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EDITORIAL IE-2023-1

Artificial intelligence (AI) is currently at the top of many research agendas, including that of *Intellectual Economics*. However, our portfolio is waiting for this wave to become more widespread. Instead, the metaeconomic approach focuses on understanding how intellectual property (IP) can be used to promote efficiency in production and distribution to encourage the development of significant human talents and creative competencies. This can be achieved through a variety of means, including the use of sophisticated technologies such as the metaverse which integrate AI, virtual reality platforms, machine learning, and blockchain-based secure authentication systems. Ultimately, by effectively leveraging these tools and approaches, we can create an innovative economy that benefits all participants of the social system. For example, cutting-edge technologies such as AI and machine learning can be used to analyze and optimize the impact of fintech and the allocation of IP, helping to ensure that these complex systems are being used in the most effective and efficient manner possible.

This issue – IE-2023:1 – begins with three studies focusing on the SME sector, each highlighting and exploring various aspects and challenges relevant to its success and sustainability. They utilize empirical research methods, employing surveys and statistical analyses to gather data and draw conclusions. These studies recognize the importance of specific factors for SMEs, such as digital talent, sustainable competitive advantage, and business ethics. The first study (Lutz Sommer – Germany) investigates the challenge of acquiring and identifying digital talents, and proposes a solution-based approach involving AI tools in procuring them due to the limited resources and high demand faced by SMEs in terms of the digitalization of corporate processes. It proposes a solution that involves using AI algorithms to identify potential digital talents within existing employee resources, suggesting that AI tools can help to overcome these challenges. The study finds that these tools are affordable and user-friendly for SMEs, challenging the belief that only larger companies can afford them. The second study (Ni Suryantini et al. – Indonesia) examines sustainable competitive advantage in the SME sector, focusing on intellectual capital, technology adoption, and strategic flexibility. It confirms that intellectual capital plays a significant role in gaining sustainable competitive advantage, while technology adoption and strategic flexibility are factors that reinforce intellectual capital. It notes the need for SME managers to foster innovation and knowledge creation within their teams. The third study (Katarina Zvarikova et al. – Slovakia, Poland) examines the role of business ethics in the SME sector, considering the influence of firm size as well as the gender and education of entrepreneurs on the practice of business ethics in the countries of the Visegrad Group. All three findings affirm the importance of internal resources and capabilities in SMEs management – whether by leveraging technology and digital talents, nurturing intellectual capital, or promoting ethical conduct. By incorporating these valuable insights into intellectual property-related strategies and policies, SMEs can foster innovation, sustainable growth, and ethical practices within their organizations.

Ilze Zumente et al. (Latvia) analyze environmental, social, and governance (ESG) dis-

closure levels and board diversity metrics in the Baltic region between 2020 and 2022. Their study finds an increase in ESG disclosure scores over this period, particularly in relation to corporate governance topics. The positive correlation between board diversity, particularly gender diversity, and ESG disclosure levels – suggesting that diverse boards may contribute to increased corporate transparency – is revealed.

Avtandil Liluashvili (Georgia) aims to establish an analytical investment framework for the Georgian economy to assist investors in analyzing the medium-term implications of different macroeconomic scenarios. Their study presents a forecast of macroeconomic variables and applies them to asset price developments, suggesting optimized investment decisions. The study demonstrates that this approach can lower risk and yield better returns compared to standard efficient frontier optimization. From the perspective of larger corporations, particularly those in the Baltic region, ESG disclosures and board diversity play a significant role in corporate transparency. Meanwhile, for investors, particularly in emerging economies like Georgia, an effective analytical framework that forecasts macroeconomic variables can be beneficial for medium-term investment decisions. There is a clear focus on leveraging technology, particularly AI, to solve challenges and optimize processes in SMEs, and both intellectual capital and strategic flexibility are becoming increasingly important for sustainable competitive advantage. Meanwhile, particularly in the context of corporate governance, the growing importance of advanced econometric techniques when making informed investment decisions in emerging economies is evident.

In the second part of this IE-2023:1 issue, Rafael Bolivar et al. (Colombia) present a study focusing on the role of management in job satisfaction, providing an insight into the importance of leadership and management style in employee well-being. Sladjana Živanović et al. (Montenegro, Ukraine) tackle the issue of sustainable management in businesses, focusing on how organizational learning contributes to this process. Yuriy Bilan et al. (Ukraine, Hungary) discuss the role of tourism in socio-economic situations, with a specific focus on the effects of war on tourism in Ukraine and its attractiveness in light of modern challenges. Thus, this study adds a geopolitical layer to our understanding of economic development, offering a perspective that was not seen elsewhere in the initial set of abstracts and underlining the impact of political stability on economic sectors such as tourism.

Maria Elena Latino examine the economic implications of trust in consumer behavior, particularly as it relates to the spread of *Xylella fastidiosa* in Italy. Their study regarding trust in the agrifood supply chain during critical events contributes a novel perspective on how public sentiment influences consumer behavior. This aligns with the suggestions by Suryantini et al. on the role of consumer trust in securing competitive advantage for SMEs. Maja Nikšić Radić et al. (Croatia, Slovenia) explore the impact of foreign remittances on economic growth, conducting a bibliometric and systematic literature review by providing a quantitative analysis. Their paper brings a global context into the discussion, suggesting how economic growth and stability can be influenced by global financial flows.

The common theme across these articles is the broad focus on how various elements – including management, sustainable practices, socio-economic conditions, trust, and foreign remittances – influence business practices and economic growth. Each paper contributes to our understanding of these multifaceted influences from different perspectives, ranging from job satisfaction and organizational learning to tourism attractiveness, consumer trust, and economic development through remittances.

Overall, the second part of this IE-2023:1 issue dives deeper into specific aspects of economic growth and business management while providing a broader global and geopolitical context. The examination of trust – in terms of consumer behavior, job satisfaction, organizational culture, geopolitical influences, and global financial flows – enriches our understanding of these topics and provides multiple points of departure for future research.

Antanas Buracas

THE DIGITAL TALENT TRAP IN THE SME SECTOR: MAKE OR BUY SOLUTION APPROACH

Lutz SOMMER

Department of Industrial Engineering
Albstadt-Sigmaringen University, Germany
sommer@hs-albsig.de

Abstract: *The purpose of this study is to answer the question of what options companies have when competing for digital talent. SMEs in particular, with their limited resources and significant backlog in terms of the digitalisation of corporate processes, find themselves in a digital talent trap which threatens to grow ever larger as digitalisation progresses. In other words, the digital talent gap could become a digital talent trap for SMEs in terms of digitalisation. The aim of this work is to derive from this insight a pragmatic and cost-effective solution which, in addition to the highly competitive "buy" option – i.e., classic recruitment via the labour market – offers a "make" option for SMEs that focuses more on their own employee resources.*

The research approach was based on two steps. In the first step, various literature approaches for recording and measuring digital skills were analysed in order to summarise them and derive potential digital talent profiles. The second step was to search for suitable software packages that are able to detect these profiles or skills in company documents. With these data sets, an analysis was carried out in the third step using AI algorithms – created in Python – in order to identify potential digital talents. An anonymised personal data set was used to test the above decision-making process.

The findings show that SMEs could already access powerful, user-friendly and low-cost digital AI tools when searching for digital talent – especially in the search for digital talents within the company. The assumption that only larger companies with the corresponding financial resources can afford this option cannot be confirmed.

The originality of the work lies in the finding that suitable AI tools exist for SMEs to search for digital talent, but that these are not currently being used extensively. Barriers such as prohibitively high costs or the low user-friendliness of AI tools could not be confirmed within the scope of this study.

1. Introduction

Digital transformation is becoming increasingly important in the global business environment. This results in high demand for employees who have the ability to work in digital teams, bring digital know-how into everyday work and develop digital skills (Deloitte, n.d.). This affects large companies, on the one hand, and smaller and medium-sized companies on the other (Statista, 2023). In SMEs in particular, the battle for digital talent is becoming a critical competitive factor (Redzepi et al., 2018) – especially as government institutions are now also making intensive efforts to recruit skilled workers in the field of digitalisation (Steinbrecher, 2021). The scale of these challenges in SMEs – compared to in large companies – is illustrated by the study of the Institut für Mittelstandsforschung Bonn (2022).
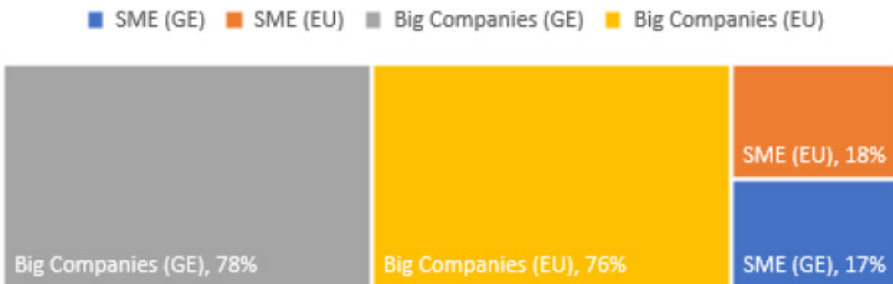
Figure 1. *Percentage of SMEs and big companies in Germany and EU with dedicated ICT experts*
Source: *Institut für Mittelstandsforschung Bonn (2022)*

Figure 1 shows that 78% of all German and 76% of all EU big companies' employees have a background in information and communication technology (ICT), whereas in SMEs only 17% of employees in Germany and 16% in the EU have a corresponding background (Institut für Mittelstandsforschung Bonn, 2022). This status is alarming if the aspect of digital intensity, understood as the degree of implementation of digital technologies and processes in companies (Deflorin et al., 2017), is also taken into account (Institut für Mittelstandsforschung Bonn, 2022).
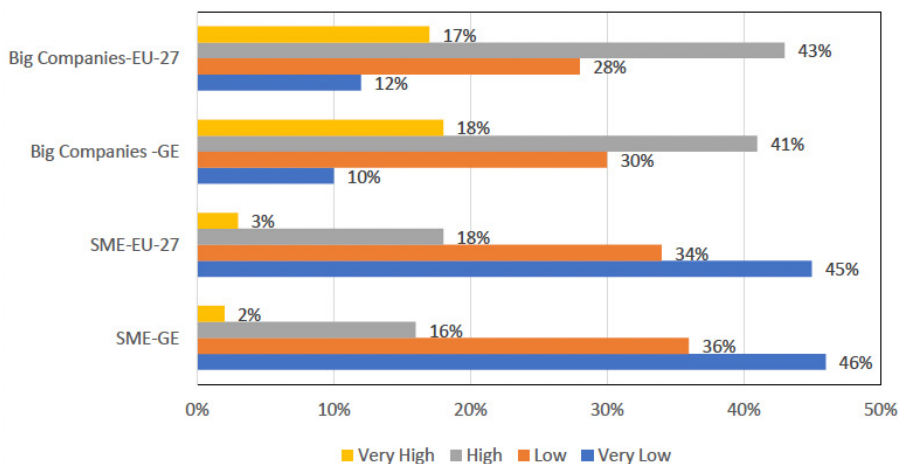
Figure 2. *Percentage of digital intensity in Germany and in the EU*
in SMEs and big companies
Source: *Institut für Mittelstandsforschung Bonn (2022)*

Figure 2 documents the comparatively low digital intensity of SMEs compared to large companies (Institut für Mittelstandsforschung Bonn, 2022), which means that under the conditions of the existing competition for digital talent, SMEs will not be able to simply close this intensity gap via the labour market in the foreseeable future. In other words, there is a risk that the digital talent gap will become a trap for companies, as the necessary digitalization depends on the staff in these companies. This poses a recruitment challenge for companies in general and SMEs in particular, as their business models can only be adapted to digital requirements at the required speed with suitable staff. Therefore, the following objectives are pursued within this article:

1. capturing the current state of research in terms of understanding what digital talent is, its importance to the labour market and the different manifestations of digital skills and how they are measured;
2. analysing whether AI algorithms or corresponding AI software packages could make a contribution to closing the digital talent gap;
3. analysing whether the digital talent gap in SMEs should be closed via the labour market (the buy approach) or via internal training (the make approach);
4. analysing whether AI software packages available on the market are suitable for SMEs;
5. analysing the results that can be achieved with cost-effective solutions, illustrated by the example of a use case from a medium-sized company.

The aim is to enable SMEs to close the gap in digital talent largely on their own. In

order to achieve this objective, the first step is to conduct a detailed literature review to record the current state of research. In the second step, suitable AI software packages are identified and applied to a suitable data set. In the third step, a recommendation for action is derived.

2. Literature Review

In short, SMEs find themselves in a competitive situation with larger companies in the "war for digital talent" (Papadopoulos et al., 2022), which poses a challenge. SMEs are in a digital talent trap, so to speak – i.e., either they are prepared to pay higher wages in the competition for digital talent, they focus on training and developing their own employees, or they implement both measures. As mentioned, this creates a "make or buy" decision in the HR departments of these companies. In connection with this, human resources management in both large and medium-sized companies is faced with the question of the company-specific digital skills that will be in demand in the future and how to meet the company-specific need for suitable employees (Deloitte, n.d.). Answering the question of sourcing suitable staff can become a matter of survival for SMEs in the age of digitalisation. Finding suitable digital talents with the ability to implement the process of digital transformation (Arora et al., 2021) in the company (Capgemini, 2017) has gained significant importance in recent years. Companies unable to solve these tasks risk a loss of competitiveness.

2.1. Digital Talent – a Definition

Before the search for talent starts, however, it must be made clear what one is actually looking for. In other words, what makes a digital talent? Is there an accepted definition for the term digital talent? The Capgemini Digital Transformation Institute (2017) explored this question and chose the following definitional approach:

> In our survey, we analyzed Digital Talent in three ways: (a) Hard digital skills (such as data analytics); (b) Soft digital skills (such as comfort with ambiguity) that constitute a "digital-first mindset" and are necessary for a successful digital transformation; (c) Digital roles that have been created as a result of digital transformation activities within an organization or the emergence of disruptive technologies (Capgemini, 2017).

Put simply, they distinguished digital talents from the perspective of hard and soft digital skills and their role. In distinction to this, there are a variety of other terms as well as definitions for employees with digital know-how, such as "digital natives, digital immigrants and digital citizens" (Saleeb & Dafoulas, 2010). Prensky (2001) provided an important basis for this definition – put simply, digital natives and digital immigrants can be distinguished as follows: "Digital natives are the new generation of young people who were born into the digital age, whereas digital immigrants are those who learned to use computers in a phase of adulthood" (Prensky, 2001). Does this mean that every digital

native is also a digital talent? The answer is no, because, as already mentioned, a variety of digital skills are required, not all of which are necessarily acquired by growing up in the digital age. This is also confirmed by studies that define digital talent as follows: "While digital transformation of products, services and processes requires employees with IT-related knowledge, skills and abilities (KSAs) ..." (Gilch & Sieweke, 2021). Another, more general approach is provided by the DQ Global Standards Report (2019).

2.2. Digital Talent – the Gap

Based on the above definition and the corresponding research, a global digital talent gap can be identified, which continues to widen (Capgemini, 2017). A comparable result for Asia was provided by the 2022 Digital Talents Insight survey, commissioned by Huawei, which concluded that "...we are witnessing a rise in the demand of emerging technologies and Digital Talents" (Huawei, 2022). The Arthur D. Little consultancy even goes one step further, and speaks of a "war for digital talent" in its 2022 study (Papadopoulos et al., 2022). In summary, they perceived the lack of digital talent as a threat to the development of companies: "The digital skills shortage presents a tangible risk to every business and organisation – especially since 'software is eating the world' and every organisation is now practically a technology company" (Papadopoulos et al., 2022). The Boston Consulting Group even spoke of the "Year 2035: Talent War in the Digital Age" (Ruan et al., 2017). Experts at PwC also confirmed that there is extensive competition for talent (Papadopoulos et al., 2022).

In sum, it can be stated that a large number of well-known management consultancies assume that currently, and for the next few years, there is extensive competition among companies with regard to the recruitment of digital talents – i.e., that the topic of digital talents is on the agenda of companies. This inevitably raises the question of suitable approaches for the needs-oriented selection or identification of suitable candidates. With regard to SMEs, the make aspect – i.e., the further training of their own staff – plays a prominent role in the recruitment of digital talents, as the buy aspect – i.e., competition with larger companies for suitable staff – often cannot be successfully implemented (European Union, 2022). In other words, the make or buy decision tends to shift towards make for SMEs. This means – in addition to recruitment in the labour market – that the increased internal search for employees who are already digital talents or could become one through education and training is of vital importance. However, with often limited resources and underdeveloped IT competences in their human resources departments, it is challenging for SMEs to carry this out in a cost-efficient and effort-reducing way. This can be achieved, among other methods, by screening the company's own HR data using AI-based software tools (e.g., text mining tools), which are available as open source, freemium (Chełkowski et al., 2021), or fully functional commercial software.

2.3. Digital Talents – Skills

Digital skills are currently named and weighted differently in terms of their importance. This applies both to companies and to studies that deal with this topic. Four different studies that have examined the topic of digital skills will be included in this section. Study 1, from the Capgemini Digital Transformation Institute, divides the relevant skills as follows (Capgemini, 2017).

Table 1. *Digital skills according to the Capgemini Report – Study 1*

Study 1: Soft digital skills	Study 1: Hard digital skills	Study 1: Digital roles
Customer-centricity	Cybersecurity	Information security
Passion for learning	Cloud computing	Chief digital officer
Collaboration	Analytics	Data architect
Data-driven decision making	Web development	Digital project manager
Organizational dexterity	Mobile application design and development	Data engineer
Comfort with ambiguity	Data science	Chief customer officer
Entrepreneurial mindset	Big data	Personal web manager
Change management	Master data management	Chief Internet of Things officer
	Innovation strategy	Data scientist
	User interface design	Chief analytics officer

Source: *Capgemini (2017)*

The results of Study 2 – the 2022 Digital Talent Insight for hard digital skills (Huawei, 2022) – shown in Table 1 – provide a similar picture, but with key differences in parts. Study 3, the DQ Global Standards Report 2019, speaks of digital intelligence (DQ) as a manifestation of digital skills (DQ Institute, 2019). Finally, Study 4 presents a comparative literature review on 21st-century digital skills" (van Laar et al., 2020).

Table 2. *Digital skills according to Studies 2–4*

Study 2: Hard digital skills	Study 3: Digital intelligence (DQ)	Study 4: 21st-century digital skills
Artificial intelligence	Digital identity	Technical
Big data	Digital use	Information
Cloud	Digital safety	Communication
Internet of Things	Digital security	Collaboration
5G	Digital emotional intelligence	Critical thinking
	Digital communication	Creativity
	Digital literacy	Problem solving
	Digital rights	

Source: *Huawei (2022); DQ Institute (2019); van Laar et al. (2020)*

Table 2 summaries the main results of Studies 2–4. Further details on skills and roles can be found in the individual studies. Looking at Studies 2–4, it is noticeable that in some cases no distinction is made between hard and soft skills, hard skills are not considered at all, or, as in van Laar et al. (2020), an approach is taken that presents seven digital skills in summary form.

Study 3 is a mixture of different digital skills which can be partly assigned to the above manifestations of skills. In contrast, Studies 1 and 2 provide information on digital skills at the level of specific technical knowledge (Dworschak et al., 2020), e.g., cloud computing. Compared to the above methodological and social competences, evidence of this is easily ascertainable via screening, e.g., via a search for keywords in CVs, assessments or certificates. If redundant technical skills and skills that are more likely to be assigned to methodological and social skills (Dworschak et al., 2020) are removed (e.g., innovation strategy), this leaves 10 technical digital skills (Capgemini, 2017; Huawei, 2022). This results in the following overview of all digital skills.

Table 3. *Digital skills according to Studies 1–4*

Digital skills – main focus: **Methodological & social competence**	Digital skills – main focus: **Professional competence**
Technical	Cybersecurity
Information	Cloud computing
Communication	Artificial intelligence/analytics
Collaboration	Web development
Critical thinking	Mobile application design
Creativity	Data science
Problem solving	Big data
	Master data management
	User interface design
	Internet of Things

Source: *Capgemini (2017); Huawei (2022); DQ Institute (2019); van Laar et al. (2020)*

According to table 3, two groups of competences can be identified: (a) the group of methodological and social competences, consisting of 7 digital skills; (b) the group of professional competences, consisting of 10 digital skills.

2.4. Digital Talents – the Measurability of Skills

The measurability of digital skills is a major challenge (Winsborough & Chamorro-Premuzic, 2016). If we look at criteria such as the effort required to record these skills, tools for recording, and their data availability, it becomes clear that the group of subject-specific digital skills can be evaluated or analysed relatively easily:

Table 4. *The allocation of digital skills according to methodological, social, and professional competence*

Digital skills **Measurability**	Digital skills – main focus: **Methodological & social competence**	Digital skills – main focus: **Professional competence**
Capture of skills	Capture via generation of new data	Simple capture based on existing data
Tools for recording skills	E.g. survey tools, interview or observation tools	Evaluation of certificates, CVs, appraisals, education and training e.g. via data scan
Data availability of skills	Generally not available, as neither direct nor indirect recording is available.	Usually available in parts, as e.g. CVs, certificates are usually available

Table 4 allows for the conclusion that subject-specific digital skills can be collected with little effort via software tools. These tools are often available as free or low-cost software packages. In other words, the use of subject-specific digital skills in the sense of the pre-selection/screening of digital talents via software tools can be a low-effort, low-cost option for larger and smaller companies (Mittal et al., 2020; Affinda, 2023b), even if this is not yet recognised by SMEs in particular (Dahm & Dregger, 2019).

2.5. Digital Talents – Software Packages

If a gap in digital skills has been identified in an internal company analysis, the make or buy options must be examined. In addition to the buy option, the make option is particularly important for SMEs in terms of training and further education (Goulart et al., 2022). Software packages with artificial intelligence (AI) algorithms are suitable for both options (Strohmeier & Piazza, 2015; Tambe et al., 2019; Pan et al., 2022). The question of which software tools are specifically suitable for SMEs requires a detailed analysis. There is extensive discussion in the literature on the application of AI approaches in human resource management (Ćormarković & Dražeta, 2022; Qamar et al., 2021; Alghanemi & Al Mubarak, 2022). For example, the capterra.com (2023) internet platform lists various easy-to-use software providers – specifically for HR (Capterra, 2023) – that use AI algorithms (Riedel, 2020). However, information is necessary in order to carry out the analysis, which is sometimes the greater challenge. For example, the ItyX AG (2023) provider states that "traditional data extraction from documents has a low degree of efficiency: this is because only a fraction of the specialist data in transaction entry in companies can be automatically recognised and utilised via rules and items ...., which leads to high costs and delayed processing". In other words, there are at least two challenges for companies and their HR departments in terms of suitable software: costs and efficiency.

3. Research Question and Hypothesis

From the above, the following options were derived specifically for SMEs in terms of the war for digital talent (Papadopoulos et al., 2022):

- SMEs can recruit digital talents in competition with other companies on the labour market (the buy option), identify digital talents in their own companies and train them accordingly (the make option), or combine both options;
- SMEs can assess the need for digital skills in the company with suitable software packages in order to, among other things, start a needs-based search for digital talents;
- SMEs can use suitable software packages in human resources management for the implementation of the buy option as well as the make option, which are already widely used in SMEs in comparison to larger companies;
- SMEs can choose between different software solutions depending on the resources of the company, opting for open source, freemium or commercial software.

In summary, SMEs do not have a cognition or awareness problem when it comes to finding digital talent. Rather, the challenge lies in the practical implementation of solutions. How can SMEs, with their limited financial resources and knowledge of AI technologies, find a way to use these technologies as a tool for cost-effective solutions to the problem of recruitment? This question is not examined in the majority of publications on this topic. Instead, as illustrated in the literature review section, the focus is primarily on the recognition of the fact that this problem exists, the assessment of size of the gap, or the definition of skills – not on the question of cost-effective, efficient solutions for SMEs. Therefore, the following research question (RQ) can be defined:

> *RQ: Is it possible to develop an SME-oriented solution with which digital talents can be identified via specific software packages in the sense of a make or buy decision with high accuracy and low cost/effort?*

Based on the research question, two hypotheses can be defined. H1 considers whether there are already enough software packages on the market that meet the requirements of SMEs; H2 checks their accuracy based on a case study.

> *H1: Easy-to-use software packages with specific AI algorithms exist on the market that enable SMEs to collect data sets on potential digital talents at low cost based on internal company personnel data (the make option) or applicant data (the buy option).*
>
> *H2: Software packages for the analysis of personnel data with specific AI algorithms exist, which enable SMEs to identify potential digital talents at low cost on the basis of the determined data sets, with an accuracy of more than 80%.*

4. Method

In order to consider H1, the first step was to conduct a literature and internet search in which software packages on the market were examined and evaluated in terms of cost. H2 saw the application of the selected software packages to an anonymised company data set – 166 persons – in order to test their accuracy. In the context of this study, anonymisation meant that names, date of birth, marital status and place of birth, among other things, were removed from the data set. Furthermore, sorting by department was

removed. Missing values in the data set were replaced by integer mean values if only one value was missing. Data sets with implausible values or more than one missing value were removed. The number of records removed was less than 10% of the total. The investigation was carried out on the basis of selected software packages. The following approaches, algorithms and data were used to conduct the study:

- Approach – CRISP-DM for machine learning with Python (Machine Learning Mastery Pty. Ltd., 2023b; Scikit-Learn, 2023a; IBM, 2021): (1) Business & Data Understanding; (2) Data Preparation; (3) Modelling; (4) Evaluation; (5) Predictions.
- Algorithms – (Machine Learning Mastery Pty. Ltd., 2023b): (1) LR – Logistic Regression; (2) LDA – Linear Discriminant Analysis; (3) KNN – K-Nearest Neighbours; (4) CART – Classification and Regression Trees; (5) NB – Gaussian Naive Bayes; (6) SVM – Support Vector Machines.
- Data set – the anonymised data set of sample company A was created based on the assumption that, of the 10 subject-specific, detailed digital skills, 4 skills were relevant for the search for digital talents in relation to sample company A. These skills were selected as: (a) DS-1 cybersecurity; (b) DS-2 cloud computing; (c) DS-3 AI; (d) DS-4 data science. CVs and job descriptions including training and further education documents were used as databases. For each digital skill, the maximum value was 2 (i.e., found in both databases) and the minimum value was 0 (i.e., not mentioned at all). The detailed assessment of the extent of the individual's experience as well as its benefit for sample company A was not the subject of this screening approach, but would be the subject of a subsequent detailed personal interview. Employees with a high score in all four digital skills were classified as digital talents, employees with medium skills were considered potential digital talents, and those with low skills were considered non-digital talents. The scores for the above classification into the three groups were defined by sample company A itself. For this purpose, one can fall back on the experience of assigning values for one's own digital talents.

5. Results

5.1. Hypothesis 1

Based on H1, we sought to investigate whether there are software packages on the market that are able to identify specific data – including skills – from CVs at low cost. CV parsing software tools belong to this class (Buttiker et al., 2021). Indeed (2022), as one of the major platform providers in the HR sector and also a provider of CV parsing software, distinguishes between three main forms of parsing:

- *grammar-based parsing* – "Grammar-based parsing involves using grammatical rules to understand the context of each word in a sentence" (Indeed, 2022);
- *statistical parsing* – "Involves using numeric models to interpret the words in a CV" (Indeed, 2022);

- *keyword-based parsing* – "Works by detecting buzzwords in a CV. They use in-dustry-specific terms to enable recruiters to select suitable candidates" (Indeed, 2022).

The following table provides an overview of 40 AI analytics tools from six 2022–2023 rankings that can extract data from CVs for recruitment purposes (Hemminga, 2021; TrustRadius, 2023; Wade, 2022; Edis, 2023; SourceForge, 2023; GetApp, 2023).

Table 5. *Overview of 40 CV parsing tools*

Software	Number of Rankings*	Homepage
1. Affinda	**4 of 6**	https://affinda.com/
2. Alex Resume	2 of 6	www.hireability.com
3. Bullhorn	1 of 6	https://www.bullhorn.com/de/
4. Burning Glass Lens	**4 of 6**	https://www.burningglassinstitute.org/
5. CleverConnect	1 of 6	https://www.cleverconnect.com/
6. CVViZ	1 of 6	https://cvviz.com/
7. DaXtra	**6 of 6**	https://www.daxtra.com
8. Ducknowl	3 of 6	https://ducknowl.com/
9. eGrabber Hiring	**4 of 6**	https://www.egrabber.com/hiringprospector/
10. Employa	3 of 6	https://employa.org/
11. Flocareer	1 of 6	www.flocareer.com
12. Freshteam	2 of 6	www.freshworks.com/hrms
13. Grove HR	1 of 6	https://www.grovehr.com/
14. HireAbility	**4 of 6**	https://www.hireability.com
15. hireEZ	3 of 6	https://hireez.com/
16. HireLakeAI	1 of 6	www.hirelake.ai/
17. HireXpert	3 of 6	www.talentxpert.com/hirexpert-product.html
18. HireZE	1 of 6	www.hirize.hr
19. Indeed.com	1 of 6	www.indeed.com/hire
20. Insperity Talent Connect	1 of 6	https://brightmove.com/
21. JobConvo	1 of 6	https://www.jobconvo.com/
22. Peoplehum	2 of 6	www.peoplehum.com
23. Rchilli	**5 of 6**	https://www.rchilli.com/
24. RESUMate	1 of 6	https://resumate.com/
25. ResumeMill	1 of 6	www.platinasoft.com/resumemill/
26. Scismic	1 of 6	https://scismic.com/
27. Seekout	1 of 6	https://www.seekout.com/
28. Skillskan	1 of 6	www.arca24.com
29. Smart Recruit Online	1 of 6	https://www.smartrecruiters.com/
30. Sovren	**6 of 6**	https://sovren.com/
31. Superparser	2 of 6	www.superparser.com
32. Tamago	2 of 6	www.tamago-db.com
33. Textkernel	3 of 6	https://www.textkernel.com

Software	Number of Rankings*	Homepage
34. Timetrex	1 of 6	www.timetrex.com
35. Tobu	2 of 6	www.tobu.ai/
36. Tracktalents	1 of 6	https://www.tracktalents.com/
37. Tribepad Applicant	1 of 6	https://tribepad.com/
38. Turbohire	2 of 6	www.turbohire.co/
39. Visiotalent	1 of 6	www.visiotalent.com/en
40. Zoho Recruit	**4 of 6**	https://www.zoho.com/de/recruit/

*Note: * = number of mentions in six examined rankings*

Source: *Hemminga (2021); TrustRadius (2023); Wade (2022); Edis (2023); SourceForge (2023); GetApp (2023)*

Table 5 shows that out of the 40 CV parsing tools examined, only 8 were mentioned in at least 4 of 6 the CV parsing rankings. In sum, the above table thus provides initial indications with regard to frequently mentioned software products without, however, claiming to be complete or objective. Taking into account the reservations mentioned, it was thus possible to derive a trend, at least with regard to 8 market-relevant CV parsing tools on three levels. According to H1, it was then necessary to examine the costs of the software packages available on the market.

Table 6. *Overview of costs per parsed document for different CV parsing tools*

Ranking	Software	Costs per parsed document
1. First Level	7. DaXtra	Upon request
	30. Sovren	10,000 parses/$1,450 per year = $0.145/parse (Sovren, 2023)
2. Second Level	23. Rchilli	6,000 parses/$825 per year = $0.138/parse (RChilli, 2023)
3. Third Level	1. Affinda	6,000 parses/$800 per year = $0.133/parse (Affinda, 2023a)
	4. Burning Glass Lens	Upon request
	9. eGrabber Hiring	5,000 parses/$695 per year = $0.139/parse (Bodapati, 2023)
	14. HireAbility	Upon request
	40. Zoho Recruit	250 active jobs/€50 per year = $0.200/parse (Zoho, 2023)

Source: *Sovren (2023); RChilli (2023); Affinda (2023a); Bodapati (2023); Zoho (2023)*

The results in Table 6 show that cost of the service per parsed document for a CV parsing tool ranges from $0.133 to $0.200. It should be noted here that, when comparing providers, it is important to consider not only the price but also the type of documents that can be processed by the software. As a rule, standard file formats (e.g., PDF, DOC,

DOCX) are processed. However, the ability to process other text formats as well as images (e.g., JPEG, JPG) and the correct processing of the captured data via AI algorithms (Inda, 2021) is also important.

5.2. Hypothesis 2

H1 identifies the various software packages that can be used to read data records regarding digital skills from documents. H2 examines how these data records can be evaluated in such a way that digital talents can be recognised at an early stage in the sense of a make or buy decision when screening. For this purpose, one could use paid, free or freemium solutions. In the context of this study, the free option was investigated, as this would be a suitable option considering the limited resources of SMEs. For this purpose, a free Python code that includes classical AI algorithms (Machine Learning Mastery Pty. Ltd., 2023a) was used to find digital talents inside or outside of the company according to a company-specific requirement profile. The Machine Learning Mastery Pty. Ltd. (2023b) approach was used for this purpose. The analysis of the data set provided the following results (see Appendix A).
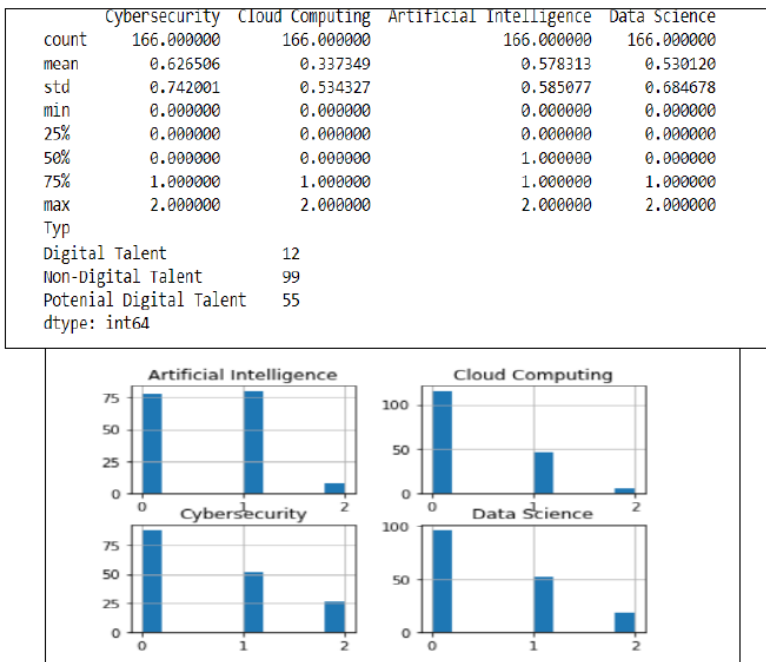
Figure 3. *Descriptive statistics in relation to the data set of 166 persons (Appendix A)*
Source: *Implemented with Machine Learning Mastery Pty. Ltd. (2023a)*

Figure 3 shows that the competences were unequally distributed: competences in AI were present in more than 70 people, whereas competences in the other three areas were significantly less prevalent. When we then modified the freely available Python program from Machine Learning Mastery Pty. Ltd. (2023b) and applied it to the data set of 166 persons from sample company A (see Appendix A) with regard to the identification of digital talents, we received the following picture (Machine Learning Mastery Pty. Ltd., 2023a).
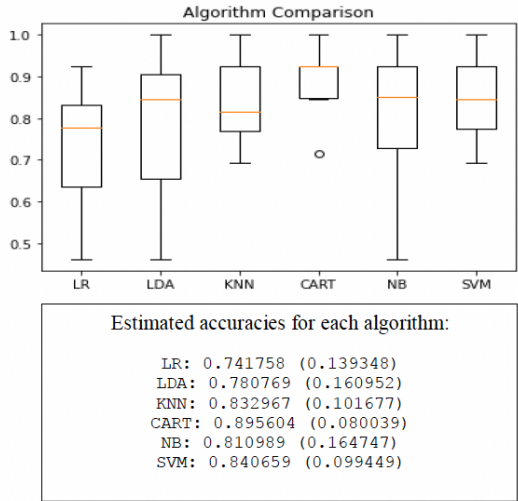
Figure 4. *Selection of algorithms*
Source: *Implemented with Machine Learning Mastery Pty. Ltd. (2023b)*

Figure 4 shows that the accuracy achieved by the CART algorithm – Classification and Regression Trees – was 89.5%, while the lowest value of 74.2% was achieved by Linear Regression. In the next step, a validation dataset was used to check these results (Lim & Loh, 2000; Machine Learning Mastery Pty. Ltd., 2023a). This report provides an overview of the "precision, recall and f1-score" indicators (Machine Learning Mastery Pty. Ltd., 2023a).

Table 7. *Classification report, implemented with Machine Learning Mastery Pty. Ltd. (2023b)*

	precision	recall	f1-score	support
Digital Talent	0.67	1.00	0.80	2
Non-Digital Talent	0.93	1.00	0.96	25
Potenial Digital Talent	1.00	0.57	0.73	7
accuracy			0.91	34
macro avg	0.86	0.86	0.83	34
weighted avg	0.93	0.91	0.90	34

The interpretation of these results is also possible for those who are not AI experts, as shown in Table 7. For this purpose, it is recommended to use trustworthy internet platforms such as developer.google.com or Sklearn (2023), which provide simplified interpretations as follows: (a) Precision: "What proportion of positive identifications was actually correct?" (Google Developers, 2023); (b) Recall: "What proportion of actual positives was identified correctly?" (Google Developers, 2023); (c) F1-Score: "The F1 score can be interpreted as a harmonic mean of the precision and recall, where an F1 score reaches its best value at 1 and worst score at 0" (Scikit-Learn, 2023b). If the interpretations presented are applied to the results of sample company A, it becomes clear that the precision and recall values are above 90% in two out of three cases, and the F1 score in all cases is at least 70%. On the basis of these results, the corresponding HR department now has the task of conducting targeted interviews with potential or current digital talents in order to analyse the second group of digital skills. This second group – methodological and social competences – cannot be recorded by means of screening, or if it potentially could then it would involve great difficulty.

6. Discussion

6.1. Hypothesis Testing

The results of testing H1 confirm that there are at least 40 software packages on the market that are capable of extracting data from various documents and making it available for subsequent analysis within a limited time. In addition, it was shown that the costs per parsed document range from $0.13 to $0.20, which are affordable for SMEs. In this respect, the study confirms that a large number of suitable, cost-effective software packages exist that could be applied to both the make and buy options. H2 questioned whether software packages exist that can identify digital talents on the basis of the identified data sets, at low cost, with reduced effort, and with an accuracy of more than 80%. The results show that free software packages exist that are able to analyse data with limited time expenditure. Digital talents were identified based on the data set of sample company A using a CART – classification and regression trees – algorithm with 89.5% accuracy. The F1 score was at least 70%. Thus, in addition to the cost-efficiency and availability of suitable software packages, the suitability with regard to a data set from a medium-sized company was confirmed.

6.2. Limitations

The present study was based on a modified data set that was already available. In other words, the testing of the software packages regarding data extraction from HR documents was not the subject of this work. In this respect, to confirm the present results, it is recommended that the entire process – from the extraction of data from documents to the analysis of the collected data – be carried out with real data from an SME. Furthermore, only one software package was checked for accuracy. Further studies should review a sample dataset with different software packages, both in terms of results and usability.

7. Conclusion and Implications

In summary, it can be said that SMEs must accept the challenge of digitalisation when searching for digital talent. The main finding is that AI algorithms or suitable software packages are available for this purpose at low cost. However, the results of the present work show that the availability of inexpensive tools and SMEs' awareness of the problem of the lack of availability of digital talent does not mean that the problem is solved. The first additional finding is that more problems were discovered, including: (a) a lack of experience in dealing with corresponding software packages in SMEs; (b) the often insufficient digitisation of paper-based documents; and (c) the failure to process personal data records. The second additional finding is that the above software tools can be helpful in terms of analysing personnel data. However, this does not solve the problem of SMEs being exposed to massive competition from large companies when recruiting staff via the labour market – the buy option. Conversely, for the make option – i.e., the training of suitable personnel within the company – these software tools can make a significant contribution in relation to the identification of suitable employees. The third finding is based on the derivation of a guideline that can facilitate practical implementation for SMEs.
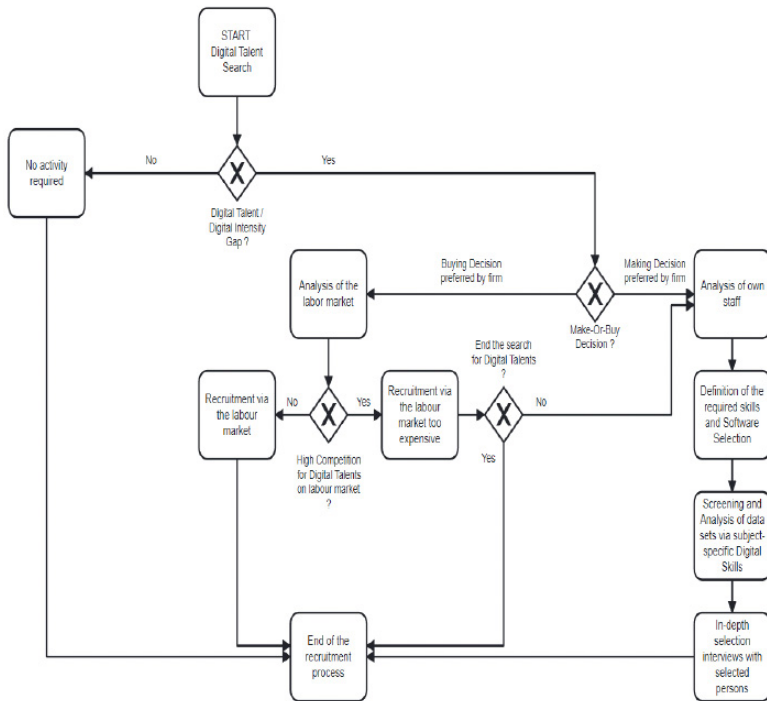
Figure 5. *A simple SME-oriented Business Process Model and Notation (BPMN) for searching for digital talent, implemented with bpmn.io*

The BPMN in figure 5 can be described as follows. (1) EU and German SMEs have a deficit in digital talents and digital intensity compared to large companies, and are thus effectively in a digital talent trap which is increasing with the digital transformation of companies. (2) SMEs can reduce the gap in digital talent through either a make or buy strategy in human resource management, whereby the buy strategy (recruitment via the labour market) represents a major challenge due to competition with large companies. (3) The make strategy (training the company's own staff) seems to be a more interesting option for SMEs, but this requires the search for potential and current digital talents on the basis of certain digital skills in SMEs. (4) Digital skills can be subdivided according to methodological and social competences as well as specialist competences, where the latter can ideally be used for screening available documents in the sense of the pre-selection of digital talent. (5) For the screening of documents (e.g., CV parsing), there is a need for a more comprehensive search for potential digital talents. (6) The data sets resulting from the screening can be analysed with a high degree of accuracy using free, paid or freemium analysis tools with regard to the identification of digital talents. (7) After the successful completion of pre-selection via subject-related digital skills, method- and social-specific digital skills can be used for the final selection of digital talents.

In summary, it can be stated that SMEs can identify and then train and develop potential digital talents within the framework of the digital talent trap primarily via the decision to "make", with limited effort and at low cost. The results also show that neither the costs nor the effort associated with the use of these software packages should represent an obstacle for SMEs. The decision to buy, on the other hand, remains a challenge for SMEs in the current labour market conditions.

Acknowledgments

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Appendix A.

DS-1	DS-2	DS-3	DS-4	Type
2	2	1	1	Digital Talent
2	1	1	2	Digital Talent
2	2	1	2	Digital Talent
2	1	1	2	Digital Talent
2	0	2	2	Digital Talent
2	2	2	2	Digital Talent
2	0	2	2	Digital Talent
2	2	2	1	Digital Talent
2	0	1	1	Digital Talent
2	2	2	2	Digital Talent
2	0	1	2	Digital Talent
2	0	1	2	Digital Talent
0	0	0	0	Non-Digital Talent
1	0	0	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
1	0	1	0	Non-Digital Talent
0	1	1	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
1	0	1	0	Non-Digital Talent
0	1	0	0	Non-Digital Talent
0	0	0	2	Non-Digital Talent
0	0	1	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
0	0	0	1	Non-Digital Talent
0	0	0	1	Non-Digital Talent
1	0	2	0	Non-Digital Talent
1	0	0	2	Non-Digital Talent
0	1	0	0	Non-Digital Talent
0	0	1	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
0	0	1	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
0	0	1	0	Non-Digital Talent
0	0	1	0	Non-Digital Talent
0	1	0	0	Non-Digital Talent
1	0	1	0	Non-Digital Talent
0	1	0	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
1	0	1	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
1	0	1	0	Non-Digital Talent
0	0	0	1	Non-Digital Talent
0	0	0	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
1	0	0	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
1	0	1	0	Non-Digital Talent
0	1	1	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
1	0	1	0	Non-Digital Talent
0	1	0	0	Non-Digital Talent
0	0	0	2	Non-Digital Talent
0	0	1	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
0	0	0	1	Non-Digital Talent
0	0	0	1	Non-Digital Talent
1	0	2	0	Non-Digital Talent
1	0	0	2	Non-Digital Talent
0	1	0	0	Non-Digital Talent
0	0	1	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
0	0	1	0	Non-Digital Talent
0	0	1	0	Non-Digital Talent
0	1	0	0	Non-Digital Talent
1	0	1	0	Non-Digital Talent
0	1	0	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
1	0	1	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
1	0	1	0	Non-Digital Talent
0	0	0	1	Non-Digital Talent
0	0	0	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
1	0	0	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
1	0	1	0	Non-Digital Talent
0	1	1	0	Non-Digital Talent
0	0	0	0	Non-Digital Talent
1	0	1	0	Non-Digital Talent
0	1	0	0	Non-Digital Talent
0	0	0	2	Non-Digital Talent

DS-1	DS-2	DS-3	DS-4	Type	DS-1	DS-2	DS-3	DS-4	Type
0	0	1	0	Non-Digital Talent	1	1	1	1	Potenial Digital Talent
0	0	0	0	Non-Digital Talent	0	0	1	1	Potenial Digital Talent
0	0	0	0	Non-Digital Talent	0	0	1	1	Potenial Digital Talent
0	0	0	1	Non-Digital Talent	1	1	1	1	Potenial Digital Talent
0	0	0	1	Non-Digital Talent	1	1	1	2	Potenial Digital Talent
1	0	2	0	Non-Digital Talent	0	1	1	1	Potenial Digital Talent
1	0	0	2	Non-Digital Talent	1	0	1	2	Potenial Digital Talent
0	1	0	0	Non-Digital Talent	1	1	1	0	Potenial Digital Talent
0	0	1	0	Non-Digital Talent	0	1	0	1	Potenial Digital Talent
0	0	0	0	Non-Digital Talent	1	0	1	1	Potenial Digital Talent
0	0	1	0	Non-Digital Talent	1	1	1	1	Potenial Digital Talent
0	0	0	0	Non-Digital Talent	1	1	0	1	Potenial Digital Talent
0	0	1	0	Non-Digital Talent	1	1	1	1	Potenial Digital Talent
0	0	1	0	Non-Digital Talent	1	0	1	1	Potenial Digital Talent
0	1	0	0	Non-Digital Talent	1	1	1	1	Potenial Digital Talent
1	0	1	0	Non-Digital Talent	1	1	0	0	Potenial Digital Talent
0	1	0	0	Non-Digital Talent	1	0	1	0	Potenial Digital Talent
0	0	0	0	Non-Digital Talent	1	0	0	1	Potenial Digital Talent
1	0	1	0	Non-Digital Talent	1	1	1	1	Potenial Digital Talent
0	0	0	0	Non-Digital Talent	1	1	1	1	Potenial Digital Talent
1	0	1	0	Non-Digital Talent	1	1	1	1	Potenial Digital Talent
0	0	0	1	Non-Digital Talent	1	1	1	1	Potenial Digital Talent
0	0	0	0	Non-Digital Talent	1	1	1	1	Potenial Digital Talent
0	0	0	0	Non-Digital Talent	1	1	1	0	Potenial Digital Talent
2	1	1	1	Potenial Digital Talent	1	1	0	0	Potenial Digital Talent
2	1	1	1	Potenial Digital Talent	1	0	0	1	Potenial Digital Talent
2	1	1	0	Potenial Digital Talent	1	1	1	1	Potenial Digital Talent
2	1	1	1	Potenial Digital Talent	2	0	1	1	Potenial Digital Talent
2	0	1	0	Potenial Digital Talent	0	1	1	1	Potenial Digital Talent
2	0	1	0	Potenial Digital Talent	1	1	2	1	Potenial Digital Talent
2	0	1	1	Potenial Digital Talent	1	1	1	0	Potenial Digital Talent
2	1	0	1	Potenial Digital Talent	1	1	1	0	Potenial Digital Talent
2	0	0	1	Potenial Digital Talent	1	1	2	1	Potenial Digital Talent
2	0	1	1	Potenial Digital Talent	1	0	1	1	Potenial Digital Talent
2	1	1	2	Potenial Digital Talent	1	0	1	1	Potenial Digital Talent
2	0	1	1	Potenial Digital Talent					
2	0	1	2	Potenial Digital Talent					
1	1	1	1	Potenial Digital Talent					
1	1	1	1	Potenial Digital Talent					
0	0	1	1	Potenial Digital Talent					
2	1	1	1	Potenial Digital Talent					
1	1	2	1	Potenial Digital Talent					
1	1	0	1	Potenial Digital Talent					
1	2	0	1	Potenial Digital Talent					

THE SUSTAINABLE COMPETITIVE ADVANTAGE OF SMES TOWARDS INTELLECTUAL CAPITAL: THE ROLE OF TECHNOLOGY ADOPTION AND STRATEGIC FLEXIBILITY

Ni Putu Santi SURYANTINI[1]
Doctoral Program of Management Science, Universitas Brawijaya, Indonesia
santisuryantini@student.ub.ac.id

MOELJADI
Faculty of Economic and Business, Universitas Brawijaya, Indonesia
moeljadi@ub.ac.id

Siti AISJAH
Faculty of Economic and Business, Universitas Brawijaya, Indonesia
aisjah@ub.ac.id

Kusuma RATNAWATI
Faculty of Economic and Business, Universitas Brawijaya, Indonesia
kusuma@ub.ac.id

Abstract

Purpose: This study examines sustainable competitive advantage in the SME sector, which consists of three determinant factors: business performance, open innovation, and intellectual capital. It also extends the accepted procedure to include the effects of technology adoption and strategic flexibility.

