scientific methodology).
- g. Empirical data and analysis** – contain documentation background and the results of the empirical analysis. The data sample shall be elaborated and the obtained results shall be explained based on statistical and econometric features, and their economic meaning.
- h. Results and discussion** – explain the results, especially their economic significance and messages. In this section, the author(s) need to elaborate how their results and conclusions contribute to the scientific field and provide practical implications and recommendations.
- i. Conclusions** – is not supposed to be a summary! Conclusions are the author's original thoughts and evaluation of the obtained results including the items as follows:
  - j.** Explanation of the working hypothesis – proved or not proved.
  - k.** Assessment of the results of research/analysis with the focus on what can be classified as a new contribution to economic science.
  - l.** Attention drawn to research limitations and problems.
  - m.** Guidelines to future research.
  - n.** Assessment of institutional-systemic implications of the results obtained by the research (suggestions and recommendations for direction or changes of economic system, economic and financial policy, development policy, instruments, measurements or similar).

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**(3) References** should include only the titles (sources) that have been referred to and quoted in the paper.

**TABLES** should be included in the text in order to present the exact values of the data that cannot be summarized in a few sentences in the text. Each column heading for numerical data should include the unit of measurement applied to all data under the heading. Large numbers can be expressed in smaller units with appropriate column headings (in thousands, millions, etc), and logical presentation of data using table grid option in MS Word for table lines (both vertical and horizontal). Each table should be self-explanatory, bearing Arabic numerals (e.g. Table 1, Table 2, etc.) with an adequate title (clearly suggesting the contents) and the source of the data should be stated below the table, if other than author's.

**FIGURES (GRAPHS, DIAGRAMS, ILLUSTRATIONS)** should also be included in the text. They should be numbered in sequence with Arabic numerals, followed by the figure title, and the legend to the figure that contains all the necessary explanations of symbols and findings. The source of the data presented in the figure should be stated below the figure if other than author's.

*Note.* The text should not simply repeat the data contained in tables and figures, i.e. the text and the data in tables and figures should be related in the text by means of reference marks.

**REFERENCES.** The ISI citations should be followed by all authors of *Zbornik radova Ekonomskog fakulteta u Rijeci: časopis za ekonomsku teoriju i praksu/ Proceedings of Rijeka Faculty of Economics: Journal of Economics and Business* (please, refer to <http://www.isinet.com>) and references to other publications must be in Harvard style. At each point in the text that refers to a particular document, insert the author's surname and publication year in brackets: (Rowley, 1996) or (Cutler and Williams, 1986), or in the case of more than two, the first author (from the title page) followed by "et al." (Matlock et al., 1986). If the author's name is repeated no *ibid* is used but his surname is repeated. If the author's name occurs naturally in the text, the year follows in the brackets: *The work of Stevens (2001) was concerned with what they teach at Harvard Business School.* In case of direct quotations the page numbers should be added, e.g. (Jones, 1995: 122–123).

At the end of the article a list of references is organized alphabetically as follows:

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If there are two or three authors you put down their surnames followed by initials:

Ridderstrale, J., Nordstrom, K. (2004) *Karaoke Capitalism Management for Mankind*, Harlow: Pearson Education Ltd.

If there are multiple authors (four or more) the first author's surname (from the title page) is followed by et al.:

Norton, M. B. et al. (1981) *A People and a Nation – A History of the United States*, Boston: Houghton Mifflin Company.

• **Journals:** Surname, Initials (year) “Title”, *Journal*, Volume, Number, pages. See example:

Kostelich, E. (1995) “Symphony in Chaos”, *New Scientists*, Vol. 146, No. 1972, pp. 36–39.

Fox, S. (1994) “Empowerment as a Catalyst for Change: An Example from the Food Industry”, *Supply Chain Management*, Vol. 2, No. 3, pp. 29–33.

If there are multiple authors (four or more), the first author’s surname (from the title page ) is followed by et al. See example:

Di Noia, C. et al. (1999) “Should Banking Supervision and Monetary Policy Tasks be Given to Different Agencies?”, *International Finance*, Vol. 2, No. 3, pp. 285–361.