Design/methodology/approach: The target sample consisted of 210 export SMEs in Bali, Indonesia. This study employs a self-administered questionnaire distributed to managers and key employees, with 630 surveys successfully collected and PLS-SEM used to analyze the data.

Findings: This study corroborates the notion that intellectual capital is crucial in building sustainable competitive advantage. Further, these results also highlight the roles of technology adoption and strategic flexibility as strategic factors that reinforce intellectual

1   *Corresponding author: santisuryantini@student.ub.ac.id*

capital and indirectly affect sustainable competitive advantage. The results of this study present an insightful understanding to theorists and managers regarding how the sustainable competitive advantage of SMEs faces global competition.

__Originality/value:__ This paper is the first study to integrate technology adoption and strategic flexibility to enhance a sustainable competitive advantage-based performance model in the SME sector.

__Research limitations/implications:__ The primary limitation involves the data collected from SMEs in Indonesia. Given the difference in SME managers' attitudes and behaviors, the findings of this study are most likely not able to be generalized.

__Practical implications:__ SME managers are required to offer employees opportunities to transmit their knowledge into great ideas. Consequently, managers are to innovate constantly, using relationships to obtain knowledge, creating unique knowledge for the organization, and meeting market expectations.

Keywords: *intellectual capital; business performance; open innovation; strategic flexibility; sustainable competitive advantage*

JEL Codes: *D23, D83, M12, O31, O34*

1. Introduction

A comprehensive annual report from the Global Competitiveness Index (WEF, 2019) points out that organizations escalate their productivity and competitiveness by actively seeking internal reinforcement while anticipating competition. Business performance and competitive advantage are flourishing, and have become a fascinating topic in various sectors – especially small and medium-sized enterprises (SMEs; Arsawan, Koval, Rajiani et al., 2022; Miroshnychenko et al., 2021). The development of business performance offers considerable benefits to SMEs, such as positive impacts on economic growth, contributions to gross domestic product, and the endorsement of sustainability (Gorondutse et al., 2020; Leckel et al., 2020; Surya et al., 2021). Consequently, given these advantages and to meet the needs of the market, the vast majority of business entities, especially SMEs, develop knowledge-based business performance; however, this leads to intensifying competition if SMEs offer very similar products and services (Bhamra et al., 2018; Falahat et al., 2020; Zaridis et al., 2021). Therefore, in this immensely competitive and challenging environment, SME managers must offer unique products and high-quality services that promote performance and expand sustainable competitive advantage (Ardito et al., 2021; Arsawan, Koval, Rajiani et al., 2022; Mady et al., 2022).

Given the ever-changing and turbulent market, the performance-based SME sector is subject to dynamic customer demands (Allal-Chérif et al., 2023; Parwita et al., 2021). Accordingly, ensuring that SMEs promote innovation, foster business performance, and offer excellent performance value is a crucial strategy for establishing sustainable competitive advantage as the key to a successful business (Kahupi et al., 2021; Khan et al., 2019; Yang et al., 2021; Zhang et al., 2023). However, notwithstanding numerous studies

devoted to examining business performance (Davcik et al., 2021; Olamide & Ogbechie, 2021), there is a scarcity of studies on SMEs' sustainable competitive advantage (Arsawan, Koval, Rajiani et al., 2022). This occurs because SMEs are often considered to have modest resources (Arsawan, Koval, Suhartanto et al., 2022), and frequently lack access to adequate financial resources (Özbuğday et al., 2020).

The existing literature has identified the determinants of sustainable competitive advantage, often including open innovation, business performance, and intellectual capital (Arsawan, Koval, Rajiani et al., 2022; Khan et al., 2019; Todericiu & Stăniţ, 2015). Furthermore, an open innovation orientation is a fundamental factor influencing sustainable competitive advantage (Alassaf et al., 2020; Allal-Chérif et al., 2023). The impact of open innovation on how the manager evaluates business performance has been explored extensively (Grimsdottir & Edvardsson, 2018; Hameed et al., 2021). Nevertheless, the impacts of technology adoption and strategic flexibility on intellectual capital are rarely explored despite the practical significance of managing business performance. Notably, studies on how technology adoption and strategic flexibility affect the establishment of sustainable competitive advantage in SMEs' business performance attract very little attention (Allal-Chérif et al., 2023). Committed to filling this gap, the present study attempts to: (1) examine business performance toward sustainable competitive advantage along with its determinants, including open innovation and intellectual capital; and (2) evaluate the roles of technology adoption and strategic flexibility in establishing sustainable competitive advantage. This study was conducted on export SMEs in Indonesia for three main reasons. First, Indonesian SMEs have a potential market spread across the American and European markets, with an ever-increasing number of customers. This encourages SMEs to improve product quality, value, and competitiveness to meet the needs of international markets (Arsawan, Koval, Rajiani et al., 2022). Second, with the increasingly important role of SMEs in increasing economic growth, fostering employment, and supporting sectors outside of oil and gas, it is necessary to improve business performance by optimizing the role of intellectual capital and open innovation (Surya et al., 2021). Finally, to increase sustainable competitive advantage, Indonesian SMEs need to prepare strategic flexibility to deal with potential turbulence, survive in difficult situations (Arsawan, De Hariyanti, et al., 2022; Miroshnychenko et al., 2021), and prepare a strategic plan to adapt to change (Gorondutse et al., 2020; Nassani & Aldakhil, 2021). Subsequently, this study not only enables the confirmation and expansion of theoretical knowledge regarding this particular concept, but also provides insightful information to SME managers, enabling them to adapt and manage SMEs and thus reinforce their competitiveness in the international market.

2. Theoretical Framework and Hypotheses Development

2.1. Sustainable Competitive Advantage

Sustainable competitive advantage is one of the essential concepts in strategic management, and a significant number of empirical studies have been produced on this topic.

Nevertheless, with the enormous amount of literature examining sustainable competitive advantage, the debate regarding the conceptualization of this concept remains (Arsawan, Koval, Rajiani et al., 2022; Mady et al., 2022). Furthermore, several studies are focusing on sustainable competitive advantage in the SME context. In management research, such as in broader strategic management, sustainable competitive advantage is generally conceptualized through one of two approaches: performance or competitive advantage. The performance approach proposes that an organization must possess a long-term plan to advance its business concept (Amjad et al., 2021; Gorondutse et al., 2020). Accordingly, this approach is generally measured based on organizational productivity and achievement (Migdadi, 2020). Meanwhile, the competitive advantage approach precisely defines how robust an organization is in optimizing unique resources, which can distinguish it from its competitors (Chatzoglou & Chatzoudes, 2018; Huang et al., 2015). Resultantly, performance alone is insufficient to examine sustainable competitive advantage. Scholars (Sharma & Sharma, 2020; Tu & Wu, 2021) assert that competitive advantage is the optimization of unique resources to produce rareness and meet customers' perceptions of value. This statement complies with the resource-based view, which states that competitive advantage results from the ability of an organization to create added value derived from a unique resource (Barney, 1991).

Consequently, predicting sustainable competitive advantage related to SMEs in the future must be based on performance and competitive advantage (Mady et al., 2022; Quaye, 2019). On the other hand, some researchers claim that the performance approach to sustainable competitive advantage may be insufficient to predict actual conditions in the future, yet it enables researchers to determine organizational competitiveness (Chatzoglou & Chatzoudes, 2018; Gutiérrez-Martínez & Duhamel, 2019). Hence, this makes the combination of performance and competitive advantage a prudent approach to measuring sustainable competitive advantage. Therefore, in this study, SMEs' sustainable competitive advantage will be considered via performance and the unique resources that they possess to establish a competitive advantage in a competitive market (Lin et al., 2020; Yang et al., 2021). Therefore, the following sub-sections discuss the determinants of sustainable competitive advantage.

2.2. Sustainable Competitive Advantage: Intellectual Capital

Intellectual capital has been a primary topic in strategic management, although its conceptualization is incredibly varied in the existing literature (Asiaei et al., 2020; Wang et al., 2016). Scholars (Castillo et al., 2019; Dabić et al., 2019) assert that a consensus has not yet been established regarding intellectual capital. Intellectual capital also be defined as knowledge that is beneficial for business performance (Weqar & Haque, 2020). Other researchers (Bontis et al., 2015; Dženopoljac et al., 2016) describe intellectual capital as an immaterial asset, which is not listed in organizational balance but is acknowledged to contribute positively to the performance of a business. Thus, the role of intellectual capital is proven to be fundamental in enhancing business performance (Mohammad Shafiee, 2022). Consequently, investing in intellectual capital is the primary source of

establishing sustainable competitive advantage (Asiaei et al., 2020). This discussion leads to the following hypothesis:

H1. Intellectual capital is significant for sustainable competitive advantage

2.3. Sustainable Competitive Advantage: Open Innovation

The existing literature defines open innovation as a construct covering new norms, challenges, and innovation process practices (Audretsch & Belitski, 2022). Open innovation improves the chance to gain complementary knowledge, leading to faster, higher-quality innovation and greater organizational productivity (Lam et al., 2021). A prior study by Barrena-Martínez et al. (2020) revealed how dimensions of intellectual capital (structural, human, and relational) contribute positively to the open innovation paradigm. This relationship further confirmed that intellectual capital is the crucial trigger for innovation; however, until the present time, it has been considered a stand-alone topic and has not received serious attention (Matricano et al., 2022). In addition, open innovation is deemed an essential strategy for long-term competitive advantage given the increasingly keen competition and dependency on external partners (Zhang et al., 2023). Hence, the construct of open innovation has become the organization's primary focus in exploring external knowledge and exploiting internal assets to orchestrate competitive advantage (Allal-Chérif et al., 2023; Barrett et al., 2021). Many knowledge collaborations with external partners will result in more opportunities to obtain technology, ideas, quality knowledge, and other intangible assets, and significant potential for profitable innovation (Greco et al., 2017). Then, the complementary and sustainable collaboration of external and internal assets can enhance innovation ability that eventually shapes their respective core competitiveness (Carmona-Lavado et al., 2021). Consequently, we formulated the following hypotheses:

H2. Intellectual capital is significant for open innovation
H3. Open innovation has a direct effect on sustainable competitive advantage

2.4. Sustainable Competitive Advantage: Business Performance

The literature confirms that intellectual capital is one of the crucial triggers in business performance (Campos et al., 2022; Verbano & Crema, 2016). Stakeholders consider that the application of measurable intellectual capital could help enhance performance. Moreover, the positive linkage between intellectual capital and business performance has been proven empirically (Campos et al., 2022; Özer et al., 2015). In this context, intellectual capital is proven to be closely related to qualitative performance (i.e., perceptions of innovation performance and adaptation performance); it refers to innovation performance, organization performance, and human resource performance. Intellectual capital is confirmed to be essential in SMEs; however, related literature remains unexplored (Demartini & Beretta, 2020). Although the role of intellectual capital has been verified empirically, there is inconsistency in the relationship with business performance, primarily regarding its direction and strength. Empirical studies have validated a signifi-

cant positive linkage between intellectual capital and business performance (Buallay et al., 2021; Singla, 2020; Soetanto & Liem, 2019). On the contrary, only a few studies have confirmed a significant negative linkage between intellectual capital and business performance (Britto et al., 2014; Morariu, 2014). Other studies (Chan, 2009; Firer & Mitchell Williams, 2003) have revealed an insignificant linkage between intellectual capital and business performance.

The literature reports that open innovation is another vital determinant for SME performance, which is considered a potential driver of growth and productivity (Albats et al., 2020). Open innovation enables SMEs to access technology that affects innovation performance positively, while simultaneously enhancing organizational performance (Tsai et al., 2022). This is feasible because open innovation promotes social changes, accelerates the adoption of technology, forms collaborative knowledge, and shapes organizational culture. Moreover, open innovation relies on environmental dynamism that facilitates the organization in acquiring external knowledge and technological infrastructure to enhance business performance (Popa et al., 2017). Furthermore, the role of business performance in establishing competitive advantage has been a significant research theme in the era of the knowledge-based economy. In order to establish sustainable competitive advantage, the organization requires an innovation culture; thus, it achieves sustainable performance (Arsawan, Koval, Suhartanto et al., 2022; Cavaleri & Shabana, 2018). Consequently, SME managers must be adaptive by building collaboration with external parties that primarily creates positive value, which is hard for competitors to imitate (Vuks & Sus, 2019; Wang, 2019). Furthermore, dynamic capability must be aligned and integrated with internal sources; hence, able to build a performance that manifests sustainable competitive advantage (Gutiérrez-Martínez & Duhamel, 2019). Subsequently, the following hypotheses were proposed:

H4. Intellectual capital has a direct effect on business performance
H5. Open innovation has a direct effect on business performance
H6. Business performance has a direct effect on sustainable competitive advantage

2.5. The role of technology adoption and strategic flexibility

The resource-based view (Barney, 1991) observes that competitive advantage can be accomplished by optimizing unique resources and dynamic capabilities. This theory further suggests that competitive advantage is achieved by sustaining high performance (Ferreira et al., 2020). Nevertheless, building performance requires adopting technology for the acceleration of agility and innovation (Panda & Rath, 2021). Previous studies that examined competitive advantage in various contexts (Qalati et al., 2021; Vu & Nguyen, 2022) have confirmed the relationship between technology and enhanced competitive advantage. Therefore, it is legitimate to include technology adoption as a potential determinant in the SME sector. Technology adoption has been widely acknowledged in many disciplines and research designs (Chinedu Eze et al., 2020; Vu & Nguyen, 2022). Moreover, the role of technology is considered to affect human behavior (Dezdar, 2017) primarily in terms of how it stimulates individuals to expedite knowledge to produce

innovative work behavior (Cepeda & Arias-Pérez, 2019; Stadler et al., 2022). Organizations that adopt technology consistently will be able to configure intellectual capital to be more creative and innovative (Stadler et al., 2022). This discussion leads to the following hypothesis:

H7. Technology adoption has a direct effect on (a) intellectual capital and (b) sustainable competitive advantage

Drawing from dynamic capabilities (Teece et al., 2009), an organization must consider devising a series of strategic plans to deal with unpredictable future scenarios. Consequently, the concept of strategic flexibility that emerges as the response to uncertainty represents a systematic effort to remain agile and resilient when dealing with environmental dynamism and market turbulence (Brozovic, 2018; Gorondutse et al., 2020; Guo & Cao, 2014). Accordingly, an organization should be responsive to possible threats and opportunities and should precisely create strategic plans (Weaven et al., 2021). Hence, the ability to adapt, reconfigure resources, and find alternative resources will make an organization more sustainable (Liu & Yang, 2020). In short, the crucial roles of strategic flexibility are related to the organizational effort to build sustainability using two mechanisms. Firstly, strategic flexibility challenges the manager to elevate knowledge in preparing essential ideas to change, according to the circumstances (Mohammad Shafiee, 2022). Strategic flexibility also enables the organization to transfer and integrate intellectual capital into ideas relevant to the current circumstances (Xiu et al., 2017). Therefore, an organization with high strategic flexibility can respond to change dynamically, resulting in the effectiveness of the organization's process of intellectual capital, thereby amplifying the value of knowledge (Gorondutse et al., 2020; Thomas, 2014). Secondly, strategic flexibility enables organizations to boost their ability to deal with various possibilities. In environmental dynamism, issues regarding sustainability have become the primary concern and have put enormous pressure on organizations to continue exploring their competitive advantage (Allal-Chérif et al., 2023). Accordingly, developing a strategy that adopts change is critical to remaining agile and resilient (Jafari et al., 2023). In order to remain agile and resilient, organizations must innovate and, therefore, possess a sustainable competitive advantage (Krishnan, 2021; Zhang et al., 2023). Thus, we formulated the following hypothesis:

H8. Strategic flexibility has a direct effect on (a) intellectual capital and (b) sustainable competitive advantage

Drawing from the resource-based view (Barney, 1991; Kock & Lynn, 2012), the present study's theoretical model examined the determinants of the impact of business performance on sustainable competitive advantage and investigated the role of technology adoption and strategic flexibility. This framework is illustrated in Figure 1.
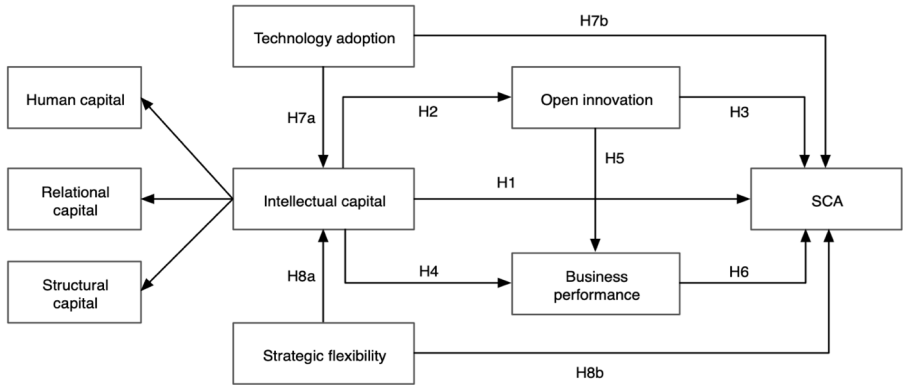
Figure 1. *A model for sustainable competitive advantage*

3. Methods

The use of quantitative approaches such as surveys, statistics and structural equation modeling (SEM) is intended to test a hypothetical model or assess the relationships between variables either directly or indirectly. In the social sciences, this methodology has been widely used, but requires ongoing justification (Sovacool et al., 2018). Because the current study examines hypotheses based on structural equations to achieve the research objectives, the quantitative approach is relevant.

3.1. Population and sampling procedure

This study comprised export SMEs active in transactions in international markets – specifically Europe, East Asia, and the United States. Employing the database from the government of Bali Province, we specified 460 export SMEs as the target population, which ultimately became the subjects of the study. Furthermore, the selection of the sample frame using a formula created by Krejcie & Morgan (1970), with a simple random sampling method, resulted in 210 SMEs being requested to participate in this study. We required three respondents from each SME within this sample frame. The representative respondents came from three levels of management: managers (top management), assistant managers (middle management), and key employees from four departments (low management). These levels were deemed to have strategic views regarding organizational policies associated with performance and sustainable competitive advantage. Given that the location of the study was spread across nine regencies, the data collection was conducted for 5 months (February to August 2022) utilizing emails, Google Forms, and direct visits with prior email notifications regarding this study. Subsequently, we collected 630 responses to be further examined to accomplish the objectives of this study.

3.2. Measurements

This proposed research model entailed sustainable competitive advantage and its determinants, including business performance, open innovation, technology adoption, strategic flexibility, and intellectual capital. All of these constructs have been developed and evaluated empirically by an abundance of empirical studies covering them. Consequently, conceptualizations and measurements were acquired from the existing literature. Table 1 presents these constructs and their sources.

Table 1. *Construct measurements*

Construct	Sources
Intellectual capital	Bontis et al. (2015); Castillo et al. (2019); Dženopoljac et al. (2016); Mohammad Shafiee (2022)
Open innovation	Parida et al. (2012); Tsai et al. (2022)
Strategic flexibility	Arsawan, De Hariyanti, et al. (2022); Brozovic (2018); Miroshnychenko et al. (2021)
Business performance	Aboramadan (2019); Arsawan, Koval, Suhartanto et al. (2022); Dabić et al. (2019)
Technology adoption	Okundaye et al. (2019); Suhartanto & Leo (2018)
Sustainable Competitive Advantage	Anwar et al. (2018); Arsawan, Koval, Rajiani et al. (2022); Sigalas & Papadakis (2018); Singh & Verma (2019)

A Likert scale from 1 – *strongly disagree* to 5 – *strongly agree* was utilized to examine all items in the study. Four academics with expertise in SMEs helped with the initial evaluation to confirm the measurement's comprehensibility and clarity. This was followed by a pilot test using a questionnaire for 30 respondents. These steps aimed to evaluate the conformity of instructions and questions, eventually resulting in a handful of minor adjustments. Sample description and summary statistics were generated using SPSS. Further, to investigate the model and examine the formulated hypotheses, the study employed partial least squares structural equation modeling (PLS-SEM), which was the adequate model for this study because the data distribution was not normal. Following the recommendation of scholars (Hair Jr et al., 2017), PLS was initially used to examine the reliability and validity construct. Then, it was used to measure the proposed models, evaluate the hypotheses, and investigate path coefficients in structural models. Finally, to confirm the data for analysis, we followed expert recommendations (Kock & Lynn, 2012), and PLS was utilized to measure the full collinearity variance inflation factor (VIF), which produced a value of 1.894. As the VIF value was less than 5, the common method met the criteria in this study (Hair Jr et al., 2017).

4. Results

4.1. Respondent profiles

The study comprised a total number of 630 respondents from 140 export SMEs. In Table 2, we present the respondents' demographic information. The position of supervisor (37.78%) was most common, followed by assistant manager (33.80%), and then manager (28.40%). This shows that the involvement of the respondents was practically even across the three levels of management, implying that establishing business performance for competitive advantage entails all of the elements in these organizations (Arsawan, Koval, Rajiani et al., 2022; Zhang et al., 2023). The ages of respondents ranged broadly, with 41–50 years being the dominant group (45.56%). The bachelor's level of education was most frequent (60.32%), which points to higher opportunities to build intellectual capital given high educational levels at a mature age. Moreover, a high level of education is a precondition to establishing knowledge networks and knowledge quality (Bouton et al., 2021; Jin & Shao, 2022). Respondents were predominantly male (74.13%), and the most common level of experience was 11–15 years (42.69%). This latter indicator implies that highly experienced respondents are essential pillars in establishing sustainable competitive advantage (Ganguly et al., 2019; Zhang et al., 2019).

Table 2. *Demographic profile of the sample*

Description		Frequency	Percentage (%)
Positions	Manager	179	28.40
	Assistant manager	213	33.80
	Supervisor	238	37.78
Age	<30	56	08.80
	31–40	189	30.00
	41–50	287	45.56
	51–60	98	15.56
Gender	Male	467	74.13
	Female	163	25.87
Education	Bachelor's degree	380	60.32
	Master's degree	233	36.98
	Doctoral degree	17	02.69
Experiences	<10	152	24.13
	11–15	269	42.69
	16–20	123	19.52
	21–25	86	13.65

4.2. Outer Model Measurement

Table 3 presents information indicating that the overall indicators of the loading factor were above 0.6. The value of average variance extracted (AVE) was greater than the recommended level of 0.5, while the composite reliability (CR) value was greater than 0.7. Additionally, the square root value of AVE was more significant than the value of construct correlation, which indicates that it met the requirements of discriminant validity. Therefore, these indicators met the validity and construct reliability requirements (Hair et al., 2016). Accordingly, the suggestion that if the value was less than 5 (i.e., 1.722–2.996) then data was free from the common method variance (Hair Jr et al., 2017), was followed.

Table 3. *Measurement of indicators*

Indicators	Loading	CR	AVE
Intellectual capital		0.946	0.593
Human capital		0.928	0.812
1. Entrepreneurial orientation	0.900		
2.Human resources' confidence to face difficult situations	0.900		
3. Technical qualifications	0.903		
Relational capital		0.922	0.663
1. Expert directories as tools to solve problems	0.814		
2. Meetings as innovation mechanisms	0.847		
3. Continuous relations with suppliers	0.846		
4. Continuous relations with clients	0.783		
5. Strategies to analyze competitors' information	0.780		
6. Strategies for market research	0.813		
Structural capital		0.915	0.783
1. Strategic alliances with groups of interest	0.873		
2. Creation of patents and other certifications	0.905		
3. Formal systems for transmitting knowledge	0.876		
Open innovation		0.936	0.646
1. Venturing	0.806		
2. Outward licensing of intellectual property	0.810		
3. Employee involvement	0.821		
4. Customer involvement	0.798		
5. External networking	0.803		
6. External participation	0.808		
7. Research & development	0.784		
8. Inward licensing of intellectual property	0.797		
Business performance		0.951	0.563
1. Product reliability	0.726		
2. Product durability	0.757		

Indicators	Loading	CR	AVE
3. Product characteristics	0.761		
4. Serviceability	0.737		
5. Comparison to competitors	0.717		
6. Satisfaction with the product	0.715		
7. Recommendations to others	0.733		
8. Exceeding the expectations	0.772		
9. High level of ability	0.772		
10. Net profit margin	0.734		
11. Return on asset	0.741		
12. Asset turn over	0.796		
13. New value	0.770		
14. Features	0.786		
15. Use of technology	0.731		
Technology adoption		0.932	0.555
1. Technology type	0.706		
2. Financial strength	0.732		
3. Infrastructure	0.725		
4. Skill and resources	0.754		
5. Government	0.744		
6. Culture	0.766		
7. ICT Training awareness	0.717		
8. Trust	0.753		
9. Perceived benefits	0.781		
10. Trend	0.761		
11. Generation	0.753		
Strategic flexibility		0.917	0.648
1. Organization can adjust its current plans effortlessly	0.772		
2. Organization is well-prepared to act accordingly	0.802		
3. Organization can adjust strategy changes	0.840		
4. Organization has the required competency to modify daily routines	0.826		
5. Organization can generate a new project proactively	0.802		
6. Organization can prioritize projects to succeed	0.785		
Sustainable competitive advantage		0.907	0.584
1. Value	0.778		
2. Service delivery system	0.736		
3. Growth and performance	0.742		
4. Market share	0.739		
5. Innovation	0.733		
6. Rareness	0.789		
7. Imperfectly non-imitable	0.827		

4.3. Inner Model Measurement

Following scholars' recommendations (Chin, 2010), the present study implemented the bootstrap method to investigate path coefficients and the implications of the overall indicators. The findings indicated a goodness-of-fit (GoF) value of 0.685. This highlighted the significance of the fit in the model (Henseler & Fassott, 2010). Consequently, the findings showed that the intended sustainable competitive advantage model was applicable in the SME sector. Further, the residual investigation denoted that the value of SRMR (standardized root mean squared residual) was 0.060; meanwhile, the value of NFI (normed fit index) was 0.069, suggesting the model's fitness (Tenenhaus et al., 2005). In addition, the examination of the R-squared value can explain that intellectual capital, open innovation, business performance, technology adoption, and strategic flexibility explained 0.905 (90.5%) of the variance in sustainable competitive advantage. The value of R-squared for business performance was 0.783 (78.3%), signifying that intellectual capital and open innovation explained the variance in business performance. The value of R-squared for the intellectual capital variable was 0.676 (67.6%), which was influenced by technology adoption and strategic flexibility. Meanwhile, the value of R-squared for open innovation was 0.672 (67.2%), which means that open innovation can be affected by intellectual capital. Subsequently, from the percentage variances explained, it can be shown that the influence of the independent variables on sustainable competitive advantage was very strong. Following the recommendations of experts (Chin, 2010), we also demonstrated that all variables had a qualified relevance prediction, because all of the Q^2 had positive values.

4.4. Hypotheses Testing

As presented in Table 4, intellectual capital has a direct effect on sustainable competitive advantage ($\beta = 0.559$, $p < 0.05$) and open innovation ($\beta = 0.819$, $p < 0.05$). Likewise, the effect of open innovation on sustainable competitive advantage ($\beta = 0.162$, $p < 0.05$) was significant. Hence, hypotheses H1, H2, and H3 were supported. Furthermore, the effect of intellectual capital and open innovation on business performance ($\beta = 0.610$, $p < 0.05$ and $\beta = 0.313$, $p < 0.05$) was significant, supporting hypotheses H4 and H5. The effect of business performance on sustainable competitive advantage ($\beta = 0.251$, $p < 0.05$) was significant, supporting hypothesis H6. Technology adoption significantly affected intellectual capital ($\beta = 0.363$, $p < 0.05$) but not with sustainable competitive advantage ($\beta = 0.016$, $p > 0.05$). Subsequently, hypothesis H7a was supported; however, hypothesis H7b was rejected. Lastly, the effect of strategic flexibility on intellectual capital ($\beta = 0.522$, $p < 0.05$) was significant, although the effect on sustainable competitive advantage was not significant ($\beta = 0.015$, p > 0.05), which supported hypothesis H8a, but rejected hypothesis H8b.

Table 4. *Hypotheses testing and effect on variables*

Hypotheses path	β	*t*-value	β	*t*-value	β	*t*-value
IC → SCA (H1)	0.559	14.579	0.350	9.452	0.908	33.887
IC → OI (H2)	0.819	42.463	-	-	0.819	42.463
OI → SCA (H3)	0.162	6.621	0,079	4.814	0.240	7.615
IC → BP (H4)	0.610	15.140	0.257	7.039	0.867	61.199
OI → BP (H5)	0.313	7.470	-	-	0.313	7.470
BP → SCA (H6)	0.251	7.361	-	-	0.251	7.361
TA → IC (H7a)	0.363	6.365	-	-	0.363	6.365
TA → SCA(H7b)	0.016	0.726	0.330	6.473	0.346	5.652
SF → IC (H8a)	0.522	9.547	-	-	0.522	9.547
SF → SCA (H8b)	0.015	0.585	0.474	8.751	0.489	8.279

Notes: IC = intellectual capital; OI = open innovation; BP = business performance; TA = technology adoption; SF = strategic flexibility; SCA = sustainable competitive advantage.
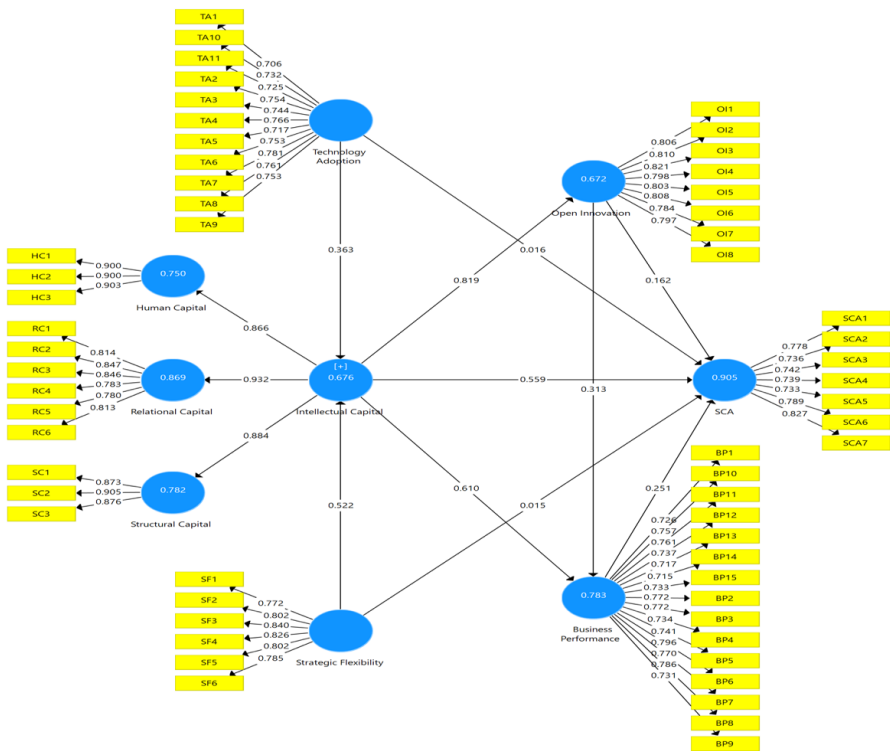

Figure 2. *Full model analysis*

5. Discussion

Environmental dynamism and turbulence constantly challenged SME managers to achieve competitive performance and establish sustainable competitive advantage. The accelerated growth of technology forces organizations to exploit opportunities and configure their overall resources to devise strategic plans compared to their competitors (Arsawan, De Hariyanti, et al., 2022). Given their limited resources, SMEs have been considered incapable of handling pressure and external competition. Hence, managers must actively seek high-quality resources to promote sustainable competitive advantage (Ying et al., 2019) besides investing in intangible assets – i.e., intellectual capital. The present study has expanded the resource-based view (Barney, 1991) concerning sustainable competitive advantage by measuring managers' perceptions of intellectual capital, open innovation, technology adoption, strategic flexibility, and business performance in the SME context. The concept of this study evolved from extensive academic literature, and was evaluated using SEM via a software program called Smart-PLS. The findings imply that immaterial resources, i.e., intellectual capital, enhance SMEs' business performance and sustainable competitive advantage.

In this study, intellectual capital was positively significant in affecting sustainable competitive advantage. The study's findings follow those of past studies (Bontis et al., 2015; Dženopoljac et al., 2016; Mohammad Shafiee, 2022), which concluded that intellectual capital is a crucial determinant of sustainable competitive advantage (Pan et al., 2021). To build sustainability, it is necessary to optimize intellectual capital because it is considered as the essence of knowledge, applied experience, technology and customer relations in the organization, with professional skills that represent the company's competitive advantage over its market competitors (AlQershi et al., 2023). In other words, its importance for business sustainability must be recognized and integrated into the research framework to increase awareness of its importance when considering market opportunities and skilled human resources (Cantele & Zardini, 2018; Koval et al., 2023).

There was also a significant linkage between intellectual capital, open innovation, and sustainable competitive advantage. This showed that intellectual capital helps to boost SMEs' open innovation and sustainable competitive advantage, and aligns with the findings from previous studies (Allal-Chérif et al., 2023; Barrena-Martínez et al., 2020; Barrett et al., 2021; Matricano et al., 2022). Furthermore, the linkage between intellectual capital and business performance was also significant, indicating that SMEs would achieve excellent performance by optimizing intellectual capital. These findings confirmed previous empirical evidence regarding the relationship between both constructs (Buallay et al., 2021; Campos et al., 2022; Özer et al., 2015; Verbano & Crema, 2016). The results of this study contradict the findings of previous researchers (Campos et al., 2022) who found no significant relationship between intellectual capital and business performance. Thus, intellectual capital is an important factor for the success of SMEs because to build competitive performance they must use knowledge and intangible assets more efficiently (Bansal et al., 2022). Thus, SMEs need quality, relevant and up-to-date knowledge to compete (Arsawan, Koval, Rajiani et al., 2022) and optimize their potential (Liu & Yang, 2020).

Another noteworthy finding in this study was the significant linkage between open innovation and business performance. This implied that SMEs with open innovation practices would develop a robust organizational culture to make social change and configure knowledge and technology to build performance (Popa et al., 2017; Tsai et al., 2022). Further, the significant linkage between business performance and sustainable competitive advantage indicated that SME managers optimize potential and resources into unique organizational value. This finding supports previous studies regarding the relationship between constructs (Arsawan, Koval, Rajiani et al., 2022; Cavaleri & Shabana, 2018; Gutiérrez-Martínez & Duhamel, 2019). Additionally, the linkage between technology adoption and intellectual capital was significantly positive. This provides evidence that technology stimulates human resources to accelerate their knowledge levels in grasping new methods and systems (Cepeda & Arias-Pérez, 2019) to support routine activities, creativity, and innovation (Stadler et al., 2022). Nevertheless, one finding was not as expected: the relationship between technology adoption and sustainable competitive advantage was insignificant. Consequently, this finding contradicts those of previous studies (Qalati et al., 2021; Vu & Nguyen, 2022) which revealed that the role of technology as a trigger for determining sustainable competitive advantage was paramount. A possible explanation for this is that export SMEs have not considered technology as a strategy to establish competitiveness. This is perhaps because technology adoption requires sufficient finances to provide infrastructure, skills improvement, perceived benefits, and training and development costs that cover all levels of employees.

Furthermore, this study also examined the linkage between strategic flexibility and intellectual capital. The findings revealed a significantly positive direction, corroborating the notion that organizations' abilities to devise flexible strategies enable them to integrate knowledge into viable solutions (Mohammad Shafiee, 2022; Xiu et al., 2017). Equally essential, strategic flexibility allows the organization to process the role of intellectual capital in enhancing the value of knowledge to counter environmental dynamism (Arsawan, De Hariyanti, et al., 2022; Gorondutse et al., 2020). Ultimately, the linkage between strategic flexibility and sustainable competitive advantage was insignificant. This unexpected finding contradicts previous studies (Allal-Chérif et al., 2023; Zhang et al., 2023), which revealed that the ability to devise a strategy that adopts change is the key to sustainable competitive advantage. Although insignificant, our findings have given crucial insights, especially for SMEs in Indonesia, to help companies devise strategic flexibility when encountering market turbulence and various scenarios that may occur in the unforeseeable future.

5.1. Theoretical implications

The present study offers several significant findings related to integrating technology adoption and strategic flexibility in comprehending sustainable competitive advantage. Firstly, this study revealed that technology adoption and strategic flexibility are vital in establishing sustainable competitive advantage in the SME sector. Notably, this study showed that the integration of technology adoption and strategic flexibility has a direct effect on intellectual capital and an indirect effect on sustainable competitive advantage.

The findings confirmed that the comprehension of sustainable competitive advantage in the SME context could be elevated when technology adoption and strategic flexibility values are added to the sustainable competitive advantage model. The complex mechanisms in the relationships between the antecedents of sustainable competitive advantage, business performance, technology adoption, and strategic flexibility are factors that no previous studies have adequately covered with this level of complexity. Although the present study found that technology adoption and strategic flexibility did not directly affect the establishment of sustainable competitive advantage in the SME sector, they contribute to intellectual capital, which has direct and indirect effects on sustainable competitive advantage. Intellectual capital plays an essential role in establishing sustainable competitive advantage for SMEs by fully mediating the roles between technology adoption and strategic flexibility towards sustainable competitive advantage. These findings validate the idea that technology adoption and strategic flexibility have a pivotal role in the development of sustainable competitive advantage in the SME sector, with the condition that this only occurs when managers have high-quality intellectual capital. Eventually, these findings present evidence supporting experts' claims (Teece et al., 2009) regarding applying a knowledge-based view in the SME sector.

Secondly, identifying the most crucial determinant of sustainable competitive advantage was a notable finding. Although business performance, open innovation, intellectual capital, technology adoption, and strategic flexibility have both significant direct and indirect effects, the present study showed that the total effect of intellectual capital has the most significant impact compared to other factors. This finding has adequately verified the results of past studies in the manufacturing service (Mohammad Shafiee, 2022; Rehman et al., 2022) and in the SME sector (Todericiu & Stăniţ, 2015) which underlined the crucial role of intellectual capital in establishing sustainable competitive advantage. Furthermore, this finding also indicated that configuring strong intellectual capital was the key factor in building sustainable competitive advantage. Therefore, theoretically, researchers examining sustainable competitive advantage must include intellectual capital as the critical factor in their sustainable competitive advantage models.

Thirdly, the examination of the order of intellectual capital hierarchy in the present study suggested another significant result. The hierarchal model of intellectual capital employed in this study indicates that the hierarchical order approach sufficiently captures the dimensions of structural capital, human capital, and relational capital. Subsequently, the investigation of the structure of intellectual capital hierarchy validated the usefulness of this particular examination approach to comprehend the significance of each dimension of intellectual capital (Bontis, 1998, 2001). Further, this finding also suggests that the most comprehensive evaluation of managers with appropriate business performance was exposed in the formation of hierarchal order. Theoretically, this finding expands the existing literature concerning intellectual capital in the SME sector (Asiaei et al., 2020; Demartini & Beretta, 2020; Vătămănescu et al., 2019). The order of intellectual capital hierarchy is relevant for researchers and business practitioners who stipulate the concise conceptualization of complex intellectual capital variables.

Ultimately, this study is one of several studies that explore and offer significant contri-

butions regarding sustainable competitive advantage, particularly in the SME sector. As previously discussed, many organizations, such as manufacturing businesses, hospitality companies, and even SMEs, have attempted to enhance their business performance. Nevertheless, these organizations should have taken advantage of intellectual capital, technology adoption, and strategic flexibility, which can make organizations more dynamic and flexible and can accelerate open innovation to achieve sustainable competitive advantage. On the contrary, organizations that exploit open innovation based on intellectual capital demand sustainable patterns, an appreciation of the role of knowledge, and a conception of how to establish robust and efficient relational collaboration (Asiaei et al., 2020; Chen & Kitsis, 2017; de Castro et al., 2004; Steinmo & Rasmussen, 2018). Since only a negligible part of these studies entailed sustainable competitive advantage, including the role of open innovation and technology adoption in intellectual capital, this study has provided indispensable insights for the literature in this field.

5.2. Managerial implications

Two crucial managerial implications can be derived from the present study. First, the results of this study revealed that boosting high-quality intellectual capital was the key factor for business performance and sustainable competitive advantage. They implied that financial and non-financial potential resources must be dedicated to creating and elevating knowledge. Specifically, efforts should be focused on the elements that drive a quality experience, such as establishing relationships and robust collaboration, lucrative contracts, and building solid connections among SMEs. SME managers are also required to offer employees opportunities to transmit their knowledge into great ideas. Consequently, managers are to innovate constantly to use relationships to obtain knowledge and create unique knowledge for the organization, meeting market expectations. Creating a knowledge-sharing culture and generating a reward and punishment system which supports knowledge spillover would assist employees and managers in sharing their ideas. Having standard operating procedures and a conducive work environment allows the organization to achieve the goal of bringing attention to other elements of the organization. These efforts should be closely integrated into SMEs' business processes to ensure that SME managers and employees apply the elements that promote intellectual capital in their routine activities in these organizations.

Second, this study highlighted the essential roles of technology adoption and strategic flexibility in determining sustainable competitive advantage, particularly by reinforcing intellectual capital. SMEs with strong adoption of technology and strategic flexibility tend to exploit available opportunities into potential benefits for their performance, create innovation, and utilize resources effectively. The strengthening effect is such that technology adoption and strategic flexibility generate intellectual capital, and indirectly contribute towards sustainable competitive advantage. SME managers can utilize this to manage aspects of technology and strategic planning that can align with the dynamic capabilities of the SMEs, incorporating technology adoption and strategic flexibility to provide benefits when developing new products.

6. Conclusions, limitations and further research

6.1. Conclusions

An abundance of previous studies have investigated sustainable competitive advantage. However, only a few have focused on integrating business performance determinants – i.e., intellectual capital, open innovation, technology adoption, and strategic flexibility, particularly in a developing country like Indonesia. Sustainable competitive advantage stipulates opportunities and reinforces SMEs, especially in developing countries, to continue contributing to nations' economic growth, providing employment, and contributing positively to gross domestic product. This study examined the roles of intellectual capital, open innovation, strategic flexibility, and technology adoption as drivers of business performance in expanding sustainable competitive advantage.

There were three significant conclusions that were drawn from this study. First, sustainable competitive advantage is a complex construct that does not merely entail intellectual capital but also business performance based upon open innovation. Second, the determinant factor that has the utmost influence on sustainable competitive advantage is intellectual capital because it has the total primary influence compared to other determinants. These findings underline that the role of intellectual capital is paramount in determining sustainable competitive advantage. Third, the examination of the order of intellectual capital hierarchy is notoriously complex and complicated. This analysis revealed that the relational capital dimension was the principal dimension, followed by the structural capital and human capital dimensions. Ultimately, SMEs that optimize open innovation based on intellectual capital value knowledge and know how to establish relational collaborations to build sustainable competitive advantage.

6.2. Limitations and further research

Although this study presented some notable findings regarding the determinants of business performance in influencing sustainable competitive advantage, it has some limitations. First, one limitation relates to the data collected from SMEs in Bali, Indonesia. Given the difference in SME managers' attitudes and behaviors, the findings of this study are most likely unable to be generalized. Consequently, replicating this study in other countries involving SMEs is strongly recommended. Replication and comparison may also be applicable in other industries, such as automobile, information communication technology, or technology-based companies. Second, another limitation relates to the variables included in the models: many variables potentially affecting sustainable competitive advantage were not included in this study. Determinants such as knowledge management, organizational learning, innovation performance, and new product development could benefit this study. Future studies can explore whether the inclusion of these variables in sustainable competitive advantage can intensify the robustness of the model and its explanatory power.

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BUSINESS ETHICS IN THE SME SECTOR – DO FIRM SIZE AND THE GENDER AND EDUCATION LEVEL OF ENTREPRENEURS PLAY A ROLE?

Katarina ZVARIKOVA[1]

University of Žilina, Faculty of Operation and Economics of Transport and Communications, Univerzitna 1, 010 26 Žilina, Slovakia
katarina.zvarikova@uniza.sk

Agata JURKOWSKA-GOMUŁKA

Chair of Administration and Political Science, University of Information Technology and Management in Rzeszow, ul. Sucharskiego 2, 35- 225 Rzeszów, Poland
ajurkowska@wsiz.edu.pl

Jan DVORSKY

University of Žilina, Faculty of Operation and Economics of Transport and Communications, Univerzitna 1, 010 26 Žilina, Slovakia
jan.dvorsky@gmail.com

Jaroslav BELAS

University of Information Technology and Management in Rzeszów, ul. Sucharskiego 2, 35- 225 Rzeszów, Poland
jbelas@wsiz.edu.pl

Abstract

Purpose. The aim of this study is to define and compare important attributes in business ethics according to company size and the gender and education of entrepreneurs in the SME sector in the four Visegrad countries (hereinafter V4).

Design/methodology/approach. Empirical research which was aimed at uncovering the attitudes of small and medium-sized companies was carried out in June 2022 in the V4 countries (Czech Republic, Slovakia, Poland and Hungary) through the renowned external company MNFORCE. In the Czech Republic, the total number of respondents was 347. In the Slovak Republic, the total number of respondents was 322. In Poland, the total number

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1   *Corresponding author*

of respondents was 381. In Hungary, the total number of respondents was 348. Statistical hypotheses were verified through descriptive statistics, the chi-squared test and Z-score at the α = 5% level of significance.

Findings. The level of business ethics in the V4 countries is high. According to our findings, SMEs consider business ethics important; they consider the ethical consequences of their decisions when managing the company and enforce the rules of business ethics. We found partial differences in the overall structure of the responses of SMEs in terms of company size, the gender of the respondents and their education. The research showed statistically significant differences in SMEs' positive attitudes toward business ethics in the Czech Republic, Poland and Hungary. No differences in the positive attitudes of SMEs were found in Slovakia. The Czech Republic most often showed differences in the overall structure of answers and the structure of positive answers.

Originality. The originality and strength of this research lie in the fact that we rely on the results of our own empirical study and do not use secondary data or opinions in a mediated form. In this study, we examine the selected attitudes of owners/managers of SMEs towards business ethics. This approach allows us to gain appropriate insights directly from the responsible people who carry out their business activities in the day-to-day business environment. The results of this research can be used by policymakers for the improvement of the business environment in the SME segment.