If there are multiple works by the same author published in the same year, the “a, b, c” is used after the year. See example:

Quah, D. T. (1993a) “Empirical Cross-section Dynamics in Economic Growth”, *European Economic Review*, Vol. 37, No. 2-3, pp. 426–434.

----- (1993b) “Galton’s Fallacy and Tests of the Convergence Hypothesis”, *Scandinavian Journal of Economics*, 95, Vol. 95, No. 4, pp. 427–443.

----- (1994) “Exploiting cross Section Variation for Unit Root Inference in Dynamic Data”, *Economics Letters*, Vol. 44, No. 1-2, pp. 9–19.

----- (1996a) “Empirics for Economic Growth and Convergence”, *European Economic Review*, Vol. 40, No. 6, pp. 951–958.

----- (1996b) “Regional Convergence Clusters across Europe”, *European Economic Review*, Vol. 40, No. 6, pp. 951–958.

The author should provide **Digital Object Identifier (DOI)** for each reference that can be found whether it exists at CrossRef <http://www.crossref.org/> and DOI appears in the form such as <https://doi.org/10.5468/ogs.2016.59.1.1>.

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Hall, J.K., Daneke, G.A., Lenox, M.J. (2010) “Sustainable Development and Entrepreneurship: Past Contributions and Future directions”, *Journal of Business Venturing*, Vol. 25, No. 5, pp. 439–448, <https://doi.org/10.1016Zj.jbusvent.2010.01.002>.

• **Internet sources:** Author’s/editor’s surname (year), “Title of the article”, *Title of the journal* [type of medium], date of publication, volume number, pagination or online equivalent, <availability statement> [date of accession if necessary]:

Martin, C.L. (1998) “Relationship Marketing: a High-Involvement Product Attribute Approach”, *Journal of Product and Brand Management* [Internet], Vol. 7, No. 1, pp. 6–26. Available at: <<http://www.apmforum.com/emerald/marketing-research-asia.htm>> [Accessed: October 3, 2002]

- **Chapter/section from a book of collected writings:** Author of the chapter/section (year of publication) “Title of the Chapter/section”. In Author/editor of collected work, *Title of collected works*, Place of publishing: Publisher. Example: Porter, M.A. (1993) “The modification of method in researching postgraduate education”. In Burges, R.G. ed., *The research process in educational settings: ten case studies*, London: Falmer.
- **Conference papers from conference proceedings:** Author of the conference paper (year of publication) “Title of the conference paper”. In *Title of conference proceedings*. Place of publication: Publisher, pagination of section referred to: Fedchak, E. & Duvall, L. (1996) “An engineering approach to electronic publishing”. In *Proceedings of the International Workshop on Multimedia Software Development*, 25-26 March, Berlin, Los Alimos, Ca: IEEE Comput. Soc. Press, pp. 80–88.
- **Theses and dissertations:** Author’s name (year) *Title of doctoral dissertation*, the name of the awarding institution: Whitehead, S.M. (1996) *Public and private men: masculinities at work in education management*, PhD thesis, Leeds Metropolitan University.
- **Official publications:** Title of publication/organisation/institution (year) *Title*, Place of publishing: Publisher. Example: Department of the Environment (1986) *Landfilling wastes*, London: HMSO (*Waste management paper*, 26).

## Guidelines for other publications

The Journal reserves the main printing space for scientific articles accepted from scientists all over the world. However, the other part is devoted to reviews of scientific achievements, which are classified by the editorial board as follows:

- **Book review.** A brief overview of the book is written in a clear and concise manner evaluating the structure, style and scientific achievements of a particular book. It starts with the title of the book, and the main data: the author’s name, academic affiliation, title of the book, subtitle (if any), year of publishing, publisher, volume (including number of pages), type of publication (hardcover or paperback), language, ISBN and the author’s contact address (e-mail address). If there are more authors than one, full names, respective affiliations and addresses of co-authors should be clearly stated. At the end of the text it is written “Reviewed by” stating the reviewer’s name, academic title and affiliation. In addition to the book review, the copy of the cover page of the book is submitted.
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It analyses theoretical and practical contribution to a particular scientific field, and implications for further research. At the end of the review, there is the reviewer's name, academic title and affiliation.

- **Reviews on International Conferences and Seminars.** It starts with the following data: title of the conference (seminar), organizer(s), date of the conference (seminar), venue, language, the name and e-mail address of the contact person, conference/seminar websites, and how, when and where conference material will be published and can be obtained (i.e. selected and reviewed conference papers). The review should provide a clear and comprehensive overview of the main objectives of the conference, mentioning the keynote speaker(s), participants' panel discussion on scientific achievements, research findings and suggestions for further research and pressing questions in need of answer. The reviewer's name is stated at the end of the text with his or her academic title and affiliation.
- **In Memoriam.** It is a short text (not longer than 1 A4 page) written in memory of a scientist or special contributor and his works. The author's name is stated at the end of the text with his or her affiliation.
- **Letters to the Editor.** Special section is available for comments, opinions and suggestions by readers, authors and other contributors.

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If the author of the manuscript does not conform to the primary format and documentation requirements that are given in the instructions, editors reserve the right to reject the article, or adapt it to comply with the Journal standards, providing other acceptance criteria are fulfilled.

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The authors receive one copy of the journal in which their articles are published.

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- in the language of the article,
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- in English if the original language of the article is other than English.

The URL address for article submission is: <https://mc04.manuscriptcentral.com/efriproceedings> where authors must first register and create their user profile by following the instructions from the ScholarOne. platform. More detailed information on the *Zbornik radova Ekonomskog fakulteta u Rijeci: časopis za ekonomsku teoriju i praksu/ Proceedings of Rijeka Faculty of Economics: Journal of Economics and Business* can be obtained on the website of the Faculty of Economics University of Rijeka: [http://www.efri.uniri.hr/en/proceedings\\_of\\_rijeka/51](http://www.efri.uniri.hr/en/proceedings_of_rijeka/51).

*Uredništvo skreće pozornost autorima da pažljivo pročitaju upute koje su dopunjene detaljnom metodologijom organizacije teksta.*

## UPUTE AUTORIMA

*Zbornik radova Ekonomskog fakulteta u Rijeci: časopis za ekonomsku teoriju i praksu/Proceedings of Rijeka Faculty of Economics: Journal of Economics and Business* međunarodno je recenziran časopis, otvoren za suradnju znanstvenicima iz cijelog svijeta iz različitih područja ekonomske teorije i prakse. Tekstovi se objavljuju, u pravilu, na engleskom jeziku. Međutim, časopis može objavljivati tekstove i na ostalim svjetskim jezicima.

### Politika uređivanja

Uredništvo zaprima sve rukopise. Glavni i odgovorni urednik tekstove, nakon pregleda i prihvaćanja, upućuje u postupak prosudbe (“assessment process”) članovima Uredništva, ali i ekspertnim stručnjacima izvan Uredništva u slučaju specifičnog sadržaja teksta. Poslije prosudbe, glavni i odgovorni urednik predlaže Uredništvu odluke za daljnji postupak i to: (a) koje se rukopise, u slučaju potrebe, vraća autoru sa sugestijama, preporukama i primjedbama radi poboljšanja, prije svega, metodološke prezentacije građe istraživanja; (b) koje rukopise uputiti u postupak recenzija (“reviewing process”); (c) koje rukopise odbiti, budući da:

- tema ne zadovoljava zahtijevanu znanstvenu razinu;
- autor je članak sa sličnom temom već objavio;
- tema ne ispunjava kriterije časopisa, osobito ako je:
  - sadržaj izvan koncepcije znanstveno-publicističke orijentacije časopisa (uvažene od relevantnih baza referiranja) i
  - ne ispunjava svjetske znanstveno-metodološke standarde kojih se časopis mora pridržavati.

Ukoliko članak nije prihvaćen Uredništvo autoru šalje obavijest, ali rukopis se ne vraća.

Ukoliko je autor usvojio primjedbe i sugestije iz postupka prosudbe i poboljšao tekst prema zahtjevu navedenog postupka, rukopis se šalje u postupak recenziranja. U tom slučaju autoru se šalje formular “Izjava o autorskim pravima” koji treba ispuniti, potpisati i vratiti Uredništvu. Svojim potpisom autor potvrđuje izvornost svoga članka i svoje autorstvo.