Keywords: *small and medium-sized enterprises, business ethics, company size, gender, education of entrepreneurs*

JEL classification: *L26, A13, M14*

1. Introduction

According to the consensus of theorists, a company's market value growth is its primary strategic goal. It is evident that small and medium-sized enterprises (SMEs) may have a different view of their primary strategic goal due to their specific characteristics such as more frequent exposure to risk, lack of resources, informal organisational structure, absence of strategic view etc. (Mayanja & Perks, 2017; Sunil, 2017; Ibañez & Fernandez, 2021). It can be assumed that their efforts are aimed at maximizing profit from their business activities, and their approach may prefer short-term goals rather than long-term goals.

Business ethics represents a significant business element, especially for large companies which are essential in improving the socio-economic system in the world's developed countries. The improvement of these conditions creates the prerequisites for higher expectations of society directed not only to large enterprises but also to SMEs. Therefore, if SMEs want to be more competitive, they must implement the concepts that large companies apply in their business activities.

However, many signals from the theoretical field and the business activity of SMEs point to the fact that SMEs also pay attention to business ethics. There are rational rea-

sons as to why SMEs behave ethically – for example, an effort to stabilize the best workers, keep the best clients, attract new clients, or avoid being at odds with their community, because these companies have more personal relationships with the community they operate in than larger organisations. In this context, Mazharul et al. (2020), Arend (2013) and other authors emphasised the necessity for SMEs to build trust with customers and other elements of their environment (suppliers, customers, local communities, etc.) and the need to build an appropriate company image.

The aim of this study was to define and compare important attributes in business ethics according to company size and the gender and education of entrepreneurs in the SME segment sector in the V4 countries. The V4 countries were selected based on their shared historical features and similar socio-economic development as post-communist countries. The originality and contribution of this research lie in the fact that we rely on the results of our own empirical study and do not use secondary data or opinions in a mediated form.

The authors define the following research questions (RQs):

RQ1: Does the gender of the respondents play an important role in the perception of business ethics?

RQ2: Does the entrepreneurs' education level play an important role in the perception of business ethics?

RQ3: Is the size of an SME important for the perception of business ethics?

The structure of the article is as follows. The first chapter presents significant scientific opinions on the given issue. The second chapter contains the goal, a description of the methodology used and a description of the data that presented in the paper. In the third chapter, the results of the research and their discussion are presented. In the conclusion, the basic results of the study are formulated in an integrated form.

2. Theoretical Background

2.1. Business ethics and entrepreneurship

Many studies prove that companies must focus on more than profit maximization in today's highly competitive environment, as such an orientation can cost them a loss of competitive position. Business ethics seems to be one of the options that can help the company to achieve its goals (Enz et al., 2021; Turyakira, 2018), although Huang et al. (2022) claimed that business ethics and profit maximization are naturally at odds, as when considering morality, we must also take into account other input variables that have a negative impact on profit (Enz et al., 2022). On the other hand, Turyakira (2018) claimed that unethical behaviour can increase a company's costs many times over, as it can lead to problems with internal or external stakeholders and can even come into conflict with the law, which ultimately affects its reputation and financial results. A company that has implemented the principles of business ethics in its daily activities applies the principles of morality, either internally or externally, and tries to do the right things

in the right way (Fernandez et al., 2016; van Wyk & Venter, 2022). These measures are commonly known within the development of corporate social responsibility programs (Gallardo-Vázquez & Lizcano-Álvarez, 2020). Moreover, the positive impact of ethical principles in business has been proved in studies on business growth factors (Derun & Mysaka, 2021), innovations and business sophistication (Oliinyk et al., 2023). Most authors characterise business ethics as a set of rules, morals and values that should guide the behaviour of the company, the entrepreneur, or its employees (Turyakira, 2018). Enz et al. (2021), however, drew attention to the fact that companies that decide to implement the principles of business ethics in their daily activities often face the suspicion of buyers, especially in developing markets.

Although the elaboration of business ethics is an aim that is of interest to both scientists and practitioners, in both cases this interest is mainly focused on solving this issue in the context of large companies that implement it within the framework of formalised codes of business conduct (van Wyk and Venter, 2022), while the formalisation of procedures is one of the weaknesses of SMEs (Belas et al., 2020; Robinson, 2017).

2.2. The specifics of business ethics in the SME sector

In the scientific literature, only limited scope is devoted to studying business ethics in SME conditions (Fassin et al., 2010; van Wyk & Wenter, 2022; Turyakira, 2018; Ji et al., 2019, etc.). However, the definition of business ethics is crucial for the SME environment, as SMEs are key to the global economy (Turyakira, 2018). Fernandez et al. (2016) claimed that even if studies deal with this issue, they are primarily oriented towards the ethical dilemmas that SMEs have to face and do not deal with the level of ethics. Van Wyk and Wenter (2022) conducted research within the developing economy of South Africa, which faces many ethical issues such as corruption, insufficient ethical awareness, or lack of ethical leadership. They researched SMEs from various industries and concluded that entrepreneurs perceive ethics in business mainly as representing transparency, credibility, responsible behaviour (toward internal and external stakeholders), integrity (represented by moral values) and doing the right thing. According to the authors, many entrepreneurs limit their understanding to the previous characteristics. In their research focused on SMEs, Sharma and Dudeja (2010) confirmed that 70% of entrepreneurs apply ethical principles in their decision-making. Still, only 43% of them implement these principles at a formalised level (e.g., through a code of ethics). Although SMEs are aware of the increasing pressure to implement business ethics in their business practice, one of the fundamental obstacles is that they cannot perceive the benefits of applying these principles due to the lack of a strategic vision (thinking) (Turyakira, 2018).

According to Belas et al. (2021), SMEs' more frequent exposure to risk is another disadvantage compared to large enterprises. Among the most common threats they have to face, the authors include a lack of managerial skills, an informal organisational structure, the entrepreneur's personality (which, as research shows, plays a significant role in business ethics), demographic factors (age, gender or education of the entrepreneur), personnel risks, legal risks, or risks arising from the market. Turyakira (2018) added that

their size, difficulties in accessing capital, dependence on word-of-mouth, and difficulties in reputation building are the main factors that make it more challenging for SMEs to compete. For the reasons mentioned above, SMEs more often encounter business ethics violations in their business activities and when trying to survive in a highly competitive environment (van Wyk & Venter, 2022; Syriati, 2022; Turyakira, 2018). Ji et al. (2019) claimed that SMEs often violate the principles of business ethics, especially in connection with corruption, bribery, or environmental pollution. In their study, the authors identified that the main motivators for the unethical behaviour of entrepreneurs include the desire for financial benefits and unfair behaviour on the part of institutions, which is especially typical in developing and transforming economies. To some extent, unethical behaviour is supported by the tolerance of stakeholders in the business environment and the perception that it is a feature of the labour markets of immature economies (Mishchuk et al., 2018). This is also supported by Cronje et al. (2017), who claimed that the financial situation largely influences the application of responsibility (and ethics) in the entrepreneur's decision-making. In addition, Ibañez and Fernandez (2021), based on a sample of 65 SMEs, stressed that actions such as establishing norms, considering employees' expectations, or making it clear that unethical behaviour is not acceptable require a significant amount of time and resources due to the size of the SME and the main challenges that these businesses have to face.

2.3. The role of gender, education, and the size of the enterprise in the implementation of business ethics

According to the literature, the implementation of business ethics in SMEs is mainly associated with the entrepreneur/manager/owner, who sets the direction in their company with their ethical behaviour, acting as a role model. In the research of Robinson (2017), a strong correlation between the values of the entrepreneur and the company's values was confirmed, which is in line with the results of the study by Sharma and Dudeja (2010). Their conclusions were based on a sample of 117 SME enterprises and prove there are fewer external demands on small enterprises than on large ones, so human factors, values, and psychological variables play a more significant role in determining decisions. Since the organisational structure is often informal in nature and business ethics is not applied based on formal procedures, the entrepreneur is a role model for their employees. Fassine et al. (2010) even applied ethics directly to the given person, not the company. Therefore, if we compare business ethics in the environment of SMEs and large companies, many authors agree that the difference is mainly in the perception of ethics by entrepreneurs. In SME conditions, this influence is much more significant than in large companies, where business ethics is implemented within formalised codes (Robinson, 2017).

According to Syariati (2022), factors such as religion, environmental pressure, gender, and social customs significantly affect differences in the moral constructs of SME entrepreneurs. Specifically, the relationship between gender and the implementation of business ethics is currently being addressed by a growing body of research. These studies prove that

women behave more ethically in business than men (Knechel & Mintchik, 2022), which is mainly manifested in more transparent management, decision-making and behaviour. Sun et al. (2021) confirmed these results, and their study even claimed that the more women are represented in managerial positions, the higher the application of ethical principles in the company. Briano-Turrent (2022) argued that increasing the number of women in executive positions has a positive effect on the overall economic performance of the company, mainly due to the ethical functioning of the management and the adoption of ethical codes. Lefley et al. (2021) investigated business ethics in SMEs by implementing follow-up audits. They claimed that boards where women were well-represented had a higher degree of inclination to audit their investments. Moreover, the authors found that the larger the company, the higher the probability of conducting an audit. The results of research by Kassie (2021) show that not only the gender, but also the age and education level of entrepreneurs influence their decision-making in ethical dilemmas. Likewise, Bitros and Karayiannis (2010) pointed to the fact that the degree of ethical behaviour of an entrepreneur is determined by their family background, the entrepreneur's education (considering only primary and secondary education), and the company's size. Authors even claim that a low level of entrepreneurial morality could be positively influenced by better education. Cronje et al. (2017) focused on micro, small and medium-sized enterprises in their study, investigating the influence of ethics in the decision-making of entrepreneurs and finding that the level of education significantly influences the level of ethics achieved. The gender of the entrepreneur was also decisive, as the results show that women more frequently take morals and ethics into account in their decisions. On the contrary, Sharma and Dudeja (2010) confirmed only age as a significant factor in their study. Gender and education did not exhibit an influence on the application of business ethics in their study.

3. Aim, methodology, and data

The aim of this paper is to define and compare significant attributes of business ethics according to company size and the gender and education level of entrepreneurs in the SME sector in the V4 countries.

Empirical research which was aimed at assessing the attitudes of small and medium-sized companies was carried out in June 2022 in the V4 countries (Czech Republic, Slovakia, Poland and Hungary).

The data collection was carried out by the renowned external company MNFORCE using Computer-Assisted Web Interviewing (CAWI research method) according to the questionnaire created by the research team. The questionnaire could be filled out by the owner or highest-ranking manager of a small or medium-sized enterprise (SME, hereinafter referred to as the respondent). The questionnaire was translated into the national language of the respondents for a better understanding of the formulated statements. The questionnaire contains control questions for verification of the consistency of respondent attitudes. The authors used an external agency because this approach has some benefits (e.g., data collection was undertaken in the same way and at the same time).

In the Czech Republic, the total number of respondents was 347. The structure of re-

spondents in terms of company size was as follows: 45.2% micro-enterprises, 30.8% small enterprises and 23.9% medium-sized enterprises. Of the Czech respondents, 47.3% were women and 52.7% were men. The educational level of respondents was as follows: 18.2% of respondents reported primary or secondary education without graduation, 52.2% of respondents with graduation, 9.2% a bachelor's degree, 18.7% a master's/engineering degree, and 1.7% a doctoral degree.

The total number of respondents was 322 in the Slovak Republic. The structure of respondents in terms of company size was as follows: 51.9% micro-enterprises, 26.7% small enterprises and 21.4% medium-sized enterprises. Of the Slovak respondents, 52.8% were women and 47.2% were men. The educational level of respondents was as follows: 9.3% of respondents reported primary or secondary education without graduation, 50.9% of respondents with graduation, 5.9% a bachelor's degree, 31.1% a master's/engineering degree, and 2.8% a doctoral degree.

In Poland, the total number of respondents was 381. The structure of respondents in terms of company size was as follows: 47.2% micro-enterprises, 27.8% small enterprises and 25.0% medium-sized enterprises. Of the Polish respondents, 51.2% were women and 48.8% were men. The educational level of respondents was as follows: 1.8% of respondents reported primary or secondary education without graduation, 33.9% of respondents with graduation, 19.2% a bachelor's degree, 42.5% a master's/engineering degree, and 2.6% a doctoral degree.

In Hungary, the total number of respondents was 348. The structure of respondents in terms of company size was as follows: 50.0% micro-enterprises, 28.2% small enterprises and 21.8% medium-sized enterprises. Of the Hungarian respondents, 54.9% were women and 45.1% were men. The educational level of respondents was as follows: 2.0% of respondents reported primary or secondary education without graduation, 41.7% of respondents with secondary education graduation, 32.8% a bachelor's degree, 22.4% a master's/engineering degree, and 1.1% a doctoral degree.

In this study, we will evaluate the respondents' attitudes towards a set of statements in the individual V4 countries according to the company's age and the gender and education of the entrepreneur. Based on previous research and a qualitative literature analysis, the following statements were established that characterise the importance of business ethics in SMEs:

ST1: I consider ethics in business to be important.

ST2: When managing the company, I consider the ethical consequences of my decisions.

ST3: I feel good when I behave ethically in business.

ST4: Our company enforces the rules of ethical conduct in business.

Based on the expert estimation method, we established the following statistical hypotheses (SH):

SH: There are no statistically significant differences in the overall structure of the answers and in the positive answers of the respondents to (SH1: ST1; SH2: ST2; SH3: ST3; SH4: ST4) according to the size of the company and the gender and educational level of the respondents in the individual V4 countries.

Statistical hypotheses were verified by descriptive statistics, the chi-squared test and Z-score at the α = 5% significance level. The null hypothesis was confirmed if the p-value was higher or equal to 0.05. If the *p*-value was lower than 0.5, the null hypothesis was rejected. Calculations were made using software that is freely available on the Internet (Chi-Square Test Calculator, n.d.; Z Score Calculator, n.d.).

4. Results and Discussion

The following tables show the research results, including verifying individual scientific hypotheses.

Table 1. *Research results and statistical calculations of ST1 according to company size and the gender and education level of respondents in individual V4 countries*

ST1: I consider ethics in business to be important.	Micro/ SME CR: 157/190 SR: 167/155 PL: 180/201 HU: 174/174	Males/ Females CR:183/164 SR: 152/170 PL: 186/195 HU: 157/191	SE/UE CR: 244/103 SR: 194/128 PL: 136/245 HU: 152/196	**Z-score:** *p*-value Micro/SME Males/Females SE/UE
1. Strongly agree	77/76 90/85 113/108 128/110	65/88 79/96 108/113 118/120	116/37 101/74 81/140 105/133	CR: 0.1362 0.1052 0.5892
2. Agree	60/99 60/63 52/74 38/59	95/64 62/61 66/60 35/62	102/57 76/47 40/86 43/54	SR: 0.0536 0.8887 0.2713
3. Neither agree nor disagree	20/14 14/6 11/13 8/5	22/12 8/12 9/15 4/9	25/9 15/5 13/11 4/9	PL: 0.7039 0.0989 0.2846
4. Disagree	0/1 3/1 3/4 0/0	1/0 3/1 2/5 0/0	1/0 2/2 2/5 0/0	HU: 0.3953 0.2891 0.3371
5. Strongly disagree	0/0 0/0 1/2 0/0	0/0 0/0 1/2 0/0	0/0 0/0 0/3 0/0	
Chi-square: *p*-value:				
Micro/SMEs	CR: 0.1205	SR: 0.3581	PL: 0.4855	HU: 0.1408
Males/Females	**CR: 0.0146**	SR: 0.8328	PL: 0.5078	HU: 0.1330
SE/UE	CR: 0.1553	SR: 0.6297	PL: 0.2262	HU: 0.7753

Source: *own research. Note: Micro – means micro-enterprise (from 0 to 9 employees), SME – small and medium-sized enterprise (from 10 to 249 employees), SE – respondents with secondary education, UE – respondents with university education.*

H1 was confirmed. There were no statistically significant differences in the overall structure of the answers or in the positive answers of the respondents to ST1 according to the size of the company, or the gender and education level of the respondents in all V4 countries. The only exception was the comparison of companies by gender, where we found statistically significant differences in the structure of respondents' answers.

From the point of view of positive answers, a specific indication of a trend can be seen in Slovakia, where larger companies agreed more intensively with ST1, and in Poland, where men agreed more with ST1 than women. However, these differences were not statistically significant.

Table 2. *Research results and statistical calculations of ST2 according to company size and the gender and education level of respondents in individual V4 countries*

ST2: When managing the company, I consider the ethical consequences of my decisions.	Micro/ SME CR: 157/190 SR: 167/155 PL: 180/201 HU: 174/174	Males/ Females CR:183/164 SR: 152/170 PL: 186/195 HU: 157/191	SE/UE CR: 244/103 SR: 194/128 PL: 136/245 HU: 152/196	*Z-score:* *p-value* Micro/SME Males/Females SE/UE
1. Strongly agree	56/64 59/64 84/88 102/81	49/71 54/69 91/81 93/90	92/28 74/49 61/111 80/103	CR: **0.0238** **0.0226** 0.1336
2. Agree	70/105 95/77 81/84 64/85	99/76 83/89 8/84 58/91	120/55 100/72 55/110 66/83	SR: 0.6892 0.3628 0.1260
3. Neither agree nor disagree	30/20 12/13 11/25 8/7	33/17 13/12 13/23 6/9	31/19 18/7 17/19 5/10	PL: 0.0629 **0.0164** 0.1499
4. Disagree	1/1 1/1 2/1 0/1	2/0 2/0 0/3 0/1	1/1 2/0 2/1 1/0	HU: 1.0000 0.5287 0.9442
5. Strongly disagree	0/0 0/0 2/3 0/0	0/0 0/0 1/4 0/0	0/0 0/0 1/4 0/0	
Chi-square: *p*-value:				
Micro/SMEs	CR: 0.1624	SR: 0.7933	PL: 0.2890	HU: 0.2514
Males/Females	**CR: 0.0123**	SR: 0.8393	PL: 0.1535	HU: 0.2467
SE/UE	CR: 0.3117	SR: 0.5377	PL: 0.3695	HU: 0.9619

Source: *own research. Note: Micro – micro-enterprise (from 0 to 9 employees), SME – small and medium-sized enterprise (from 10 to 249 employees), SE – respondents with secondary education, UE – respondents with university education.*

H2 was not confirmed. The research showed statistically significant differences in the overall structure of answers (men/women in the Czech Republic) and the positive answers of respondents to ST2 according to company size and the gender and education level of respondents in individual V4 countries. We also found statistically significant differences in respondents' positive answers. In the Czech Republic, larger enterprises agreed more intensively with ST2 than micro-enterprises. When comparing genders, we encountered ambiguous results: in the Czech Republic, women more intensively agreed with ST2; in Poland, the opposite was true.

Table 3. *Research results and statistical calculations of ST3 according to company size and the gender and education level of respondents in individual V4 countries*

ST3: I feel good when I behave ethically in business.	Micro/ SME CR: 157/190 SR: 167/155 PL: 180/201 HU: 174/174	Males/ Females CR:183/164 SR: 152/170 PL: 186/195 HU: 157/191	SE/UE CR: 244/103 SR: 194/128 PL: 136/245 HU: 152/196	*Z*-score: *p*-value Micro/SME Males/Females SE/UE
1. Strongly agree	60/75 77/69 101/100 114/84	51/84 61/85 109/92 99/99	100/35 85/61 70/131 82/116	CR: **0.0232** 0.0854 0.7795
2. Agree	67/95 74/70 56/77 50/78	100/62 72/72 64/69 53/75	108/54 88/56 45/88 62/66	SR: 0.8259 0.1471 0.5157
3. Neither agree nor disagree	27/18 16/15 14/18 7/8	28/17 18/13 8/24 3/12	32/13 21/10 17/15 6/9	PL: 0.8026 **0.0019** 0.1707
4. Disagree	3/1 0/1 6/4 3/2	3/1 1/0 3/7 1/4	3/1 0/1 4/6 2/3	HU: 0.6599 **0.0293** 0.4777
5. Strongly disagree	0/1 0/0 3/2 0/2	1/0 0/0 2/3 1/1	1/0 0/0 0/5 0/2	
Chi-square: *p*-value:				
Micro/SMEs	CR: 0.2352	SR: 0.9987	PL: 0.5132	**HU: 0.0258**
Males/Females	**CR: 0.0004**	SR: 0.3748	**PL: 0.0242**	HU: 0.1018
SE/UE	CR: 0.6433	SR: 0.8866	PL: 0.2423	HU: 0.6678

Source: *own research. Note: Micro – micro-enterprise (from 0 to 9 employees), SME – small and medium-sized enterprise (from 10 to 249 employees), SE – respondents with secondary education, UE – respondents with university education.*

H3 was not confirmed. The research confirmed that there are statistically significant differences in the overall structure of answers (Hungary in terms of company size; Czech

Republic and Poland in terms of gender), and there are also statistically significant differences in the positive answers of respondents to ST3 according to company size and the gender and education level of respondents in individual V4 countries. In the Czech Republic, larger companies agreed more intensively with ST3. In Poland and Hungary, more men than women agreed with this statement.

Differences in respondents' positive attitudes according to their education level were not detected.

Table 4. *Research results and statistical calculations of ST4 according to company size and the gender and education level of respondents in individual V4 countries*

ST4: Our company enforces the rules of ethical conduct in business.	Micro/ SME CR: 157/190 SR: 167/155 PL: 180/201 HU: 174/174	Males/ Females CR:183/164 SR: 152/170 PL: 186/195 HU: 157/191	SE/UE CR: 244/103 SR: 194/128 PL: 136/245 HU: 152/196	*Z*-score: *p*-value Micro/SME Males/Females SE/UE
1. Strongly agree	57/64 65/64 89/86 109/86	48/73 55/74 94/81 98/97	92/29 77/52 63/112 89/106	CR: **0.0014** **0.0183** **0.0160**
2. Agree	58/101 83/70 62/83 53/72	91/68 75/78 72/73 50/75	113/46 93/60 50/95 52/73	SR: 0.5552 0.2891 0.9761
3. Neither agree nor disagree	36/21 16/18 19/26 8/12	37/20 20/14 16/29 7/13	31/26 20/14 18/27 8/12	PL:0.9601 **0.0063** 0.7188
4. Disagree	5/3 2/1 6/2 1/3	6/2 1/2 3/5 2/2	7/1 3/0 4/4 2/2	HU: 0.4295 0.1499 0.6241
5. Strongly disagree	1/1 1/2 4/4 3/1	1/1 1/2 1/7 0/4	1/1 1/2 1/7 1/3	
Chi-square: *p*-value:				
Micro/SMEs	**CR: 0.0092**	SR: 0.8352	PL: 0.2833	HU: 0.0779
Males / Females	**CR: 0.0057**	SR: 0.4647	**PL: 0.0493**	HU: 0.2251
SE/UE	**CR: 0.0343**	SR: 0.9720	PL: 0.5492	HU: 0.8669

Source: *own research. Note: Micro – micro-enterprise (from 0 to 9 employees), SME – small and medium-sized enterprise (from 10 to 249 employees), SE – respondents with secondary education, UE – respondents with university education.*

H4 was not confirmed. The research showed that there are statistically significant differences in the overall structure of the answers and in the positive answers of the re-

spondents to ST4 according to the size of the company and the gender and education level of respondents in the individual V4 countries.

When evaluating this question, it can be concluded that the attitudes of Czech respondents differed most significantly from those in other V4 countries. The overall structure of Czech respondents' answers was statistically significantly different when compared according to the size of the company and the gender and education level of the respondents.

We found that larger firms showed stronger agreement with ST4, women more strongly agreed with ST4 compared to men, and less-educated respondents agreed more strongly with ST4.

The research results can be summarized in the following areas.

The average rate of agreement with statements ST1 to ST4 was 90% in all V4 countries, which is a positive signal in the field of business ethics.

An interesting finding was that the intensity of agreement with statements ST1 to ST3 was higher than that of agreement with ST4. This means that SMEs in the V4 countries confirmed with a higher degree of intensity that they consider ethics to be important. They admitted that they consider business ethics when managing the company and feel good when they behave ethically in implementing business activities. On the other hand, they declared a lower intensity of ethical behaviour in their personal lives.

The last time we conducted similar empirical research was in 2020, where 454 respondents in the Czech Republic and 368 in Slovakia were consulted. In that study, "90% of Czech entrepreneurs and 88% of Slovak entrepreneurs within the SME sector agreed that they should take into account the moral and ethical consequences of their decisions." The structure of the attitudes of entrepreneurs was very similar in both countries (Belas et al., 2020).

It is obvious that the business activities of SMEs must not be separate from compliance with the ethical aspects of the business. Business without ethics would cause SMEs to become difficult to control and would justify their ethically inappropriate behaviour in their business activities (Syariati, 2022).

According to some authors, the ethical approach to business is primarily determined by the personal attitude of the entrepreneur, which reflects a number of factors such as their own moral values and character traits, the culture of the country where the entrepreneur operates, and their family background (Fuller & Tian, 2006; Sunil, 2017; Vivier, 2013; Signori & Fassin, 2023 and other authors). Business owners should set the rules of business ethics in the environment of SMEs (Vivier, 2013), and their position is irreplaceable in this process (Mayanja & Perks; 2017).

When analysing the overall structure of the answers, we found statistically significant differences in relation to the size of the company (the attitudes of micro-enterprises differed from those of small and medium-sized enterprises), but also in terms of the gender and education level of the respondents.

When analysing the positive answers, we found that the most frequent differences occurred in terms of gender and company size. The differences in SMEs' attitudes from the educational point of view were minimal.

The most frequent differences in the structure of all responses and the positive responses of SMEs were found in the Czech Republic. Some differences were found in the case of Poland and Hungary. It is an interesting fact that in the case of Slovakia, no differences in the attitudes of SMEs were found.

Our research is compatible with claims that SMEs pay attention to profit maximization and attach great importance to business ethics (Enz et al., 2021; Turyakira, 2018; Arend, 2013).

Several previous studies have shown that the application of business ethics in business is more often associated with women, which confirmed the conclusions of selected authors who claim that women behave more ethically in business compared to men (e.g., Knechel & Mintchik, 2022; Sun et al., 2021; Briano-Turrent, 2022). However, the results of this research were not clear-cut. It could be assumed that this trend is less evident in the developed countries of Europe.

Our previous research found "that women were more aware of business ethics than their male counterparts, as were those entrepreneurs who possessed a higher education over those with a secondary education" (Belas et al., 2020).

The size of the company represents an important criterion for defining differences in the approaches of SMEs to business activities, which are manifested primarily in their economic attitudes. According to Belas and Sopková (2016), larger companies in the SME segment are more innovative, active and autonomous than microenterprises. In the field of business ethics, we only found an indication of the trend that larger companies have a more positive attitude towards business ethics in the Czech Republic. This trend was not detected in the other V4 countries. In this context, Zsigmond et al. (2021) stated that there is a directly proportional relationship between ethical institutions and the company's size, which creates more appropriate conditions for applying business ethics in larger companies.

Some authors, such as Bitros and Karayiannis (2010) and Cronie et al. (2017), have emphasised that the entrepreneur's level of education determines the degree of their ethical behaviour. On the other hand, Sharma and Dudeja (2010) did not confirm the influence of education on the application of business ethics in their study. Different cultures produce a different view of this topic. In this research, the trend of education level influencing the implementation of business ethics in SMEs was minimal.

5. Conclusion

The aim of the article was to define and compare important attributes in business ethics according to company size and the gender and education level of entrepreneurs in the SME segment in the V4 countries.

As a part of this research, we stated four areas that define the field of business ethics.

The primary conclusions from this research can be formulated as follows. The level of business ethics in the V4 countries is high. According to our findings, SMEs consider business ethics important; they consider the ethical consequences of their decisions when managing their company and enforce the rules of business ethics in real life.

We found partial differences in the overall structure of the responses of SMEs in terms of company size, the gender of the respondents and their education. The research showed statistically significant differences in SMEs' positive attitudes toward business ethics in the Czech Republic, Poland, and Hungary. No differences in the positive attitudes of SMEs were found in Slovakia. The Czech Republic most often showed differences in the overall structure of answers and also in the structure of positive answers. The research questions (RQ1, RQ2, RQ3) were partially supported.

The research indicates a particular trend regarding company size, but this needs to be more convincing and robust. The bigger the company, the more positive the attitudes towards business ethics. When evaluating attitudes by gender, we did not find a clear trend. While women had a more positive attitude towards business ethics issues in the Czech Republic, in Poland and Hungary it was men who showed more positive attitudes towards this topic.

Thus, the results of our research can expand the limited research on business ethics in the context of SMEs, not to mention the criteria that we took into account when comparing the perception of business ethics – gender, education and company size – as we divided companies according to their size into micro-enterprises, small enterprises and medium-sized enterprises.

The limits of this research can be seen in the limited, albeit representative, sample of respondents. The fractured international political situation caused by the war in Ukraine, the worsening security situation in the world, and the retrograded economic situation, manifested by extreme increase in energy prices and inflation, could affect the attitudes of SMEs. We expect that these impacts could be manageable since SMEs are mainly oriented towards the internal market, and governments have informed SMEs well in advance about upcoming compensation and support. These research results will enrich the knowledge base in applying business ethics in the segment of SMEs.

Future research should aim to recognise motives for applying business ethics tools in SMEs, mainly from the perspectives of gender and company size, as they were identified as important factors. Although education was not identified as such a significant factor, the field of education could be another interesting factor to study.

Acknowledgement

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ESG DISCLOSURE IN THE BALTIC REGION – EVIDENCE FROM A TEMPORAL PERSPECTIVE

Ilze ZUMENTE[1]
Riga Technical University, Riga, Latvia

Nataļja LĀCE
Riga Technical University, Riga, Latvia

Abstract. *This study is a comprehensive analysis of the environmental, social, and governance (ESG) disclosure levels and board diversity metrics of stock-listed companies in the Baltic states, comparing between two different time points: 2020 and 2022. The approach of the research involves qualitative content analysis of sustainability reports in order to determine disclosure levels, and statistical methods such as t-tests of differences in means to draw conclusions on the differences in disclosure levels based on diversity parameters.*

The results of the study demonstrate that ESG disclosure scores have improved over time. The average ESG disclosure score increased from 40% in the 2020 sample to 47% in the 2022 sample, with this improvement largely driven by an increase in the disclosure of corporate governance topics. Furthermore, this study provides evidence that companies with female board members and larger boards tend to achieve higher ESG transparency levels. The results show that companies with female members on their boards have higher ESG disclosure levels, with an average of 54% for companies with female members on their management boards compared to 42% for those without, and an average disclosure level of 52% for companies with gender-diverse supervisory boards compared to 42% for those with all-male supervisory board members.

The findings of this study contribute to the academic literature by shedding light on the differences in ESG disclosure levels during a time of heightened corporate sustainability awareness, as well as connecting diversity to corporate sustainability.

Keywords: *Baltics, CEE, corporate sustainability, diversity, ESG, sustainability reporting*

JEL Classification: *G30, G32, Q56*

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1   *Corresponding author: Ilze Zumente, Riga Technical University, Riga, Latvia, e-mail: ilze.zumente@rtu.lv*

1. Introduction

While the sustainability agenda across corporations globally continues to rise, academic evidence and data on environmental, social, and governance (ESG) matters are still inconsistent and only partly available. The lack of unified measurability hinders comparability, and many companies still do not have external ESG disclosure or performance scores to aid in evaluation and comparability for financiers (Dorfleitner et al., 2015). An article by Zumente and Lāce (2020) was the first to shed light on the ESG disclosure levels of stock-listed companies in the Baltic states, and provided insights into the correlation between board diversity and ESG disclosure (Zumente & Lāce, 2020). Given the rapid pace of development of corporate sustainability and its regulatory requirements, this article aims to provide an update on previously obtained results and to obtain and analyze data to answer the following research questions:

1. How has the average ESG disclosure level across listed companies in the Baltic states changed from 2020 to 2022?
2. Has the average level of board diversity improved?
3. Does the previous result of higher ESG disclosure for companies with larger and more diverse boards still hold true after 2 years?

While only 2 years have passed between the initial research and this updated contribution, the corporate sustainability landscape has changed significantly. The pace of corporate sustainability development, especially in recent years, has been significant, as indicated by increasing regulatory requirements, wider overall ESG adoption, and increased disclosure practices (UN PRI, 2022).

The EU's sustainability-related regulatory base has evolved across all dimensions, applying not only to companies and specific products but also to the requirements of financial investors and asset managers with respect to investment decisions and processes. Since 2020, impactful regulations such as the EU's Green Taxonomy, Sustainable Finance Package, and Corporate Sustainability Reporting Disclosure (CSRD) have come into force, signaling the rapid development of the regulatory landscape. In particular, in June 2022, the Women on Boards Directive – which aims to foster transparent recruitment procedures in companies, with the goal of having at least 40% of non-executive director posts or 33% of all director posts filled by underrepresented genders – was approved by the European Parliament. This directive will come into force in mid-2026, and EU stock-listed companies will have to comply with and report on this information annually (European Parliament, 2022).

Meanwhile, the share of ESG assets continues to rise. According to Bloomberg Intelligence, ESG assets grew from $22.8 trillion in 2016 to $35 trillion in 2020. These figures are expected to surpass $41 trillion by the end of 2022, nearly doubling in size within a 6-year period. Europe has historically accounted for around half of ESG assets, but the US market has seen significant growth in recent years (Bloomberg, 2022). In addition, ESG assets have proven to be resilient in times of high market turbulence, and growth in the attractiveness of investments in this segment is therefore predicted (Kaminskyi et al., 2022).

Despite the increasing importance of ESG in financial decision-making, Baltic companies are underrepresented in ESG coverage by sustainability rating providers (Zumente & Lāce, 2021), creating a deficit in the academic evidence for the region. To assess ESG disclosure levels, therefore, a qualitative content analysis of sustainability reports (and their equivalents) for 2021 was performed. This involved evaluating the reported information against NASDAQ Baltic stock exchange ESG reporting guidelines and a supplementary list of disclosures compiled from the assessment. This approach is largely based on the work of Roca and Searcy (2012), and allows for the assessment of ESG disclosure without external ratings or formal measurements.

This study provides novel insight into the differences in ESG disclosure levels among Baltic companies listed on stock exchanges during a time of increased corporate sustainability awareness. By analyzing data from 2020 to 2022 – a period during which global discourse on ESG disclosure and sustainability practices has intensified – this research sheds light on the correlation between the board diversity metrics of the largest public companies and non-financial transparency. The findings of this study contribute to the growing body of academic literature connecting board diversity to corporate sustainability and ESG disclosure. The study provides a valuable contribution to the ongoing discourse around the importance of ESG transparency and the role of board diversity in promoting it. Moreover, it serves as a valuable resource for investors, stakeholders, and regulators in their efforts to promote sustainable business practices and responsible investment. The study's findings can also serve as a reference point for future research and policy development aimed at enhancing ESG transparency and sustainable business practices while addressing the gaps in the current academic literature.

The paper is organized as follows: Section 2 provides a summary of relevant academic literature, Section 3 presents the methodology and data used, Section 4 presents and discusses the results, and Section 5 concludes.

2. Literature review

The absence of a universal standard for ESG reporting has caused a wide range of differences in disclosure practices, even between companies in the same industry or operating in the same country. The level of ESG disclosure depends on the specific regulations, norms and standards applied by the company, which can result in a lack of comparability between the ESG reports of different organizations. This lack of uniformity makes it difficult to assess the overall ESG performance of a company and creates uncertainty for investors and stakeholders (Ioannou & Serafeim, 2012). Nevertheless, with increasing ESG-compliant asset levels, overall ESG disclosure is also following a positive trend (Chen & Xie, 2022).

Based on the Voluntary Disclosure theory developed by (among others) Dye (1985) and Verrecchia (1983), which suggests that companies which perform better should also like to voluntarily disclose more, it could be assumed that higher ESG disclosure results in better corporate sustainability performance (Dye, 1985; Verrecchia, 1983). Indeed, according to most academic studies, wider ESG disclosure is generally linked to higher

sustainability performance (Fatemi et al., 2018; Lopez-de Silanes et al., 2019). Nevertheless, there is some evidence stressing that ESG disclosure and performance are not directly comparable. For example, the meta-analysis conducted by Whelan et al. (2021) compared the correlation between ESG disclosure and financial performance versus ESG performance measures and financial performance. The findings showed that only 26% of the studies that focused solely on ESG disclosure found a positive correlation with financial performance, while 53% of the studies that analyzed ESG performance measures found a positive correlation, emphasizing the importance of the content of ESG reporting over the form of reporting (Whelan et al., 2021).

The academic literature on measuring the impact of ESG disclosures on financial performance has used various approaches, such as:

1. measuring only the quantity of reported ESG information (i.e., ESG disclosure level) (Atan et al., 2016);
2. using external ESG ratings to evaluate the quality of sustainability performance (Dorfleitner et al., 2015);
3. developing individual methods or performing qualitative/quantitative analysis to assign a relative ESG performance score (Roca & Searcy, 2012).

As external sustainability ratings gain popularity and investors use them to make investment decisions, wider non-financial information disclosure is also necessary for rating providers to consider in their processes. As documented by previous studies on the subject, there is limited coverage of the Baltic companies when it comes to external sustainability rating, leading to the necessity of finding alternative ways for sustainability measurement (Zumente & Lāce, 2021). All of these factors signal the significance of proper ESG disclosure and transparency levels in order to reap the benefits associated with improved sustainability performance.

Corporate governance has a significant impact on ESG disclosure levels. A meta-study by Cucari & Lagasio (2019) that analyzed 24 empirical findings concluded that board independence, board gender diversity, and board size positively contribute to voluntary non-financial transparency (Cucari & Lagasio, 2019). Board diversity is also often linked to improved ESG performance, as a diverse board brings diverse perspectives and human capital resources to decision-making, leading to better alignment between sustainability strategies and long-term value (Hillman & Dalziel, 2003). Rao & Tilt (2016) reviewed the literature and found a positive relationship between board diversity and corporate social responsibility. So far, limited evidence has been provided from similar studies in the context of the Baltic region.

While the recent evidence on the impact of board gender diversity on ESG score and sustainability reporting level is mainly positive and significant, as confirmed by studies such as those of Velte (2016), Tamimi and Sebastianelli (2017), and Kamarudin et al. (2021), some studies find no significant relationship, or suggest that a critical mass of diversity (e.g., at least three females on a board) is necessary for a positive impact (Manita et al., 2018). One study with a similar methodology is that of Bakar et al. (2019), which examined the extent and quality of sustainability reporting among Malaysian publicly listed companies in relation to their board characteristics. The authors used content

analysis and *t*-tests to discover that companies with female board members exhibited improved sustainability scores. On the other hand, they found no evidence linking board members' age or ethnic diversity to sustainability reporting (Bakar et al., 2019).

On the business side, the positive impact of board diversity is arguably not fully recognized. A recent Annual Corporate Directors Survey by PwC revealed differences in directors' views compared to previous years in the areas of ESG, diversity & inclusion. Although overall support for board diversity is rising, 58% of directors surveyed believed that diversity was driven by political correctness rather than business decisions (PwC, 2021). Therefore, the level of gender diversity among companies remains imbalanced (European Parliament, 2022).

3. Data and variables

This analysis was based on a sample of 38 companies listed on the NASDAQ Baltic stock exchange as of August 2022, including 32 prime-listed companies and 6 secondary or alternative market-listed companies that published dedicated ESG or CSR reports in their annual disclosures. Compared to the initial sample procured by Zumente et al. (2020), 3 companies were delisted, and 5 new companies were stock-listed. However, 3 companies from the prime list were excluded due to the absence of their 2021 annual reports. This sample has a comparability of 85% with the 2020 sample, and includes 16 Lithuanian, 17 Estonian, and 5 Latvian companies.

The industry split of the sample of companies is presented in Table 1, below.

Table 1. *Industry split of sample companies.*

Industry	Count
Utilities	7
Consumer staples	7
Consumer discretionary	5
Real Estate	5
Finance	4
Infrastructure	4
Industrials	4
Consumer services	2

Source: *compiled by the authors.*

Given the previously reported low coverage of corporate sustainability evaluations of companies operating in the Baltic states, the ESG disclosure score computation approach of Zumente et al. (2020), adopted from Roca and Searcy (2012), was applied. This approach is similar to that used by Bakar et al. (2019) and Al-Tuwaijri et al. (2003), and broadly aligns with Bloomberg's disclosure score calculation method.

The method used for ESG disclosure score computation involves content analysis of company disclosures and checking the inclusion of specific measures and factors. The overall checklist, based on NASDAQ ESG reporting guidelines, GRI reports, the NAS-DAQ Corporate Governance Code, and the United Nations Sustainable Development Goals, consisted of 106 factors in the 2020 study. This increased to 119 in 2022 due to new indicators and measures, such as EU taxonomy-related information and whistleblowing policy.

The method of qualitative content analysis was performed on the companies' non-financial reports for the year 2021, as well as the reports and disclosures available in the regulatory stock-exchange filings and on the website of the stock exchange. For comparison purposes, information and sustainability disclosures available elsewhere were excluded from the analysis. The reports analyzed included Sustainability Reports, ESG Reports, Social Responsibility Reports, Governance Reports, Non-financial Reports, and specific sections in the Management Reports of the annual disclosures, due to differences in reporting form.

The split between the individual ESG metrics was approximately similar, with 35 indicators corresponding to environmental factors, 45 indicators relating to social aspects, and 38 indicators reporting on corporate governance practices. A point was added to the checklist for each instance in which a company reported on a specific ESG indicator.

Correspondingly, the ESG disclosure score was calculated as:

$$ESG\ Disclosure\ Score = \frac{\text{Sum of individual disclosure items}}{\text{(Max score according to checklist (119))}}$$

The method used for the ESG disclosure score computation only provides information on the relative degree of ESG transparency, and not on the quality or performance of the specific disclosures. The result is expressed as a percentage to facilitate comparison.

The analysis of board diversity in the second part includes variables such as board size (overall count of members across the company's management and supervisory boards), the proportion of female representatives on the management and supervisory boards (proportion of female representatives from the overall board size), and binary variables indicating the presence of at least one female representative at the highest decision-making level.

4. Results

The results of the study reveal that, in line with expectations, Baltic stock-listed companies have improved their overall ESG affinity and are indeed more transparent in their corporate sustainability achievements.
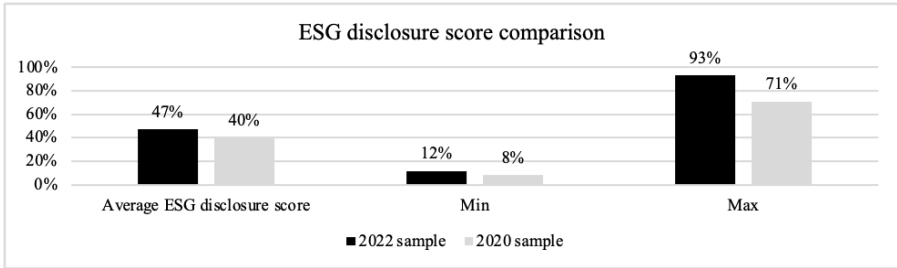
Figure 1. *ESG disclosure score comparison by year.*
Source: *compiled by the authors.*

By evaluating the total volume of reported information against the maximum attain-able transparency level, the percentage of the disclosed ESG information was obtained. As visible in Figure 1, the average ESG disclosure score has improved by 7 percentage points – from 40% in the 2020 sample to 47% in the 2022 sample. While there are still companies that disclose insufficient non-financial information (below the 12% minimal disclosure level), there is also a significant improvement in the best performers – with one corporation even achieving a 93% transparency level. This result is in line with the global evidence suggesting that the overall disclosure levels of companies tend to increase over time (Chen & Xie, 2022; Gez & Anagnosti, 2022).

When split between industries, as depicted in Figure 2, the highest ESG disclosure level was achieved by companies in the utilities sector, as was the case in 2020. The aver-age level of disclosure in this sector increased from 61% in 2020 to 63% in 2022. The low-est disclosure scores were achieved by companies in the real estate segment, which pre-sent only half of the transparency levels achieved by their peers in the utilities segment.
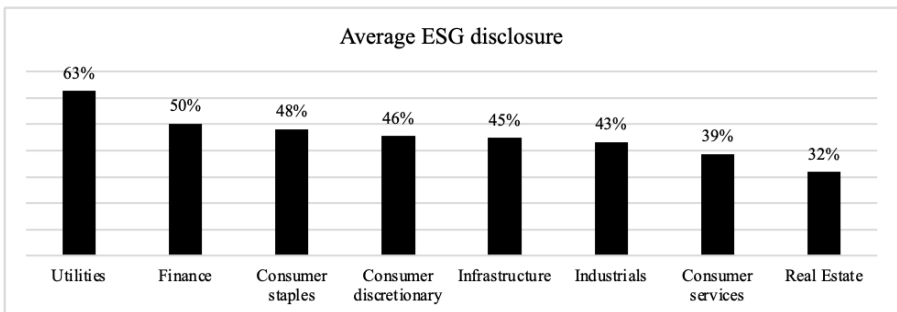
Figure 2. *Average ESG disclosure scores by industries.*
Source: *compiled by the authors.*

The results across these pillars have remained consistent with the patterns observed in 2020 by Zumente et al. (2020), as explained in Figure 3. The highest transparency level was achieved across the governance pillar (60%), followed by social disclosures at the

48% level, and the environmental pillar at 31%. The average disclosure level has increased since 2020 across all ESG factors.
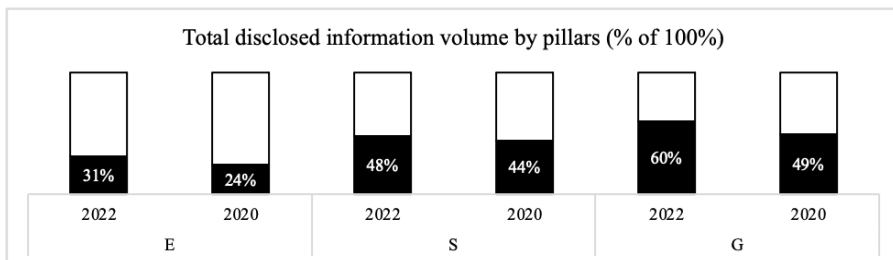

Figure 3. *Disclosed information level across the individual ESG pillars.*
Source: *compiled by the authors.*

While the disclosures in the corporate governance pillar are strongly driven by the requirement for stock-listed companies to publish a dedicated corporate governance report, the environmental pillar is still relatively underrepresented, and this is driven by more complex data measurement. Nevertheless, with the overall trend of higher ESG transparency in the Baltic region, improvements in environmental data disclosure have also been documented. Specific improvement areas relate, for example, to the measurement of emissions levels (57% of the sample companies report on their emissions levels at least in Scope 1 and 2), as well as more quantified information on water consumption, waste generation levels, etc. All in all, however, the availability of environmental information remains the largest pitfall for Baltic corporations, which is confirmed by the vast number of companies disclosing insufficient environmental data (Figure 4). This result contradicts the tendencies among US companies, for example, where a trend among Security Exchange Commission (SEC) listings can be observed: environmental disclosure, with a focus on climate change, moved up from third to first in 2022 (Gez & Anagnosti, 2022), suggesting that this area should be further stimulated by policy-makers.
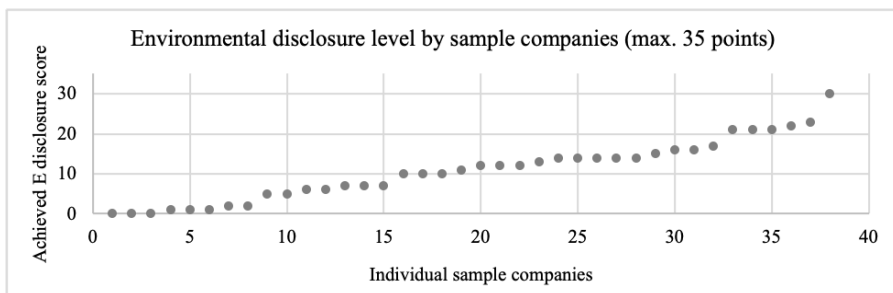

Figure 4. *Environmental disclosure level by companies in the sample*
(out of max score of 35 points.
Source: *compiled by the authors.*

With respect to the second research question, additional analysis was performed regarding board characteristics. The board composition of the reporting year was used for this analysis in order to relate it back to the ESG disclosure scores.
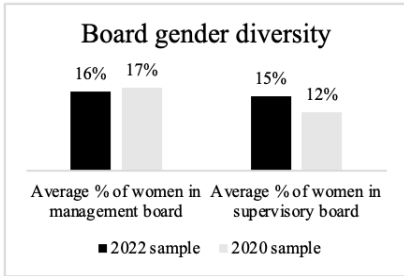

Figure 5. *Board gender diversity of the sample companies.*
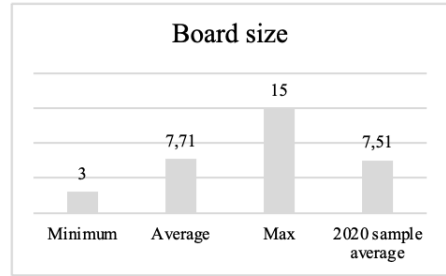**Source:** *compiled by the authors.*

Figure 6. *Board size of the sample companies.*
Source: *compiled by the authors.*

As indicated by Figures 5 and 6, average total board size increased minimally – from 7.51 members in 2020 to 7.71 members in 2022. Board size still shows a wide variance – ranging from a minimum of 3 board members to a maximum of 15 members. With respect to gender diversity, these changes were mixed – while female representation on management boards has slightly decreased from 17% to 16%, there has been a positive trend in the diversity of supervisory boards, which reached 15% in the 2022 sample. All in all, these numbers are still significantly below the threshold of 33% that was foreseen by the Directive of the European Parliament and of the Council on improving the gender balance among the directors of companies listed on stock exchanges. These figures are also noticeably below the European average of 30.6% (European Parliament, 2022).