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Prikazi knjiga, doktorskih disertacija, međunarodnih konferencija i drugih znanstvenih skupova ne podliježu recenziji. Uredništvo odabire i uređuje prikaze koji su relevantni za objavljivanje u časopisu sukladno koncepciji uređivačke politike.

## Postupak recenziranja

Svi znanstveni članci obvezno se recenziraju. Za svaki članak predviđena su dva recenzenta, jedan iz inozemstva i jedan iz Hrvatske, a oba su anonimna. Imena autora također su za recenzente anonimna. Recenzenti pišu recenziju prema dobivenim uputama i na propisanom formularu. Ukoliko članak, prema stajalištu recenzenta, ne udovoljava međunarodnim standardima i kriterijima časopisa, Uredništvo članak ne prihvaća. Ukoliko pak recenzent članak pozitivno ocijeni, može ga kate gorizirati u jednu od kategorija vrsnoće:

*Izvorni znanstveni članak (Original scientific paper)* je originalno znanstveno djelo u kojem su izneseni novi rezultati fundamentalnih ili primijenjenih istraživanja. Informacije iznesene u članku potvrđuju da je moguće:

- a) reproducirati metodološki i računski postupak i dobiti rezultate s jednakom točnošću ili unutar granice stupnja slobode, kako to navodi autor; ili
- b) ponoviti autorova opažanja i prosuditi njegove analize; ili
- c) provjeriti točnost analiza i dedukcija na kojima se temelje autorovi nalazi.

*Prethodno priopćenje (Preliminary communication)*. Taj znanstveni članak obavezno sadrži jednu ili više znanstvenih informacija, ali bez dovoljno pojedinosti koje bi omogućile čitatelju provjeru iznesenih znanstvenih spoznaja.

*Izlaganje sa znanstvenog skupa (Conference paper)*. Može biti objavljeno samo kao cjeloviti članak koji je prethodno referiran na znanstvenom skupu, a u obliku cjelovitog članka nije objavljeno u zborniku skupa.

*Pregledni rad (Review article)*. Sadrži poseban problem o kojem je već publiciran znanstveni rad, ali mu se pristupa na nov način.

*Stručni članak (Professional paper)*. Sadrži korisne priloge iz struke i za struku.

Nakon primljenih recenzija, Uredništvo analizira recenzije. Ukoliko je to potrebno, rad vraća autoru koji ga je dužan prilagoditi zahtjevima recenzenta. Rad se dostavlja autoru nakon primitka obje recenzije. Međutim, u slučajevima gdje se ne dovodi u pitanje kvaliteta i autoriziranost teksta, Uredništvo također može intervenirati. Nakon što autor ponovno dostavi rad, Uredništvo utvrđuje usklađenost članka s primjedbama recenzenata.

Objavljuju se samo kategorizirani radovi koji imaju dvije pozitivne recenzije.

Glavni i odgovorni urednik, nakon završetka postupka recenziranja te izmjena i dopuna tekstova od strane autora i Uredništva, predlaže redosljed prihvaćenih članaka u sadržaju.

Kriteriji redosljeda jesu:

- (1) kategorizacija sukladno stupnju znanstvene vrsnoće;

- (2) u slučaju dva različita stupnja kategorizacije članka od strane recenzenata, glavni i odgovorni urednik predlaže odluku Uredništvu, u pravilu, u prilog autora, tj. višu kategoriju;
- (3) u slučaju konkurentnosti radova iste razine znanstvene vrсноće (kategorije) uvažava se aktualnost teme, autora i interes časopisa.

U okviru ciljeva povećanja kvalitete i broja objavljenih radova Uredništvo se obvezuje da će nastojati odgovoriti autorima o statusu poslanog rada u okviru od deset radnih dana. Također, od 2018. godine, objavljuivat će se radovi u najavi na web stranici Časopisa koji će biti tiskani u redovnom polugodišnjem tiskanom izdanju. Okvirni rok završetka **recenzentskog** postupka, tehničkog uređivanja te online objave rada je dva mjeseca.