To determine whether there are significant differences in ESG disclosure scores between companies with female representation on their decision-making boards and those with gender-homogeneous boards, independent sample *t*-tests comparing the differences in means were conducted to evaluate the potential relationship and its statistical significance. These *t*-tests provide a statistical analysis of the data, enabling the researchers to determine whether the differences in ESG disclosure scores are significant. As board size is also believed to impact ESG disclosure, additional *t*-tests were performed to indicate whether board size was below or above the average board size of 7. The results of all *t*-tests are shown in Table 2.

Table 2. *Independent t-test analysis*

Variables	ESG disclosure score			Two-sample *t*-test	
	Mean	**St.dev.**	**Observations**	***t*-statistic**	***p*-value**
Women on MB	0.54	0.17	16	2.028	0.05**
No women on MB	0.42	0.18	22		
Women on SB	0.52	0.20	21	1.701	0.09*
No women on SB	0.42	0.15	17		
Board size <=7	0.42	0.18	20	−1.774	0.08*
Board size >7	0.53	0.17	18		

Source: *computed by the authors. MB – management board; SB – supervisory board; * mean difference is significant at the 0.10 (2-tailed); ** mean difference n is significant at the 0.05 level (2-tailed); *** mean difference is significant at the 0.01 level (2-tailed).*

The results indicate that companies with female representation on their boards exhibit higher levels of ESG disclosure. On average, companies with female members on their management board have an ESG disclosure score of 54%, compared to 42% for companies without. In addition, companies with gender-diverse supervisory boards have an average disclosure level of 52%, whereas those with male-only supervisory boards have an average disclosure level of 42%. These differences are statistically significant at the 95% and 90% levels, respectively.

With respect to board size, an additional *t*-test was performed to check the differences across companies with larger boards and those with fewer members (below or equal to 7). The results indicate that there is a significant (at the 90% level) difference between companies having smaller boards, with those companies showing an average ESG disclosure level of 42%, versus companies with larger boards on average achieving a transparency level of 53%.

These results are largely in line with previous literature that has confirmed the positive relationship between higher board diversity measures and corporate sustainability (Kamarudin et al., 2021; Rao & Tilt, 2016; Tamimi & Sebastianelli, 2017; Velte, 2016). The results of the *t*-tests allow an answer to the third research question of this study to be provided, indicating that the previous result of higher ESG disclosure for companies with larger and more diverse boards still holds true after 2 years. In addition, while the previous study did not find significant differences relating to differences in management boards, this study confirms such a conclusion. These findings also support the view that female participation in a company's decision-making bodies correlates with a larger dedication to non-financial activities and their disclosure, as this is confirmed by the sample of Baltic stock-listed corporations.

It must be noted that a different method for the assessment of gender weights could potentially yield slightly different results for corporate governance ratings, as suggested by Nerantzidis (2018). Therefore, such an assessment of different measurement weightings could potentially be encouraged in future research endeavors.

5. Conclusions

Given the unprecedented speed of development of the corporate sustainability agenda and related regulatory requirements, this article aimed to provide an update on the first evidence published in 2020 on the ESG disclosure level and its correlation with corporate governance metrics among NASDAQ-listed companies. The results, based on a qualitative content analysis of the information disclosed in sustainability reports, show that the average ESG disclosure score has improved by 7 percentage points – from 40% in the 2020 sample to 47% in the 2022 sample. The highest transparency level was found in the governance pillar (60%), followed by social disclosures at 48% and environmental disclosures at 31%. The average disclosure level has increased across all ESG factors since 2020, while the range of ESG disclosure has remained wide – from a minimum of 12% to a maximum of 93%.

While the overall increase in sustainability disclosures is in line with expectations from global literature, the fact that environmental data disclosure is at the lowest level of the three pillars contradicts global trends – as observed by SEC filings (Gez & Anagnosti, 2022), for example. This suggests that disclosures in this area should be further stimulated by policy-makers.

Companies with female board members show higher levels of ESG disclosure, with an average of 54% for companies with diverse management boards and 52% for those with diverse supervisory boards, compared to 42% for those without gender diversity. No positive trend was observed for higher diversity levels, but differences based on board diversity have increased since the previous measurement 2 years ago.

Despite the novel insights generated by this study and their relevance to region-wide academic evidence on the level of adoption of corporate sustainability, it is limited in its scope as it measures ESG disclosure rather than ESG performance. To build upon the findings of this study, it is recommended that further research be conducted to assess the relationship between board diversity and ESG performance among Baltic companies. This could involve using third-party ESG performance scores, once they become available, which provide a more robust and comprehensive measure of a company's sustainability performance. Alternatively, novel and original ESG performance calculation methods could be applied.

This study contributes to the specific academic evidence on the corporate ESG disclosure level among stock-exchange listed companies in the Baltic region during a time of increased corporate sustainability awareness. It also contributes to the academic literature measuring the impact of board diversity metrics on non-financial performance. The findings of this study can be used as a reference point for future research and policy development aimed at promoting ESG transparency and sustainable business practices.

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MACROECONOMIC ASSET ALLOCATION TO SOLVE PROBLEMS OF UNCERTAINTY IN THE MEDIUM-TERM INVESTMENT HORIZON IN GEORGIA

Avtandil LILUASHVILI[1]

Ivane Javakhishvili Tbilisi State University,
Faculty of Economics and Business, 0179 Tbilisi, Georgia
Avtandil.liluashvili611@eab.tsu.edu.ge

Abstract

Purpose. The author targets the creation of an analytical investment framework by merging existing statistical techniques. The paper aims to introduce a framework constructed for the Georgian economy that can assist investors in analyzing the medium-term implications of different macro scenarios. For this, a tactical and strategic asset allocation decision-making framework was developed to optimize portfolios by employing a Balanced Portfolio approach, with the help of forecasted macroeconomic variables using econometric techniques (VECM – Vector Error Correction Model; Taylor rule estimation with OLS – Ordinary Least Squares). The author also intends to lay the foundations for future research regarding the investment characteristics of the emerging market.

Design/methodology/approach. The first forecasts of inflation and policy rate are obtained with the Vector Error Correction and Taylor rule models. Macroeconomic forecasts/projections are then applied to link asset price developments derived from Monte Carlo simulations. Finally, the Balanced Portfolio approach is utilized to optimize asset weights given different scenarios.

Findings. The results show that this approach lowers risk in all assumed scenarios and obtains better returns compared to plain vanilla efficient-frontier optimization. Portfolios have better risk-return profiles than before optimization with this approach. These results were obtained by using the macro model described in the paper.

Originality. The paper aims to introduce a framework that is a combination of multiple well-established macroeconomic and investment models in the academic community, which is tailored for a developing economy such as Georgia. Thus, the originality of the research rests

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1   *Contact person – Avtandil.liluashvili611@eab.tsu.edu.ge*

in the method of choosing specific techniques, variables, and connections between different models to best estimate the optimal portfolio given the objective of the investment.

1. Introduction

Although investment techniques are evolving and many different alternatives are available on the market, emerging economies are an exception in this regard. Developing countries have different macroeconomic characteristics, and research papers on these differences are needed to understand investment trends and guide investors' decisions with well-tailored frameworks. The list of problems which this research intends to solve is as follows:

1. With this information, investors can create a Balanced Portfolio allocation for many emerging economies.
2. A Balanced Portfolio framework enables the creation of sophisticated risk-based allocation given an analysis of possible scenarios.
3. Investment funds can assess risk based on macroeconomic feedback to the portfolio, and can evaluate the diversification of allocation given different scenarios.

Despite portfolio allocation techniques differing across investment styles, most conventional investors need to determine capital market assumptions – i.e., future views of return, correlation and risk. Recent decades have posed challenges to all types of investment views, suffering large losses from the increased asset price volatilities during the 2008 financial crisis and 2020 COVID-19 pandemic. In-between these two worldwide events, the oil price shock in 2014, globalization and multiple regional conflicts were significant drivers of capital market assumptions. Long-term investments are the safest options during an uncertain and changing landscape, as is the case now. However, a long investment horizon does not guarantee better or worse results in terms of risk-adjusted returns compared to different investment styles.

A crucial factor when evaluating the results of different long-term investment funds is a Strategic Asset Allocation (SAA) exercise that has a large contribution in generated returns. The foundations of SAA are based on academic literature from the 1960s (Mean Variance, etc.). More recent papers are combinations of literature from academia and the investment sector itself, which has generated papers based on practice and theory (Black-Litterman Model, Risk Parity, Balanced Portfolio etc.). More exotic types of SAA (Strategic Asset Allocation) could also employ Machine Learning algorithms such as Neural Networks and different types of clustering. However, this approach has not gained academic ground yet as investment literature very much depends on actually realized time series, which need to be at least 10 years in length to be considered worthy.

The speed of the changing economic landscape and corresponding changes to investment theory are very much different. New knowledge reveals and is added to academic literature only years after economic changes take place. Thus, simulations gained ground in investment literature, and practitioners use them frequently. Simulations and other statistical techniques are dependent on the quality and length of data, which in many emerging economies are not satisfactory. Moreover, using only statistical methods cannot bring alpha from a long period of time, as technical innovations are rapidly spread across competitors in the investment industry, which reduces the returns generated by individual funds using a certain statistical method. Thus, most investment funds try to generate alpha via the extensive and continuous research of ongoing investment trends through investing in human capital.

There exist only quantitative funds, but most frequently we meet funds that use a combination of statistical methods and research into investment trends to bring alpha for investors. We concentrate on the method that uses knowledge generated by Bridgewater which spans over 30 years of research in the investment industry, offering an investment formula for lowering risk given that return stays optimal compared to the traditional frontier technique. This method allows for a combination of statistical methods (Monte Carlo simulation) and derives capital market assumptions based on investor views. We will combine already existing statistical methods and knowledge of emerging economies to derive a procedure for long-term investors, aiding in portfolio optimization. We leverage statistical tools to reduce errors caused by the small range of the time series, which is characteristic of emerging economies. Adding expert judgement on economic developments, we improve the estimations of capital market assumptions.

In our research, we will focus on the biggest institutional investor in Georgia, which is the State Pension Agency, and we will challenge its Benchmark Portfolio to understand the implications of different asset allocation decisions (Pension Agency of Georgia, 2021). As a result of these observations, the long-term investor will have the technical and analytical capacity to analyze and assess the adequacy of both strategic and tactical asset allocation decisions through a macroeconomic lens.

In times of uncertainty and amid a changing political landscape, it is crucial to evaluate risks stemming from economic and political circumstances. Georgia remains a small, developing, open economy that is highly dependent on regional turbulence, which increases the need for understanding local capital markets given different scenarios. This research derives a framework that will benefit long-term investors exposed to GEL (the Lari, the Georgian currency) securities and enable policymakers to assess the risk-return profile of local institutional investors. In the near future, our framework can be used by many different investors in Georgia, both institutional and non-institutional.

2. Literature Review

The two core blocks that this research builds on are our macroeconomic modeling and the balanced asset allocation approach, which combined to create a complete framework of top-down asset allocation for long-term investors. Flavin and Wickens (2003)

showed that macroeconomic variables help to improve estimations of asset volatility, which in turn is a crucial factor for deriving optimal portfolio allocations either via a traditional approach or through the more exotic type of balanced portfolio framework (Shahidi, 2015) which is employed in this research. A more recent paper by Sebastian and Gebbie (2019) argued that macroeconomic variables help to explain equity market trends in the case of South Africa. Further research by Aithal et al. (2019) on Indian stock market indices showed that macroeconomic variables combined with modern data science techniques predict index movements with 87%–92% accuracy. The influence of macroeconomic variables on financial market trends is easy to justify. However, one should be careful in choosing explanatory variables for a specific economy, especially in the case of developed markets where the economic literature is small. We concentrate on the existing chain of papers produced by Maliszewski (2003) and the NBG working group, which are related to the Georgian economy specifically. For asset allocation purposes, we chose a balanced portfolio framework that arrives at a better risk-return profile than the current allocation of the pension fund portfolio, and shows that by balancing risk across different scenarios, funds can narrow the volatility of an investment portfolio.

This research concentrates on two-stage asset allocation diverting from the conventional methods that assume constant volatility and, as a result, a continuous efficient frontier. Timmermann and Blake's (2005) estimate improved after including the time-varying factor and showed that pension funds lost −0.2% per annum during market timing, based on a large panel of UK funds. A recent paper on the time-varying nature of risk by Díaz and Esparcia (2021) suggested deriving risk aversion parameters from time-varying risk premiums. More precisely, to take the time-varying nature of the frontier into account, this research estimates two portfolios derived from the different lengths of time for forecasting key variables. Using this approach, we are able to construct a conditional covariance matrix given the forecasted macroeconomic states in different scenarios.

With the current approach, portfolio risk is reduced by two fundamental factors: the time-varying covariance matrix; and balancing risk through possible scenarios (Shahidi, 2015). In multi-currency portfolios, it is possible to reduce risk by taking appropriate currency forward contracts (Topaloglou, Vladimirou, & Zenios, 2008). However, the Georgian currency market provides limited and expensive hedging instruments with forward contracts. Thus, we avoid this discussion as it cannot be practically replicated in our universe of asset classes. According to Topaloglou, Vladimirou, and Zenios (2008), besides reducing risk, multistage models also outperform single-stage models in terms of return. Another paper by Xiaoyue, Uysal and Mulvey (2022) showed that multistage models with risk parity and a mean-variance framework outperform fixed benchmarks on a risk-adjusted basis.

Moreover, these authors showed that a risk parity framework conceptually similar to our choice of balanced portfolio framework dominates mean-variance with a better sharp ratio (Xiaoyue, Uysal, & Mulvey, 2022). Finally, we chose a multistage model in a Balanced Portfolio framework that allows for a short-term tactical portfolio reacting to current macroeconomic developments and long-term target asset allocation that assumes the convergence of the economy to its steady state. As a result, long-term inves-

tors can choose the optimal allocation and short-term deviations of asset weights due to exogenous shocks in the economy.

The macroeconomic model consists of multiple components from which inflation and monetary policy paths are target variables for forecasting. Beltratti and Morana (2006) argued that inflation volatility is one of the key drivers of the breaking process in stock volatility. The inflation model rests on Maliszewski's (2003) paper, which underpinned price development dynamics and constructed a theoretical model for the Georgian economy. Although multiple other econometric models exist and could be integrated into this framework, we understand the implications of a small open economy that is well captured in the Maliszewski inflation forecasting model. As emerging markets are defined by specific characteristics, monetary policy channels are impaired; thus, the inflation rate reacts in particular ways. Montiel et al. (2010) indicated that emerging markets are characterized by weak institutional frameworks and the reduced role of securities markets. This causes key monetary policy channels to be impaired (Montiel, Spilimbergo, & Mishra, 2010). In this regard, the bank credit channel is dominant in most emerging countries due to low financial market development and the importance of bank lending to the private sector. This causes monetary policy rates to affect not only short-term rates, but also real economic variables (Abukaa, Alindaa, Minoiub, Peydrócd, & Presbiteroef, 2019). On the other hand, Barajas et al. (2018) argued that the mechanism of monetary policy transmission through credit channels could be weakened by remittance inflows that are likely to happen in emerging markets. Moreover, the efficiency of monetary policy in gouging inflation to its target depends on financial openness and economic globalization (Mendonça & Nascimentob, 2020). However, for emerging economies, it is a difficult task to manage external price shocks due to the high share of imports in trade balance and FX volatility. Recent literature has debated the notion that the difficulty for emerging economies in gouging inflation is derived from the fact that external price shocks have significant effects on domestic prices (Ha, Ivanova, Montiel, & Pedroni, 2019). Effiong et al. (2020) showed that a possible solution for better monetary transmission could be deepening financial sector development.

Technically estimating the monetary transmission mechanism for a small open economy is challenging. Therefore, we chose to follow the existing literature on the Georgian economy (Li, Adam, Berg, Montiel, & O'Connell, 2019). Another reason to use the Maliszewski model is derived from our goal of achieving the best possible estimate of monetary policy rules that the National Bank of Georgia (NBG) employs (NBG, Monetary Policy Reaction Function, 2016). This will allow better estimation of possible monetary policy dynamics given the forecasted inflation path in any given scenario. As a result, the ability to evaluate asset allocation decisions in different scenarios will be improved (Flavin & Wickens, 2003). Recent literature employing error correction mechanisms shows that stock market prices and macroeconomic indicators are in a long-run relationship (Kotha & Sahu, 2016; Lee & Brahmasrene, 2018; Misra, 2018).

3. Methodology

3.1. *The Balanced Portfolio framework*

Three fundamental factors mainly drive general principal asset class volatilities:
- Shifts in expected policy rate path (non-diversifiable).
- Shifts in investor risk appetite (non-diversifiable).
- **Shifts in the macroeconomic environment (diversifiable).**

As the first two sources of volatility are not diversifiable, long-term investments should seek diversification of macroeconomic factors that will result in the development of balanced returns over the investment horizon. The possibility of diversification of economic conditions is derived from the fact that different asset classes have different price responses to changes in unanticipated macroeconomic conditions, which appears not to be the case for Georgian capital market securities that are limited due to the early stage of development of the financial sector. The pricing function of every asset class incorporates expectations of GDP (gross domestic product) growth and inflation; thus, if what the market expects is not realized, then the price should change and reflect the new reality where economic conditions are different. Based on these two fundamental macro variables, we establish four different scenarios relative to market expectations, which are illustrated in Figure 1.

First, we assume that markets are functioning well and expected future economic environments are priced well into any asset class, which is why any realization of the future that was not expected will change asset class pricing. Even in the case of Georgia, where we have incomplete markets and low liquidity, there are still key players who are forming expectations about future economic conditions and affecting the pricing of assets. NBG is one of these players that affect the pricing of all GEL asset classes by forming expectations of future economic conditions and disclosing policy rate paths over medium-term horizons. If economic conditions change in a way that was not anticipated by NBG when setting the policy rate path, it will adjust its expectations and change the policy rate direction, which will alter the pricing of all GEL asset classes, including the Treasury and the Certificate of Deposit (CD).

"This diagram tied key principles together and became a template for All Weather. Much as a portfolio can be boiled down to three key drivers, economic scenarios can be broken down into four. There are all sorts of surprises in markets, but the general pattern of surprises follows this framework because the value of any investment is primarily determined by the volume of economic activity (growth) and its pricing (Inflation). Surprises impact markets due to changes in one or both of those factors" (Bridgewater Associates, 2012).
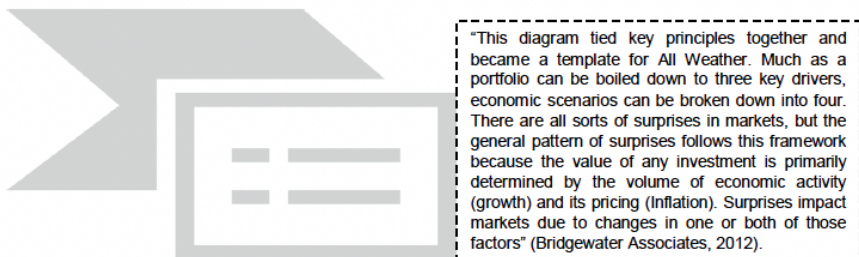
Figure 1. *Possible economic conditions based on a Balanced Portfolio*
Source: *Bridgewater Associates, 2012*

It is now essential to learn how different unanticipated economic conditions will affect different asset classes. This is where we get the opportunity to diversify and balance our investment portfolio. First, we show the general examples of asset class performance across different unanticipated economic conditions (inflation and growth scenarios). Then, we move closer to GEL securities for investment portfolios to decompose return structure and attach macroeconomic links to see the effects of different macro scenarios. This will help us to explore the opportunities for possible diversification even under such limited eligible assets.

A general example will include plain vanilla securities: Long-Term Treasury, Long-Term Treasury Inflation-Protected Securities (TIPS), Equity, and Commodities. Below, four tables (Table 1, Table 2, Table 3 and Table 4) summarize asset price movements given the realization of this scenario based on Balanced Portfolio research.

Table 1. *The effects or unanticipated economic conditions on Long-Term Treasury pricing*

Relative to market expectations	Treasury price feedback
High inflation	Declines
Low inflation	Rises
High growth	Declines
Low growth	Rises

Source: *Bridgewater Associates, 2012*

Table 2. *The effects of unanticipated economic conditions on Equity pricing*

Relative to market expectations	Equity price feedback
High inflation	Declines
Low inflation	Rises
High growth	Rises
Low growth	Declines

Source: *Bridgewater Associates, 2012*

Table 3. *The effects of unanticipated economic conditions on TIPS pricing*

Relative to market expectations	TIPS price feedback
High inflation	Rises
Low inflation	Declines
High growth	Declines
Low growth	Rises

Source: *Bridgewater Associates, 2012*

Table 4. *The effects of unanticipated economic conditions on Commodity pricing*

Relative to market expectations	Commodity price feedback
High inflation	Rises
Low inflation	Declines
High growth	Rises
Low growth	Declines

Source: *Bridgewater Associates, 2012*

3.2. The Balanced Portfolio's edge

The securities described above have different price responses to the unexpected economic scenarios realized. Therefore, investors implementing a balanced portfolio framework can construct an asset allocation strategy that will be neutrally balanced to changes in economic conditions. This can be achieved first by selecting the counterbalancing asset allocation classes and second by selecting balanced weightings between asset classes so that when the same macroeconomic environment causes one asset class to underperform, there are other asset classes in the portfolio that outperform its average returns so that it adequately compensates the portfolio loss. The key task left is to understand the market consensus view about economic conditions and how GEL-denominated asset classes are affected by different economic scenarios. This will allow for the selection of assets and respective weights to neutralize the effects of unexpected economic conditions. The remainder of the research describes how the consensus view about the economic conditions can be understood and linked to the performance of our investment portfolio.

3.3. Macroeconomic links to Benchmark Portfolio

To understand how the Macro Model is developed, we first deconstruct the Benchmark Portfolio into different return components and attach macroeconomic links to it, which are crucial for projecting possible portfolio performance across different scenarios.

To test our Macro Model, we took the current Benchmark Portfolio of the Georgia State Pension Agency for eligible asset classes: global equity (MSCI), GEL treasuries, and GEL CDs. We chose this Benchmark Portfolio because, first of all, it is actually in use, and its benefits are connected to millions of Georgian citizens who are members of the Funded Pension Scheme in Georgia.

3.4. Equity return macro channels

The global equity MSCI (Morgan Stanley Capital International) return part of the portfolio consists of the capital return (i.e., price appreciation/depreciation and dividend distribution) and FX (foreign exchange market; GEL exchange rate movement) components. It is easy to see that the capital return component completely depends on global

economic trends and company valuations. At the same time, FX is derived from domestic and regional economic developments. The GEL exchange market reacts to market movements generated by both domestic and regional agents. Later, we will demonstrate how NBG reacts to these market activities (only in its mandate to protect price stability), and how it is therefore a crucial player to be incorporated into our macroeconomic forecasting model. These relationships are summarized in Figure 2.
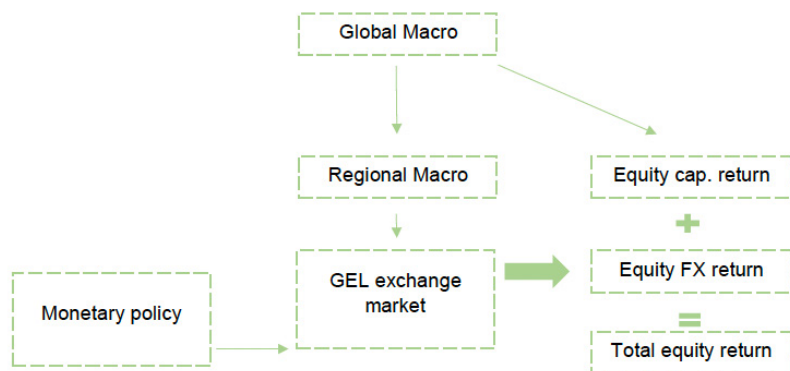

Figure 2. *Equity return macro channels*
Source: *Author's model description*

3.5. Treasury and CD return macro channels

The next more significant part of portfolio return is generated by GEL Treasuries and CDs, which are interconnected by credit risk premium. The role of market pricing in CD valuation also needs to be clarified. It is safe to assume that treasury prices are a function of the expected monetary policy rate and banks' liquidity objectives due to the REPO (repurchase agreement) agreement with NBG. The first part of the treasury pricing function depends on monetary policy objectives, which respond to the short-term expected inflation path and current economic activity in the form of an output gap. This component is explicitly modeled by estimating the monetary policy response function that outputs a forecasted medium-term policy rate path, which is further explained in the next section of this paper. The second part of treasury pricing is harder to estimate as it depends on banks' liquidity preferences due to the REPO operations for which treasuries are used.

For CD pricing, if we follow the book value principle, which mechanically "shuts down" volatility, then the macro-economic environment affects CDs through the credit risk factor. However, if we analyze CDs on a fair value basis then the following holds true: a) in a rising inflation and rising GDP growth environment, on the one hand, interest rate are rising which negatively affect CD prices. However, credit risk premium is declining, which, on the other hand, might have a positive effect. Therefore, the net effect

between the two shall be analyzed; b) under rising inflation and falling GDP growth, this is certainly negative for CD prices, while there are rising interest rates and rising credit risk premiums; c) under falling inflation and falling GDP growth, interest rates are falling, which is on the one hand positive. However, credit risks are increasing, so here it also depends on the net effect; d) under falling inflation and rising GDP growth, there is also a net effect between GDP growth rate (a positive effect on credit risk premiums) and falling inflation rates (a negative effect through the interest rate channel).

Finally, inflation enters this model by affecting the total real return of all portfolio assets. It is crucial to understand that inflation not only narrows real return but also affects the interest rate path by altering the NBG response function. The effect of FX rate on inflation and monetary policy response is another important relationship to estimate in the model. These described macro channels are summarized in Figure 3.
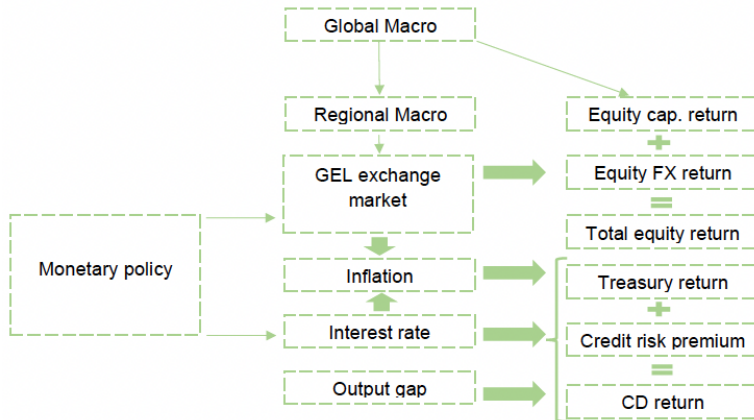

Figure 3. *Treasury & CD return macro channel*
Source: *Author's model description*

3.6. Framework overview

1. Inputs from the macroeconomic model are used to derive asset price developments for two horizons – one year and five years – and four different scenarios.
2. The resulting asset prices are then used to calculate the risk and return of assets in each scenario.
3. Calculated risk is used to balance risk in each scenario by taking asset weights to equalize weighted risk for every asset in the given scenario.
4. In this way, we receive four portfolios in each scenario that are each balanced in their respective scenario. These portfolios are assigned weights in such a way as to equalize the weighted risk of each portfolio.

5. We calculate final weights by multiplying the resulting weighted risk from steps 3 and 4 for each asset. This gives the final asset weights of the Balanced Portfolio, which is balanced in each scenario.

Inputs from the macroeconomic model:
$Inf_{t,s}$ – Monthly inflation
$MPR_{t,s}$ – Monetary policy interest rate
$FX_{t,s}$ – USD to GEL exchange rate
Here $t = 1, M$, where $M = 12 \text{ or } M = 60$ denotes elements in a monthly time series and
$s = 1,4$ refers to distinct macroeconomic scenarios.

Selected benchmark grade asset classes:
1. Georgian Zero-Coupon Certificate of Deposit (CD) with 24 months of maturity.
2. Georgian Zero-Coupon Certificate of Deposit (CD) with 60 months of maturity.
3. Georgian Treasury Note with 60 months maturity.
4. Foreign equity – iShares MSCI World ETF (URTH).
The selected example follows the current low-risk benchmark portfolio of the Pension Agency of Georgia.

Other inputs for the Monte-Carlo simulations

$YC_{t,n}$ – the Georgian Lari Yield Curve

$CDYC_{t,n}$ – the Georgian CD Yield Curve

$PE_{t,n}$ – Equity prices in USD

Here $t = 1, M$, where $M = 12 \text{ or } M = 60$ denotes elements in monthly time series and n is the index of instance in the Monte-Carlo simulation.

Both the Georgian Lari Yield Curves and the Georgian CD Yield Curves are represented using the Nelson-Siegel parametric model:

$$y(m) = \beta_0 + \beta_1 \frac{1 - \exp(-m/\tau)}{m/\tau} + \beta_2 \left(\frac{1 - \exp(-m/\tau)}{m/\tau} - \exp(-m/\tau) \right) \ (1)$$

With the fixed value of $\tau = 1.39237$ and m being the maturity in years.

The link between forecasted macroeconomic parameters and the Monte-Carlo simulations
While the forecasted USD to GEL exchange rate is directly used to convert simulated equity prices into GEL, forecasted monthly inflation is used to obtain inflation-adjusted real returns:

$$Rr_{t,s} = \frac{Rn_{t,s}}{1 + Inf_{t,s}}$$

here $Rr_{t,s}$ and $Rn_{t,s}$ are the real and nominal returns for the $t - th$ month and s scenario, respectively.

We empirically estimate the average difference between the monetary policy interest rate and the Georgian Lari yield at 1-week maturity, and obtain 0.002695. To apply the forecasted scenarios to the simulated Georgian Lari yield curves and Georgian CD yield curves, we adjust β_0 (in equation (1)) for each yield curve as follows:

$$\hat{\beta}_0 = \beta_0 + MPR - YC(m) + 0.002695 \ (2).$$

Here, $\hat{\beta}_0$ is the adjusted value of β_0 and $YC(m)$ is the Georgian Lari yield at 1-week maturity.

Constructing the balanced portfolio:
Using the Monte-Carlo simulations, we calculate standard deviations $\sigma_{i,s}$ and returns $r_{i,s}$ for each asset class in each scenario.

Next, we define the weights of asset classes in each scenario to allocate equal risk to each selected asset class:

$$W_{i,s}^a = \frac{\frac{1}{\sigma_{i,s}}}{\sum_{i=1}^n \frac{1}{\sigma_{i,s}}} \ (3)$$

Here, $W_{i,s}^a$ is the normalized asset class weights, and n is the number of selected assets ($i = 1 .. n$).

Once we have the weights of each asset class, we use the Monte-Carlo simulations for each portfolio with different scenarios and obtain returns r_s^p and STDs σ_s^p.

The next step toward finding a balanced portfolio within all scenarios is to define the weights of each scenario, so that risk allocation within scenarios is equalized:

$$W_s^p = \frac{\frac{1}{\sigma_s^p}}{\sum_{s=1}^4 \frac{1}{\sigma_s^p}} \ (4),$$

Where W_s^p is the normalized weight of s scenario.
Then, the weights of assets in final balanced portfolio W_i are calculated as follows:

$$W_i = \sum_s W_{i,s}^a \cdot W_s^p . \ (5)$$

3.7. The macroeconomic model

From the macroeconomic channels developed in the previous section, we see key economic variables and their interconnected relationships that are important to project portfolio performance. Besides careful treatment of the macroeconomic forecasts of each variable, it is crucial to understand that their relationship should be taken as one whole organism and not as separate parts of one structure, since we often observe circular refer-

ences in macroeconomic theory. A good example of this could be inflation and economic activity, which are interconnected by virtue of the macroeconomic constructs that we know at this point.

The starting point of forecasting is first to understand the current economic stance and analyze possible medium-term developments from that standing. Based on this view, we first developed a quarterly macroeconomic report that helps to analyze key macroeconomic trends and relationships. In the previous section, we described target macroeconomic variables that affect benchmark portfolio performance, and that are listed below:

a) Global macro – affects equity markets and regional economies from which it transmits to the Georgian economy.

b) GEL exchange market – affects equity FX return, inflation rate, and thus monetary policy, while monetary policy decisions are affected by foreign flows and monetary policy.

c) Inflation – affects the real return of all assets and formulates the inflation expectations that are key variables for the monetary response function. It is affected by the FX rate and interest rate channels through monetary policy, while also being influenced by domestic economic activity.

d) Output gap – a proxy for economic activity and the cyclical position of the economy. The final structural view of this relationship is described in Figure 4.
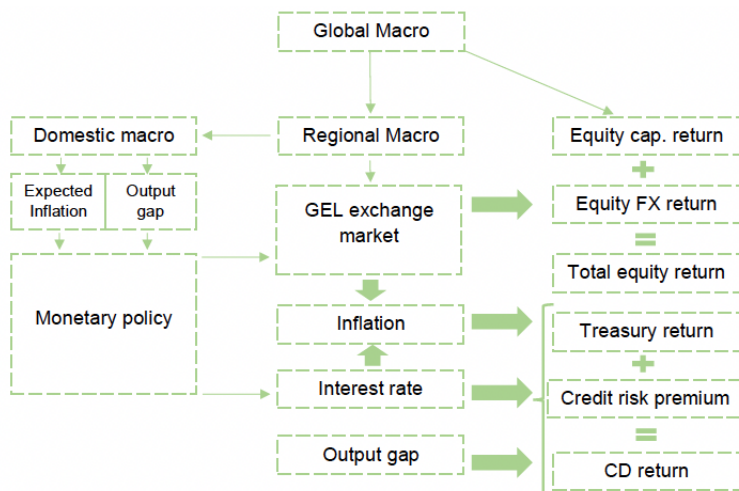

Figure 4. *The final structure of macroeconomic links to our investment portfolio assets*
Source: *Author's model description*

3.8. Estimating the monetary policy response function

At this point, domestic macro developments are the most important for analyzing return projections as the portfolio is 80% exposed to GEL securities. From the domestic

macro, we first focus on monetary policy as it influences both interest rate path and, indirectly, FX rate (when pressure on prices is high), which finally has an effect on real interest rates through inflation. We take the Taylor Rule type function described by NBG (NBG, Monetary Policy Reaction Function, 2016) equation 6 below to forecast the policy rate path. To estimate equation 6, we need to forecast inflation after four periods (i.e., expected inflation π_{t+4}) and estimate the output gap ($\hat{Y}$).

$$i_t = \gamma_1 i_{t-1} + \gamma_2 i_t^N + \gamma_3 (\pi_{t+4} - \pi_t^{tar}) + \gamma_4 \hat{Y}_t + \varepsilon_t \quad \textbf{(6)}$$

- i_t is the policy rate (Target variable estimated using OLS procedure in Python)
- i_t^N is a neutral policy rate
- π_{t+4} is expected inflation after four periods (forecasted with VECM model in Python)
- π_t^{tar} is target inflation
- $\hat{Y}_t$ is the output gap (currently estimated with HP filter in R, which will be updated later with a semi-structural Kalman filter)

Despite realizing the importance of a full structural model that reflects all important macroeconomic relationships, we first start with a semi-structural vector error correction model. VECM equation 7 is based on NBG (NBG, FPAS, 2016) and IMF (International Monetary Fund) working papers (Maliszewski, 2003). There are a few reasons for choosing the VECM model: first and foremost, it is developed by NBG modeling documentation, which is important in reflecting the expected inflation that monetary authorities project, which will help to estimate the monetary policy response function (Taylor Rule). Secondly, structural model development takes more time, and these models need more accuracy in terms of short-term forecasting versus VECM models that are efficient in short-term forecasting. Finally, we combine VECM with a Taylor Rule type function and an output gap estimated by a HP filter (this can be updated by a semi-structural Kalman Filter with New-Keynesian Philips Curve). In this setup, we forecast the next 24 months' inflation based on VECM and estimate the monetary policy response function where we input forecasted inflation that finally yields a policy rate projection. All models are built in Python and excel, which helps to maintain flexibility in estimation techniques.

$$\Delta p_t = \sum_{i=1}^{k} p_i^p \, \Delta p_{t-i} + \sum_{i=1}^{k} p_i^m \, \Delta m_{t-i} + \sum_{i=1}^{k} p_i^e \, \Delta e_{t-i} + p^f \, \Delta p^f{}_t + p^o \, \Delta p^o{}_t + \mu * ecm_{t-1} + \sum_{i=1}^{k} D_i + u_t \quad \textbf{(7)}$$

- $\sum_{i=1}^{k} p_i^p \, \Delta p_{t-i}$ describes the dependence of prices on their own lagged changes.
- $\sum_{i=1}^{k} p_i^m \, \Delta m_{t-i}$ describes the dependence of prices on the lags of change in money supply (Δm_{t-i}).
- $\sum_{i=1}^{k} p_i^e \, \Delta e_{t-i}$ describes the dependence of prices on the lags of change in the effective exchange rate (Δe_{t-i}).
- $p^f \, \Delta p^f{}_t$ describes the dependence of prices on the current period change in relative food cpi (Δp^f).
- $p^o \, \Delta p^o{}_t$ describes the dependence of prices on the current period change in relative oil price index (Δp^o).
- $\mu * ecm_{t-1}$ is a short-term adjustment factor of prices to the long-term equilibrium after the previous period's deviation.
- $\sum_{i=1}^{k} D_i$ is a dummy variable to adjust the seasonality of data in the model.

3.9. Macroeconomic scenario analysis

Macroeconomic scenarios are chosen to first cover the most likely/consensus scenario (baseline) for next year and then deviations from it based on economic activity and the possible depreciation of the Georgian Lari.

3.9.1. Baseline scenario

As a result, the baseline forecast reflects the consensus view that economic activity will continue to strengthen in 2023, and global commodity price pressure will persist during 1H23. Also, one-off factors such as the utility subsidy effect on inflation during 1Q22 are included in all scenarios. Thus, model inputs of exogenous variables (real growth, commodity price & oil price) are calibrated according to the market view. This method is also used for subsequent scenarios. In the baseline scenario, high inflation continues at the end of 2022 and in 1Q23, and then declines rapidly as one-off factors (utility subsidy, commodity price pressure) fade away, as shown in Figure 5. As a result, tight monetary policy is maintained during 1H23, which then declines gradually, shown in Figure 6.
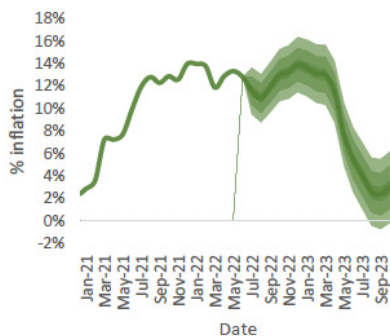

Figure 5. *Inflation forecast (baseline)*
Source: *NBG*
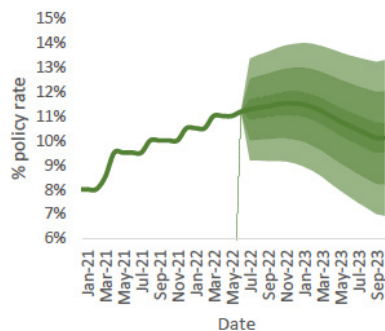
Figure 6. *Policy rate forecast (baseline)*
Source: *NBG*

3.9.2. High inflation and high growth scenario

The following scenario assumes higher-than-expected (baseline) growth, thus pushing prices slightly higher than in the baseline. In the Balanced Portfolio framework, this scenario constitutes higher-than-expected growth and inflation, shown in Figure 7. This can be justified by improved business/consumer confidence due to improved credit ac-

tivity and better-than-expected inflows. As a result, the monetary policy forecast yields higher values for 1H23 and starts to decline later than in the baseline, shown in Figure 8.
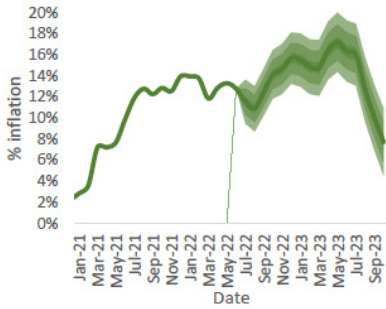

Figure 7. *Inflation forecast (high inflation–high growth)*
Source: *NBG*
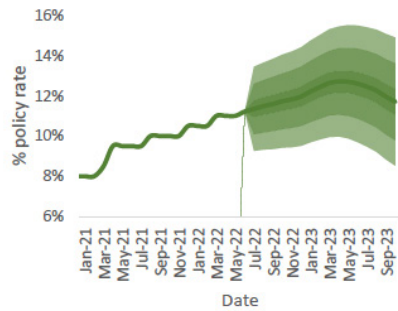
Figure 8. *Policy rate forecast (high inflation–high growth)*
Source: *NBG*

3.9.3. High inflation and low growth (FX) scenario

Similar to the high growth and high inflation scenario, we could assume another FX depreciation and forecast inflation and policy rate given this assumption, as shown in Figure 9 and Figure 10. This serves another purpose of generating high inflation, low growth economic conditions, and evaluating portfolio performance according to the Balanced Portfolio framework. Also, it reflects our belief that continued CA (Cash Account) deficit and corresponding pressure on FX and on prices will continue in the next decade, which will be reflected in the volatility of both inflation and FX rate.

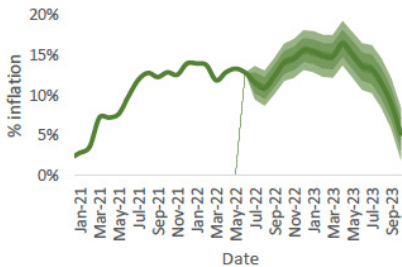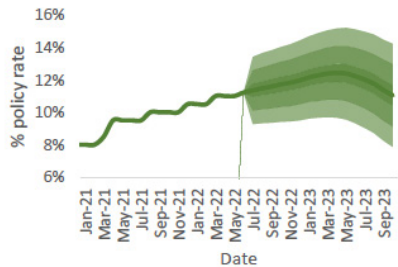**Figure 9.** *Inflation forecast (high inflation–low growth-FX)*
Source: *NBG*

Figure 10. *Policy rate forecast (high inflation–low growth-FX)*
Source: *NBG*

3.9.4. Low inflation and low growth scenario

The last scenario assumes lower-than-expected growth, thus a faster decline in prices and, accordingly, a fast exit from tight monetary policy as shown in Figure 11 and Figure 12. This scenario is useful to evaluate asset class performance in a low inflationary and growth environment, finally allowing us to see room for diversification, if any.
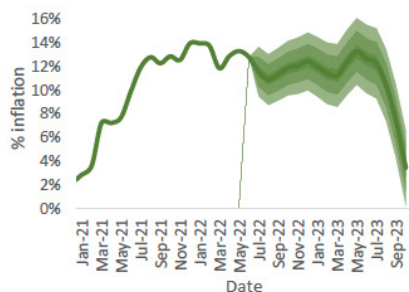

Figure 11. *Inflation forecast*
(low inflation–low growth)
Source: *NBG*
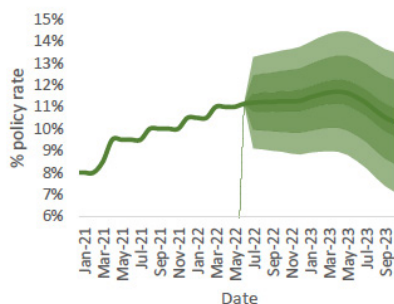
Figure 12. *Policy rate forecast*
(low inflation–low growth)
Source: *NBG*

4. Results

4.1. The results of scenario analysis with a Benchmark Portfolio

To use macroeconomic scenarios in the Monte-Carlo simulation, the forecasted policy rate was taken as the average of simulated GEL yields. In this way, we gauged simulation around the forecasted policy rate. Inflation was directly linked to simulated asset prices during real return calculation. At the same time, the projected FX rate was used when converting the MSCI simulated price to the GEL equivalent. FX rate is the extra source of income, as GEL rates are volatile due to the continued CA deficit.

Before presenting results, we list eligible assets and their performance expectations across different scenarios:

- **Georgian government treasuries** – a) under a rising inflation and rising GDP growth environment, treasuries tend to underperform, while there are expectations of raising interest rates; b) under rising inflation and falling GDP growth, again expectations of raising interest rates drive its underperformance; c) on the other hand, under falling inflation and falling GDP growth, treasuries tend to overperform, while interest rate expectations are declining; d) the same overperformance holds true under falling inflation and rising GDP growth.

- **CD** – if we follow the book value principle, which mechanically "shuts down" volatility, then the macro-economic environment affects CDs through the credit risk factor. However, if we analyze CDs on a fair value basis, then the following holds true: a) under a rising inflation and rising GDP growth environment, on the one hand, interest rates rise, which negatively affects CD prices. However, the credit risk premium declines, which, on the other hand, might have a positive effect. Therefore, the net effect between the two shall be analyzed; b) under rising inflation and falling GDP growth, this is certainly negative for CD prices, while there are rising interest rates and rising credit risk premiums; c) under falling inflation and falling GDP growth, interest rates are falling, which is on the one hand positive. However, credit risks are increasing, so here it also depends on the net effect; d) under falling inflation and rising GDP growth, there is also a net effect observed between GDP growth rate (a positive effect on credit risk premiums) and falling inflation rates (a negative effect through the interest rate channel).
- **GEL-denominated international equity** – here, it shall be highlighted that foreign equity prices themselves are neutral to the Georgian macro-economic environment and, therefore, only through FX can macro conditions affect the Benchmark Portfolio. If inflationary pressures are brought by the FX channel into the economy, then this works as a positive diversifiable in the portfolio. On the other hand, if inflationary pressure is caused by high real GDP growth, this is the time when the other FX effect can be neutral or even negative due to the appreciation effect.

4.2. The performance of the Benchmark Portfolio in the baseline scenario

Looking at the results, we can derive what types of relationships between asset classes and macro variables hold true. Despite similar outcomes, portfolio performance is evaluated for two investment horizons – 1-year and 5-year – and the final results show risk-return characteristics which differ in scale only. The baseline scenario forecasted increasing inflation during 2H22–1Q23 that negatively affects return, but an important consideration is the high initial interest rates at which the portfolio will be constructed. Therefore, despite tight monetary policy during 2H22, declining rates have a stronger positive return factor than high inflation at the start of the investment horizon. This is why the benchmark portfolio outperforms the baseline scenario (First bar on Figure 13, Figure 14, Figure 15, and Figure 16).

4.3. The performance of the Benchmark Portfolio in a high inflation low growth (FX) scenario

In this scenario, benchmark performance is second best due to higher-than-expected inflation pushing the policy rate slightly higher than the benchmark. Here, high inflation stems from FX depreciation paired with low economic activity. However, it is interesting

that FX depreciation, which drives inflation up, positively affects portfolio performance through Global Equity (MSCI) FX return. This diversification gives a slight edge over the 4.3 scenarios during the 1-year horizon, while in 5 years it results in similar returns as 4.3. With political instability and weak foreign flows (a persistent CA deficit), it is crucial to treat FX diversification carefully as the next decade might not be too different for the Lari.

4.4. The performance of the Benchmark Portfolio in a low inflation low growth scenario

In terms of return, this scenario is the second worst for benchmark portfolios, while risk results are slightly mixed due to different shock effects in the first years and then convergence to a neutral policy rate. It should be noted that in the longer horizon return in this scenario improves due to declining rates.

4.5. The performance of the Benchmark Portfolio in a high inflation high growth scenario

This scenario is similar to the previous one and is underperforming due to high inflation and a faster increase in interest rates compared to the baseline. This means that introducing diversifiers such as local FX-denominated equity, fixed income, and commodity could be beneficial as they overperform in strong growth environments and could balance the decline of portfolio return in this scenario, which is also due to the FX effect.
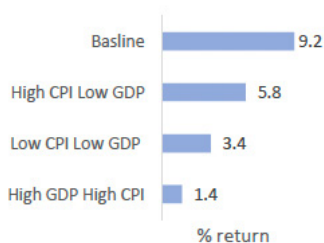

Figure 13. *Benchmark portfolio performance across macro scenarios (1-year returns)*
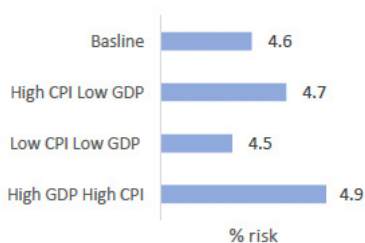
Figure 14. *Benchmark portfolio performance across macro scenarios (1-year risk measures)*
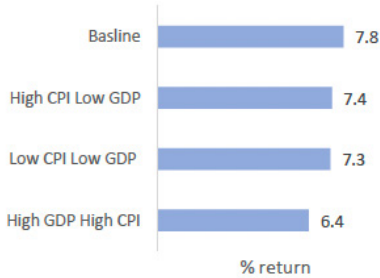
Figure 15. *Benchmark portfolio performance across macro scenarios (5-year returns)*
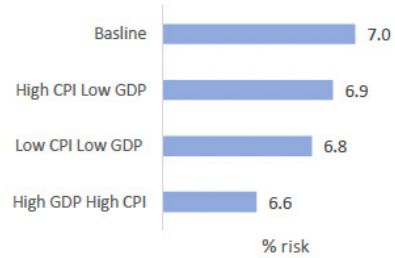
Figure 16. *Benchmark portfolio performance across macro scenarios (5-year risk measures)*

Source: *Author's calculations*

To test the credibility of our macro model and corresponding Monte-Carlo simulation results, we looked at similar periods of high inflation and high growth with corresponding FX depreciation in 2017 and derived back-testing results. From Table 5, we can observe that the diversification effect that we discussed exists in real data and shows a similar 1% improvement over a non-MSCI portfolio. Moreover, we validated that a low inflation, low growth environment conclusively beats a high inflation, high growth environment, which was one of the worst scenarios in the Monte-Carlo generated results.

Table 5. *Back-testing results of the Benchmark Portfolio:*

Back-testing results for 2017 (high inflation, high growth with FX depreciation)		Back-testing results for 2012 (low inflation, low growth)	
Assets	**Return**	**Assets**	**Return**
CD60% + GOV20%	6.7%	**CD60% + GOV20%**	22.4%
CD60% + GOV20% + MSCI20%	7.6%	**CD60% + GOV20% + MSCI20%**	20.5%
CD	5.9%	**CD**	22.0%
GOV	9.3%	**GOV**	23.8%
MSCI	10.6%	**MSCI**	13.1%

4.6. Deriving a Balanced Portfolio

As we see in the results of the Benchmark Portfolio, it has high volatility across different economic scenarios that results in the unfair distribution of gains to participants due to large differences when withdrawal occurs. To narrow risk for all economic scenarios and obtain a better return profile, we derived two portfolios that will be compared to the

current Benchmark Portfolio in different scenarios and in the historical context. Balanced Portfolio 1 is optimized by looking at one-year look-ahead data, while Balanced Portfolio 5 is constructed using a five-year look-ahead. The resulting weights are shown in Figure 17 and Figure 18:
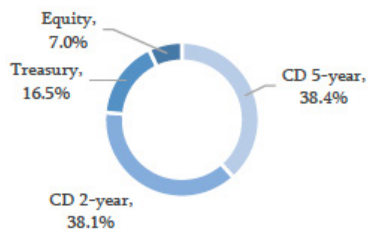
Figure 17. *Balanced Portfolio 1 weights*
Source: *Author's calculations*
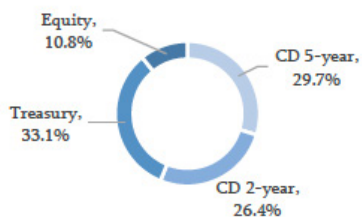
Figure 18. *Balanced Portfolio 5 weights*
Source: *Author's calculations*

In the figures below, we see that both balanced portfolios outperform the benchmark. In the short-run tactical allocation case, Balanced Portfolio 1 has a lower risk in all scenarios and dominates on returns except in the high inflation low GDP case (Figure 19 and Figure 20). Thus, it creates a better risk-return profile and is the dominant benchmark in all scenarios. In the long-run asset allocation case, Balanced Portfolio 5 has lower risk and dominates based on return in all scenarios, without exception (Figure 21 and Figure 22). In the historical context, while both balanced portfolios outperform the benchmark slightly, it is evident that the volatility of the benchmark is larger, which would have resulted in an unfair allocation of gains to participants withdrawing at different times (Figure 23).
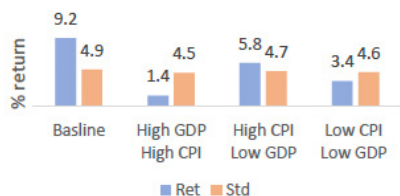
Figure 19. *Benchmark Portfolio*
performance across macro scenarios
(1-year)
Source: *Author's calculations*

Figure 20. *Balanced Portfolio 1*
performance across macro scenarios
(1-year)
Source: *Author's calculations*
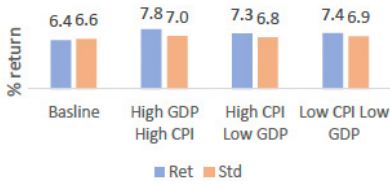
Figure 21. *Benchmark Portfolio performance across macro scenarios (5-year)*
Source: *Author's calculations*

Figure 22. *Balanced Portfolio 5 performance across macro scenarios (5-year)*
Source: *Author's calculations*
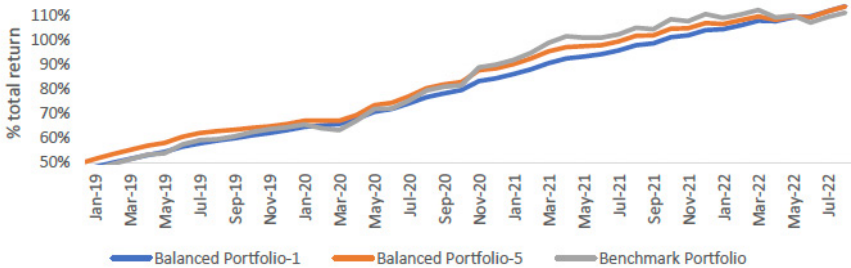
Figure 23. *Portfolio historical performance*
Source: *Author's calculations*

5. Discussion

5.1. Recommendation

From the results of Balanced Portfolio comparisons, it is evident that the benchmark could be improved even in the current asset mix. First of all, a tactical allocation exercise should allow for maintaining optimal tilting versus long-term strategic allocations, which will improve the risk-return profile of the portfolio. Secondly, looking from the risk side and balancing across scenarios shows that the equity part of the Benchmark portfolio is weighted too strongly; thus, lower allocation in that direction can improve the portfolio.

5.2. Future research directions

We accept that the nature of forecasting is not an exact science and depends on both expert judgment and the careful use of economic models. That is why projected variables should stand on a mixture of structural and plain vanilla econometric models. At this

point, we have developed a framework that estimates the policy rate path and corresponding forecasted inflation rate. Currently, real GDP is projected by taking a ballpark consensus view of yearly growth and distributing it across months based on previous data on economic activity. This can be replaced by an econometric model based on Principal Component Analysis across different methods of GDP calculation. As a result, economic activity will be forecasted based on multiple models, which will improve forecast accuracy. The next steps can also involve replacing the HP filter with a semi-structural Kalman-Filter that can be used for output gap estimation. In the future, we also see the need for developing individual company risk assessment frameworks that could be a mixture of Bloomberg and Fitch risk models. This can help to improve counterparty risk valuation and credit risk premium estimation for CD securities. All of the above techniques will improve estimation accuracy and might be a good source of validation for this research. The natural continuation of this paper is to test the framework across different developing markets and understand the similarities/differences of this group. In this research direction, key points could involve the effects of different monetary policy regimes (tightening/expansionary) that very much determine the returns of domestic market instruments. Another interesting topic for future research in the area of emerging market securities is to understand the effects of FX volatility on the multi-currency portfolio – i.e., estimate the correlation between domestic and foreign currency denominated assets to achieve optimal diversification benefits from asset allocation.

6. Conclusion

Performance across different scenarios exposed the weaknesses of the current Benchmark Portfolio, which tends to perform poorly during a higher-than-the-market-expected growth environment. The underperformance of this portfolio in the high growth scenario can be balanced by introducing asset classes that perform well in these settings. It appears that a high growth scenario is favorable for GEL corporate fixed income, domestic FX-hedged equity (TBC & BOG) and international instruments (TIPS, Commodity, etc.). During a "High inf. (FX)" scenario, increasing exposure to FX denominated assets could be a balancing factor due to the frequent GEL depreciation that benefits a foreign asset portfolio, while corresponding high inflation benefits GEL securities through monetary policy tightening. Thus, domestic FX-hedged equity can balance portfolios in both high inflation-growth and high inflation-FX depreciation cases. Also, the introduction of GEL inflation-linked securities to the market can bring a slight edge to the return, and improve the balance of the portfolio.

Possible diversification factors and their performance in different macroeconomic conditions are listed below:

- Georgian Corporate Fixed Income – has similar performance as CDs. Moreover, cause-effect channels on credit risk premiums are much more direct.
- Ref-rate linked deposits – this is difficult. Results depend on the net change between nominal rates and inflation. Thus, in inflationary scenarios, nominal interest rates rise. However, this does not have any effect on bond prices in nominal

terms. However, if inflation is rising at a higher rate, then the net effect will be negative. In addition, GDP growth positively affects this while credit risk premiums are decreasing and there is a fixed credit risk premium. On the other hand, GDP decline affects this through the credit risk channel.

- FX-hedged Georgian Equity (TBC and BOG) – a) inflation growth has a negative effect, while the cost side, through an increase in the FX effect and a rise in the IR effect, increases; b) GDP growth is positive while the cost of risk is decreases and repayments increase.

Although the Georgian market is in its first stages of development in terms of liquidity and the variety of its instruments, institutional and retail investors can replicate the same portfolio due to the base cost being very low for both investor types, thus benefiting from the insights that result from this paper. The modernization of the market around the globe and the reduction of fees for international instruments is reflected in Georgian markets, as brokerage companies provide low-cost trading platforms (partnered with SAXO BANK, DriveWealth etc.). For domestic securities, local brokerage companies provide channels for retail investors with low fee structures. The accessibility of instruments and taxation benefits are partly a result of the country's policy objective of financial market development, declared both by the Georgian Ministry of Finance and the National Bank of Georgia.

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THE MANAGER'S ROLE IN JOB SATISFACTION DUE TO MULTI-MEDIATION EFFECTS

Rafael BOLIVAR[1]

University of Pamplona, Pamplona, Colombia
Email: rbolivarl@unipamplona.edu.co
Phone: 57 300 770 22 90

Gonzalo MORENO

University of Pamplona, Pamplona, Colombia
Email: gmoren@unipamplona.edu.co

Deward RICO

Francisco de Paula Santander University, Ocaña, Colombia
Email: dwricob@ufpso.edu.co

Abstract: *Job satisfaction has been measured, analyzed, and understood in different dimensions in previous works. However, this work analyzes it from the broader perspective of the organization. This study analyzed data from 364 respondents belonging to a public university through a survey that covered the following six dimensions: salary compensation, working conditions, the manager's role, co-workers' relationships, labor welfare & promotion, and task & process. An SEM model using AMOS V23 contrasted seven hypotheses to evaluate the direct or mediating effect of the manager's role on the other five dimensions. The manager's role results in a direct and strong effect on the relationships between co-workers and in the labor welfare & promotion dimension. A direct and moderate effect was observed on work conditions and tasks & processes. The indirect effect of the manager's role on the salary dimension was observed, along with an effect of total mediation on the dimensions of labor welfare & promotion and work conditions. This study contributes to a holistic view by providing an understanding of the manager's role in job satisfaction, clarifying the interactions between the six organizational dimensions, and highlighting the*

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1   *Corresponding author: Rafael Bolivar, University of Pamplona, Pamplona, Colombia,*
     email: rbolivarl@unipamplona.edu.co

relevance of styles of manager that lead to organizational growth and job satisfaction. Finally, the limitations associated with this research are also discussed.

Keywords: *job satisfaction in public universities, labor-management relations, mediation of manager's role, mediator's effect on job satisfaction, SEM model.*

JEL Code: *C15, M54*

1. Introduction

Job satisfaction is the broadest issue researched in the managerial (Özpehlivan & Acar, 2016; Yang & Kassekert, 2010), human resources, productivity (Bakotić, 2016), performance (Bakotić, 2016; Davidescu et al., 2020; Eyupoglu et al., 2018), sustainability, and flexibility (Davidescu et al., 2020) administrative areas. It is classified as involving work attitudes – contributors that influence effectiveness, work motivation, and behaviors (Chun et al., 2019; Harrison et al., 2006; Yang & Kassekert, 2010) – and both academic and managerial solutions to this organizational issue emerge in the business field (Özpehlivan & Acar, 2016). A famed concept of job satisfaction is the notion of "a pleasurable or positive emotional state resulting from the appraisal of one's job experiences" (Locke, 1976). However, the concept of job satisfaction is multidimensional and transcultural. Broadly, it can be considered to mean the extent to which, and why, employees like their job (Fritzsche & Parrish, 2005). It is a predictor of productivity and performance (Judge et al., 2001; Kampkötter, 2017; Patterson et al., 2004; Whitman et al., 2010), and involves both negative feelings and attitudes towards the job and positive attitudes towards the organization, co-workers, and job (Sypniewska, 2014). In fact, there are hundreds of definitions related to the concept of job satisfaction (Davidescu et al., 2020). Many researchers have observed that job satisfaction is connected with personality trials (Judge et al., 2002; Kampkötter, 2017; Törnroos et al., 2019), individual working factors, living environment (Bakotić, 2016), performance-related pay systems (Bryson et al., 2014; Kampkötter, 2017), and the efficiency and output of employees (Özpehlivan & Acar, 2016). Moreover, there are many differences in its constructs and measurement scales, and some instruments applied to Western cultures have been translated and applied without bearing in mind cultural discrepancies (Özpehlivan & Acar, 2016).

A high job satisfaction level implies that the job provides workers with favorable aspects such as: challenges, good pay, diversity, security, an agreeable working atmosphere, autonomy, and the recognition of the worker's contribution to the organization's progress (Özpehlivan & Acar, 2016; Sypniewska, 2014). Organizations rely on employees with the capacities of creativity and commitment, the ability to overcome any obstacle in the realization of specific jobs, the initiative to assist their colleagues and superiors, and the delivery of extraordinary performance (Bakotić, 2016). As a consequence, this brings the fulfillment of their objectives and an increase in their productivity and performance. Moreover, job satisfaction is a source of innovation and autonomy in public organiza-

tions (Demircioglu, 2021). On the other hand, dissatisfied employees can lead to layoffs, absenteeism, decreased effectiveness, performance and discipline problems, the creation of isolated groups, and high employee turnover, causing departures from the organization (Özpehlivan & Acar, 2016; Demircioglu, 2021). Ensuring employee satisfaction in the organization is one of the most critical managerial tasks. With this in mind, employees can increase efficiency and performance, contributing to the organization's progress. Employees are satisfied when they are convinced of the manager's backing and business competence. For this, it is necessary to define job satisfaction in measurable constructs that contemplate different factors that can be adjusted through actions or strategies led by management.

Currently, the statistical tools used in this research area are migrating from correlational analysis between indicators belonging to dimensions towards the proposal of structural equation modeling (SEM) or partial least squares (PLS) statistical models that empirically explain possible mediations between dimensions. Previously, researchers have proposed models that define the comprehensive association between job satisfaction and diverse dimensions such as: public service motivation and person-organization fit (Thuy & Phinaitrup, 2021), leadership styles and different dimensions (Braun et al., 2013; Chan, 2019; Misra & Srivastava, 2018; Mwesigwa et al., 2020; Ozturk et al., 2021; Wong & Laschinger, 2013; Yang et al., 2019), job variety, organizational support and turnover intention (Huang & Su, 2016; Jolly et al., 2021), supervisor cooperation or career growth and work atmosphere (Ashraf, 2019), social support and emotional labor (Asumah et al., 2019), HR practices and employee performance (Jawaad et al., 2019; Omar et al., 2017; Stirpe et al., 2022), leaders' and followers' political skills (Wang & McChamp, 2019), job embeddedness and affective commitment (Yang et al., 2019), organizational justice and employee outcomes (Mashi, 2018), burnout in job and task performance (Kim et al., 2017), and supervisor relationship and resources (Elfering et al., 2017). These models take into account dimensions as diverse as the concept of job satisfaction itself; however, these different perspectives, empirically supported by the data obtained, profoundly contribute to broadening the construct of job satisfaction. In fact, these models provide practical guidelines for defined sectors and populations which are applicable through organizational strategies. Our research clarifies the multiple mediating effects on six defined dimensions of job satisfaction, proposing a model focused on the manager's role regardless of style and hierarchical level based on data obtained from higher education workers in a country with an emergent economy. The following six dimensions define job satisfaction: salary, work conditions, manager's role, co-workers' relationships, labor welfare & promotion, and task & process. These dimensions were defined via bibliographical references and interviews with executive coaches, directors of human talent departments, and organizational psychologists. We propose that the manager's role influences the other five dimensions, and structural analysis was used to define this direct influence and the mediations between the different dimensions. It is essential to highlight that the relationship between those dimensions is complex, and published research has not contributed to unveiling the connections among these six dimensions.

2. Literature Review

Several researchers have proposed SEM and PLS models concerning job satisfaction, including different approaches obtained from diverse economic sectors and cultures. However, in the bibliographical review, no information has been found on a model to explain the direct or mediating effect of the manager's role on several dimensions of the job satisfaction construct. Researchers have explained the effect of managerial leadership on job satisfaction, but leadership style is a characteristic of this role. These researchers define the effects of different types of leadership (L) on job satisfaction, mediated by dimensions such as work engagement for employee L (Ozturk et al., 2021), trust in the supervisor and the team for transformational L (Braun et al., 2013), organizational commitment for transformational and transactional L (Mwesigwa et al., 2020), personal effectiveness for transformational L (Misra & Srivastava, 2018), job embeddedness and effective commitment for entrepreneurial L (Yang et al., 2019), level of fun experienced at work and work engagement for participative L (Chan, 2019), and structural empowerment for authentic L (Wong & Laschinger, 2013). As different leadership styles are assumed by the managers within each organization, even an individual manager can manifest a mixture of styles, or can take on other styles depending on the situation. In this study, the manager's role was not based on the behavior of leaders depending on a specific style. Instead, it focused on skills that different styles can share. In addition, to consider a construct of job satisfaction adapted to one's own culture (Özpehlivan & Acar, 2016), different factors were taken into account, such as: type of work, promotion and educational opportunities, leadership style, co-workers' relationships, supervisors and feedback, earnings, position in the company, working conditions, activities and tasks, security, permanent employment, workload, and working hours (Bakotić, 2016; Sypniewska, 2014).

The manager's role in the relationship between management and workers is significant in the organization and directly impacts job satisfaction in various ways (Özpehlivan & Acar, 2016); it implies a healthy relationship, practical procedures, setting goals, feedback (productivity), respect (Sommer & Kulkarni, 2012), and forming a harmonious work atmosphere (Ashraf, 2019; Shu et al., 2018). The impact of the manager's role is diverse: it includes the well-being of employees and the worker's participation in organizational decisions, which affects job satisfaction positively (Wood et al., 2012). It also creates the need for responsibility, recognition, respect, and autonomy for each individual (Özpehlivan & Acar, 2016; Sypniewska, 2014; Wikhamn et al., 2021), and at the same time implies a degree of shared power (Wikhamn et al., 2021), allowing for the better design of the work objective (Wood & de Menezes, 2011). Another subtlety is the treatment of employees, which is related to receiving fair and equitable treatment – in which case, they tend to exhibit positive behavior, greater loyalty, better care for the organization's interests, more significant self-improvement, and better professional growth (Iqbal, 2013). Finally, the manager's role affects the capacity of management to communicate effectively, give and receive feedback, and provide continuous recognition to their employees (Sypniewska, 2014).

The notion of work conditions refers to aspects of the work environment that impact the suitability and safety of workers. Conditions include work equipment, tools,

and physical and mental aspects generally regulated by health and safety standards (Sypniewska, 2014). Working conditions are directly related to increased job satisfaction and, in turn, to increased efficiency, effectiveness, and productivity (Baeza et al., 2018; Davis, 2004; Khoreva et al., 2017; Raziq & Maulabakhsh, 2015).

Labor welfare & promotion can be separated into two items. Labor welfare includes benefits, facilities, and perks provided to employees, including their salaries, (Bandara et al., 2020; Ganesh, 2017) to improve their health, safety, and well-being. Investments in this regard, translated into employee benefit packages, often help attract and retain qualified employees, improve organizational advancement and image or persona, and increase job satisfaction (Mendis, 2016). Promotion, in turn, is the possibility of advancement within the organization. Both labor welfare and promotion are aspects that ensure a low turnover of staff. Employees join other organizations because they are unhappy with their bosses, unclear about opportunities for advancement, or lack career or salary growth (Green & Ayalon, 2017).

Salary is related to all quantifiable and financial aspects that the employee obtains for their work (Sypniewska, 2014). It is susceptible to job satisfaction in the case of variable payments or economic bonuses and individual rank in income distributions (Card et al., 2012; Clark et al., 2010; Kampkötter, 2017; Ockenfels et al., 2015).

Co-workers' relationships are crucial for job satisfaction and are determined by communication (Sypniewska, 2014), respect, the establishment of agreements, commitment, and recognition among peers.

Task & process is the way an organization carries out its activities, processes, and operations, and includes the relations among workers to attain them, such as: communication, resources, personal capacity, and procedures. In particular, the importance of the task implies that employees are conscious of the relationship between their contributions, the company's success, and their impact on others – in short, it involves the employee knowing that they make a difference. This factor contributes to both motivation and job satisfaction (Andrade & Westover, 2022).

3. Method

This research is directed at elucidating the relationship between the manager's role and working conditions, co-workers' relationships, labor welfare & promotion, task & process, and salary that conform to the multifaceted construct of job satisfaction in a covariance-based context.

3.1. Proposed Model

Based on the theoretical review, our research aimed to establish the direct or mediating effect between six dimensions that are inherent in job satisfaction: manager's role, work conditions, co-workers' relationships, labor welfare & promotion, task & process, and salary. We explored how the manager's role influences the other dimensions. Therefore, the following hypotheses were formulated (Figure 1):

H1: The manager's role directly influences work conditions;

H2: The manager's role directly influences labor welfare & promotion;

H3: The manager's role directly influences co-workers' relationships;

H4: The manager's role directly influences task & process;

H5: The manager's role directly influences salary.

On the other hand, we considered the mediating effect of work conditions, co-workers' relationships, and labor welfare & promotion between the manager's role and two outcome dimensions: task & process and salary. Thus, the subsequent hypotheses were proposed (Figure 1).

H6: Work conditions and co-workers' relationships mediate between the manager's role and task & process;

H7: Work conditions and labor welfare & promotion mediate between the manager's role and salary.
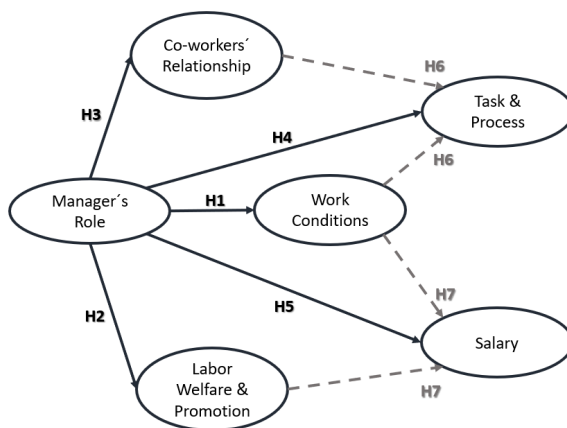
Figure 1. *Research model*

3.2. Participants

The research participants encompassed 364 workers from a Colombian public university. The organization's total number of workers was 1,560, giving this research a confidence level of 97% with a margin of error of 5%. After the population was selected, the simple random sampling method was applied. Respondents included teachers, administrators, and general services personnel. The demographic distribution of the respondents can be seen in Table 1.

Table 1. *Demographic distribution of respondents*

Age (years)	18–35	36–45	46–55	56–65	66+
	40.4%	40.7%	14.6%	3.8%	1%
Gender	Female		Male		
	49.5%		50.5%		
Marital status	Single	Married	Common law marriage	Divorced	Widowed
	39%	30.2%	26.1%	4.4%	0.3%
Employment contract	Permanent assistant	Permanent administrative	Professor – semester	Hourly paid assistant	Provisional services
	8.2%	13.7%	27.7%	33.5%	16.8%
Length of service (years)	Up to 5	6–10	11–15	16–20	21+
	40.9%	30.5%	14.8%	9.9%	3.8%
Educational level	High school/ Technical	Graduate	Graduate plus certification	Master's degree	PhD
	3.8%	24.2%	33.8%	30.8%	7.4%
Minimum wages per month*	1 to 2	3 to 4	5 to 6	7 to 8	9 or more
	52.5%	34.1%	7.7%	4.7%	1.1%

*The number of legal minimum wages that the worker earns per month.

3.3. Procedure

Based on the previously described dimensions, 34 indicators were defined to measure job satisfaction; each is equivalent to one question in the survey. These dimensions and indicators are shown in Table 2.

Table 2. *Dimensions and indicators to measure job satisfaction*

Dimensions	Indicators
1. Salary (4 questions)	Payment received for work performance includes (1.1) salary assignment, (1.2) responsibility, (1.3) coverage of basic needs, and (1.4) credit support.
2. Working conditions (6 questions)	Work characteristics concerning (2.1) safety and health of the worker, (2.2) physical and environmental conditions, (2.3) job stability, (2.4) demand for physical and mental energy, (2.5) autonomy to carry out actions, and (2.6) workload.
3. Manager's role (9 questions)	Actions carried out by the manager aimed at (3.1) easing the expression of opinions and being listened to, (3.2) recognition, (3.3) clarifying the importance of the work for the organization, (3.4) confidence, (3.5) the personal situations of employees, (3.6) the accompaniment of their boss to achieve results, (3.7) precision in instruction, (3.8) assertive instructions, and (3.9) effective feedback.

Dimensions	Indicators
4. Co-workers' re-lationships (6 questions)	Relationships between individuals who are part of a community related to (4.1) respect and trust, (4.2) the acceptance of different points of view, (4.3) the ease of establishing joint agreements, (4.4) teamwork, (4.5) the commitment to respond to a request, and (4.6) recognition among peers
5. Labor welfare & promotion (4 questions)	Activities that aim to create, maintain and improve the conditions that stimulate the worker's integral development in terms of (5.1) wellness activities, (5.2) incentives or recognition, (5.3) promotion opportunities, and (5.4) professional development.
6. Task & process (5 questions)	Organizational aspects required to carry out activities, processes, and operations, such as: (6.1) communication effectiveness, (6.2) availability of resources, (6.3) the capacity of the worker (6.4) technical sufficiency, and (6.5) compliance with processes and procedures as they have been defined.

The measurement tool consisted of a survey involving six dimensions and 34 indicators (Table 2) using a self-assessment Likert scale ranging from 1 to 3 (1 – *I am satisfied*; 2 – *I am neither satisfied nor dissatisfied*; 3 – *I am dissatisfied*). During working time, the survey was answered voluntarily in writing or digitally; it took around 20 minutes, and there was a prior and detailed explanation of how each dimension was to be scored.

4. Results

Three experts evaluated the survey in four categories: clarity, coherence, relevance, and sufficiency, with positive results (Galicia Alarcón et al., 2017). Analysis of standard deviation was performed for all of the answers of each respondent. Those whose standard deviation was less than 0.3 were ignored, since such a slight deviation causes doubts as to whether the survey was answered sincerely or finished too quickly. In this way, data from 22 respondents were removed, leaving a total of 342 respondents. Reliability was measured with Cronbach's alpha (α) (Lee-Kelley et al., 2007) in two phases: the first was determined by applying a pilot survey to 40 workers from a higher technical institute located in the same city, resulting in high reliability with a value of α = .902; the second was performed on the study population, with an excellent result of α = .924. SEM analysis was executed using AMOS software. Model validity was evaluated using standardized factor loading (SFL). Only those indicators with an SFL value higher than .70 were retained (Dash & Paul, 2021; Hair et al., 2019). Nine items were eliminated: four from work conditions, one from manager's role, one from co-workers' relationships, one from labor & welfare promotion, and two from task & process. The resampling method used 2,000 bootstrap samples to obtain statistically significant mediations among dimensions. The mediation effect was realized by evaluating the direct and indirect effects on the dimensions via the control flow shown in Figure 2. The suitability of eight fit indices for the proposed CF model were evaluated by AMOS, resulting in excellent reliability and validity (Dash & Paul, 2021; Hair et al., 2019), as shown in Table 3.
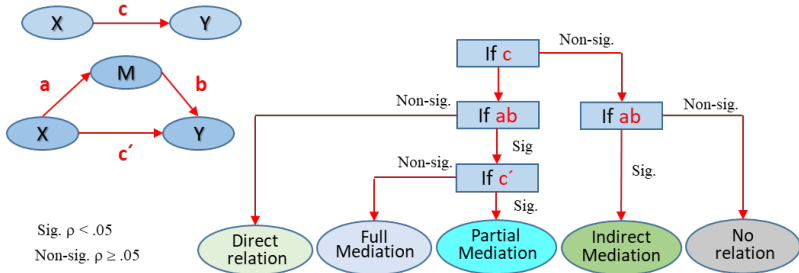
Figure 2. *Flow control to determine the effects among dimensions (Byrne, 2000)*

Table 3. *Reliability and validity fit index for the proposed CF model*

Fit index	Value	Conclusion
CMIN/DF	2.552	Excellent
CFI	.928	Excellent
TLI rho2	.918	Excellent
RFI rho1	.873	Good
IFI Delta2	.929	Excellent
NFI	.888	Good
RMSEA	.065	Excellent
SRMR	.0556	Excellent
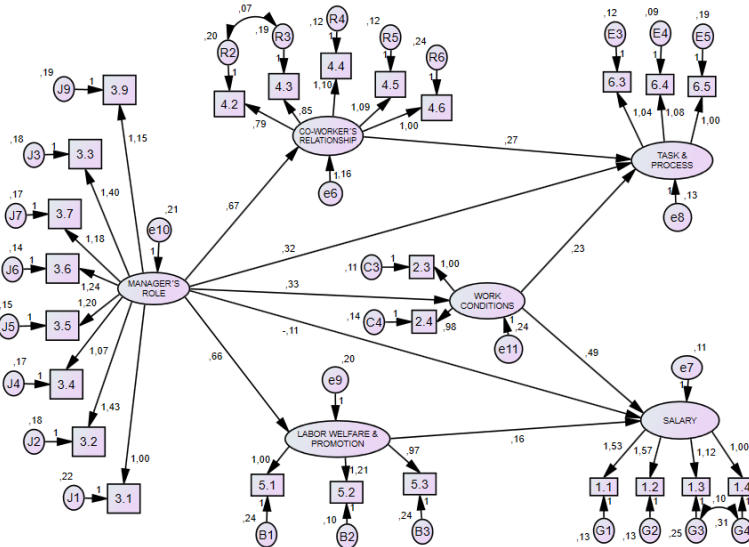
Figure 3. *SPSS model analyzed by AMOS*

Table 4 shows the evaluation of hypotheses 1 to 5 and the direct and total effects between the manager's role, the other five dimensions, and the consequent relationships resulting from this effect. As can be seen, the first four hypotheses are accepted, but the fifth is rejected. The direct influence of the manager's role on labor welfare & promotion and co-workers' relationships is strong and direct; for the case of work conditions, it is moderate and direct, while for task & process, it is moderate and direct with mediation. There is a non-direct influence on the relationship between manager's role and salary, but there is mediation.

Table 4. *The direct effect among dimensions*

Relation and hypothesis		Direct effect		Total effect		Result
Manager's role → work conditions	H1	+M	.329	+M	.329	Medium direct
Manager's role → labor welfare & promotion	H2	+S	.656	+S	.656	Strong direct
Manager's role → co-worker's relationship	H3	+S	.673	+S	.673	Strong direct
Manager's role → task & process	H4	+M	.321	+S	.582	Medium direct + mediation
Manager's role → salary	H5	No	-	+W	.152	Only mediation

Note: S – strong, M – medium, W – weak

Table 5 shows the results of hypotheses 6 to 9, where multi-mediation effects between some dimensions were evaluated. As can be seen, all hypotheses are accepted. The multi-mediation effect of both co-workers' relationships and work conditions between the manager's role and task & process is partial (H6). In contrast, the multi-mediations effect of both work condition and labor welfare & promotion between manager's role and salary are total (H7). Table 6 summarizes the results of these hypotheses.

Table 5. *The indirect effect among dimensions*

Relation and hypothesis		Direct effect		Indirect effect		Total effect		Result
Manager's role → task & process		+M	.321	+W	.261	+S	.582	
Manager's role → co-worker relationships		+S	.673			+S	.673	
Co-worker relationships → task & process	H6	+W	.274			+W	.274	Partial mediation
Manager's role → work conditions		+M	.329			+M	.329	
Work conditions → task & process		+W	.231			+W	.231	
Manager's role → salary		No		+W	.266	+W	.152	
Manager's role → work conditions		+M	.329			+M	.329	
Work conditions → salary		+M	.489			+M	.489	Full mediation
Manager's role → labor welfare & promotion	H8	+S	.656			+S	.656	
Labor welfare & promotion → salary		+W	.160			+W	.160	

*M – medium, **S – strong, ***W – weak

Table 6. *Hypotheses results*

Hypothesis		Results
Manager's role directly influences work conditions	H1	Accepted, direct, and moderate effect
Manager's role directly influences labor welfare & promotion	H2	Accepted, direct, and strong effect
Manager's role directly influences co-worker's relationship	H3	Accepted, direct, and strong effect
Manager's role directly influences task & process	H4	Accepted, direct and moderate effect with mediation
Manager's role directly influences salary	H5	Rejected
Work conditions and co-workers' relationships multi-mediate between manager's role and task & process	H6	Accepted, partial multi-mediation
Work conditions and labor welfare & promotion multi-mediate between manager's role and salary	H7	Accepted, full mediation

5. Discussion

Management practices, specifically talent management, contribute significantly in several organizational dimensions to increasing the organization's competitive advantage, developing high-performance teams, promoting a structure of hiring competent personnel, and ensuring an organization's continuous commitment. They influence the employee's attitudes and behaviors to increase their potential and make them more agile, motivated, and engaged. Managers commonly develop these practices through experience and leadership training (Khoreva et al., 2017). Therefore, this research seeks to clarify the influence of the manager's role in various organizational dimensions. The direct effects of the manager's role were determined when assessing H1 to H4. These hypotheses were statistically validated, verifying satisfaction concerning the direct influences of the manager's role with strong satisfaction in regard to labor welfare & promotion (H2) and co-workers' relationships (H3), moderate work conditions (H1) and tasks & processes (H4). On the other hand, the hypothesis that the manager's role directly influences salary (H5) was rejected; that is, satisfaction with the manager's role does not directly influence satisfaction with salary. The empirical findings of this research agree with those proposed by several authors: worker satisfaction is directly related to the manger's role, and directly affects several organizational dimensions related to satisfaction (Braun et al., 2013; Misra & Srivastava, 2018; Moslehpour et al., 2022; Ozturk et al., 2021).

The direct effect of the manager's role on co-workers' relationships (H3) can be analyzed considering previous research on the service (Ozturk et al., 2021) and transformational (Braun et al., 2013; Misra & Srivastava, 2018; Yang, 2016) leadership styles. These styles entail greater empowerment for the worker, with their consequent increase in job satisfaction. Likewise, the emotional and ethical competence of managers leads to positive changes at all organizational levels, helps workers to manage themselves emotionally (Moslehpour et al., 2022), and increases the quality of relationships among workers and

the positive perception of the organizational climate (Braun et al., 2013; Den Hartog, 2015; Yang, 2016). The manager can understand feelings and needs, provide emotional support to achieve goals, motivate workers towards a positive internal attitude, and improve the cohesion of the working group from an emotional perspective (Yang, 2016). In addition to transformational or service leadership, managers promote spaces where workers freely express their opinions, accompany them, recognize and value their efforts, promote effective, assertive, and precise communication, and provide constructive and healthy feedback, which leads to increased satisfaction. Thus, manager's behavior is reflected in workers fostering positive relationships among other workers that are conducive to generating respect and trust, dialogue, agreements, and cooperation. Hence, the direct relationship between the manager's role and co-workers' relationships is validated. In effect, fair and equitable standards and workers' relationships promote the effective functioning of organizations, thereby increasing job satisfaction (Omar et al., 2017). Behavior is also replicated downwards and generates both satisfaction in relationships among colleagues and developments in the promotion of welfare and increases in commitment. Furthermore, the model constructed by Braun et al. (2013) determined a positive relationship between transformational leadership in workers both at the individual and team level, and proposed the team as a reliable entity that develops shared perceptions, emphasizing an effect between the motivation and inspiration provided by leader and team performance. For this work, although leadership styles are not explicitly measured, the results confirm the existence of a direct and positive relationship between the manager's role (which includes some behaviors characteristics of certain leadership styles) and co-workers' relationships (which includes teamwork). This leads us to point out the expansion of said concept into a wider area contained within the indicators of the manager's role.

The strong direct influence of the manager's role on labor welfare & promotion (H2) gives rise to welfare activities generated by human resources or other dependencies. These activities should be well received and without stress, and involve promoting spaces for incentives and recognition as well as professional development. This then strongly influences the activities of well-being, and is promoted via the manager's role.

The relationship between the manager's role and promotion is also direct according to Ashraf (2019) and Green and Ayalon (2017), who defined the fact that leaving a job is influenced by aspects such as interaction with the supervisor and a lack of opportunities for promotion and growth. Margolis (2008) proposed the idea that the commitment and empowerment of employees in the workplace is the result of the deep cooperative commitment of managers in all areas to involve, train and develop their employees to achieve the desired level. As a result, managers lead employees towards a particular direction of professional growth – that is, the importance of the manager's role in the development of employees is essential, as was observed in this study. When this is lacking, the work atmosphere changes negatively, turnover intentions increase, and productivity decreases (Ashraf, 2019).

In the case of the work condition dimension (H1), a moderate direct effect of the manager's role was found. These findings also agree with those of other authors; they indicate that physically and environmentally favorable working conditions – where the demand for physical and mental energy is balanced and job stability, workload, and autonomy are en-

sured – have a direct effect on worker satisfaction. The moderate direct effect of the manager's role is understood from the point of view that some of the indicators measured – such as physical conditions, health, and safety – have a slight influence on other indicators, but they depend on those resources that the organization provides and not on the relationship with the manager. Finally, the lack of a relationship between salary and the manager's role shows that workers are aware of the payment systems defined by the organization independently of the managers who lead the processes. This effect may be explained by the fact that, in the public and academic organization investigated, salaries are fixed according to internal standards and the possibility does not exist for them to be improved due to increased productivity or the achievement of goals – as is often the case in private organizations. In this case, the supervisor's evaluation in terms of productivity directly affects salary.

A multi-mediating effect was determined in hypotheses H6 and H7. A mediating effect exists when a third variable or construct intervenes between two other related constructs; that is, a change in the exogenous variable produces a change in the mediating variable or construct, which, in turn, produces a change in the variable or endogenous construct. To define the mediating effect of a variable or construct, direct and indirect effects must first be defined. The direct effect is the relationship between two variables represented by an arrow that joins them, and the indirect effect is a sequence of two or more direct effects among three variables or constructs that are represented by multiple arrows between them (Hair Jr et al., 2021). This mediating effect can be single or multiple; for our study, the analyzed mediating effects are multiple.

The proposed model shows two multiple-mediating effects of three mediating dimensions: co-workers' relationships, work conditions, and labor welfare & promotion. These three dimensions do not affect each other nor influence the task & process and salary dimensions. There are multiple partial mediating effects of the co-workers' relationships and work conditions dimensions on the task & process dimension, reinforcing the influence of the manager's role through those dimensions.

There is a total multiple mediating effect of the work conditions and labor welfare & promotion dimensions on the salary dimension; this also implies no direct influence of the manager's role. No specific research on this interaction of dimensions was found in the bibliographic review; however, Jawaad et al. (2019) found that job satisfaction did not mediate between rewards and organizational commitment due to restrictions in emerging economies, such as the availability of suitable jobs, low job security and financial constraints, which entailed the preservation of jobs despite dissatisfaction. Our socioeconomic conditions are similar to those where the aforementioned study was applied; therefore, a non-direct or strong mediation effect was observed, but a moderate and weak influence of working conditions and labor welfare & promotion was found.

6. Implications and Conclusion

There are a number possible theoretical contributions from this article. First, a small number of articles relate holistically to the manager's role and focus on determining the effect on some specific dimensions. Our research aims to contribute to understanding the

dimensions of job satisfaction from a general view since it includes six dimensions. In other words, our research provides a broader view of the interaction between those dimensions and determines their interrelationships. Secondly, this research explains the relationship between the manager's role and five general dimensions: salary, work conditions, co-workers' relationships, labor welfare & promotion, and task & process. As explained above, empirical evidence is provided on the significant influence of the manager's role on four of the five organizational dimensions investigated. The proposed model conceptualizes the direct effects and mediations among them. These results are consistent with the findings on the direct influence of the manager's role and expand its area of influence. Third, this research contributes to the empirical determination of the multiple mediating effects of work conditions, co-workers' relationships, and task & process, which have not been previously evidenced. In addition, the full multiple mediation effects of work conditions and labor welfare & promotion on the aspect of salary were observed, and the satisfaction of the latter does not depend on the manager's role. Fourth, this study contributes to conceptualizing the manager's role, and can be extended to public universities. Our research is one of the few that empirically demonstrates the impact of the manager's role in the organization from a systemic perspective in higher educational academic organizations.

Regarding practical implications, we can then conclude as follows. First, the result of this study finds that the dimensions determined to measure job satisfaction – such as work conditions, co-workers' relationships, labor welfare & promotion, and task & process – are strongly dependent on the manager's role. This is an important finding for public universities and other organizations in academic areas. It can also be used to guide human resources policies in the selection and hiring of managers who have developed the following soft skills: (1) ease of expressing their opinions and being listened to; (2) recognition of superiors; (3) knowledge of the importance of their work; (4) confidence; (5) performance; (6) accompaniment of their boss; (7) precision; (8) assertiveness in the instructions; and (9) effective feedback. Secondly, being an academic organization, a university is designed to promote experiential training for its directors, supervisors, and members in management positions. As such, it should promote the development and well-being of workers with a focus on the growth of the organization, and also define a leadership style leading to unification within the organizational culture. The possibility of offering this same training to other educational institutions and companies from different sectors is then potentially opened. Third, given the importance of the manager's role on all organizational dimensions, this contribution can initiate reflection in the people who exert influence in organizations, and with it, the characteristics of positive leadership styles that empower staff may be elucidated, providing appropriate ideas to the organization. As widely recommended by different investigations, such styles are transformational regarding service quality.

7. Limitations and Future Research

The first limitation of this study is related to the research sample: it consisted of workers within a Colombian public university that voluntarily participated in this study.

Therefore, an organization belonging to this particular economic sector could use our results, albeit harboring some reservations about the representativeness of the research sample, particularly when casting some general conclusions. However, it should be noted that this research is worth taking into consideration since it is based on 364 employees' assessments, which is a respectable sample size. The second limitation is that the research was carried out during the COVID-19 pandemic, and workers' motivation, needs, life projects, and priorities could have changed.

Finally, further research should explore the validity of our model in other economic sectors or perform important satisfaction with partial or thorough measurements in similar dimensions. This should take place both before and after experiential training carried out on managers, and could thus empirically support the proposed theoretical implications.

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THE IMPORTANCE OF THE ORGANIZATIONAL LEARNING CONCEPT IN THE SUSTAINABLE MANAGEMENT OF ORGANIZATIONS

Sladjana ŽIVANOVIĆ
Faculty of Business Economics and Law, Adriatic University Bar, Montenegro
https://orcid.org/0000-0002-6001-3685

Sandra DJUROVIĆ
Faculty of Business Economics and Law, Adriatic University Bar, Montenegro
https://orcid.org/0000-0001-5874-9581

Nikola ABRAMOVIĆ
Faculty of Business Economics and Law, Adriatic University Bar, Montenegro
https://orcid.org/0000-0002-7865-3592

Olga POBEREZHETS
Odesa I. I. Mechnikov National University, Odesa, Ukraine
https://orcid.org/0000-0003-1535-9991

Viktoriia UDOVYCHENKO[1]
Taras Shevchenko National University of Kyiv, Kyiv, Ukraine
https://orcid.org/0000-0003-4588-8149

Abstract. *The purpose of this research is to address the fact that the changes taking place in society in the socio-economic and environmental spheres determine the need for companies to adapt to these changes in order to survive, as well as contribute to the development of the entire community. The achievement of activities by companies can contribute to the sustainable development of society, which must, first of all, be sustainable in all four aspects: economy, environment, social relations, and management. All four aspects are almost equally important, but management is a process that permeates the other three aspects, and it is impossible to achieve positive results and goals in the three previous areas without it. The national culture, organizational culture, structure, leadership,*

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1   *Corresponding author: Viktoriia Udovychenko, e-mail udovychenko.vv@knu.ua*

learning and progressive goals of an enterprise lead it towards sustainable management and business. Human capital within such an organization provides the basis for creativity and innovative ventures. This approach of the organization, with a set of organizational values, beliefs and ways of behavior, influences socially responsible behavior and sustainable management and business. This paper provides an analysis of factors that influence sustainable management and business, such as national culture, organizational culture, organizational learning and leadership, and proposes a model of organizational culture that supports the process of organizational learning and enables the achievement of the ultimate goal: sustainability.

Keywords: *sustainable business management, organizational learning, organizational culture, organization leadership.*

JEL Codes: *D83, M15, O31*

1. Introduction

Contemporary society is characterized by a series of economic, technological, social, and environmental changes (Ahlstrom et al., 2020; Goworek et al., 2020). As part of society, businesses and organizations must follow these changes and adapt to them in order to survive and contribute to the development of the social community, which must, first of all, be sustainable, including in all four aspects of sustainability: economy, environment, social relations, and management. All four aspects are almost equally important. However, management is a process that pervades all three preceding aspects and is required to achieve positive results and meet the goals set in the preceding three areas. Good governance enables economic growth. Without adequate management, preserving a healthy environment and conserving natural resources are impossible. Relations in society are a product of the management process. Therefore, this paper will pay special attention to the management process and the factors that influence it and make it sustainable.

Managing a company is a complex process that requires, first of all, a lot of knowledge and skill from managers as well as a large amount of information and data, on the basis of which they, using the knowledge and skills they possess and taking into account the external factors of the environment and the internal factors of the organization, can make the best decisions (Goworek et al., 2020). The different areas and environments in which companies exist require the formation of appropriate organizational structures that will enable efficient management and the achievement of certain goals (Shrestha et al., 2019). Today, production companies – that is, industrial production – face specific challenges in terms of economic and environmental sustainability, and above all, the most important condition of sustainability must be met (Moshood et al., 2022). In modern business conditions, the development of science and technology creates the need for constant changes for organizations and individuals – i.e., there is a need for a flexible organizational structure in companies. Business and management problems in both society

and business are becoming more complex, and a large amount of knowledge is needed to solve them. This means that the principles of sustainable development must be respected through every activity of the management process: planning, organizing, leading, and controlling (Barbosa et al., 2020).