Osim tradicionalnog fokusa na empirijske radove, časopis poziva autore da dostave teorijske radove koji bi trebali pokriti nedostatak temeljnih istraživanja i meta-analize literature s ciljem pružanja temelja za kvalitetnija empirijska istraživanja, kao i razvoj novih ideja i uvida u ekonomskoj teoriji i praksi. Posebno pozivamo autore s radovima s visokom razinom teorijske argumentacije (ali za većinu ljudi razumljive) s jasnom analizom / porukama / preporukama usmjerenom na preporuke i buduća istraživanja; studije koje se usredotočuju na međuovisnost različitih, osobito aktualnih, ekonomskih kretanja; studije usmjerene na transdisciplinarni i interdisciplinarni karakter ekonomskih analiza (tehnička, pravna, socijalna, ekonomska i druga područja).

Časopis crpi metodologiju za teorijske radove iz časopisa *Journal of Economic Perspectives* (<https://www.aeaweb.org/journals/jep>), sa sličnim ciljevima: sintetizirati i integrirati naučene lekcije iz najrelevantnijih područja i dilema suvremene ekonomske teorije i prakse; prezentirati ekonomske analize vezane za dileme javnih politika; poticati međusobnu razmjenu ideja među pojedinim znanstvenim područjima; ponuditi čitateljima dostupan izvor za najsuvremenija ekonomska promišljanja i predložiti smjerove za buduća istraživanja. Fokus teorijskih članaka trebao bi biti na razumijevanju središnjih ekonomskih ideja, koje su postojeće dileme i neistražena područja, zašto su navedena pitanja posebno važna, koja su najnovija dostignuća i koje aspekte treba ispitati.

U slučaju predaje teorijskog rada umjesto cjeline *Empirijski podaci i analiza*, autori trebaju obraditi poglavlje *Teorijska/konceptualna analiza* gdje bi autori trebali dati argumentaciju na temelju predložene metodologije/koncepta istraživanja. U ovom dijelu autori trebaju dati novu analizu područja/teme, dati teorijsku argumentaciju koja svoju hipotezu dokazuje korištenjem različitih dostupnih alata kao što su matematički, grafički ili bilo koji drugi koji jasno prikazuju i otkrivaju ekonomske odnose u odnosu na određeno znanstveno područje.

## Sadržaj članka

Rad treba biti relevantan za međunarodnu znanstvenu i stručnu javnost s jasno naznačenim ciljevima i rezultatima istraživanja, zaključkom, referencama u tekstu i

bibliografskim jedinicama na kraju rada. Ideje u radu moraju biti originalne i trebaju značajno doprinostiti razvoju predmeta istraživanja, a metodologija mora biti jasno opisana.

Autori u članku moraju posebnu pozornost obratiti na odgovarajuće strukturiranje teksta sukladno priznatim standardima znanstvene metodologije u ekonomskim istraživanjima, kako je navedeno:

*Posebna stranica treba sadržavati:* naslov članka, ime i prezime autora ili ako je više koautora za svakog ponaosob znanstveno zvanje, stručnu spremu, znanstveni interes, odnosno područje kojim se autor bavi, naziv i adresu institucije u kojoj je autor zaposlen i e-mail adresu. Svi navedeni podaci moraju biti napisani:

- na jeziku članka,
- na hrvatskom jeziku,
- na engleskom jeziku ako izvorni jezik članka nije engleski.

*Prva stranica članka* treba sadržavati: naslov članka, sažetak, JEL klasifikaciju i ključne riječi na jeziku članka.

Na kraju članka isti podaci daju se na:

- hrvatskom jeziku, te
- na engleskom jeziku ako izvorni jezik članka nije engleski.

*Tekst članka* mora početi uvodom, a sadrži još glavna poglavlja, fusnote, tablice, grafikone, slike, reference u tekstu, zaključak i popis korištene literature.

## Tehničko uređivanje članka

*Tekst rada* piše se u programu Microsoft Office Word (inačica 95 i viša). Opseg rada smije iznositi **do 8.000 riječi**, što je oko 16 stranica A4 formata, a tekst je pisan vrstom slova Times New Roman (veličine 12 točaka), s jednostrukim razmakom, poravnan s obje strane, pisan od početka reda (bez uvlačenja prvog retka pasusa), s marginama od 2,5 cm. Ukoliko je u tekstu potrebno posebno označiti neku riječ ili rečenicu koriste se pisana kosa slova (italic), nikako ne podebljana (bold). Za odvajanje pasusa koristi se dvostruki razmak. Opseg rada može biti veći samo u dogovoru s glavnim i odgovornim urednikom.