On the other hand, organizational culture and organizational learning also represent important influences on the management process (Tortorella et al., 2020). This arises through the process of creating common assumptions, beliefs, values, norms, and symbols and their acceptance by all or most employees (Novicevic, 2014). Thus, the process of creating an organizational culture is related to the collective solving of problems faced by members of a group or organization, and reveal the dependence of this process on national culture. The fact is that the organizational culture is founded on collaboration – teamwork – and all activities and values are shared; otherwise, the organizational culture is founded on the national culture on which it is founded and the heritage of shared values.

In order to successfully solve the mentioned problems, it is necessary to constantly invest in the knowledge of the individual as well as the organization to which they belong; the value of the organization consists of people, their knowledge, and their ability to use that knowledge. An organization's competitive advantage is realized by the ability to create and use knowledge; knowledge has a strategic role in the management of a modern organization. Therefore, in modern society and the management of modern business systems, the application of the concept of organizational learning is necessary.

It is vital to distinguish between organizational learning and organizational change. Those two concepts, although closely related, are clearly separated. Every learning implies change, but not every change implies learning, implying that organizations can change without learning anything. Every organizational change implies some change in the understanding and behavior of individuals and groups as well as business processes at the organizational level. However, only in the process of organizational learning does this change lead to the improvement of the key competencies of the organization, which enables it to adapt to its environment. It is understandable that responsible companies are at the heart of society (Novicevic, 2014). Companies that understand their connections to the communities in which they operate, as well as their environmental impact, are the ones that have the best chance of long-term success. At the same time, stakeholders' interest in the company's environmental performance is at its peak. It is increasingly recognized that good environmental performance is also effective for business (Sachs, 2015). All signs point to the fact that sustainable company management and sustainable business contribute to sustainable development. Considering that it is the only kind of development that is acceptable today, sustainable management requires a lot of attention and implementation in all organizational systems.

The remainder of this paper is organized as follows. Section 2 presents the methodological approach, Section 3 presents the literature review, Section 4 presents the research design, Section 5 provides the results, Section 6 outlines the discussion and Section 7 suggests the conclusions.

2. Literature review

The concept of sustainability becomes a key concept for the survival of life and the progress of humanity. The reasons for this are the increasing use of resources, the energy crisis, environmental pollution, population growth, and economic and political inequality in the world. Now, the concept of sustainable development has a central place in science, society, and the media. Even though it is one of the most common concepts today, it is still very often characterized by the unknown.

Initially, the concept of sustainable development primarily referred to the problems of environmental protection in less developed countries. Today, sustainable development is a global concept, which, according to Sachs (2015), represents an attempt to understand the interactions of three complex systems: the world economy, global society, and the physical environment of our planet. At the core of the idea of sustainable development is the improvement of the quality of life, which would be achieved by balancing economic growth and development, environmental protection, and social factors.

There is still no single definition of sustainable development, but the most frequently cited definition was created by the World Commission on Environment and Development (UN, 1987).

Meanwhile, sustainability strategies have become key in achieving a balance between the preservation of the planet's natural potential and resources and their use (Galpin et al., 2015). Therefore, creating an organizational infrastructure that promotes a culture of sustainable development may be associated with some strategic risks in implementing green innovations to achieve sustainable development goals (Cavaleri & Shabana, 2018).

The need for raw materials, which are a source of food, energy and building materials, has been present throughout history, and the exhaustion and exploitation of natural resources has been considered a recurrent problem faced by humanity since ancient times. Now, when society has reached an advanced level of scientific and technological progress, this historical problem is perhaps at its most alarming (Wang et al., 2019).

With the constant growth and advancement of humanity, the exploitation of natural resources, primarily wood, coal, forests and topsoil, has progressed. These resources have been defiled to such an extent that an increasing impact on both households and companies is evident. Given that sustainable development represents the provision of basic social, economic and environmental opportunities for humans as individuals within society, such a form of development is only achievable in the event of a change in the current pattern of behavior in production and consumption, so that the lives of future generations can proceed normally and unhindered (Saaty, 1980).

After the World Summit in Rio, the World Summit on Sustainable Development was held in Johannesburg in 2002. The participants of the conference presented the same vision as 10 years ago, only with an undoubtedly greater appeal and further ambitions for improving the global environment and encouraging the best possible implementation of Agenda 21. In 2012, the Rio+ 20 United Nations conference held in Brazil focused on the green economy within sustainable development and the institutional framework for sustainable development. One of the most suitable ways to successfully implement sustain-

able development around the world is the transition to a green economy. This concept of sustainability has been met with much approval as well as disagreement, so the question is often raised as to whether the green economy is actually an obligation.

The world economy has enormous proportions and is still proliferating (by 3%–4% per year). Income distribution within and among countries is very uneven. The world is divided into the enormously rich and the extremely poor: at least one billion people live in extreme poverty and struggle for survival every day. The lives of the poorest are constantly threatened due to insufficient nutrition, the lack of a roof over their heads, a lack of clean drinking water and the absence of health care.

The global economy is creating an ecological crisis. Therefore, humanity today has two possible alternatives; two paths it can take. One possibility is that it continues on a path that fundamentally changes the climate on Earth, that the world economy continues to use mostly fossil fuels as it does now, and many other things proceed in their current manner. Sachs calls this scenario at this time "business as usual" (Paunković, 2014). If humanity chooses to continue down the path it is now on, it will face serious dangers and consequences.

Another possibility is a fundamental change in the way humanity moves, in order to quickly adopt new technologies (e.g., replacement of electricity production in thermal power plants with solar energy, use of wind energy, biomass energy, efficient use of water to avoid its depletion, etc.). This second possibility – that is, an alternative path, the goal of which is not only economic growth, but also social inclusion and ecological sustainability – is the path of sustainable development.

By comparing these two paths, the following can be concluded: if the usual way of production and consumption is continued, progress would certainly still be achieved in various areas. Science and technology would continue to improve, poverty would decrease in many parts of the world, and the rich would become even richer. However, progress will reach its peak, and the negative consequences of harming the environment will over time outweigh the aforementioned positive tendencies. Then, social and ecological disasters will follow, and all of the progress achieved will be worth nothing. If, on the other hand, humanity follows the path of sustainable development, finds alternatives to fossil fuels, uses green technologies and finds ways not to destroy the physical environment, some of these solutions will most likely be more expensive. An example of this might be buildings that use less energy for heating, the construction of which may be more expensive due to the use of specific materials and insulation techniques. Likewise, battery-powered electric vehicles remain much more expensive than conventional internal combustion engines that consume large amounts of gasoline. However, these costs do not even come close to being comparable to the costs that may arise from the social and environmental catastrophes that will undoubtedly occur if we continue with existing ways of production and consumption.

All of this makes it necessary to also carry out organizational changes aimed at sustainable management. Implementing organizational change based on the link between sustainability and organizational learning helps to meet the organization's own needs (Marsick & Watkins, 2003). One of the components of this direction is the development

of a culture of organizational learning, including an environmental culture. However, all changes must occur at every level of learning, both organizational and environmental.

3. Methodological approach

Modern business and management problems are becoming more complex, and a large amount of knowledge is needed to solve them, which conditions the need to introduce the concept of organizational learning in companies. It is necessary that these changes in people's consciousness cause a change in their behavior in order to produce some positive consequences for the organization. Only in the process of organizational learning does change lead to the improvement of the organization's key competencies, which enables it to adapt to its environment. One of the key requirements that the environment sets today is sustainable business and sustainable management (Sachs, 2015).

The subject of this paper is the impact of organizational learning on the sustainable management of companies. Research indicates the need to apply the concept of organizational learning as a process of acquiring and using knowledge that should provide an organization with flexibility and better performance for its sustainable management. Learning is a process that requires the interest of participants in accepting and acquiring knowledge and skills, taking into account many factors within the organization itself – that is, the company, as well as external factors, such as national culture. Research into organizational structure and cultural factors as internal factors and national culture as an essential external factor will also take place in this paper. An important task is the discovery and scientific explanation of other factors that influence sustainable management – i.e., factors such as national culture, organizational culture, structure, and leadership, which influence the very process of acquiring knowledge and organizational learning in companies and enable employees to act as agents of learning and the application of new knowledge, with the aim of sustainable business. Sustainable enterprise management should be based on generally accepted principles of sustainable development, which must be integrated into the enterprise management process. In order to achieve their integration, many factors must be taken into account, such as the competencies of managers themselves, which can be influenced, but also factors such as national culture, which is almost impossible to influence. It is possible to explain the mutual relationships between the application of the concept of organizational learning and the sustainable management of companies (enterprises) based on previous research (UN, 1987).

The exceptional scientific value of the research in this paper is in the formation of an organizational model with suitable and measurable aspects of organizational culture, structure and leadership, which will enable the application of the concept of organizational learning and thus create conditions for sustainable management and business. Moreover, the contribution of this work and its results affect the theoretical and experiential knowledge of the application of the concept of organizational learning and its contribution to sustainable management and business, as well as indicating the necessity of comprehensive theoretical and practical research.

To measure the relevance of *organizational culture* and *organizational learning* to *sustainable business*, the aforementioned keywords and their usage over time were plotted on a chart using Google Ngram Viewer (https://books.google.com/ngrams) in the period from 1950 to 2020 (Figure 1).
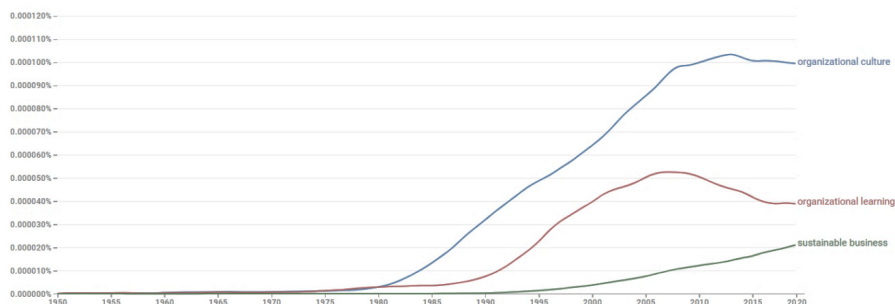
Figure 1. *The frequency of the usage of the terms "organizational culture," "organizational learning," and "sustainable business" between 1950 and 2020 (Mehrabi et al., 2013).*

A search for "organizational culture" and "organizational learning" showed that the number of publications increased moderately from 1980. A significant surge began in 2006 for "organizational learning", and from 2012 for "organizational culture", but since 2013 there has been a decline in both terms.

Observing the frequency of the term "sustainable business" on the graph, we can conclude that there was a slight increase from the mid-1990s until 2015, when it increased sharply, up to 0.000000161% in 2015. This is associated with the adoption of 17 Goals by the UN member states in 2015 as part of the Sustainable Development Agenda.

This paper aims to identify organizational factors and their impact on sustainable business management by applying the concept of organizational learning and sustainable management in the organizational cultures of companies. This research should prove that the application of the concept of organizational learning contributes to the acceptance of the principles of sustainability in organizations, and will be applied in the management process to make it more efficient and better – i.e., sustainable.

The social goal of the research is reflected in the fact that the work directly points to the importance of applying the concept of organizational learning and its impact on the sustainable management of companies.

In the research, data, information and their interpretations were collected. In order to prove the assertions of the study, a method of multi-criteria decision-making was used, which is based on the breakdown of a complex problem and which enables relationships between influential factors in complex problems to be identified relatively easily.

Using the method of theoretical analysis, the previous theoretical findings related to national and organizational culture and their mutual connection and the importance of a proper understanding of their relationship for business practice were followed and studied.

In the process of the research, during the collection of data, information and their interpretation, and in order to confirm the set hypotheses, the following research methods were used:

- The AHP (Analytic Hierarchy Process) method of multi-criteria decision-making.
- Theoretical analysis.
- Statistical methods.

The AHP is a multi-criteria decision-making method based on the breakdown of a complex problem into a hierarchy. It is very flexible because it allows researchers to find relationships between influential factors for complex problems with many criteria relatively easily, as well as to determine the dominance of one factor over another. In the case of this particular research, it was used to determine the most influential factor in the process of sustainable management, one of the problems faced by modern companies and organizations.

Using the theoretical analysis method, it is advisable to follow and study the previous theoretical findings related to: national and organizational culture and their mutual connection, the importance of a proper understanding of their relationship for business practice, as well as the influence of national culture on management theory and practice. This research aims to determine the causal relationships between the two cultures and management techniques, methods and concepts.

The problem of measuring consistency arises when using the AHP in a group context. In that case, the consistency of several decision-makers should be measured. One method used to determine group consistency is Spearman's rank correlation coefficient (S).

A separate part of the research was carried out using structured questionnaires (surveys), where the respondents contributed by choosing specific answers offered to questions. For the research, questionnaires were used to examine the value attitudes of individuals, which are a reflection of the national culture, and these were adapted to the research methodology (Marsick & Watkins, 2003). Questionnaires were also used to examine the organizational culture, structure, leadership and capacity of the organization to apply the concept of organizational learning. Questionnaires were adapted from that which was used by Marsik and Watkins to measure organizational learning in their research.

A separate part of the research was implemented using structured questionnaires (surveys), where respondents answered by choosing specific answers to the questions. Paunković and colleagues used questionnaires to survey values, attitudes, and personalities, which are reflections of national culture, and customized a research methodology (Marsick & Watkins, 2003). Also used in this study were: survey questionnaires for organizational culture, structure, leadership, and capacity implementation organizations; customized questionnaires to measure organizational teaching on each concept; and organizational learning questionnaires used in Marsik and Watkins (2003).

The goals of the research were: to determine the connection between national culture, organizational culture and structure; to find the dependence of organizational development and learning on the structure of the organization; and to prove the conditionality of the application of the concept of sustainability and sustainable management and organizational development and learning.

Therefore, the characteristics of an organization that is managed according to the principles of sustainability and in accordance with the concept of sustainable development should be shown, as well as the influential factors that contribute to sustainable management.

4. Research hypothesis

The hypothetical research framework in this study consisted of one general hypothesis and five special hypotheses.

Research hypothesis: The greater the organization's ability to learn and develop, the greater the possibility of sustainable management.

Special hypotheses:

Special hypothesis (H-1): The more employees in the organization are ready to accept the concept of organizational learning, the greater the possibility of organizational development.

Indicators:
- Statistical data obtained by processing the original questionnaire for examining organizational learning;
- Statistical data obtained by processing the questions that were extracted from each questionnaire, which refer to organizational development.

Special hypothesis (H-2): The more flexible the organizational structure, the more employees in the organization are ready to accept the process of organizational learning and application of new knowledge.

Indicators:
- Statistical data obtained by processing the original questionnaire for examining the organizational structure;
- Statistical data obtained by processing the original questionnaire for examining organizational learning.

Special hypothesis (H-3): The stronger and more homogeneous the organizational culture, the more pronounced its influence on organizational learning.

Indicators:
- Statistical data obtained by processing the original questionnaire for examining organizational culture;
- Statistical data obtained by processing the original questionnaire for examining organizational learning.

Special hypothesis (H-4): The better the knowledge of cultural dimensions, the easier it is to structure the organization.

Indicators:
- Statistical data obtained by processing the original questionnaire for examining organizational culture;
- Statistical data obtained by processing the original questionnaire for examining the organizational structure.

Special hypothesis (H-5): The more pronounced the willingness of employees in the

organization to learn and improve, the greater the possibility of achieving the sustainable development of the company.

Indicators:

- Statistical data obtained by processing the original questionnaire for examining organizational learning;
- Statistical data obtained by processing the questions that were extracted from each questionnaire, which refer to the sustainable development of the company.

Business strategy in a company with a strong organizational culture and training is a key source of competitive advantage. A sustainable competitive advantage is gained only by what the company knows and can do better than the competition.

5. Results

5.1. The role of organizational culture in managing an organization

Values, ideologies and beliefs were considered particularly important for understanding organizational culture, and were seen as reliable representations.

Robbins and Judge (2013, as cited in Wang et al., 2019) define organizational culture as a system of mutual values that are supported by the members of the organization, and on the basis of which a certain organization differs from others.

Robbins and Judge (2013, as cited in Wang et al., 2019) also point to the influence of organizational culture on the strategic decisions of top management, as well as on operational and everyday decisions in the organization. It determines the character of interpersonal relations in the organization, improves employee motivation, determines the leadership style that will be applied in the organization, reduces conflicts and facilitates coordination in the organization.

Many theorists have investigated the cause-effect relationship between organizational culture and organizational performance. Research has shown that culture is a key factor in organizational effectiveness. Essentially, four aspects of organizational culture contribute to organizational effectiveness: adaptability, consistency, involvement (participation) and mission (Marsick & Watkins, 2003). Three sub-dimensions can be found within these dimensions:

- Mission: strategic direction, goals, vision.
- Adaptability: ability to create changes, customer orientation and organizational learning ability.
- Inclusion (participation): empowerment, team orientation, opportunities for development.
- Consistency: basic values, agreement, coordination (integration).

These four dimensions of organizational culture have a positive impact and contribute to knowledge management in the organization. The influence of organizational culture on organizational learning can be found in the works of many theorists (Mehrabi et al., 2013).

Organizational culture arises in two ways. The first way is with the intention of the

members of the organization and their constant care regarding different aspects of culture. In this case, founders face two challenges when creating a culture. The first challenge relates to external adaptation, setting goals, defining the organization's mission, vision and strategy, as well as ways to realize them. No matter how stable an organization's culture is, it exists in a specific environment that is constantly influencing it. Therefore, it is necessary to develop mechanisms for adapting culture to the environment, which is the basis of its efficient functioning and sustainability. Adaptation sometimes requires changing the strategy and structure of the organization. The second challenge represents internal integration and the regulation of mutual relations in the organization.

Another way of creating organizational culture is when it arises by accident – that is, due to unavoidable circumstances in the organization's development.

5.2. The influence of organizational culture on sustainable business management

The efficiency of the divisiveness of companies is related to the guidelines and challenges for the implementation of an appropriate organizational culture that ensures sustainable business and management in practice (Parwita et al., 2021). Different cultural orientations and their impact on sustainability can be represented by a four-cell framework that includes four dimensions. The internal-external dimension shows whether the organization is focused on its internal dynamics, work organization and employees, or on the demands of its external environment. The control-flexibility dimension shows the tendency of the organization towards strict specialization, structuring, coordination and control or towards flexibility (Linnenluecke & Griffiths, 2010). As a result of these two dimensions, it is possible to form four different cultural quadrants. The organizational culture of rational purpose refers to centralized decision-making. Individuals are motivated by assurances that they will be rewarded for professional work that should lead to the desired organizational goals (Zammuto, 2005).

The question arises as to what constitutes a culture focused on sustainability and whether there is a connection between organizations emphasizing an organizational type of culture (characteristic of one or more of the four different types of culture) and adopting the principles of corporate sustainability. Essentially, each quadrant or cultural type represents a set of valued outcomes and a consistent management ideology regarding how to achieve those outcomes. Ideologies of managers (generally accepted management ideologies rooted in society) are introduced into organizations and form the ways in which people think and behave in them (Linnenluecke & Griffiths, 2010). Thus, it can be assumed that different types of organizational culture influence how employees perceive and implement corporate sustainability (Parwita et al., 2021).

Theories and ideologies that depict the internal process quadrant are characterized by their focus on economic performance and the general omission of the wider environment of the organization. The internal process quadrant corresponds to the ideology of scientific management, which is aimed at maximizing economic gain through rationalized production processes. Hierarchical structure and the imposition of rules and pro-

cedures are very effective under relatively stable conditions in the environment, and in such a stable environment, they enable the maximization of the production of goods and services (Jones et al., 2005). The internal process quadrant also coincides with the classification of closed rational systems models (Linnenluecke & Griffiths, 2010) that represent organizations as a means of achieving and improving organizational efficiency and economic performance. Putting formalization at the center of attention suggests that there are cognitive and motivational limitations in individuals that limit the choice and action of employees within the organization and limit the application of the concept of sustainability (Zammuto, 2005).

The major assumption behind this understanding of corporate sustainability is that the organization is moving towards maximizing production and services. In a hierarchical culture, efficiency is valued, and this culture is defined as the simplification of products, services and processes in order to achieve price reduction, product maximization and the pursuit of economic outcomes (Jones et al., 2005). From this point of view, it becomes imperative for the management of the organization to increase the consumption of the products that the company produces as well as the services it offers to increase profits. However, not every effective gain means that the organization takes environmental sustainability and the needs of the wider social community into account. Many studies have shown that the inclusion of the natural environment and ecology can improve the company's performance. Organizations that are tightly focused only on achieving economic outcomes may miss sustainability-related innovation and the business opportunities that sustainability creates.

Contrary to the internal process quadrant, theories and ideologies that are presented in the interpersonal relations quadrant place great emphasis on social interaction, interpersonal relations, employee development and the creation of a human work environment (Cameron & Quinn, 2006). Accordingly, it can be said that organizations dominated by a culture of interpersonal relations will place greater emphasis on internal staff development, learning and capacity-building for their pursuit of corporate sustainability (Parwita et al., 2021). Such organizations adopt a strong and clearly defined corporate ethical position regarding issues such as discrimination and business ethics (Cameron & Quinn, 2006).

Theories and ideologies that explain the quadrant of the rational goal speak about the importance of the wider environment for the organization, and the need for rational planning and organizing in light of the demands of the environment. This quadrant is related to the ideology of the system of rationalism in which the focus is on planning, forecasting, controlling and designing the structure of the organization and the decision-making process, taking into account the requirements of the external environment. This is about the culture of open-rational systems in which work is organized in a rational way, taking into account the various requirements of the environment (Miletic et al., 2016).

Many organizations use human resources and environmental protection measures to reduce costs and increase efficiency. Investing in staff training can be expensive, but the result is compensation in added value through increased quality of products and services.

Employee training that improves technical knowledge also improves interpersonal skills. Teamwork is encouraged and relationships with interest groups outside the organization are developed in order to achieve business benefits. ISO 14000 systems are integrated into TQM and OH&S systems or into other systems with the aim of achieving greater efficiency in the company (Perović et al., 2015). The sale of the company's by-products (waste) is also encouraged, which improves cooperative relations with other members in the supply chain to reduce waste and preserve a healthy environment. The culture of organizations belonging to the fourth quadrant, open systems models, is most likely to enable and support sustainable business and organizational management. This culture emphasizes the importance of the external environment, which influences the behavior, structure and changes in the life cycle of the organization. The needs of the wider social community in which the company exists are also taken into account.

It can be concluded that organizations dominated by an open systems culture will place more emphasis on innovation that will contribute to environmental and social sustainability in their quest to achieve sustainable business. Companies must act responsibly towards their natural environment because they are part of the environment. Activities in the organization can have significant negative impacts on the natural environment through, for example, the emission of pollution or excessive exploitation of resources. In turn, the quality of the environment, as is already apparent, can affect the organization's activities through the effects of climate change. In order to achieve environmental sustainability, companies are challenged to control the pollution they produce, to carry out pollution prevention and to act within the carrying capacity of the natural environment by minimizing the use of natural resources and reducing their ecological footprint (Parwita et al., 2021).

Considering the relationship between the culture of the organization and the adoption of corporate sustainability, the integration approach implies: (1) that employees throughout the organization should be part of the same culture of one organization, and (2) that employees should share similar views on corporate sustainability (Karabasevic et al., 2016).

To achieve corporate sustainability, leaders will most likely need to abandon a purely economic paradigm in favor of a more balanced set of values concerning environmental and social responsibilities. This is because leaders must be able to design and implement change in an organization's culture focused on sustainability.

5.3. The impact of leadership on sustainable management

In modern business conditions, characterized by dynamic changes, organizations and society as a whole need good leaders. Leaders have the greatest influence on the performance of the organization, so any organization's success depends on its leader's skills and abilities. Many management theorists have dealt with leadership, which indicates the existence of a large number of definitions of this term (Paunković, 2014).

The leader creates the vision of the organization for the future and must know how to make the members of the organization believe in that vision and accept it as their own.

In addition, it is the leader who motivates, inspires and guides employees toward the achievement of organizational goals. The followers grant the leader the legitimate right to shape actions for the achievement of organizational or group goals on their behalf. The influence that the leader achieves, through the members of the organization, stems from the fact that the members of the organization see the world and interpret it through the leader's vision, so it is logical that the behavior of the employees is shaped by the vision and wishes of the leader.

The fundamental question that captures the attention of many researchers in the field of management and leadership is: what is it that makes leaders? That is, what separates them from other people who are not leaders, and even from managers? The main difference between leaders and managers is that managers do not have the ability to influence their subordinates', i.e., the employees they manage (Miletic et al., 2016). The manager's right to influence subordinates' activities stems only from their hierarchical position. The relationship of dependence between the subordinate and the manager exists, but unlike the relationship between the leader and the subordinate, it is not voluntary. Thus, the source of power is the basic difference between a leader and a manager. A manager's power is based on a formally defined role in a hierarchical structure, while a leader's power is based on their ability to move the attention of their followers, articulate a meaning of reality that is acceptable to them, and define effective collective action that employees will willingly accept. It is the leader who creates the vision and mobilizes employees to achieve it. This indicates the fact that the organization needs a manager in stable conditions, while in conditions of large turbulent changes the organization should be led by leaders.

According to some studies, there is an assumption that some people are "born leaders" – i.e., they have an innate talent for leadership. This means that leaders have some qualities that "ordinary people" do not. However, research has not yet revealed a single trait that only leaders have. Some qualities, such as self-confidence, intelligence and openness, are characteristic of leaders, but these qualities can also be possessed by others who are not leaders. Therefore, possessing certain characteristics is a necessity, but not a sole condition for someone to become a successful leader.

This suggests that the research may have gone in the wrong direction, and that instead of the personal characteristics of leaders, the skills and abilities of leaders that set them apart from other people should have been investigated (Azadi et al., 2013).

5.4. Organizational learning and its impact on sustainable management

In the 18th century, the basic resource was land and natural resources; in the 19th century, technology; the 20th century was characterized by finance as a basic resource; and in the 21st century, the basic resource and source of competitive advantage for organizations becomes knowledge. Advantage is no longer held by those companies and countries that have access to natural resources or those that have abundant financial resources. Those organizations that have the ability to acquire and use knowledge continuously are at an advantage. Only learning and knowledge enable organizations to gain sus-

tainable competitive advantage and sustainable business. Sustainable business requires the application of knowledge, skills and technology that brings economic profit to the company, preserves the environment and contributes to the development of the wider social community in which the organization is located (Miletic et al., 2015).

Contrary to former development theories and the understanding of wealth according to which it is measured by financial and physical capital, the concept of sustainable development and sustainable business is based on a new theory. At the center of this new theory is applied knowledge. The key determinant of the growth and development of organizations in modern business is the speed of creating innovations as well as the ability of companies to convert theoretical knowledge into new technologies that will contribute to sustainable business.

Organizational learning is a multidisciplinary concept; therefore, there is no single definition of this term. Some authors view organizational learning in various configurations: changes and adaptation to the environment, adaptation to the environment and transformation of the organization, the acquisition of new knowledge in the organization, adaptation to the environment and acquisition of knowledge, adaptation to the environment, or transformation and the acquisition of knowledge by employees. The latter depends on the degree of development of the organization, research, and the exploitation of knowledge, or the process of change in an individual and the shared opinion and activity that is influenced and embedded in the organization's institutions (Mehrabi et al., 2013).

Organizational knowledge encompasses all of the skills, knowledge and abilities that the company's employees and managers have, and is also the basis of how they run their business (Barbosa et al., 2020). The knowledge possessed by managers and employees contributes to the sustainable management of the organization. The end product of sustainable management is sustainable business. That is why organizational knowledge must constantly be used and increased. The technical side of organizational learning refers to information processing, which includes the process of collecting, processing, memorizing, disseminating and using information.

The social character of organizational learning implies a specific type of social interaction among the members of the organization. The consequence of that interaction can be knowledge that no individual member of the organization possesses. For organizational learning, it is very important that there is solidarity in the teamwork of employees and that creative managerial processes should not be separated.

In the research carried out in the organization, the above questions were asked, and the following data were obtained from 92 respondents. Table 1 provides information on responses to the question of whether the company encourages teamwork and cooperation. Teamwork is essential for organizational learning. Through teamwork, employees have a greater opportunity to acquire new knowledge and skills that contribute to sustainable business. Inter-functional teams are especially important because they consist of employees from different business functions.

Table 1. *Responses to the prompt: "Collaboration and teamwork is encouraged in your company."*

	Answers	%
1.	Totally disagree	3%
2.	Partially disagree	13%
3.	I don't know	11%
4.	Partially agree	45%
5.	Totally agree	28%
In total		100%

The next prompt related to the process of teamwork estimation concerning the creative managerial process and the measurement of organizational learning (Figure 2).
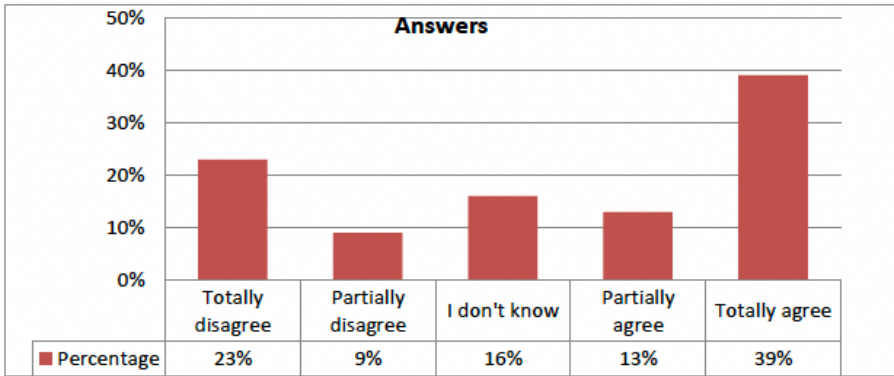
Figure 2. *Responses to the prompt "Is a creative managerial process an accurate measurement of organizational learning?"*

The analysis of the previous tests confirms the importance of the organizational culture of continuous learning in the sustainable management and operation of the company. Based on previous research, it is considered that organizational learning is a process that expands the repertoire of potential behaviors of the members of the organization as individuals, and of the organization as a collective. Through the process of organizational learning, the organization develops capabilities that it did not have before. Through organizational learning, new rules and principles are developed and applied in the organization that can contribute to sustainable business, and enable managers to manage the organization sustainably. New knowledge is needed for sustainable business and management. Organizational learning can only be achieved through teamwork and cooperation because, in fact, organizational knowledge is the knowledge that no one employee possesses individually, but that they all possess as a collective. It is necessary to distinguish between organizational learning and a learning organization. Organizational learning is a process, while the learning organization is both a condition and a conse-

quence of that process. A learning organization is one that develops organizational learning capabilities. Such an organization represents a favorable framework for learning and encourages and directs the efforts of all employees to learn. At the same time, a learning organization is created in the process of organizational learning.

Many factors such as organizational culture, national culture, and leadership influence the process of organizational learning. National culture shapes organizational culture and, through its dimensions, influences the organization's commitment to organizational learning. Organizational culture and its dimensions influence the way employees think. Based on the existing organizational culture, the organizational learning ability of a company can be predicted (Bocken et al., 2014).

Leadership is of great importance for organizational learning. Without leadership, there is no organizational learning. This is agreed upon by many authors (Mehrabi et al., 2013) who have investigated the influence of leadership on the elements and process of organizational learning. Leadership unites all other components that make up the content of organizational learning (structure, culture, organizational changes, communication, etc.). Leaders make it possible to build an organizational structure that enables organizational learning and cultural values that are oriented toward learning and international development (Laktionova et al., 2021).

5.5. Selection of the factors that have the biggest influence on sustainable management

Leaders are the ones who create the organizational culture and structure that supports the organizational learning process. That is why it is necessary that they are also aware of the dimensions of national culture. By knowing these dimensions, they will know which values are essential for the members of a particular social group, so it will be easier for them to manage organizations in that society and employees in organizations will be more satisfied.

Leadership brings together all other components that influence organizational learning: organizational structure and culture, organizational change, communication and motivation. The task of leaders is to ensure the construction of an organizational structure that will enable organizational learning. Leaders should establish cultural values of learning and development, build a culture of trust and tolerance for mistakes and establish communication channels that ensure organizational learning. For organizational learning, employees' autonomy is needed, for which the leadership is responsible (Arsawan et al., 2023).

An organization in which the concept of organizational learning is applied should be led by leaders who are committed to learning and who will motivate other managers and employees in the company with their energy to learn individually and collectively every day and acquire new knowledge that they will apply in business. Leaders must respect the autonomy of their collaborators and their ideas, and also their right to make mistakes. They must have the attitude that mistakes are inevitable and represent a chance to learn something new. Sustainable management can only be achieved by managers who take

employees' motivation, satisfaction and loyalty into account (Trachenko et al., 2021).

Applying the concept of organizational learning in an organization requires that its structure be designed in such a way that it can ensure that the process of generating and using new knowledge takes place smoothly to develop resilience (Nikolić, 2009). This means that there should be a minimum specialization of jobs and tasks in the organization. Only in such conditions employees can create and apply new knowledge (Fietz & Günther, 2021). In the presence of considerable specialization, employees are demotivated, while reducing the degree of specialization encourages learning, motivates employees and increases their satisfaction. The successful application of the concept of organizational learning implies as few hierarchical levels as possible, as this accelerates vertical communication and increases the degree of employee autonomy (Aristana et al., 2022).

6. Discussion

The concept of corporate sustainability or sustainable business has gained importance in recent years in both theory and practice within organizations. Modern business requires organizations to be more responsible and sustainable, as an imperative for an eco-friendly future and the basis for the joint work of the public and private sectors.

Because of their impact on the environment and society, companies are responsible for sustainable management and sustainable operations. Personal care for social and environmental impacts and their social and moral obligations should be ensured by the management of companies, which should include sustainability in strategic planning (Thaher & Jaaron, 2022). Companies must focus on the application of technologies and innovations that prevent the negative consequences of their production on the environment and help preserve a healthy environment in order to increase revenues and remain competitive. The growth and development of an organization always imply certain changes related to the application of new technologies, innovations, knowledge, and, not least, ways of thinking in the organization. This means that knowledge is the key resource of any organization, and the process of organizational learning contributes to the increase of total knowledge in an organization. The company's growth and development are the result of the process of organizational learning and the acceptance of new knowledge (Bhatnagar et al., 2022).

Business and management problems in both society and business are becoming more complex, and a large amount of knowledge is needed to solve them. In order to successfully solve these problems, it is necessary to constantly invest in the knowledge of the individual as well as the organization to which they belong; the value of the organization consists of people, their knowledge, and their ability to use that knowledge. The competitive advantage of the organization is realized by its ability to create and use knowledge. Knowledge plays a strategic role in the management of a modern organization. Therefore, this key resource needs to be constantly increased, which is achieved through the process of organizational learning. Modern organizations are required to be more responsible. In order to achieve sustainable management and more responsible business, it is necessary to establish new social values. Those values are based on the knowledge,

creativity, and the capabilities of human resources. Establishing these values should lead to the transformation of traditional organizations into learning organizations. In order to establish and develop such values, companies need leadership that will create a culture that supports them and a structure that enables organizational learning. Sustainable management and business involve the application of new knowledge, techniques, technologies, and management skills that contribute to achieving the concept of sustainable development through its three fundamental aspects: economy, environment, and society (Hassel & Cedergren, 2021). The existence of organizational learning can contribute to the sustainable management of the organization and its sustainable business.

7. Conclusions

By ranking the factors that influence sustainable management and business with the help of the AHP method of multi-criteria decision-making based on a group decision, a group of the most influential factors can be singled out, in which organizational learning comes first, followed by national culture and leadership.

The results of the part of the research in which the value attitudes of employees were examined showed almost identical values among employees in both companies where the research was conducted. This was expected given that these employees are members of the same national culture and share the same values. This further means that their expectations are very similar and that leaders and managers must use the same techniques and methods in the process of management, the motivation of employees, and solving all other problems that may arise in the organization.

What is important, and what the second part of the research shows, is that leaders and managers must know the dimensions of their national culture, on the basis of which they will easily know what the fundamental values of their subordinates are and what they expect from them. Knowing employees' values and attitudes greatly facilitates the leadership and management process for leaders and makes it sustainable, primarily considering the social aspect of this concept. The results of the second part of the research, in which organizational culture, structure, organizational learning, and leadership were examined, differ significantly between the two companies. In the first company, an organizational culture prevails in which the end justifies the means and there is a strong competitive spirit, due to which there is often a lack of cooperation among employees. The organizational structure is strictly centralized, which slows down the process of organizational learning, and the leadership shows little interest in the needs of employees.

The second company shows loyalty to its employees, and there is strong cooperation among employees. A lower degree of decentralization of the organizational structure gives employees the opportunity to participate in making certain decisions related to the performance of work, and the leadership shows great interest in the needs of employees and encourages them to tolerate mistakes from which they learn. The organization itself constantly gathers information about new technologies and innovations and encourages the process of organizational learning. Based on the findings and the fact that many studies have shown that leadership creates organizational culture, it can be concluded that the

organizational culture in one of the companies is the responsibility of the leadership. This is because numerous studies have shown that it takes a more extended period of time to create and change an organizational culture. This means that with the goodwill and commitment of the management and leadership, the other company's organizational culture can be changed and, above all, improved.

The data obtained from the research were processed using two methods: regression analysis and the AHP method of multi-criteria decision-making. The same results were obtained in the manner previously explained in detail. The scientific contribution of the work is reflected in the fact that – based on previous research and data in the literature obtained on that basis and based on the results of the study – it proposes an organization model with an appropriate organizational culture, structure, and leadership that will support organizational learning and create conditions for sustainable business management. After all of the above, it is concluded that the hypotheses have been confirmed.

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THE ATTRACTIVENESS OF TOURISM
IN THE CONDITIONS OF MODERN CHALLENGES:
METHODOLOGY, ASSESSMENT, PROSPECTS

Yuriy BILAN[1]

Research Center for Sustainability and Competitiveness, Budapest Metropolitan University,
1-9 Nagy Lajos király útja, 1148 Budapest, Hungary;
Academic and Research Institute of Business, Economics, and Management, Sumy State University,
2 Rymskogo-Korsakova St., 40007, Sumy, Ukraine
y.bilan@csr-pub.eu
ORCID: 0000-0003-0268-009X

Victoria KARYUK

Department of Tourism, Faculty of Economics, KROK University of Economics and Law;
30-32 Tabirna St., Kyiv, Ukraine, 03113; VictoriyaKI@krok.edu.ua
ORCiD: 0000-0002-2800-6565

Olena GRISHNOVA

Department of Business Economics, Faculty of Economics, Taras Shevchenko National University of Kyiv;
90-A Vasylkivska St., Kyiv, Ukraine, 03022; grishnova@ukr.net
ORCID: 0000-0002-4178-1662

Halyna MISHCHUK

Faculty of Economics, Széchenyi Istvàn University, Egyetem tér 1, 9026 Győr, Hungary;
Department of Labour Resources and Entrepreneurship,
National University of Water and Environmental Engineering, 11 Soborna St., Rivne, Ukraine, 33028
h.y.mischuk@nuwm.edu.ua
ORCID: 0000-0003-4520-3189

Abstract

Purpose. The purpose of this study is to develop a methodological tool for assessing the level of tourism attractiveness in the country and to analyse the socio-economic consequences of the war for Ukrainian and international tourism on this basis.

Design/methodology/approach. A method of integral assessment of the attractiveness

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[1]   *Corresponding author: Yuriy Bilan, y.bilan@csr-pub.eu*

of tourism at the macro level has been developed. The integral index includes 30 partial indicators describing the economic, political and legal, social, cultural and health, infrastructure and environmental pillars of the attractiveness of the country for tourists. The integral assessment of tourism attractiveness is conducted using the case of Ukraine and Poland in 2017–2022.

Findings. According to the comparative analysis performed based on the integral index, the level of tourism development in Poland was significantly higher compared with Ukraine. The most obvious lag was evident in the political and legal, cultural and recreational, environmental and infrastructural components. The gaps in tourism development are increased by the influence of the war, where an especially harmful impact was felt in the social, economic and environmental spheres.

Originality. The originality and advantages of our approach are in using the official statistical data available for the objective estimation of the holistic attractiveness of tourism in a country, as well as the possibility of comparing a certain country in terms of touristic attractiveness with any other country considering differences in the values of partial indicators. The gaps obtained in the values of partial indicators can be used by policymakers in strategies for tourism development.

Keywords: *war, tourism attractiveness, tourism competitiveness, integral index of touristic attractiveness.*

JEL index: *L83, Z31.*

1. Introduction

The tourism attractiveness of each country is influenced by many factors of the internal and external environment, and largely depends on the efficiency of the national tourism market. In these conditions, taking into account the specific indicators of the degree of influence of various factors which are both incentives and barriers to the growth of the touristic attractiveness of the country is a necessary step in the construction of an effective strategy for the development of tourism and its adaptation to global trends.

In the scientific literature there are several groups of factors that affect the formation of the touristic competitiveness of a country, in particular: natural and environmental, social, economic, political, legal, demographic and cultural factors. Under the influence of these factors, the competitiveness of the tourism sector is reduced to that which best meets the needs of tourists. This is possible only under the conditions of constant monitoring of market changes, the creation of new tourism products that are interesting to consumers, timely responses to changes in various fields of activity related to tourism, actively informing tourists about the presence and benefits of tourism in the country, and creating a system of service that is the most comfortable for tourists.

Another less intensively studied group of factors that influence the formation of the country's tourism potential and stimulate the development of the market of tourist ser-

vices is personal behavioural factors. They are formed by motives that provide the desire to travel according to the requirements of the tourist. Analysis of the role of psychological factors in the formation of the market of tourist services shows that only a small proportion of tourists return to places where they have previously been. This, however, does not apply to cases in the presence of economic, therapeutic or sensory impulses. With the growth of income, tourists are beginning to give more preference to psychological reasons when choosing a new trip. This is why the concept of attractiveness as a socio-psychological category begins to come to the fore in the development of modern approaches to assessing the development of tourism in the country, replacing such purely economic categories as the competitiveness of tourism, tourism potential and the like.

In this regard, ensuring a high level of tourism attractiveness in the country is increasingly attracting the attention of researchers working in various subject areas – in particular, in the economy of sustainable development, tourism, and socio-cultural research. Despite differences in the methodology and methodological principles of research, the definition and development of an optimal set of social and economic indicators suitable for assessing the tourism attractiveness of the country is common. In this context, the possibility of combining existing practical techniques with new techniques focused on the socio-psychological component of the concept of attractiveness is of particular importance. However, this issue has not yet been adequately covered in the works of scientists, which confirms the relevance and prospects of research in this direction.

However, although most modern research shows the existence of a link between the development of tourism and the presence of socio-cultural and historical potential in the country, methodological tools for assessing and measuring these elements of attractiveness require clarification and further development. This is particularly the case in terms of the standardization of indicators and the possibility of measuring them at the level of national economies, since most scientists use fairly abstract concepts to measure tourism attractiveness in the country, which are either very difficult to calculate or can be assessed only if the expert methodology of the study is applied. These approaches are dominant now, and some successful tools are outlined in works of Al Mamun and Mitra (2012), Havryliuk et al. (2021), Kim et al. (2020), Shpak et al. (2022), Vasanicova et al. (2021), and Reményik et al. (2020). However, the majority of works are focused on partial features of the touristic attractiveness of territories, and are particularly aimed at touristic brand development with an emphasis on the development of the most obvious competitive advantages (Castillo-Manzano et al., 2021; Tóth et al., 2013; Zaman & Aktan, 2021). Alternatively, many works in the field are devoted to investigating the links between tourism development and the consequences for communities, or prerequisites for tourism and hospitality industry support via taxation and support for other tools of doing business (Ajide, 2022). No doubt, challenges to tourism development caused by the COVID-19 pandemic have led to increased research into tourism threats and prospects (Kostynets et al., 2021; Tóth et al., 2015; Woosnam et al., 2022), including attempts to find solutions regarding opportunities for augmented reality and other advanced technologies in order to maintain links with potential customers (Florek & Lewicki, 2022).

The slow recovery of the tourism industry in light of the mitigation of pandemic risks

was destroyed again by the war in Ukraine, influencing not only neighbouring countries. Specifically, experts predict that a prolonged war between russia and Ukraine could translate into a loss of $14 billion in tourism receipts globally in 2022 (UNWTO, n.d.). European tourism is the zone at greatest risk. Moreover, these assumptions apply not only to Eastern Europe, where the war is directly ongoing, but also to the entire continent as a whole. The main reason for this is security. Russian armed aggression forces tourists, particularly those from other continents, to think about the feasibility of traveling to Europe. That is why they increasingly choose safer alternatives. As a result, tourism attractiveness decreases not only for Ukraine, but also for all European countries.

Taking into account all of the abovementioned, the aim of this study is to develop a methodological tool for assessing the level of tourism attractiveness in the country and to analyse the socio-economic consequences of the war for Ukrainian and international tourism on this basis. In light of this aim, the objectives of the study cover the development of a complex system of partial indicators of tourism attractiveness in the country as well as the calculation of the integrated index of tourism attractiveness using the cases of Poland and Ukraine. This makes it possible to undertake cross-country comparisons, to test the authors' methodological approach and to evaluate the consequences of the war in Ukraine for tourism development.

To the best of our knowledge, there is a lack of research dealing with country-level data based on the objective indicators describing the holistic system of factors influencing tourism attractiveness. Therefore, a comprehensive approach to assessing tourism attractiveness in the country based on publicly available data and covering the core constituents of the tourism environment is important for comprehensive management in this area. The authors' method is novel in this regard, and is important for diminishing the research gap in current investigations into tourism attractiveness at the country level.

The paper is organised as follows. The subsequent section provides a literature review considering tourism attractiveness and approaches to its assessment. Section 3 describes the methodological basis of the authors' research. The data, empirical approach, and results of the empirical study conducted using the cases of Ukraine and Poland are elaborated in Section 4. Lastly, concluding remarks as well as policy implications can be found in Section 5.

2. Literature review

The concept of attractiveness can be defined as the property of causing admiration and attracting special qualities and characteristics. The question of tourism attractiveness as a separate area of research has not yet been subject to comprehensive analysis, and has instead been considered through the prism of the attractiveness of tourist regions, territories or specific places. Thus, the scientific literature on tourism often uses the concept of "attractiveness" (from Lat. *attrahere* – attractiveness), which defines such important properties of tourist resources as their recreational value. In the context of this concept, the touristic attractiveness of the territory is formed by a combination of natural, historical and cultural tourist resources, and is determined by the presence of attractions (historical and cultural

monuments, natural heritage, etc.), developed tourist infrastructure (enterprises in the hotel industry, restaurants, transport, sightseeing services, information services, etc.), the level of security and law and order, trends in society (fashion for a particular type of recreation) and the like (Havryliuk et al., 2021). At the same time, scientists widely consider concepts such as "the attractiveness of the destination": since tourist destinations consist of specific physical, natural and cultural resources that are unique, exclusive and irreplaceable (for example, physiography, social and cultural resources of the country), these same factors are the basis of their attractiveness (Bernd & Brunner-Sperdin, 2015). In this sense, the attractiveness of the destination is considered in terms of the feelings and opinions of tourists about the ability of the destination to meet their needs (Vengesayi, 2003). From the demand side of particularly attractive tourist places or services, this perspective allows suppliers to effectively manage the level of their attractiveness in order to achieve the maximum sense of well-being for tourists (Cracolici & Nijkamp, 2008). At the same time, it should be noted that these resources do not establish the level of attractiveness of a territory. Tourism attractiveness is a variable phenomenon, which may change depending on the actions of various economic, social, natural and other types of factors.

Scientific interest in further research in this direction was fostered by: the growing importance of the tourism sector in the regional, national and global economy; increased competition in the tourism business, although over the years this has not changed a great deal; and the obvious advantages of tourism for the economy. Based on current trends in the development of tourism, solely from an economic point of view, tourism attractiveness as an industry that provides services is a faster return on investment and income. The development of tourism as an industry has led to the use of such concepts as "investment tourism attractiveness", "competitiveness of tourism", and "tourism potential". "Competitiveness" in tourism, along with other definitions mentioned, is a complex concept, so it is firmly entrenched in the scientific literature. The competitiveness of tourism lies in the ability of the industry to optimize its attractiveness for residents and non-residents by providing quality, innovative and attractive tourism services to consumers in order to gain a share in the domestic and global market, while ensuring the effective and sustainable use of available resources to support tourism (Gooroochurn & Sugiyarto, 2005). Thus, the conceptual framework for tourism competitiveness is based on innovative research that began to be published in the economic literature in the late twentieth and early twenty-first centuries, along with other methods of research on tourism attractiveness.

The competitiveness assessment methodology developed by Ritchie and Crouch (2003) was the first of the modern models presented in this paper to assess the competitiveness of tourism. Scientists consider it the main reference model of tourism competitiveness that has been created to date. This statement is based on the fact that this technique includes all of the important factors that can determine the competitiveness of a tourist destination. The authors of this model believe that the competitiveness of tourism is primarily caused by both the competitive environment at the level of microeconomics and the global environment at the macro level. The competitiveness of tourism is determined according to five levels: direct external and internal environment; global forces that change the composition and nature of tourism attractiveness; the main resources

and monuments of the local geographical enclave; additional factors and resources of the tourism industry; and activities that increase interest in the main resources (promotions or development of a tourism package) (Ritchie and Crouch, 2003).

Another well-known approach to assessing the competitiveness of tourism is the methodology developed by Dwayer and Kim (2003), who considered four sources of tourism competitiveness: economic agents involved in the development process; tourism policy (planning, management, investment in the tourism sector, taxes levied on tourism activities); tourism infrastructure; and the demand for tourism services and the employment generated by the sector.

These conceptual approaches to the methodology for assessing the competitiveness of tourism have contributed to significant empirical progress. The existing concepts highlight the need to define tourism competitiveness through a set of interrelated variables that must be measurable in order to assess and compare competitiveness. This led to the further development of a wide variety of indicators that are offered in the economic literature, the main drawback of which is that it is very difficult to find the values of indicators in all proposed areas of assessment.

Thus, since the appearance of the first theoretical foundations of the competitiveness of tourism, this area of economic research has received international recognition. In this context, in modern conditions, the most famous method is that of assessing tourism attractiveness using the competitiveness index in the field of tourism and travel (Travel and Tourism Competitiveness Index – TTCI), which was developed by experts of the World Economic Forum in conjunction with the International Air Transport Association (IATA), the UN World Tourism Organization (UNWTO) and the World Travel and Tourism Council (WTTC). The competitiveness index in tourism and travel has been calculated since 2012 and covers 140 countries, assessing their competitiveness using open-source data, information from institutions and experts in the field of tourism and travel, as well as the results of a survey of company managers. This index is measured in three sub-indices: legislative regulation; business climate and infrastructure; and human, cultural and natural resources (World Economic Forum, 2019). Each of the above sub-indicators consists of 14 core pillars, which in turn form the 90 indicators characterising differently oriented aspects of the development of tourism. Despite the worldwide popularity of this technique, which is characterised by the significant breadth of the scope of the subject area of the study, the simplicity of comparing estimates for different elements and the clarity of the presentation of the results, this tool for assessing tourism attractiveness has significant disadvantages, in particular the need to accumulate large amounts of information and to exert additional control over its reliability "at the exit". In addition, this technique is not devoid of subjectivity, since some of its indicators are calculated based on the opinions of experts and surveys of enterprises.

Today, competitiveness factors are of significant importance in explaining and assessing the level of tourism development at both the macro and micro levels, and are used as tools to assess tourism attractiveness. However, based on the etymology of the concept of tourism attractiveness, it is not correct to consider that the use of factors and comparative methods of assessing the competitiveness of tourism in the country is suffi-

cient for an exhaustive assessment and disclosure of the essence of the concept of tourism attractiveness. This leads to the emergence of a significant number of modern techniques that focus not on "dry" economic calculations, but instead vary the components and characteristics that can determine tourism attractiveness in the economic literature. One of such modern concepts of touristic attractiveness assessment is the weighted sum of attractiveness (WSM) method, which includes several successive stages: 1. The attributes of attractiveness and their weight are determined. The physical attributes of this method include geographical location, regional communication and vehicle availability, local souvenirs, and the availability of quality and special food. Social attributes include the existing influx of tourists, the intensity of fairs and festivals, safety for tourists, the likelihood of social crimes and the like. Environmental attributes include the probability of natural disasters within a specified time period, natural and anthropogenic threats and the like. 2. Evaluation of each attribute by respondents (Al Mamun & Mitra, 2012). Since the conceptual basis of the methodology is a fairly broad economic concept (tourism attractiveness), in addition to three components (physical, social and environmental), other groups of indicators should be included in the overall assessment, which traditionally assesses attractiveness in the social and economic sense (economic, political, cultural, etc.). Another controversial point of such methods is that this approach to evaluation is based solely on expert research, which gives grounds for doubt as to the reliability of the results obtained on the basis of this method.

Another group of modern techniques that determine the level of tourism attractiveness are techniques that are based on the determination of the level of attractiveness of the destination by measuring the attractiveness to each individual person (individual opinion) and combining these values into a single indicator. As a result, according to foreign scientists, the opinion of each person contributes to the overall touristic attractiveness of the destination or region, and therefore the competitiveness of the destination depends largely on the degree of production of individual levels of attractiveness. In other words, the characteristics of tourism which are perceived by tourists as the most important (or the most interesting) and which cause the strongest and most positive feelings among tourists, can be defined as the most important components of the formation of tourism attractiveness, and they are characterised by the highest values of the indices. In our opinion, this approach is very useful in determining the attractiveness of individual groups of historical and cultural sites or a particular area in order to determine the main factors that cause the desire of tourists to travel in a particular direction. Thus, it is possible to analyse the structure of attractiveness and determine the relative importance of the various elements of the destination for overall attractiveness. However, these studies do not require an assessment of the formation of attractiveness, but rather an analysis of the level of attractiveness of the tourism sector (Krešić & Prebežac, 2011).

The continuation of the mentioned approach can be found in the modern research of Kim et al. (2020), Shpak et al. (2022), Vasanicova et al. (2021), and Zaman and Aktan (2021). These authors include a variety of factors of the touristic attractiveness of a destination. However, there is a lack of complexity and unification in these approaches. They are mostly devoted to measuring the attractiveness of a certain territory consider-

ing its specific identity or the system of competitive advantages typical for the territory. Therefore, these methods are difficult to implement for comparative studies, where some typical and universal measurements are required.

The same limitations are distinctive of other studies with an emphasis on certain features of the attractiveness of the territory for some kinds of tourists. For instance, some important approaches have been developed to investigate: heritage attractiveness (Castillo-Manzano et al., 2021); natural resources, landscape and overall environmental attractiveness (Vukoičić et al., 2023; Ziernicka-Wojtaszek & Malec, 2022); cultural features (Devkota et al., 2020), including food attractiveness (Savelli et al., 2022); and other peculiarities of territories. Some useful approaches to the estimation of the attractiveness of certain territories can be found in related studies. In particular, not only touristic but also migration studies have developed a theoretical background to measure a country's attractiveness in terms of plentiful surroundings for the satisfaction of professional needs (Oliinyk et al., 2022) and other factors of ensuring well-being (Mishchuk & Grishnova, 2015; Papadopoulos & Fratsea, 2022). In all cases, the attractiveness of territories is linked with expectations of migrants or visitors and is described by a set of pull-factors. Their choice depends on the aims of the researchers; however, the majority of studies justify the most crucial factors due to their impact on subjective decisions, but do not use a complex approach.

The challenges for the development of tourism and hospitality under pandemic conditions caused new interest in the prospects of the industry. In this regard, the threats and measures for tourism industry support were studied by Florek and Lewicki (2022), Kostynets et al. (2021), Woosnam et al. (2022), and many others. The common feature of all similar studies is the emphasis on the positive economic impact of tourism, and therefore the necessity of supporting its steep recovery in different ways. Typical conclusions in this sphere are connected with the evidence of the economic growth influenced by tourism development, particularly due to visitors' expenses, remittances, investment growth (Akbulaev & Salihova, 2020; Virak & Bilan, 2022), and real estate market development (Nikšić Radić, 2022). Therefore, there is a need for the development of positive relations between local communities and visitors (Kim et al., 2020) and support for legal businesses with the restriction of latent entrepreneurship (Ajide, 2022).

Despite the developed background for the assessment of the most essential factors of evaluating touristic attractiveness, there is still a lack of comprehensive studies suitable for measuring the attractiveness of a territory considering the holistic complex of factors. Consequently, this slows down the development of appropriate strategic tools for territorial development based on the objective evaluation of weaknesses and possibilities for tourism development according to the gaps identified in ensuring the impact of certain factors.

Among the methods of assessing touristic attractiveness at the macro level developed by Ukrainian scientists, the most complex is the technique proposed by the Institute for Strategic Studies of the NAS of Ukraine. Economists propose determining the index of touristic competitiveness in Ukraine for two groups of indicators that assess the competitive advantages and disadvantages of the country (National Institute for Stra-

tegic Studies, n.d.). Behind the approaches to the content and the list of indicators, the methodology has many features and differences in comparison with the methodology for calculating the competitiveness index in the field of travel and tourism. As a result, it is very specific, since it is aimed at testing in countries that are developing and is not suitable for assessing countries with market economies, nor for comparing Ukraine with economically developed countries.

As we can see from the results of the literature analysis, there is no method for determining a complex indicator for the social and economic evaluation of the touristic attractiveness of a country. Therefore, there is a need to develop a methodology for assessing the tourism attractiveness in a country which would take into account the main set of factors affecting the touristic attractiveness of the country for tourists and be subject to formalization and the calculation of comparative and composite indicators.

Taking into account the negative trends in Ukraine and the existing methodological framework for assessing tourism attractiveness – involving single studies that relate to fragmented aspects, mainly the analysis of financial and economic indicators of the tourism industry – we find it important to develop a methodology for the integrated assessment of touristic attractiveness at the macro level.

The existing approaches to assessing the level of tourism attractiveness in the country highlighted above cannot be identified with the methods of assessing the competitiveness of tourism, as they are different in the essential characteristics of the concepts of attractiveness and competitiveness and have different specifics of the set of indicators and the method of their calculation, as confirmed and proved in the literature review. At the research stage, the following main differences in the use of these techniques were identified:

1. methods of assessing competitiveness are mainly large-scale and comprehensive, aimed at assessing attractiveness at the state and international level, while the methods that determine attractiveness are more localised, aimed at the study of certain territories, regions or individual objects;

2. methods of assessing competitiveness are based mainly on the integral values of indicators that can be quantified, while the methods of attractiveness are more abstract and practically impossible to calculate without the use of expert methods;

3. methods of competitiveness are often limited to the analysis of economic components, while methods of attractiveness, on the contrary, often gravitate to the analysis and accounting of such components as sociocultural, legal, environmental and the like, although often the indicators of these methods in the studies of domestic authors are intertwined and complementary.

Thus, there is a need to combine the useful peculiarities of tourism competitiveness and attractiveness assessment methods in order to develop a specific integrated method of assessing tourism attractiveness in the country. It should cover the complex of features, particularly, socio-cultural, political and other important components of tourism attractiveness. Today, the most widely used methodological tool for the estimation of tourism attractiveness is the Tourism Travel and Competitiveness Index. However, it has a different purpose and does not disclose the tourism potential of the country.

An effective comprehensive method of assessing tourism attractiveness in the coun-

try, on the one hand, should be built on a methodological basis appropriate to, on the basis of world rankings, provide a unified methodology for the comparability of the results of calculations. On the other hand, it should be detailed enough and provide possibilities for the managerial decisions of both business entities and the authorities of the country. In this aspect, assessing the level of tourism attractiveness only based on international indicators of competitiveness is not enough, because, in addition to the possibility of comparing the country and its specific indicators with other countries, it is necessary to develop indicators covering specific features of tourism attractiveness, as well as identifying the most problematic of them, in order to improve policy and strategies regarding tourism development.

3. Material and methods

Considering the described differences in assessing tourism attractiveness and tourism industry competitiveness, we find it important to develop the methodological basis for assessing tourism attractiveness in the country. This is based on the calculation of an integrated index of tourism attractiveness covering some partial quantitative indicators available in official databases. It is important to note that partial indicators are calculated exclusively on the basis of public, standardized, quantifiable values, without distorting the results of research by expert assessments and abstract descriptions of social and economic phenomena.

The integrated indicator includes six groups of partial indicators – economic, political and legal, social, cultural and health, infrastructure, and environmental. The detailed meaning and approach to the calculation of each group of indicators are presented in Table 1.

Table 1. *A complex system of indicators for the integrated assessment of tourism attractiveness in a country*

No.	The name of the indicator	Calculation formula	The symbols in the formula to calculate
I. Economic indicators of tourism attractiveness			
1	Index of consumption of tourist services	I_{cts} = Vts/GDP	Vts – volume of tourist services sold in value terms, billion USD; GDP – gross domestic product, billion USD.
2	Index of excess expenses of tourists	I_{eet} = (Cod − DA)/Cod	Cod – average cost of a 1-day stay for foreign tourists in the country, USD; DA – amount of daily allowance according to the legislation of the country, USD.
3	Index of profitability of food in the country	I_{pf} = 1 − Ibmc/Ibmh	Ibmc – international Big Mac index of the country, USD; Ibmh – highest international Big Mac index, USD.

No.	The name of the indicator	Calculation formula	The symbols in the formula to calculate
4	Index of health, recreation and culture expenditure in consumer spending	$Ihrc = Vhrc/Vcs$	Vhrc – volume of expenses on health, rest and culture, UAH; Vcs – volume of consumer spending, UAH.
5	Tourism employment index	$Ite = Net/Nec$	Net – number of people employed in the tourism industry, thousand people; Nec – total number of employed population of the country, thousand people.
II. Political and legal indicators of tourism attractiveness			
6	Peace index of the country	$Ip = 1 - Pc/Nc$	Pc – country's place in the international ranking of peaceful countries in the world; Nc – number of analysed countries in the international ranking of peace in the world.
7	Index of law enforcement by foreign citizens in the country (per 1,000 foreigners who enter the country)	$Ile = 1 - Nfcc/Nfe$	Nfcc – number of foreign citizens and persons who are prisoners or convicts; Nfe – number of foreigners who enter the country, million people.
8	Index of duration of stay of foreigners in the country	$Idsf = Pms/Pcy$	Pms – maximum period of stay of foreigners in the country, days; CYD – calendar year, days.
9	Index of openness of the tourist area of the country	$Iota = 1 - Nvi/Nfei$	Nvi – number of visas to enter the country issued; Nfe – number of foreigners who entered the country, thousand people.
10	Index of rates of airport tax	$Irat = 1 - RAFmin/RATmax$	RAFmin – minimum rate of airport fees in the country for passengers of economy class aircraft in international traffic, USD; RATmax – maximum rate of airport tax for passengers of economy class aircraft of international traffic, USD.
III. Social indicators of tourism attractiveness			
11	Index of activity of foreigners visiting the country for the purpose of tourism	$Iavt = Nft/Nfe$	Nft – number of foreigners who visited the country for tourism, million people; Nfe – number of foreigners who entered the country, million people.
12	Hotel room occupancy index	$Ihro = Nhro/Nhrt$	Nhro– number of occupied hotel rooms; Nhrt– total number of hotel rooms.
13	Index of perception of representatives of other nationalities	$Ipon = Npon/Ntp$	Npon – population of other nationalities legally living in the country, million people; Ntp – total population, million people.
14	Human development index of the country	$Ihd = HDI$	HDI – international human development index of the country.

No.	The name of the indicator	Calculation formula	The symbols in the formula to calculate
15	Index of duration of tourist trips to the country	$Idtt = ALst/ADcm$	$ALst$ – average length of stay in the country, days; $ADcm$ – average duration of a calendar month, days.
	IV. Cultural and health indicators of tourism attractiveness		
16	Index of availability of health resorts (per 1,000 km^2 of the territory of the country)	$Ihr = Nhr/Ac$	Nhr – number of health resorts; Ac – area of the whole country, thousand km^2.
17	Index of the availability of UNESCO world heritage sites	$Ihs = Nhsc/Nhsw$	$Nhsc$ – number of UNESCO world heritage sites in the country; $Nhsw$ – largest number of UNESCO world heritage sites concentrated within one country.
18	Index of concentration of historical and cultural monuments (in 1 km^2 of the territory of the country)	$Ihcm = Nrhcm/Ac$	$Nrhcm$ – number of registered cultural and historical monuments; Ac – area of the whole country, km^2.
19	Index of the prevalence of the network of restaurant businesses	$Inrb = Nicr/Nce$	$Nicr$ – number of institutions such as cafes and restaurants; Nce – total number of catering establishments.
20	Index of the capacity of stadiums for large-scale events	$Ics = CSt/Ntp$	CSt – total capacity of stadiums with a size of more than 10,000 seats, million seats; Ntp – total population, million people..
	V. Infrastructure indicators of tourism attractiveness		
21	Access to the Internet index	$Iai = Nsci/Nscp$	$Nsci$ – number of subscribers connected to the Internet, million people; $Nscp$ – number of subscribers connected to power supply networks, million people.
22	Index of security of tourism enterprises	$Iste = Nte/Nre$	Nte – number of tourist enterprises; Nre – total number of registered enterprises.
23	Solid road surface index	$Isrs = Lhsr/Ltr$	$Lhsr$ – length of class A, B, C roads (with hard surface), thousand km; Ltr – total length of roads, thousand km.
24	Index of the level of hotel service	$Ilhs = Nh/Ncaf$	Nh – number of hotels; $Ncaf$ – number of collective accommodation facilities.
25	The service index of passenger traffic via air transport	$Ispt = Npt/(Ntp + Nfe)$	Npt – volume of passenger traffic in all airports of the country, million people; Ntp – number oftotal population, millions of people; Nfe – the number of foreigners who entered the country, million people.

No.	The name of the indicator	Calculation formula	The symbols in the formula to calculate
VI. Environmental indicators of tourism attractiveness			
26	Landscaping index of the territory	$Ilt = Af/Ac$	Af – forest area, thousand km^2; Ac – area of the whole country, km^2.
27	Air pollution index	$Iap = 1 - Nco_2/Ac$	Nco_2 – CO_2 emissions, million tons; Ac – area of the whole country, km^2.
28	Urbanization index	$Iu = 1 - Nup/Ntp$	Nup – urban population, million people; Ntp –- number of total population, millions of people.
29	Surface water pollution index	$Iswp = 1 - Vswp/Vswt$	Vswp – volume of surface water that does not meet environmental standards, million cubic meters; Vswt – total surface water volume, million cubic meters
30	Index of efficiency of environmental measures in the country	$Ieem = 1 - Pepi/Nepi$	Pepi – place of the country in the international rating of the ecological efficiency of the countries of the world (EPI); Nepi – number of analysed countries in the international ranking of environmental efficiency in the world.

Source: *compiled by the authors*

The procedure for calculating the integrated index of tourism attractiveness in the country consists of three stages:

1. Calculation of indices for each individual group based on available statistics. Since the absolute indicators that form the base of the study are, as a rule, different, combining them into an integral assessment initially involves bringing the original data into one type. Therefore, all the absolute values in the proposed method are presented in relative terms, expressed as a coefficient or percentage. Indices that suggest a destructive impact on tourism attractiveness in the country are converted to compare with other indicators using the formulas given in Table 1, resulting in the growth of the modified indicator being regarded as a positive impact on the development of tourism. The maximum value of each index for all groups of indicators does not exceed 1.
2. Calculation of the tourism attractiveness index for each group of indicators. At this stage, the total level of indicators is calculated for each group to obtain an overall integrated assessment. Indicators are normalised for each group of indices using the expert methodology.

This is only one subjective feature of our approach which, in turn, can be modified later using other approaches to define the weights of certain indicators (like a statistical method of factor loadings, or others). We justify the use of expert evaluations in this stage of the development of the methodology in order to demonstrate the importance of differences in the consideration of factor weights. Further, based on scientific discussion in this field, this stage of factor value normalization can be changed or developed.

In our pilot calculations, the priority of groups of indicators of tourism attractiveness is determined by the method of direct evaluation, where each expert gives a numerical value according to a given scale. The beginning of this scale, 0 points, corresponds to the absence of a value, and the upper gradation of the scale, 10 points, is an indicator of the maximum significance of the group. After the normalization of the scores, the weight coefficients k_{ij} for all experts (m) for each group and the value k_i for each group are determined by finding the arithmetic mean of the obtained values – k_{ij}. The formula for the normalization of the score values is as follows:

$$k_{ij} = \frac{p_{ij}}{\sum_{i=1}^{n} p_{ij}} \quad (1)$$

kij – the weight of the i-th group (I = 1,..., (n) provided by the j-th expert;

p_{ij} – the score of the j-th expert (j = 1,..., m) for the i-th group (I = 1,..., n);

$\sum_{i=1}^{n} p_{ij}$ – the sum of points given by the j-th expert to all groups.

The expert evaluation was conducted on 9–22 January 2023. The 12 experts involved were representatives of the tourism industry. They represented all levels of stakeholders linked to the development of the tourism industry: authorities (Ministry of Culture and Information Policy, State Agency for Tourism Development of Ukraine); business entities and NGOs in the field (National Tourism Organization of Ukraine, owners and managers of tourism establishments and organizations); and practitioners, analysts and researchers (professionals listed in the unified register of environmental impact assessment, scientists of Taras Shevchenko Kyiv National University involved in tourism research).

3. The calculation of the integrated index of tourism attractiveness in the country is defined as the total value of the normalised integrated indices of tourism attractiveness in the country by the economic, political, legal, social, cultural, health, infrastructure and environmental groups of indicators.

$$I = \sum_{i=1}^{n} k_i \times x_i \quad (2)$$

I – integrated index of tourism attractiveness in the country;

k_i – weighted coefficient of tourism attractiveness for the i-th group of indicators;

x_i – integral index of tourism attractiveness for the i-th group of indicators, calculated as the total value of the sub-indexes of the group;

n – number of index groups (economic, political, legal, social, cultural, health, infrastructure, environmental).

Our approach, on the one hand, reflects the complexity of the structure of the tourism attractiveness index and the frequent inability to identify one priority or key factor. On the other hand, it determines the relevance of a wide range of indicators for the compact presentation, clarity and ease of perception of an integrated assessment.

4. Results

Russia's full-scale invasion of Ukraine on 24 February 2022 resulted in large-scale human casualties, massive population displacement, and significant infrastructure damage. The impact on Ukraine's economic activity was also enormous: real GDP fell extensively, inflation rose drastically, trade was severely disrupted, and the budget deficit rose to unprecedented levels. In addition, Ukraine suffered significant destruction. The cost of the recovery and reconstruction of Ukraine, including its economy, has already reached around $349 billion. More than 7 million Ukrainians (around one fifth of the total population) left the country or became internally displaced, which puts pressure on the social security system (Wilkie, 2022).

As a result of the russian invasion and damage to the country's infrastructure, there is a whole list of current environmental threats and challenges, including the following:

- damage to the water supply, sewerage systems and communications, which is a direct threat to the emergency pollution of rivers, which are water sources for industrial and municipal enterprises and the population;
- the repair of water pipes and power lines in war zones is often delayed, and the quality of drinking water deteriorates severely during such periods;
- there is local (yet significant in terms of its consequences) pollution of underground and surface waters as a result of large-scale oil spills from exploded tanks, from destroyed equipment and other military actions;
- the probability of the destruction of sludge storage facilities and landfills is growing catastrophically, which carries the threat of water pollution and emergency situations in the regions;
- the ecosystems of all territories affected by the war have been comprehensively disrupted.

In general, the russian invasion of Ukraine led to serious environmental consequences for the Donetsk, Luhansk, Zaporizhzhia, Kherson, Kyiv, Chernihiv and Sumy Oblasts (regions). In particular, they include air, soil and water pollution, the flooding of territories, the decommissioning of large tracts of arable land, the destruction and damage of nature reserve fund objects, and the occurrence of forest fires, including those in the exclusion zone of the Chernobyl Nuclear Power Plant, etc. (Ministry of Environmental Protection and Natural Resources of Ukraine, 2022b).

In particular, as a result of the hostilities, in March 2022 the entire network of large metallurgical and chemical industry facilities which were concentrated in the east of Ukraine was completely destroyed. Azovstal, the Avdiivka Coke Chemical Plant, the Lysychansk Oil Refinery, Sumykhimprom and others appear to be the most ecologically dangerous manufacturers among a great number of industrial enterprises damaged as a result of hostilities. These enterprises traditionally posed the greatest danger to the environment in Ukraine and formed some of the most polluted environments in the country around their locations (Ministry of Environmental Protection and Natural Resources of Ukraine, 2022a).

Ammunition explosions and the destruction and burning of military equipment together with fuel and ammunition are a source of significant air and soil pollution. Several aircrafts and helicopters which were shot down fell into water reservoirs and even into the sea. Furthermore, several warships were also destroyed, including the *Moskva* missile cruiser, which suffered an ammunition detonation, and the *Saratov* troop ship, which had up to 1,000 tons of fuel and ammunition on board. According to rough estimates, 10%–25% of all russian equipment was slowed down or blocked by water reservoirs (Ministry of Environmental Protection and Natural Resources of Ukraine, 2022b).

Since 24 February 2022, the data from the Chernobyl Exclusion Zone has shown increased levels of gamma radiation as heavily armoured vehicles and other transport have moved over the contaminated soil and emitted radioactive dust into the air.

According to preliminary calculations, a total of 900 objects of the nature reserve fund with an area of 12,406.6 km² (1.24 million hectares) fell into the zone of military occupation and hostilities, which is around a third of the total area of the nature reserve fund of Ukraine (Ministry of Environmental Protection and Natural Resources of Ukraine, 2022a).

The russian-Ukrainian war is recognized as the worst conflict in Europe since World War II. Its consequences will be felt for several generations – and not only for Ukrainians, as the development of human potential has been disrupted, cultural heritage has been destroyed, an ecological disaster is brewing, and the positive trajectory of economic development and the level of poverty has changed into a negative one. The World Bank predicts that due to russia's unprovoked invasion of Ukraine, global economic growth is forecast to slow from 4.1% to 3.2% in 2022, and countries will face stagflation (stagnation in manufacturing occurs simultaneously with inflation), rising energy prices, and the disruption of supply chains. The population will be forced to live in a turbulent environment, experiencing a constant shortage of food and a limited number of jobs (Wilkie, 2022).

In order to interpret the results of using the suggested methodology and assess the effects of the war in Ukraine on social, economic and ecological spheres, we will compare touristic attractiveness in Ukraine and Poland. The initial conditions for the construction of the model are the calculation of partial indices for groups of economic, political, legal, social, cultural, health, infrastructure and environmental tourism attractiveness indicators and the reduction of relative indicators to standard values for comparison. At the same time, the expert commission, consisting of 8 specialists in the field of economy and tourism, established a priority for each of the six groups of indicators. The results of the usage of the proposed method based on the case of Ukraine and Poland are presented in Table 2.

Table 2. *The results of the analysis of integrated tourism attractiveness in Ukraine and Poland in 2017–2022[1]*

No.	The name of the indicator	2017		2018		2022 [2]	
		Ukraine	Poland	Ukraine	Poland	Ukraine	Poland
I. Economic indicators of tourism attractiveness							
1	Index of consumption of tourist services	0.015	0.060	0.006	0.045	0.001	0.059
2	Index of excess expenses of tourists	0.150	0.212	0.115	0.090	0.198	0.121
3	Index of profitability of food in the country	0.760	0.620	0.757	0.573	n/d[3]	0.588
4	Index of health, recreation and culture expenditure in consumer spending	0.100	0.130	0.062	0.090	0.026	0.097
5	Tourism employment index	0.056	0.045	0.001	0.043	0.021	0.052
Integral index of economic tourism attractiveness		1.081	1.067	0.941	0.841	0.246	0.917
Weighted coefficient of economic tourism attractiveness according to the results of expert evaluation		0.187	0.187	0.187	0.187	0.187	0.187
Normalised integral index of economic tourism attractiveness		0.202	0.199	0.176	0.157	0.046	0.187
II. Political and legal indicators of tourism attractiveness							
6	Peace index of the country	0.055	0.804	0.080	0.804	0.061	0.847
7	Index of law enforcement by foreign citizens in the country (per 1,000 foreigners who enter the country)	0.914	0.989	0.998	0.990	1.498	1.098
8	Index of duration of stay of foreigners in the country	0.493	0.493	0.493	0.493	0.493	0.493
9	Index of openness of the tourist area of the country	0.994	0.980	0.990	0.985	0.494	1.226
10	Index of rates of airport tax	0.365	0.504	0.345	0.504	n/d[4]	0.523
Integral index of political and legal tourism attractiveness		2.821	3.770	2.906	3.776	2.546	4.187
Weighted coefficient of political and legal tourism attractiveness according to the results of expert evaluation		0.145	0.145	0.145	0.145	0.145	0.145
Normalised integral index of political and legal tourism attractiveness		0.409	0.547	0.421	0.548	0.369	0.607
III. Social indicators of tourism attractiveness							
11	Index of activity of foreigners visiting the country for the purpose of tourism	0.003	0.218	0.005	0.228	0	0.238
12	Hotel room occupancy index	0.510	0.489	0.310	0.498	0.102	0.695

No.	The name of the indicator	2017		2018		2022[2]	
		Ukraine	Poland	Ukraine	Poland	Ukraine	Poland
13	Index of perception of representatives of other nationalities	0.222	0.029	0.222	0.030	0.201	0.097
14	Human development index of the country	0.751	0.865	0.751	0.872	n/d[5]	n/d[5]
15	Index of duration of tourist trips to the country	0.234	0.210	0.445	0.234	0.037	0.343
	Integral index of social tourism attractiveness	1.720	1.811	1.733	1.862	0.340	1.373
	Weighted coefficient of social tourism attractiveness according to the results of expert evaluation	0.159	0.159	0.159	0.159	0.159	0.159
	Normalised integral index of social tourism attractiveness	0.273	0.288	0.276	0.296	0.054	0.218
	IV. Cultural and health indicators of tourism attractiveness						
16	Index of availability of health resorts (per 1,000 km² of the territory of the country)	0.089	0.140	0.096	0.144	0.087	0.149
17	Index of the availability of UNESCO world heritage sites	0.132	0.302	0.132	0.302	0.132	0.302
18	Index of concentration of historical and cultural monuments (in 1 km² of the territory of the country)	0.209	0.247	0.209	0.246	0.225	0.263
19	The index of the prevalence of the network of restaurant business	0.460	0.590	0.522	0.558	0.318	0.549
20	Index of the capacity of stadiums for large-scale events	0.024	0.022	0.024	0.022	0.024	0.022
	Integral index of cultural and health tourism attractiveness	0.914	1.301	0.983	1.272	0.786	1.285
	Weighted coefficient of cultural and health tourism attractiveness according to the results of expert evaluation	0.214	0.214	0.214	0.214	0.214	0.214
	Normalised integral index of cultural and recreational tourism attractiveness	0.196	0.278	0.210	0.272	0.168	0.275
	V. Infrastructure indicators of tourism attractiveness						
21	Access to the Internet index	0.520	0.730	0.626	0.929	0.793	0.932
22	Index of security of tourism enterprises	0.010	0.004	0.002	0.001	0.001	0.005
23	Solid road surface index	0.978	0.971	0.978	0.972	n/d[6]	0.980
24	Index of the level of hotel service	0.589	0.364	0.588	0.234	0.421	0.483
25	The service index of passenger traffic via air transport	0.235	1.041	0.485	1.093	n/d[4]	1.231

No.	The name of the indicator	2017		2018		2022 [2]	
		Ukraine	Poland	Ukraine	Poland	Ukraine	Poland
	Integral index of infrastructure tourism attractiveness	2.332	3.110	2.679	3.229	1.215	3.631
	Weighted coefficient of infrastructure tourism attractiveness based on the results of expert evaluation	0.184	0.184	0.184	0.184	0.184	0.184
	Normalised integral index of infrastructure tourism attractiveness	0.429	0.572	0.493	0.594	0.224	0.668
VI. Environmental indicators of tourism attractiveness							
26	Landscaping index of the territory	0.208	0.267	0.155	0.296	n/d [7]	0.308
27	Air pollution index	0.786	0.612	0.791	0.999	n/d [8]	1.098
28	Urbanization index	0.311	0.391	0.307	0.399	0.287	0.395
29	Surface water pollution index	0.250	0.400	0.250	0.500	n/d [9]	0.549
30	Index of efficiency of environmental measures in the country	0.394	0.722	0.394	0.722	n/d [10]	n/d [10]
	Integral index of ecological tourism attractiveness	1.949	2.492	1.897	2.916	0.278	2.350
	Weighted coefficient of ecological tourism attractiveness according to the results of expert evaluation	0.111	0.111	0.111	0.111	0.111	0.111
	Normalised integral index of ecological tourism attractiveness	0.216	0.277	0.211	0.324	0.032	0.261
	The integrated index of tourism attractiveness in the country	1.725	2.161	1.787	2.191	0.893	2.216

[1] We do not include 2019–2021 in comparative calculations, aiming to prevent data distortion and the impossibility of their calculation. During this period, the COVID-19 pandemic covered the whole world and had devastating consequences for the tourism industry due to the unprecedented closure of borders between countries, the reduction of transport connections both at the international and national levels, social distancing limiting gatherings in public places, etc. Experts testify that such a crisis in tourism has not been observed since World War II.

[2] During this period, the Integral Index of Tourism Attractiveness in the country was calculated fragmentarily (that is, only for those indices that could be determined as of October 2022), particularly aiming to reflect the impact of the war in Ukraine on tourism attractiveness, as well as the social, economic and environmental situation.

[3] In 2022, Ukraine was not included in the Big Mac index of The Economist magazine. McDonald's restaurants shut down after the full-scale russian invasion began.

[4] Ukraine closed all of its airspace to civilian traffic on 24 February 2022 due to the full-scale russian military invasion. Along with this, all air transportation to, from and within Ukraine completely stopped, and the activities of dozens of airports, airlines and other enterprises of the aviation market have stopped as well.

[5] The country's Human Development Index is calculated in the next period (in 2023). Currently, the United Nations believes that in the nearest future there will be a global decline in the Human Development Index due to COVID-19 and russia's military invasion of Ukraine.

[6] As of October 2022, more than 25,000 kilometres of highways have been damaged as a result of the war in Ukraine, of which 8,800 kilometres are state highways; 326 bridges and overpasses were destroyed, 140 of which were on state highways; and the current damages to the state road network are equal to 973 billion hryvnias (Levchuk, 2022).

[7] As of September 2022, as a result of hostilities in Ukraine, around a third of the country's forests have been destroyed or significantly damaged, and 450,000 hectares of forests at this moment are under russian occupation. Moreover, 2.45 million hectares of forests have been taken back, but they are "burnt and trenched" and it will take decades to restore them.

[8] As of September 2022, as a result of forest fires, bombings of oil refineries and manufacturing facilities, the volume of carbon emissions into the atmosphere is at least 31 million tons. At the same time, potentially 79 million tons of greenhouse gases will be produced during the post-war reconstruction of Ukraine, in particular for the rebuilding of infrastructure.

[9] The bombing of cities, towns and villages led to dozens of broken pipelines and non-working pumping stations. The sewage treatment facilities of the Severodonetskvodokanal Municipal Enterprise, Lysychanskvodokanal Municipal Enterprise, Rubizhanske VUVKH Municipal Enterprise, Popasniansky Vodokanal Municipal Enterprise, and Oblvodokanal Municipal Enterprise were damaged. Because of this, untreated wastewater from Severodonetsk, Lysychansk, Rubizhne, Popasna and part of Zaporizhzhia pollutes surface water. Two commercial ships carrying fuel and chemicals (the Moldova-flagged chemical tanker Millennial Spirit and the Panama-flagged bulk carrier Namura Queen) were hit by russian missiles to the east of Odesa, causing a local fuel spill and a fire at sea.

[10] The Environmental Performance Index, which is the basis for the calculation of this index, is a method of quantitative assessment and comparative analysis of environmental policy indicators around the world. Using 40 performance indicators across 11 issue categories, the EPI ranks 180 countries on climate change performance, environmental health, and ecosystem vitality. The index is published every 2 years. Therefore, for 2017–2018, we took a common value based on the indicators of 2018, and the data for 2022 is not available yet, hence this indicator cannot be calculated.

Source: *compiled by the authors according to the data of: the State Statistics Service of Ukraine (n.d.), Statistics Poland (2019a, 2019b), the migration profile of Ukraine and Poland, the Human Development Indices and Indicators, the statistics in the sector of air transport, European statistics, the Global Peace Index (Institute for Economics and Peace, 2022) and others.*

In order to facilitate perception, we will compare the tourism attractiveness in Ukraine and Poland according to the Integral Index of Tourism attractiveness in the country with the use of a graph (see Fig. 1).

As we can see from Figure 1, tourism attractiveness in Poland is significantly higher than tourism attractiveness in Ukraine. Based on the results of the calculation of a number of integral indices, it was found that the integral coefficient of Ukraine in 2017 and 2018 was lower than the integral coefficient of Poland (1.725 and 2.161 in 2017, 1.787 and 2.191 in 2018; therefore, the difference was 0.436 in 2017 and 0.404 in 2018 respectively). This trend indicates that Poland is ahead of Ukraine in its level of tourism attractiveness. As a result of the analysis of the structure of tourism attractiveness, the authors determined that according to 5 out of 6 indicators, there is a significant gap between the level of tourism development in Poland and its level in Ukraine, especially in the groups of indicators for political and legal, cultural and recreational, and environmental and infrastructural components. Nevertheless, in terms of the economic attractiveness, there is not a big difference between the countries. In 2017–2018, the countries were almost equal in terms of social tourism attractiveness (the difference in 2017 was only 0.015, and in 2018 was equal to 0.02). Thus, as a result of the comparison of the tourism attractiveness of Ukraine and Poland according to the suggested methodology, it is obvious that the majority of tourists would give preference to Poland.
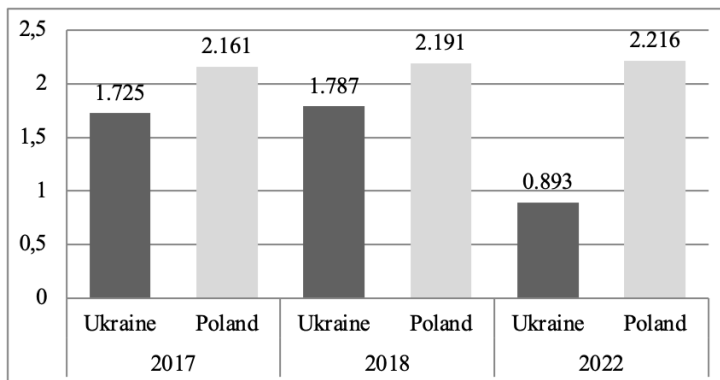
Figure 1. *Comparative assessment of tourism attractiveness in Ukraine and Poland according to the developed methodology*
Source: *authors' own research*

The use of the suggested methodology for comparing the tourism attractiveness in Ukraine and Poland in 2022, as well as the analysis of the indicators' dynamics, clearly demonstrates the harmful impact of the war on the social, economic and environmental spheres in Ukraine. Consequently, in 2022, compared to the relatively peaceful period of 2018, all partial indicators for Ukraine decreased with dramatic dynamics: the normalised integral index of economic tourism attractiveness by 73.9%; the normalised integral index of political and legal tourism attractiveness by 12.4%; the normalised integral index of social tourism attractiveness by 80.4%; the normalised integral index of cultural and health tourism attractiveness by 20.0%; and the normalised integral index of infrastructural tourism attractiveness by 54.6%. The normalised integral index of ecological tourism attractiveness decreased most drastically, i.e., by 84.8%.

The analysis suggests that the proposed method provides a holistic view of tourism attractiveness due to the usage of a complex system of indicators. It has a high theoretical consistency and is suitable for practical use as the results obtained reflect the existing trends in tourism development and are important for understanding the gaps in specific dimensions of ensuring tourism attractiveness.

5. Conclusion

According to the research results, it was found that it is difficult to objectively assess the tourism attractiveness of the country since there are differences between countries and their regions in tourist infrastructure, geographical location, economic and socio-cultural development, resource potential, and the like. At the same time, in the economic literature to there is no comprehensive methodology assessing tourism attractiveness that would cover the diversity of tourism activities.

Theoretical implications

Our research was conducted with an emphasis on the use of objective values of partial indicators. This makes our method more convincing in terms of the reliability of results and easier to use compared with methods based on expert evaluations of tourism attractiveness – for example, those developed by Al Mamun & Mitra (2012), Kim et al. (2020), Shpak et al. (2022), and Vasanicova et al. (2021). Simultaneously, our approach enables policymakers and other stakeholders of the tourist market to assess partial indicators and thus find relative advantages and gaps compared with other countries. These advantages are not currently accessible, as the more precise attention of researchers is focused on the overall attractiveness of the tourism industry, which is particularly reflected in country brand attractiveness estimates (Castillo-Manzano et al., 2021; Zaman & Aktan, 2021) and the ubiquitous challenges caused by pandemic restrictions and possible similar large-scale threats in the future (Kostynets et al., 2021; Woosnam et al., 2022).

In light of these comparisons, we can conclude that our approach has some obvious advantages:

1. it is based on the available statistical indicators, so stakeholders of touristic market development can relatively easily assess the current situation and perspectives if trends are considered. These estimates are not time-consuming to a great extent and can be fulfilled using the most commonly used software;
2. it makes it possible to compare countries with different sizes and levels of economic development as it is developed with the use of relative indicators;
3. it takes into account all constituents of tourism attractiveness, particularly indicators relating to economic, political, legal, social, cultural, infrastructure and environmental development areas. It also creates the possibility to produce a holistic understanding of the overall lag behind the leaders, as well as partial gaps in certain constituents of the integral index. These estimates, using the experience of countries with similar geographical positions (which cannot be changed despite the majority of other attributes of touristic attractiveness), are useful to develop strategic decisions regarding the development of tourism in the country.

Of course, this methodology can be developed – for example, by considering the most important constituents of determinants of the tourist environment in the country. Particularly for those countries with higher risks in certain spheres, such as the personal security of tourists, the Global Terrorism Index can be included in the list of political and legal indicators. Similar methodological changes can be undertaken by researchers based on discussions and the consideration of peculiarities typical for some groups of countries. In our study, we tried to ensure the most ubiquitous approach to assessing tourism attractiveness with an emphasis on publicly available values for calculations, which, in their turn, provide a reliable basis to understand the differences as well as the strengths and weaknesses of tourism attractiveness.

Practical implications

Using the cases of Ukraine and Poland to demonstrate the advantages of our approach, we found that the level of tourism development in Poland was significantly different from its level in Ukraine. The most obvious lag was typical of the political and legal, cultural and recreational, and environmental and infrastructural components. Even before the war and pandemic, some obvious crisis tendencies were typical for the development of Ukrainian tourism. However, the war significantly enlarged this gap. A comparison of indicators of the tourism attractiveness in Ukraine in 2022 clearly demonstrates the harmful impact of the war on the social, economic and environmental spheres.

In light of post-war political, economic and environmental issues, the primary influence and support for the industry from the authorities should be focused on innovative changes to increase tourism attractiveness and strengthen the competitive positions of tourism enterprises. In this regard, the most obvious competitive advantages can be achieved based on unique product offers, which are possible considering the growing attention of the global community towards Ukrainian identity. These efforts should be considered for the development of the strategy of the recovery of Ukrainian tourism.

A second important direction of policymaking is the implementation of the concept of sustainable tourism, which will contribute to the balanced development of territories. This issue becomes especially important considering the increasing disparities in regional development caused by war destruction. The development of post-war tourism in Ukraine could be supported, for example, by using the best practices of other post-war territories (Dissanayake & Samarathunga, 2021) as well as the existing experience of multilateral political influence (Zhou et al., 2021).

Limitations and future research

The significant limitations in the development of our methodology were linked to the prioritization of the indicators used. We involved experts for this aim; however, there is a significant obstacle to involving a larger number of experts in the field due to the war in Ukraine and appropriate difficulties for the activities of tourism representatives. As a result, some of them stopped their activities and lost motivation to cooperate in this study. However, we believe that our future research in the field will allow us to fill this gap. In this research, we propose the principal proposition of a research methodology which can be improved, including via improvements at the stage of the weighting of the factors.

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WHAT IMPACT DOES TRUST HAVE ON CONSUMER INCLINATIONS? ECONOMIC IMPLICATIONS FROM A CASE STUDY OF THE *XYLELLA* EMERGENCY

Maria Elena LATINO[1]

Department of Innovation Engineering, University of Salento, Lecce, Italy
mariaelena.latino@unisalento.it
ORCID: 0000-0001-8686-5109

Marta MENEGOLI

Department of Innovation Engineering, University of Salento, Lecce, Italy
marta.menegoli@unisalento.it
ORCID: 0000-0002-6771-509X

Fulvio SIGNORE

Department of Humanities, University of Foggia, Foggia, Italy
fulvio.signore@unifg.it
ORCID: 0000-0003-4046-7353

Angelo SCIALPI

Department of Innovation Engineering, University of Salento, Lecce, Italy
angelo.scialpi@unisalento.it
ORCID: 0000-0001-5216-5366

Angelo CORALLO

Department of Innovation Engineering, University of Salento, Lecce, Italy
angelo.corallo@unisalento.it
ORCID: 0000-0001-5216-5366

Abstract

Aim. The modern economic era is riven with issues that significantly affect day-to-day existence. Climate change and its effects are among the most crucial. In this regard, Xylella fastidiosa infection represents one of the most difficult challenges in Italy. The purpose of

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1   *Corresponding author: Maria Elena Latino, Research Fellow, Department of Innovation Engineering, University of Salento, Italy. Campus Ecotekne, Edificio Aldo Romano, Via per Monteroni s.n., 73100, Lecce, Italy. Email address: mariaelena.latino@unisalento.it*

this study is to propose decision-making insights that, beginning from the emotive information provided by the media, build a foundation for containing the negative economic effects of the Xylella phenomenon by involving the key actors in the agri-food supply chain.

Design/methodology. The study was composed in different consequent phases: an indepth historical and literature analysis of the phenomenon; a sentiment analysis on the emotions mostly conveyed by the newspapers that covered the topic; and a PLS-SEM model in a case study of consumers. Measures were detected through a quantitative questionnaire.

Findings. The results suggest that the most frequently conveyed emotion was trust. The PLS-SEM mediation model highlighted that trust in farmers could have an indirect impact on willingness to buy olive oil through the perception of safety in the Italian market. Estimates were validated through bootstrap analysis.

Novelty. The study aims to investigate a subject that has not yet been addressed, outside of a biological perspective, from a systemic point of view. Complementing the current biological and agronomic viewpoints with a different framework could represent a well-established element in assessing the relationship between trust in agri-food supply chain actors and consumer willingness to buy during critical events by offering crucial insights on economic engagement policies.