*JEL klasifikaciju* predlaže autor u skladu s Journal of Economic Literature klasifikacijom koja je dostupna na web stranici: [http://www.aeaweb.org/journal/jel\\_class\\_system.html](http://www.aeaweb.org/journal/jel_class_system.html).

*Fusnote* se rabe samo za dodatna pojašnjenja osnovnoga teksta. One se ne koriste kao poziv na Literaturu. Označavaju se na dnu stranice, u kontinuitetu, kroz cijeli članak, arapskim brojevima počevši od 1.

*Naslovi poglavlja* (od Uvoda do Zaključka) moraju biti kratki i jasni, te redom numerirani arapskim jednocifrenim brojevima. Poglavlja mogu imati i podpoglavlja koja se obavezno numeriraju s dvocifrenim odnosno trocifrenim brojevima. (primjer: 1; 1.1.; 2.; 2.1.; 2.1.1. itd.), ali ne više od toga.

Tablice, grafikoni i slike moraju imati, broj, naziv i izvor podataka. Numeriraju se u kontinuitetu arapskim brojevima (posebno grafikoni, posebno slike).

*Važna napomena:* Ukoliko tablica, grafikon ili slika sadržavaju posebne znakove te su rađeni u posebnom programu dostavljaju se u posebnom dokumentu s točno navedenim i označenim položajem na kojem dolaze u tekstu.

Članak mora zadovoljavati sve tehničke pozicije navedene u ovim uputama.

## Stil i organizacija teksta

Autori se obvezno moraju pridržavati znanstvene metodologije prezentacije građe u pisanju tekstova koja je uobičajena u znanstvenim publikacijama (“Harvard style”). To zahtijeva sljedeći pristup:

### (1) Naslov i organizacija prezentacije građe:

Naslov je najvažniji sažetak rada koji mora održavati sadržaj i svrhu rada. Ne smije biti “opisan” niti sadržavati riječi poput “analiza” ili “metoda”, i sl. Građu se raspoređuje u dijelove kao što su:

- *Sažetak (Abstract)* – ispod naslova
- *Ključne riječi*
- *JEL klasifikacija.*

Iza toga slijedi glavni dio rada podijeljen u odlomke:

- *Uvod*
- *Pregled literature*
- *Metodologija/metoda/model/konceptija analize* (treće poglavlje)
- *Empirijski podaci (dokumentacijska podloga) i analiza* (četvrto poglavlje)
- *Rezultati i diskusija* (peto poglavlje)
- *Zaključci* (šesto poglavlje).

### (2) Sadržaj pojedinih dijelova prezentirane građe:

**a. Sažetak** – ispisi se u 100-250 riječi, a obvezno treba sadržavati:

- utvrđeni cilj istraživanja,
- metodu/model/konceptiju analize,
- glavni rezultat istraživanja (analize),
- temeljni zaključak istraživanja.

Sažetak se ne smije pisati u odlomcima!

**b. Ključne riječi** – moraju odražavati suštinu sadržaja rada, a navodi se do pet takvih riječi.

**c. JEL klasifikacija** – autor svoju temu mora razvrstati sukladno kodu časopisa The Journal of Economic Literature (JEL).

**d. Uvod** – sadrži definiranje problema i predmeta istraživanja s pozivom na recentnu literaturu odnosno rezultate istraživanja. Taj se dio može istaknuti i

u posebnom, tj. 2., poglavlju kao *Literature review*. Pri kraju uvodnog dijela treba utvrditi radnu pretpostavku (hipotezu) istraživanja o kojoj se treba očitovati (kasnije) na početku poglavlja *Zaključak*. *Uvod* treba završiti s naznakom organizacije teksta.

- e. **Pregled literature** – prethodi istraživačkom dijelu, a pruža čitateljima pregled referentne literature s ključnim točkama dosadašnjih spoznaja temeljenih na relevantnim rezultatima aktualnih istraživanja. Pregled literature ne smije biti taksativno navođenje prethodnog znanstvenog doprinosa, već autori trebaju izvršiti sintezu dosadašnjih istraživanja kako bi dokazali opravdanost teorijskog i empirijskog doprinosa vlastitog rada.
- f. **Metodologija/Metoda/Model/Koncepcija** – obično se prezentira u trećem poglavlju; metoda/model/koncepcija analize mora biti transparentno istaknuta radi eventualnog ponavljanja testiranja rezultata od strane zainteresiranih istraživača (to je jedno od temeljnih pravila znanstvene metodologije).
- g. **Empirijski podaci i analiza** – sadržavaju dokumentacijsku podlogu i rezultate empirijske analize. Potrebno je opisati i prikazati uzorak podataka korišten u analizi te prezentirati i objasniti statistička te ekonometrijska obilježja dobivenih rezultata uz tumačenje njihova ekonomskog sadržaja.
- h. **Rezultati i rasprava** – autor objašnjava rezultate, osobito njihovo ekonomsko značenje i poruke. U ovom dijelu očekuje se argumentacija znanstvenog doprinosa, povezivanje rezultata rada s rezultatima te zaključcima dosadašnjih empirijskih istraživanja te preporuke za promjene javnih i drugih politika.
- i. **Zaključci** – treba imati u vidu da taj dio teksta nije i ne smije biti sažetak! Zaključci su autorovo originalno mišljenje (ocjena) o dobivenim rezultatima i obvezno sadrže:
  - očitovanje o polaznoj hipotezi – je li ili nije dokazana;
  - ocjenu rezultata istraživanja/analize, novine, te koji je doprinos znanosti;
  - osvrt na ograničenja i probleme u istraživanju;
  - smjernice za buduća istraživanja;
  - utvrđivanje institucionalno-sustavnih implikacija dobivenih rezultata istraživanja (kao npr. prijedlozi za promjene u ekonomskom sustavu, ekonomsko-financijskoj i razvojnoj politici, instrumenti, mjere i sl.).

Preporuka je da se Zaključak ne piše u odlomcima.

**(3) Literatura** – navesti samo one naslove (izvore) koji su korišteni u tekstu!

*TABLICE* dolaze unutar teksta. Svi podaci u tablici stavljaju se u redove i kolone odvojene jednostrukim tankim linijama. Svaka kolona sadrži naziv i uključuje numeričku jedinicu koja se odnosi na cijelu kolonu. Tako se za višecifrene brojeve rabe jedan ili dva broja, a u nazivu za određenu kolonu označuju se numeričke jedinice u tisućama, milijunima i sl. Tablice se numeriraju u kontinuitetu arapskim brojevima (Tablica 1, Tablica 2, itd.), a pored broja i naziva, moraju imati i izvor podataka.

Mole se autori da se pridržavaju sljedećih pravila:

- iza godine nikad ne dolazi točka;
- tisuće, milijuni i sl. odvajaju se zarezom: 2,000; 250,000; 3,555,284 i sl.; milijarde se označavaju s bn (billion); decimalni brojevi odvajaju se točkom: 2.32; 0.35 i sl.

**GRAFIKONI I SLIKE** dolaze unutar samog teksta. Moraju imati broj, naziv i izvor podataka. Numerira ih se u kontinuitetu arapskim brojevima (posebno grafikoni, posebno slike). Izvori podataka navode se ispod grafikona odnosno slika.

*Napomena.* U tekstu se ne prepričavaju i ne ponavljaju rezultati koji su navedeni u tablicama i grafikonima, već se rabe referentne oznake koje upućuju na podatke u tablicama ili grafikonima.

**REFERENCE U TEKSTU.** Citirane dijelove navodi se u tekstu, a ne u bilješkama. Stavljajući ih se u zagrade i sadrže prezime autora i godinu izdanja npr. (Babić, 2003), a u slučaju citata navodi se još i stranica (Babić, 2003: 150), ili ako se radi o dvojici autora: (Babić i Courty, 2004), ili ako je više od dva autora navodi se prvi i piše: (Babić i suradnici, 2003). Svaka referenca navodi se kao i prvi put. Ne koristi se *ibid* i sl. Ukoliko se autor spominje u tekstu, u zagradi se navodi samo godina: *The work of Stevens (2001) was concerned with what they teach at Harvard Business School.* Svaka referenca mora se navesti u dijelu Literatura na kraju članka.

**LITERATURA** obuhvaća sve korištene izvore i potpune podatke o djelima koja se spominju u referencama u tekstu. Popis literature piše se bez broja poglavlja i dolazi na kraju rada (poslije Zaključka). Literatura se ne numerira. Uređuje se abecednim redom autora te kronološki za radove istog autora. Preporuča se autorima kao literaturu što više koristiti časopise referirane od strane ISI (Institute of Science Information).

Literatura se citira prema primjerima za knjige, časopise i ostale izvore:

• **Knjige:** Prezime, Inicijali (godina) *Naslov*, Mjesto izdavanja: Ime izdavača. Primjer:

Mohr, L. B. (1996) *Impact analysis for program evaluation*, 2<sup>nd</sup> ed., London: Sage.

Ukoliko su dva ili tri autora, redom navesti njihova prezimena i inicijale (godinu)

*Naslov*, Mjesto izdavanja: Ime izdavača. Primjer:

Ridderstrale, J., Nordstrom, K. (2004) *Karaoke Capitalism Management for Mankind*, Harlow: Pearson Education Ltd.

Perišin, I., Šokman, A., Lovrinović, I. (2001) *Monetarna politika*, Pula: Sveučilište u Rijeci, Fakultet ekonomije i turizma “Dr. Mijo Mirković”.

Ukoliko su četiri ili više autora, navodi se prezime prvog autora nakon čega slijedi et al. Primjer:

Norton, M. B. et al. (1981) *A People and a Nation – A History of the United States*, Boston: Houghton Mifflin Company.

• **Časopisi:** Prezime, Inicijali (godina) “Naslov članka”, *Naziv časopisa u kojem je objavljen*, volumen, svezak, broj, stranice. Primjer:

Fox, S. (1994) “Empowerment as a Catalyst for Change: An Example from the Food Industry”, *Supply Chain Management*, Vol. 2, No. 3, pp. 29–33.

Ukoliko je više autora (četiri ili više), navodi se prezime prvog autora nakon čega slijedi et al. Primjer:

Di Noia, C. et al. (1999) “Should Banking Supervision and Monetary Policy Tasks be Given to Different Agencies?”, *International Finance*, Vol. 2, No. 3, pp. 285–361.

Ukoliko je više radova istog autora objavljenih iste godine, uz godinu se rabe oznake “a, b, c”:

Quah, D. T. (1993a) “Empirical Cross-section Dynamics in Economic Growth”, *European Economic Review*, Vol. 37, No. 2-3, pp. 426–434.

----- (1993b) “Galton’s Fallacy and Tests of the Convergence Hypothesis”, *Scandinavian Journal of Economics*, 95, Vol. 95, No. 4, pp. 427–443.

----- (1994) “Exploiting cross Section Variation for Unit Root Inference in Dynamic Data”, *Economics Letters*, Vol. 44, No. 1-2, pp. 9–19.

----- (1996a) “Empirics for Economic Growth and Convergence”, *European Economic Review*, Vol. 40, No. 6, pp. 951–958.

----- (1996b) “Regional Convergence Clusters across Europe”, *European Economic Review*, Vol. 40, No. 6, pp. 951–958.

Autor za svaku referencu treba navesti **Digital Object Identifier (DOI)**, ukoliko postoji. DOI je dostupan na adresi CrossRef-a <http://www.crossref.org/> u obliku <https://doi.org/10.5468/ogs.2016.59.1.1>.

DOI autor upisuje na kraju reference prema primjeru:

Hall, J. K., Daneke, G. A. Lenox, M. J. (2010) “Sustainable Development and Entrepreneurship: Past Contributions and Future directions”, *Journal of Business Venturing*, Vol. 25, No. 5, pp. 439–448, <https://doi.org/10.1016/Zj.jbusvent.2010.01.002>.

• Izvori preuzeti s Internet stranica: Prezime autora/urednika, Inicijali imena (godina) “Naslov članka”, *Naslov Časopisa*, datum publikacije, godište, broj, stranice, Internet adresa [datum pristupa].

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