Keywords: *Xylella, trust, policy, PLS-SEM, agri-food supply chain, sentiment analysis*

JEL CODES: *D12, D81, D91, Q13, Q54*

1. Introduction

Xylella fastidiosa (hereinafter – *X. fastidiosa*) is one of the most dangerous insect-vectored bacterial plant pathogens worldwide (Schneider et al., 2020). Insect vectors feed on the xylems of host plants (Cornara et al., 2018), leading them to marginal or total leaf necrosis, delayed growth, and the death of plants (Hopkins, 1989). The decline in the health of the host plant results, firstly, in the decrement of yields, and then in the reduction of fruit quality (Saponari et al., 2019). The host plants of *X. fastidiosa* are encompassed in a long list of 655 species present in European, Asian and American territories (European Food Safety Authority et al., 2022; Harvey & McMeekin, 2005). The countries affected by *X. fastidiosa* infection in March 2022 are marked in orange in Figure 1, in which the yellow circles highlight the presence of the infection and the purple circles the transient status of the infection.
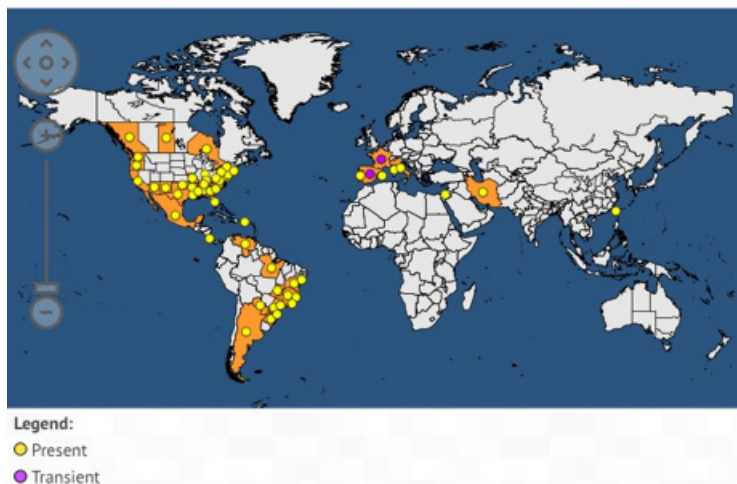
Figure 1. *Geographical distribution of the global spread of X. fastidiosa infection in March 2022*
Source: *EPPO Global Database (n.d.)*

Italy was the first European country affected by *X. fastidiosa* infection, with the first event observed in October 2013 in olive trees in the Apulia region (Schneider et al., 2021). For centuries olives have been at the agronomical, cultural and culinary heart of the Mediterranean area (Vossen, 2007). Moreover, olive trees can grow for hundreds of years, contributing to the agro-ecological landscape and cultural heritage in the area (Rallo et al., 2014). A large part of the bulk of harvested olives is processed to create the iconic Mediterranean product: olive oil. The EU is the largest global producer of olive oil, accounting for around two thirds of worldwide production, and 95% of the olive trees in the world are cultivated in the Mediterranean region (Eurostat, 2020). Therefore, the potential effects of the disease persisting over many years in the same regional area (e.g., Apulia) eventually lead to very significant implications for national and international economies and agri-food companies. As stated by the European Commission[2], *X. fastidiosa* "has the potential of causing in the EU, an annual production loss of 5.5 billion euros, affecting 70% of the EU production value of older olive trees (over 30 years old), and 35% value of younger ones […]. This would put at risk nearly 300,000 jobs across Europe currently involved in that production. In addition to direct impacts on production, pests have significant indirect effects on upstream or downstream economic sectors." For this reason, EU regulatory measures were enacted in response to the spread of the infection, encompassing: i) the establishment of an infected zone and a buffer zone; ii) the eradication of infected or symptomatic plants in the infected zone; iii) the establishment of

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2   https://ec.europa.eu/food/plants/plant-health-and-biosecurity/legislation/control-measures/xylella-fasti-diosa_it

agricultural practices to prevent the presence of and reduce the vector population (e.g., removal of weeds, ploughing of the soil); iv) the planting of specific crops in the infected zone (i.e., *X. fastidiosa*-resistant species); and v) control over the movement of plants within and out of the demarcated zones. These government measures were observed by EU countries and translated into regional action plans. Specifically for the Apulia region, in March 2022 the Councilor for Agriculture, the Agri-Food Industry, Agri-Food Resources, Land Reform, Hunting and Fishing, and Forests approved the latest version of the "Action plan to combat the spread of *Xylella fastidiosa* in Puglia."[3] This plan aimed to: i) eradicate the harmful olive trees to protect *X. fastidiosa*-free areas within the region and prevent the spread of *X. fastidiosa* in European Union territories; ii) prevent the spread of the organism by reducing the vector population; iii) and strengthen the communication and information campaign. Apulian agri-food companies which deal with olive production were called to align their own practices of intervention with this directive, sometimes against their willingness. There are several testimonies in this sense from single farmers, biologists, botanists, and researchers fighting to find alternative measures to eradication (Almeida, 2016). These individuals were backed by trade associations (e.g., Coldiretti) working at the regional level to safeguard small and medium enterprises in the sector (di Iacovo et al., 2006).

The first source of testimonies is the mass media, which has the power and the responsibility to provide information to society (Guglielmi, 2017). Regarding *X. fastidiosa* infection, from the first part of the 2014 a significant effort was made by national news organizations to divulge the extent of this phenomenon given its relevance for the Italian territory and its impact on businesses and the economy. An example news headline is shown in Figure 2.

Figure 2. *Example of Italian national news headline during the X. fastidiosa outbreak*

As argued in Section 2, the *X. fastidiosa* phenomenon has been deeply studied, thus triggering the interest of academics in searching both for its causes and for solutions to this problem. Indeed, the strong presence of studies that address the issue from the biological and agronomic viewpoints is evidenced. Therefore, a lack of studies focused on analyzing the impact that the diffusion of this pathogen has had on society, business

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3   http://cartografia.sit.puglia.it/doc/xylella/pda/DGR_343.pdf

and consumers emerged in the process of researching the *X. fastidiosa* phenomenon. Moreover, considering the effect that the media have generated in society through socio-political debate on this topic, a frequent feeling of trust in the possibility of a decisive intervention by food system actors emerged.

Leveraging on this research premise, this paper aims to investigate the prevalent sentiment conveyed in the context of *X. fastidiosa* (RQ_1) and the role that trust plays in influencing consumers' buying intentions (H_{1-5}). To address this scope, and utilizing the model proposed by Yee et al. (2005), the conceptual framework of this study was established, and five hypotheses on the relationship between consumers' trust in food system actors and consumers' intention to purchase olive oil produced after the spread of *X. fastidiosa* in the Apulia region were proposed. A survey research method was applied on a sample of 56 Apulian consumers, and the established hypotheses were tested through Partial Least Squares Structural Equation Modelling. The findings of this study are discussed in this paper, highlighting the impacts that the *X. fastidiosa* phenomenon has generated in society, business and consumers. The research itself, practical implications, and limitations are then discussed, before the final section provides closing remarks and a follow-up.

2. Building the research premise of the study: bibliographic and sentiment analyses

As mentioned in the introduction, the *X. fastidiosa* bacterium caused massive damage to the economy and the social structure of Apulian farmers. This issue devastated the entire sector, forcing farms to close, resulting in the eradication of thousands of centuries-old olive trees (Saponari et al., 2019), and even impacting the landscape of the region. Since it appeared, as well as its extreme practical effects on the economy and society of Salento, the lower area of the Apulian region (and therefore on Italy as a whole), the *X. fastidiosa* phenomenon has been deeply studied, thus triggering interest in both its causes and solutions. Confirming this, this section of the paper presents the results of a bibliographic analysis of the research stream performed by entering the following keywords into a Scopus query: "*Xylella*" AND "Puglia" OR "Apulia" (10 March 2022). Scopus, managed by Elsevier publishing, represents one of the most extensive and high-quality databases in the world (Jo Yong-Hak, 2019). The resulting analysis sample was composed of 104 manuscripts. As shown in Figure 3, scientific production began in 2013 (with 3 manuscripts) and constantly increased, reaching its peak in 2021 with 24 articles on this topic. The 70% increment of papers testifies to the relevance that this theme assumes on a global level, even though it arose from a problem with a defined territorial impact.
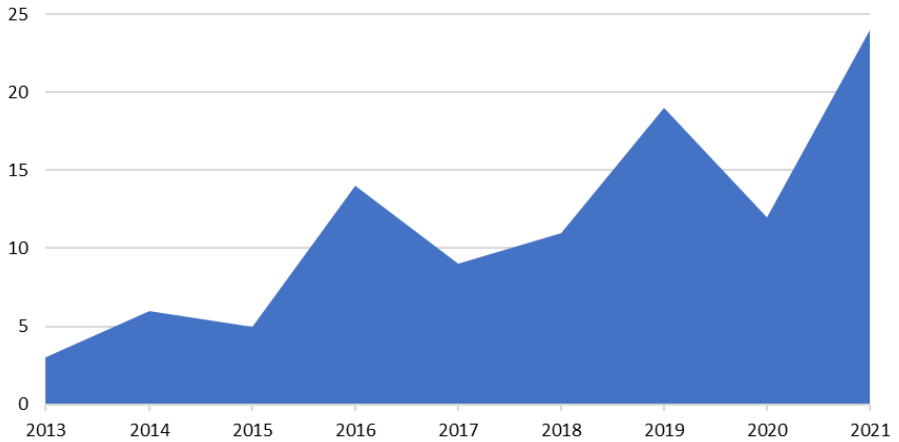
Figure 3. *Annual scientific production on X. fastidiosa from 2013 to 2021*

The country with the largest production on these issues was obviously Italy (81.9%), followed by Spain (6.8%) – both European territories in which the pathogen exists. These countries were followed by the United States (3.0%), as highlighted in Figure 4.
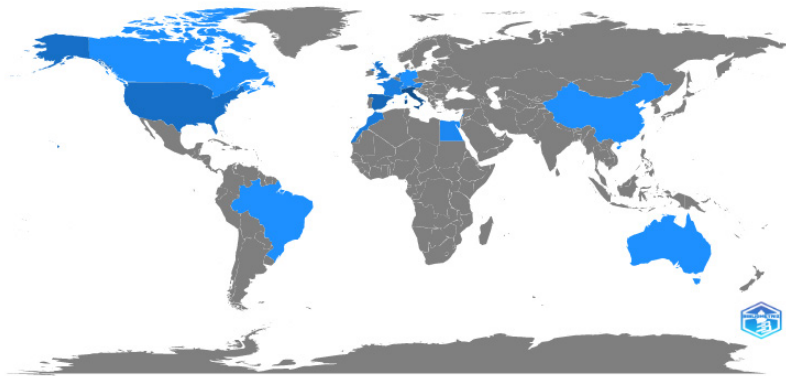
Figure 4. *Most productive countries in terms of X. fastidiosa research*

A total of 52 different sources were identified in the analysis sample. Among these, 21 journals published at least two studies (Figure 5).
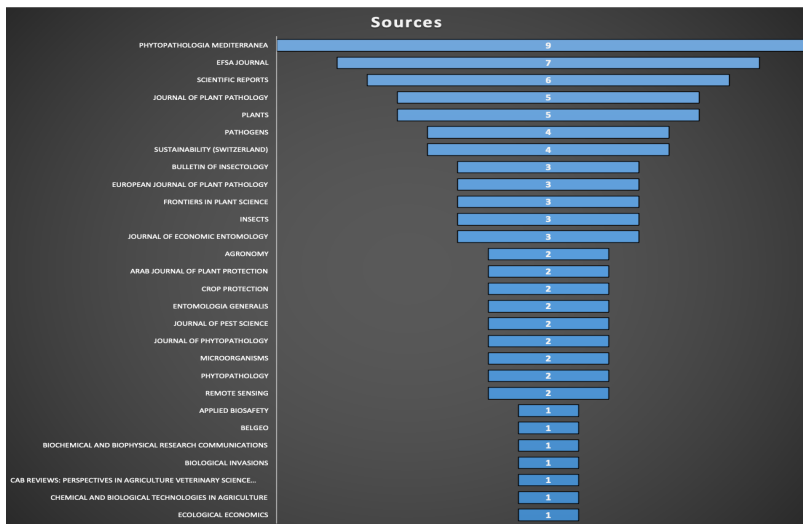
Figure 5. *Principal sources of scientific articles on X. fastidiosa*

The distribution of literature contributions among the several subject areas proposed by Scopus is shown in Figure 6. Agricultural and Biological Science was the most referenced (39.9%), followed by Environmental Science (15.0%), Immunology and Microbiology (9.8%), Biochemistry, Genetics and Molecular Biology (8.1%), and Medicine (5.8%). Therefore, this analysis suggests the strong presence of studies from biological and agronomic viewpoints. A clear lack of studies on the impact that the diffusion of *X. fastidiosa* generated on society, business and consumers is highlighted.
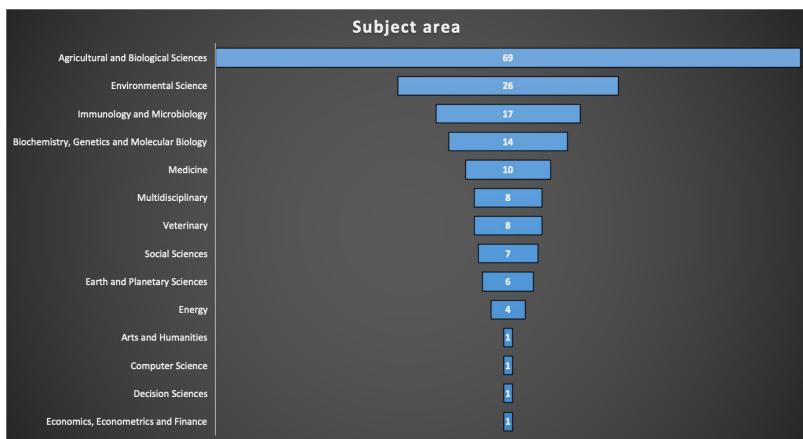
Figure 6. *Scopus subject areas of X. fastidiosa papers*

With the aim of identifying the prevailing sentiment when dealing with the topic of *X. fastidiosa* in the local context of Apulia, a sentiment analysis (Amoore & Piotukh, 2015) on a corpus of 18 newspaper articles from several Italian newspapers (such as *Corriere del mezzogiorno*, *Quotidiano*, *La gazzetta del mezzogiorno*, *La Repubblica*) was carried out, answering RQ_1 and providing the theoretical framework for addressing H_{1-5}. According to (Singla et al., 2017), data from unstructured information, such as textual information, can provide more intelligent and informed decisions for different stakeholders, such as large industries and consumers. The functionality of such information is crucial, as it benefits consumers and manufacturers by suggesting the best strategies to be pursued to secure the economy, thereby affecting purchasing behavior. Sentiment analysis can be defined as language processing based on determining the type of attitude within a body of text from different sources (Cambria et al., 2017). Analyzing sentiment linked to a phenomenon can provide useful insights for subsequent analysis (Bilro et al., 2022; Khan et al., 2022). Analysis was performed using the *syuzhet* R Studio package (Jockers, 2017), providing important insights into the following eight emotions postulated by the model (Plutchik, 1980): anger, anticipation, disgust, fear, joy, sadness, surprise, and trust. Following a graphic approach, these emotions are represented within a circumplex Plutchik model, depicting a wheel in which the radius denotes strength (Figure 7).
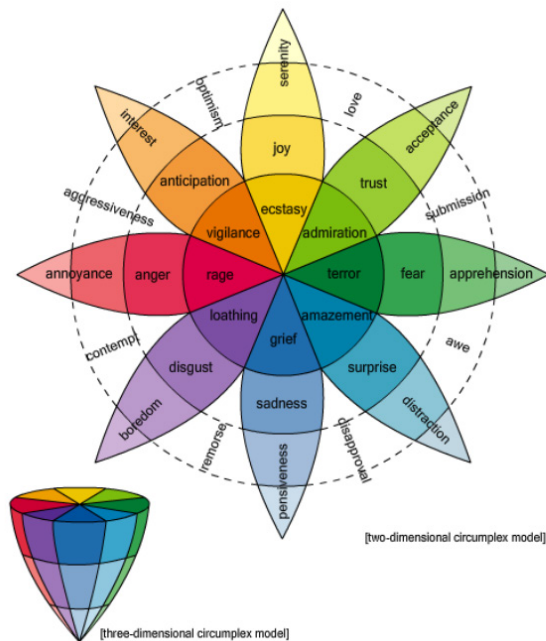
Figure 7. *The Plutchik model (representation from Mohammad and Turney, 2013)*

According to the Plutchik model, the eight basic emotions constitute four opposing pairs: joy-sadness, anger-fear, trust-disgust, and anticipation-surprise (Plutchik, 1980). As reported by Mohammad and Turney (2013), the underlying reasons for this choice have well-established foundations in psychological, physiological and empirical research. Through a non-exclusive focus on predominantly negative emotions, sentiment analysis reveals the presence of predominant emotions within the analyzed text corpus. Figure 8 and Table 1 summarize the predominant sentiments and the frequencies of the concerned categories, respectively.
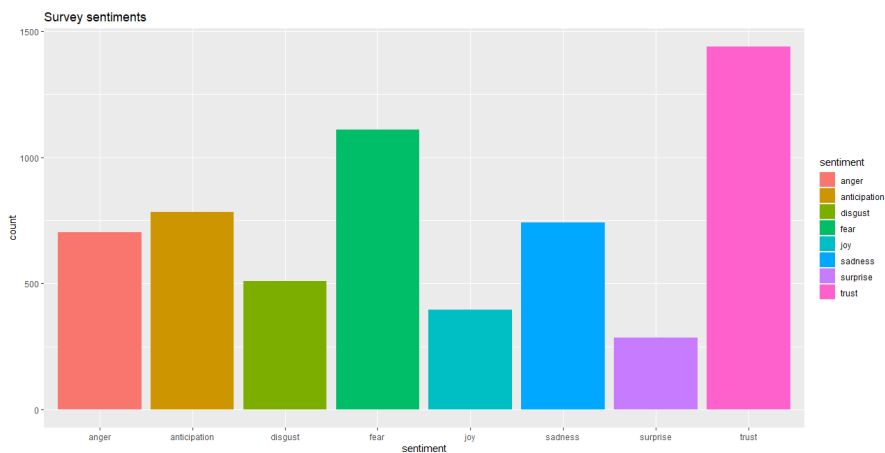
Figure 8. *Sentiment analysis of X. fastidiosa newspaper articles*

Table 1. *Count and percentage of words indicating each sentiment*

Anger	702	11.8%
Anticipation	783	13.1%
Disgust	510	8.5%
Fear	1,110	18.6%
Joy	396	6.6%
Sadness	743	12.5%
Surprise	284	4.8%
Trust	1,439	24.1%
	5,967	100.0%

The most frequent feeling in the newspaper articles was *trust*, which suggested that despite its harsh framing, the media intended to convey messages of hope and confidence in the possibility of solving the problem. Meanwhile, however, trust seemed to be the only positive emotion frequently mentioned in the analyzed texts. Besides this feeling, the most commonly expressed media themes were *fear* (18.6%), *sadness* (12.5%), *antici-*

pation (13.1%), and *anger* (11.8%). According to the overall view of the phenomenon and the knowledge of the authors regarding the history surrounding this issue, the critical problems that marked the *X. fastidiosa* emergency for the social actors involved were: the fear experienced by farmers involved in olive and olive oil production of losing their own cultivations (very often centuries-old trees); subsequent fear in the wider Italian food market of suffering economic damage resulting from the loss of production; as well as a generalized anger against government measures that proposed the eradication of olive trees as a strategy to contain the spread of the pathogen. Therefore, farmers, the Italian food market and the government were directly involved in the problem.

Furthermore, a literature analysis carried out on Scopus by entering "*Xylella*" and "Trust" as keywords (in the title and abstract fields) returned just two results (dated 2018 and 2020), only one of which presented an in-depth analysis of the issue in terms of communication. In the first study in which the concept of *Xylella* was associated with the concept of trust (Capua, 2018), the aim of the dissertation was to give greater importance to the credibility of science (i.e., the danger of the *X. fastidiosa* phenomenon) in a socio-political context that is increasingly oriented towards populism. In this case, therefore, *Xylella* becomes just one example of scientific truths being criticized by society. The second identified article (Monica, 2020) emphasizes that it is very common for health protection decisions to be made directly on the basis of scientific assessments that are not immediately understood, as highlighted in the example of *Xylella*. In this case, therefore, it is emphasized how good and appropriate communication strategies are needed to provide guidance to stakeholders on risk and behavior management.

Therefore, it is clear how a gap emerges in the influence that trust, already widely noted in the literature as a crucial determinant in purchasing processes, holds in the management of problematic emergency situations such as *Xylella*, particularly in the socio-political and economic contexts. In this regard, this research, based on the analysis of a context in which the sentiment most outlined in newspaper articles on *Xylella* in Apulia is trust, first aims to explore the relationship between *Xylella* and trust, deepening this aspect by including the most important social actors involved in the phenomenon. Starting from this research premise, the purpose statement of the study declared in the introduction section was defined.

3. Theoretical framework: the strategic role of trust in economic behavior

The analysis in Section 2 allowed for the discovery of the most strongly conveyed sentiment in a sample of articles related to the *Xylella* phenomenon in Apulia. Therefore, starting from the assumption that the existing literature on *Xylella* focuses exclusively on a biological-agronomic framework, this study focused on the role of trust in influencing purchasing behavior during a period of emergency. This will provide useful indications to fill Layton's macro-cross (Layton, 2011), suggesting economic and political decision-making plans (Iacobucci, 2019).

Trust is a concept with considerable polysemy in different domains, although there is common ground such that trust is placed within the context of positive expectations for the individual and is framed in conditions of uncertainty – both for the individual and the community (Giani, 2010). Trust can be perceived as a positive expectation that reassures one about another's actions and communications under conditions of uncertainty. One's trust in another is based on the expectation that the other's behavior will not be detrimental to one's own behavior. It follows that one should be truthful and not manipulate this communication (Giani, 2010; Prandini, 1998). Trust, in its many different meanings, has inspired various theoretical approaches to suggesting how it represents the basis for countless human actions (Aassve et al., 2021). Being a markedly interpersonal experience, hence tied to relations with others, whether individuals or institutions, different studies have led towards the belief that it could be promoted or minimized to steer political, economic and social choices (Chakraborty et al., 2022; Brice et al., 2020; Buck & Alwang, 2011; Evans & Krueger, 2009).

A nuanced understanding of trust rather implies that it ought to either be promoted or discouraged, as the context requires. Such an understanding needs to reflect the notion that both trust and distrust can and frequently do coexist. In most relationships, actors trust each other on some issues and yet fail to trust in others (Sekhon et al., 2014). The applications of how trust can affect people's behavior are plentiful, and concern several areas; some of this research focuses on the constituent characteristics of trust as it relates to interpersonal relationships with roles that are perceived to be at a higher hierarchical level, such as an employer (Zenger & Folkman, 2019). Following this perspective, and according to Zenger and Folkman (2019), trust is composed of three elements:

1. *Positive relationships* – when an individual is able to create functional interactions with other people or groups. This driver can enable a sense of trust to be instilled as there is a flourishing connection with the concerns of others, balancing the results of the concerns of others, generating cooperation, and resolving conflicts.
2. *Good judgement and expertise* – when a subject is well informed and constantly seeking opportunities to enrich their knowledge. Thus, it is possible to give the impression of understanding technical aspects and possessing adequate experience in dealing with problems. The fundamental aspect, therefore, is the perception of knowledge and expertise so as to provide an essential contribution to the achievement of results and to anticipate and respond efficiently to problems.
3. *Consistency* – when someone is able to influence the behavior of individuals by virtue of the trust they express. In particular, consistency must be represented as a model, which involves committing to actions and keeping promises.

These aspects, therefore, may represent prodromal signs of the feeling of trust. There is thus no doubt that trust plays a fundamental role in facilitating exchange relationships, which are central, for example, in the marketing, economic and consumer choice processes (Aljukhadar et al., 2017; Civera et al., 2018; Hobbs & Goddard, 2015). Numerous scholars have argued that commitment built on trust is essential to the effective functioning of marketing relationships, and that relationships cannot be created or managed without trust (Bilan et al., 2019; Chams-Anturi et al., 2020; de Jonge et al., 2008; Hobbs &

Goddard, 2015). By virtue of its importance in various domains, the issue of trust has received crucial attention in various studies, and it is considered to underlie many business (Bilan et al., 2019; Brenkert, 1998) and non-business interactions (Orth & Green, 2009). Therefore, the understanding of how trust affects different processes is well developed in the literature (Brice et al., 2020; Muringani, 2022).

In a broad sense, then, the trust-building process is vital in affecting how consumers build adequate confidence in a specific actor potentially perceived as having an influence on well-being (Carfora et al., 2019; King et al., 2019). According to a more focused approach centered on the consumption of agri-food products, the supply chain actors involved consequently have an influence (Aung & Chang, 2014; Lindgreen & Hingley, 2003) on the perception of food safety that is not merely material, but also and above all psychological (Ackerley et al., 2010; Behrens et al., 2010; Kotykova et al., 2021), and consequently affect consumer behavior (Evans & Krueger, 2009; Xie, 2015; Yee et al., 2005). Moreover, being a dynamic process, consumer confidence may be susceptible to sudden changes in situations of crisis or food hazards (Yee et al., 2005). Yee and Yeung (2002), for example, identified a list of factors necessary for the development of consumer confidence in farmers when conducting research in the context of emergency bovine growth hormone residue in milk. Furthermore, Phillips and Hallman (2013) provided insights on marketing in relation to this issue by exploring the risks of genetically modified food. Specifically, the five cognitive processes identified are: competence (e.g., the ability to vouch for raw materials with a healthy and safe profile in the supply chain, meeting consumers' concerns about their well-being and the environment); credibility (e.g., the trustworthiness of the activity); reliability (e.g., the range of actions available to address consumer concerns); integrity (e.g., positive and genuine behavior with the consumer); benevolence (e.g., the concern and interest expressed in acting in line with consumer needs); and information provision (e.g., the process of transmitting reliable feedback to ensure food safety). These were analyzed in this study according to the model proposed in Yee et al. (2005).

Whilst the previously mentioned theory deals with trust-building factors and the extent to which trust influences the probability of purchase, in our study the willingness to buy olive oil was considered as an outcome variable. Therefore, based on the focus on the *X. fastidiosa* emergency and its socio-economic implications, the key issue is not the determinants that contribute to developing functional consumer trust, but how trust in different actors in the agri-food system (Tsolakis et al., 2014) influences buying intentions (Carfora et al., 2019).

The role of trust, therefore, becomes crucial in the study of how to improve and implement the purchasing process. As highlighted by various studies, trust in the various actors in the food supply chain seems to have a direct effect on, for example, green purchasing behavior (Dong et al., 2022) and services (Zhani et al., 2022). In this regard, although many studies have focused on the role of trust in purchasing behavior (Kenning, 2008; Sahney et al., 2013; Tandon et al., 2020), especially in periods of extreme uncertainty such as during the COVID-19 pandemic (Faqih, 2022) (to the extent that trust was included as an integral element of the TBP model; Hamid et al., 2023), at present few

studies seem to have focused on its role in situations of natural disasters. These disasters can be caused either by events such as earthquakes or hurricanes or by the consequences of climate change, such as the proliferation of bacteria that are harmful to plant health. Moreover, since the *Xylella* phenomenon and the infection caused by it directly descend from climate change, it can be counted among the elements of strategic importance for case studies that can provide important elements for the correct management of situations, and can also be of use in an economic and marketing sense. Furthermore, according to Layton (2011), a flourishing body of literature exists in the fields of economics and marketing. A diagram depicts the main topics commonly discussed by scholars, suggesting a reflection on the nature of the most frequent studies in the literature. Within the macro-cross – i.e., the area where it is possible to identify topics that are still underexplored but remain important in a strategic sense as they can serve as a basis for new knowledge or for developing management plans for emerging problems (Iacobucci, 2019) – there are studies on the economic and managerial logic of natural disasters such as *Xylella*. Furthermore, until the present day, there have been no studies in the literature in which the role of trust and how it can act as a trigger for purchasing behavior during emergency situations, such as *Xylella* infection, has been explored.

3.1. Hypothesis development

Consistently with the research premise presented in Section 2, and in accordance with a theoretical perspective which accounts for the role of influences on trust exerted by different agri-food actors in determining purchase choices (Carfora et al., 2019; Tsolakis et al., 2014), this study aims to explore the following research hypotheses (Figure 9):

H_1: as suggested by Wang et al. (2020), since perceived quality positively influences consumers' intention of buying certified food, trust in farmers (and consequently food quality) increases trust in the Italian food market;

H_2: according to Anania & Nisticò (2004) and Hakim et al. (2020), we hypothesize that trust in the Italian food market will improve the willingness to buy Apulian olive oil produced after the spread of *X. fastidiosa*;

H_3: trust in farmers influences the willingness to buy Apulian olive oil produced after spread of *X. fastidiosa*, as the studies of Lee et al. (2019) and Lazaroiu et al. (2019) suggested;

H_4: trust in farmers enhances trust in government policies that deal with the *X. fastidiosa* emergency and its consequences, following the above-mentioned studies of Wang et al. (2020) and Stefani et al. (2008).

H_5: by implementing the studies of Zagata & Lostak (2012) and Qiu et al. (2012), in which trust in the government increases trust in buying products, we hypothesize that trust in government policies boosts the willingness to buy Apulian olive oil produced after the spread of *X. fastidiosa*.

Specifically, consumers' choice of which agri-food actors to trust in solving the problems generated by *X. fastidiosa* focused on farmers, the government, and the Italian food market. This is because these three actors were directly involved in the problem, as outlined in Sections 1 and 2, and therefore were more involved in identifying a solution.

As a further hypothesis, in terms of mediation, confidence in the Italian food market and in government policy represent total mediators (Nitzl et al., 2016) in the relationship between trust in producers and the propensity to buy Apulian olive oil after the *X. fastidiosa* emergency.
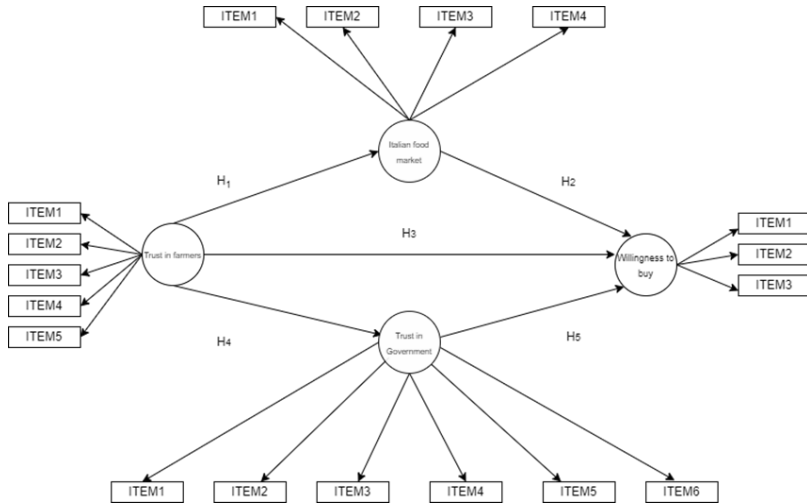
Figure 9. *The proposed overall model*

4. Methodology

4.1. Procedure

The analysis was carried out by means of a questionnaire prepared for the purpose of the survey, containing quantitative variables (measured with a Likert scale) and qualitative variables, with the aim of detecting the main socio-demographic characteristics of the sample (gender, age group). Subjects participating in the study were previously informed of the objectives and methods of the research; after this step, they were able to decide whether to participate voluntarily in the research without any compensation. Finally, subjects were guaranteed anonymity for the purposes of the survey and data were analyzed in an aggregated manner, with no possibility of tracing them back to the individual. In terms of analysis, data were explored using indices of normality of distribution (skewness and kurtosis). The quantitative measures included in the questionnaire were investigated for reliability (using Cronbach's α and Jöreskog's ρ) and validity (Average Variance Extracted – AVE). The characteristics of the sample, mainly as a function of numerosity, were directed towards a processing methodology using non-parametric structural equations (PLS-SEM – Hair et al., 2011; Sarstedt et al., 2022; Signore et al.,

2021; van der Merwe et al., 2017). The goodness of fit of the exploratory model was then assessed via a structural model (5000 bootstrap).

4.2. Mediation analyses through PLS-SEM modeling

Statistical analysis techniques enable complex phenomena to be modelled, increasing the possibility of predicting causal relationships between variables. There are different statistical methods, and among the most frequently used are the so-called second-generation techniques which involve more sophisticated procedures, such as Partial Least Squares Structural Equation Modeling (henceforth PLS-SEM, mainly exploratory) and Covariance Based Structural Equation Modeling (henceforth CB-SEM, typically confirmatory). Highly applicative in nature, these methodologies are typically used to confirm theories set a priori or to identify regularities, translated into statistical models, in data and relationships (Hair Jr et al., 2017). PLS-SEM and CB-SEM thus pertain to the more general framework of Structural Equation Models (SEMs), whereby hypotheses in studies might be tested through the incorporation of variables which are not explicitly observable (so-called latent variables), but can be indirectly measured by manifest indicators, such as questionnaire items. CB-SEM can be performed when certain criteria are met, such as the normal distribution of the data and a satisfactory sample size (Hair Jr et al., 2017; Iacobucci, 2010; Signore et al., 2019). When these cannot be ascertained, a viable alternative is the use of PLS-SEM, which is mainly used for theory development in exploratory research. PLS-SEM performs efficiently with small sample sizes and complex patterns, without assuming any assumptions about the underlying data distribution (Hair Jr et al., 2021). This technique allows researchers to investigate the relationship between certain latent variables in a sample of modest size. Furthermore, mediation analysis, based on running several regression models, enables the role of an intervening variable in the statistical relationship between an independent variable (X) and a dependent variable (Y) to be highlighted (Hayes, 2017; Nitzl et al., 2016). Mediation effects can be depicted by means of three models of regression equations:

1. Between a predictor variable (X) and an outcome variable (Y);
2. Between a predictor variable (X) and a mediator variable (M);
3. Between a mediator variable (M) and an outcome variable (Y).

Finally, to assess the mediation model, both the indirect effect (a × b) and the direct effect (c') must first be tested. Thereafter, the indirect effect (a × b) and the strength of the direct effect (c') must be analyzed to determine the size of the mediation. Lastly, the results must be validated through specific tests, such as bootstrapping (Hayes, 2017).

4.3. Participants

The analysis was performed on a sample of 56 individual olive oil consumers from Apulia. Participants were recruited through probability sampling by an external agency specializing in this purpose. Specifically, the subgroup was drawn from a larger sample of the Italian population interviewed in the March–June 2020 period with the aim of

investigating the media impact in a sample more aware of the problem because they had experienced it directly. The criteria for the representativeness of the general sample considered the socio-demographic characteristics of the Italian consumers in terms of age, educational qualification, region of origin and eating habits (regular oil consumers).

Therefore, the sample was mainly composed of female individuals (57.1%), while males constituted 42.9%. In terms of age, the majority of the sample were between 45 and 54 years old (28.6%), 23.2% between 35 and 44, 19.6% between 25 and 34, and 12.5% between 18 and 24. The other age groups were less frequent, with 8.9% between 65 and 75 years old and 7.1% between 55 and 64. The average age of respondents was around 42.4 years (SD = 14.2), and ages ranged between 19 and 75 years. All of the sample responded from the Apulia region, and stated that they habitually consumed Apulian olive oil.

4.4. Measures

Measures were scored using 7-response Likert scales, with responses ranging from 1 = *Completely disagree* to 7 = *Completely agree*. Hypotheses were investigated by means of non-parametric structural equations (PLS-SEM; Mishra et al., 2022), with three latent variables measured by manifest indicators that were bound to the former through reflective (Cheah et al., 2019) relationships. Specifically, the latent dimensions and their respective indicators were:

1. Trust in farmers, a latent factor measured by 5 items adapted from de Jonge et al. (2008). The reliability of the measures was confirmed by Cronbach's and Joreskog's composite reliability indices of $\alpha = 0.89$ and $\rho = 0.95$, respectively. Moreover, the discriminant validity (AVE = 0.71) was verified as it exceeded the threshold of 0.50, as suggested by Hair Jr et al. (2021). An example item: "*Farmers possess the knowledge to ensure the safety of agri-food products.*"
2. Italian food market security, identified by 4 items adapted from Chen (2017), with the reliability (Cronbach's $\alpha = 0.78$, Joreskog's $\rho = 0.81$) and validity of the measures (AVE = 0.60) respected. An example item: "*Xylella legislation is effective.*"
3. Trust in government, a dimension identified by 6 items from the adaptation of the scale produced by de Jonge et al. (2008). Reliability (Cronbach's $\alpha = 0.91$ and Joreskog's $\rho = 0.95$) and validity (AVE = 0.67) were confirmed. An example item: "*The government really care about the safety of agri-food products.*"
4. Willingness to buy post-*Xylella* Apulian olive oil, measured by 3 items adapted from Armitage and Conner (1999). Reliability (Cronbach's $\alpha = 0.99$ and Joreskog's $\rho = 0.99$) and validity (AVE = 0.98) were verified. An example item: "*I plan to consume Apulian olive oil produced after the spread of Xylella.*"

5. Results

Prior to the implementation of the analytical model to exploratively examine the relationships between the constructs, enquiries were conducted to check the normality of the data distribution. Accordingly, not all latent dimensions fit within the ranges (±1.96)

of skewness and kurtosis suggested by George (2011) (Table 2). For this reason, in addition to the small sample size, we proceeded to process the model using PLS-SEM (Pappa et al., 2018).

Table 2. *Principal descriptive statistics of included variables*

	Farmers	Italian food market	Government	WTB
Mean	5.49	4.62	5.13	6.15
Standard deviation	1.09	1.24	1.39	1.62
Skewness	−0.31	0.04	−0.66	−2.03
Kurtosis	−0.90	−0.75	0.27	3.10

Reliability and validity analysis prove that the employed measures were consistent and appropriate to the latent constructs postulated, as shown in Table 3.

Table 3. *Reliability and validity measures of the latent variables*

	Cronbach's α		ρ		AVE	
	Original sample	Sample mean	Original sample	Sample mean	Original sample	Sample mean
Farmers	0.89	0.89	0.95	0.93	0.71	0.71
Italian food market	0.78	0.77	0.81	0.82	0.60	0.60
Government	0.91	0.90	0.95	0.93	0.67	0.66
WTB	0.99	0.99	0.99	0.99	0.98	0.98

Table 4. *Correlation analyses (Spearman non-parametrical test)*

	1	2	3	4
1. Farmers	—			
2. Italian food market	0.54***	—		
3. Government	0.50***	0.37**	—	
4. WTB	0.12	0.38**	0.06	—

Note: $^*p$ <0.05, $^{**}p$ <0.01, $^{***}p$ <0.001

As evidenced by the results of the analysis, specifically in Table 4, trust in farmers correlates positively and significantly with trust in the Italian food market (r_1 = 0.54, <0.001) and trust in the government (r_2 = 0.50, <0.001). However, despite positively correlating with willingness to buy post-*Xylella* Apulian oil (r_3 = 0.12, *not significant* – hereafter *ns*), this relationship is not significant. Trust in the Italian food market, in turn, correlates positively and significantly with trust in the government (r_4 = 0.37, <0.01) and the propensity to buy post-*Xylella* Apulian olive oil (r_5 = 0.38, <0.01). Finally, trust in the government yielded an almost null and non-significant correlation with willingness to buy post-*Xylella* Apulian olive oil (r_6 = 0.06, *ns*).

Table 5. *Measurement model outputs*

	Original sample	Sample Mean	SD	*p*-value
Farmers1 ← FARMERS	0.62	0.62	0.10	0.000
Farmers2 ← FARMERS	0.83	0.83	0.05	0.000
Farmers3 ← FARMERS	0.92	0.92	0.02	0.000
Farmers4 ← FARMERS	0.93	0.93	0.02	0.000
Farmers5 ← FARMERS	0.87	0.86	0.06	0.000
Italian food market1 ← ITALIAN FOOD MARKET	0.88	0.88	0.04	0.000
Italian food market2 ← ITALIAN FOOD MARKET	0.81	0.81	0.06	0.000
Italian food market3 ← ITALIAN FOOD MARKET	0.75	0.74	0.13	0.000
Italian food market4 ← ITALIAN FOOD MARKET	0.64	0.63	0.11	0.000
WTB1 ← WTB	0.99	0.99	0.00	0.000
WTB2 ← WTB	0.99	0.99	0.00	0.000
WTB3 ← WTB	0.98	0.98	0.02	0.000
Government1 ← GOVERNMENT	0.66	0.63	0.15	0.000
Government2 ← GOVERNMENT	0.62	0.60	0.16	0.000
Government3 ← GOVERNMENT	0.88	0.87	0.05	0.000
Government4 ← GOVERNMENT	0.87	0.86	0.06	0.000
Government5 ← GOVERNMENT	0.90	0.89	0.06	0.000
Government6 ← GOVERNMENT	0.92	0.91	0.05	0.000

The outcomes of the measurement model suggested that the indicators performed well as proxies for latent variables (Table 5). Specifically, all loadings exceeded the cut-offs of 0.60 (Hair Jr et al., 2021), even after bootstrapping to 5000, and were significant. Notably, for the latent variable, trust in farmers, the range was [0.62;0.93]; for trust in the Italian food market [0.64;0.88]; for willingness to buy post-*Xylella* Apulian olive oil [0.98;0.99]; and for trust in the government [0.62;0.92].

Table 6. *Structural relationships between latent variables*

	Original sample	Sample Mean	SD	p.value
Farmers → Italian food market	0.51	0.52	0.08	0.000
Italian food market → WTB	0.53	0.54	0.18	0.003
Farmers → WTB	0.18	0.18	0.10	0.086
Farmers → Government	0.52	0.55	0.10	0.000
Government → WTB	−0.11	−0.10	0.10	0.284

Analysis of the structural model showed that there was no significant direct effect between trust in farmers and the willingness to buy post-*Xylella* Apulian olive oil (β_3 = 0.18 [0.18], *ns*). Similarly, though, trust in farmers tended to increase trust in institutions and

organizations acting at a higher level, such as the Italian food market (β_1 = 0.51 [0.52], 0.000) and the government (β_4 = 0.52 [0.55], 0.000). Moreover, trust in the Italian food market appeared to have a significant and positive effect on the willingness to buy post-*Xylella* Apulian olive oil (β_2 = 0.53 [0.54], 0.003). Conversely, trust in the government resulted in a negative and non-significant effect on the latter variable (β_5 = −0.11 [−0.10], *ns*). In terms of indirect effect, therefore, the relationship connecting trust in producers to the willingness to buy post-*Xylella* Apulian olive oil via trust in the Italian food market leads to a complementary indirect mediation (0.27 [0.28], 0.012), as hypothesized by Nitzl et al. (2016). Finally, the incorporation of the trust in the government variable mediated (0.06 [0.06], *ns*), albeit hardly significantly. The aforementioned structural relationships prove to be significant after bootstrap resampling equal to 5,000 re-entries (Table 6).
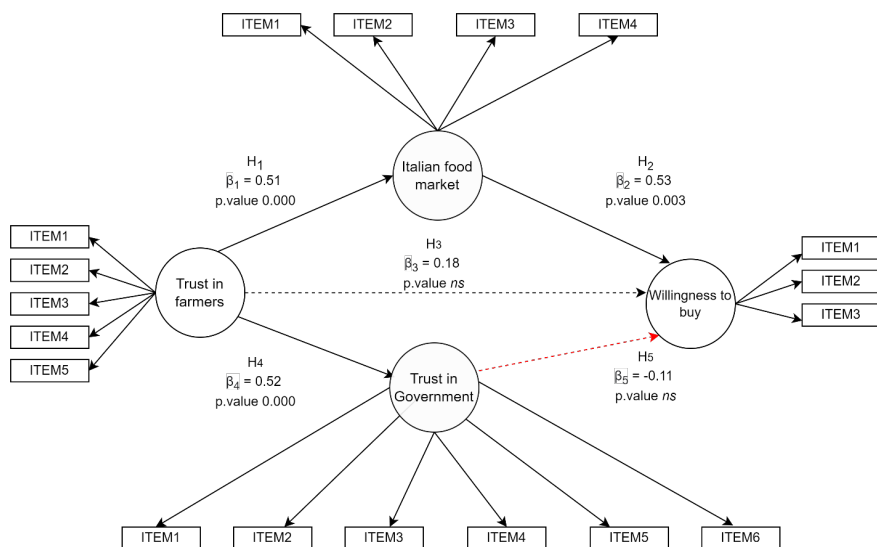
Figure 10. *Model with path coefficients*

6. Discussion and Implications

The obtained findings (Figure 10) reveal that, in Apulian consumers, trust in farmers does not have a significant and direct effect on willingness to buy post-*Xylella* olive oil (H_3). This result fails to agree with the literature and specific applications on the issue, according to which trust in farmers is an important element in determining the willingness to buy agri-food products (Hamzaoui-Essoussi et al., 2013; Ladwein & Sánchez Romero, 2021). In the context of the *X. fastidiosa* emergency, this element assumes great significance since it could, if confirmed by further studies, be one of the most striking

consequences of the current situation. Moreover, it provides an important insight for the development of management policy (Vorobei, 2022). As previously debated, the construction of trust depends on certain characteristics, which can also be considered from a transversal viewpoint (Yee et al., 2005; Zenger & Folkman, 2019). A conceivable interpretation of this lack of significance in the statistical relationship, according to the required features for building trust, could be related to the failure of farmers to be perceived by consumers as being capable of handling the emergency with good judgement and experience, appearing, at the same time, inconsistent in solving the issue. Understanding the determinants of what prevented the appropriate trust-building process from occurring could thus ensure a more robust discussion of the ways in which the problem was addressed.

On the contrary, trust in farmers tends to increase trust in the Italian food market (H_1). A possible explanation for this could lie in the fact that trusting the context (Bronfenbrenner, 2005) closest to the consumer – in this case the farmer – could have systemic effects (Andreasen, 2006) on other actors in the supply chain (Bachmann & Inkpen, 2011; L. A. Chen et al., 2019). In turn, perceiving the food market as safe in all its facets produces a positive and significant effect on the willingness to buy (Nocella et al., 2014) post-*Xylella* Apulian olive oil (H_2). This outcome is aligned with other studies in which the relationship between trust in the food market and the willingness to buy a product was positively and significantly explored (Hamzaoui Essoussi & Zahaf, 2009; Sassatelli & Scott, 2001).

In terms of the effect of trust in farmers on trust in the government (H_4), in this case the closest context assumes a crucial role in determining an increase in trust towards the general institution (Farrell & Knight, 2003). This is a sign that the role of farmers, although not directly influencing the propensity to buy oil, becomes strategic towards two central elements: the Italian food market and the government. Furthermore, as stated by Guo et al. (2022), consumers generally believe that detailed safety information can greatly increase their trust, which is crucial for making sustainable and well-informed choices. Therefore, as the above studies show, the effect of consumer confidence on the Italian food market could be described as cascading. Consumer confidence could be expressed in confidence in the quality of the product, and this also aligns with relative security vis-à-vis the food market because of perceived guarantees. Furthermore, as the study by Suhartanto et al. (2022) observed, trust could be part of a determinant that contributes to explaining food behavior, integrating both value and environmental aspects. As suggested by the authors, the role of trust could in fact be part of the strategic aspect consistent with the functional and social aspects, triggering systemic mechanisms capable of provoking effects from the micro (farmer) to the macro (the Italian food market and government) context.

Finally, the effect of trust in the government does not seem to have had a significant effect on the propensity to buy Apulian olive oil produced after the spread of *X. fastidiosa* (H_5) – specifically, it tended to be negative. Therefore, in this study it is clear that government policies and the trust they can produce in the consumer are perceived as not influencing the choice to buy olive oil. This is in contrast to other studies (e.g., Moon &

Balasubramanian, 2004; Qiu et al., 2012), in which the role of trust in government and institutions was shown to play a fundamental role (Bottasso et al., 2022) even when the consumer experienced an objective lack of knowledge about a product or technology. Aligned with this perspective is the study produced by Aliasgharzadeh et al. (2023) which considered the determinants of the purchase of genetically modified foods: there, too, trust in control institutions (and thus also in government institutions) were a positive influence on willingness to buy. Trust in institutions, therefore, becomes one of the most important determinants of trust, contrary to what was identified in this study. In this regard, however, it should be borne in mind that the regional government was the body most involved in the management of the emergency, with often ambiguous and contra-dictory results regarding the main stakeholders. Therefore, the non-significance of this relationship, in addition to the highly exploratory nature of this study and the fact that it was based on a small number of observations, could be a direct cause of this situation. Once more, this result may be further interpreted as a function of the above-mentioned necessary attributes for the development of trust in order to further comprehend the failure to communicate safety and security signals in government.

6.1. Research and Practical Implications

Leveraging on the results of this study, this section discusses the research and practi-cal implications.

From viewpoint of the implications of this research, to the best of the authors' knowl-edge, this study was the first to investigate the role that trust plays in influencing the con-sumers' willingness to buy Apulian olive oil after the spread of *Xylella*. Specifically, trust in the main actors that revolved around the *Xylella* emergency (farmers, the government and the Italian food market) was evaluated, considering a sample of consumers territori-ally involved in the emergency. This opens a new research route in the stream of studies focused on *X. fastidiosa*, and is capable of complementing the biological and agronomic viewpoints that are currently being investigated. Moreover, the proposed model could represent a well-established element to assess the relationship between trust in agri-food supply chain actors and consumer willingness to buy during phytosanitary emergencies, or more generally during critical events (e.g., pandemics, economic or political crises; Cárdenas, 2016).

Regarding practical implications, the lack of impact that trust in farmers had on consumers' willingness to buy Apulian olive oil produced after the spread of *X. fas-tidiosa* generated critical consequences for farmers – especially those who sell to final consumers (Park et al., 2014). The actions undertaken by these actors to try to solve or contain this emergency – such as the adoption of agricultural practices to prevent and reduce the infection or the diversification of production through the introduction of new species of olive trees resistant to the *X. fastidiosa* bacterium – were not sufficiently well-perceived by consumers. Therefore, the results of this study could help farmers to reinforce their businesses through a well-established communication strategy focused

on explaining the experimental cropping actions undertaken and the results obtained. This could generate a positive impact regarding consumers' trust in farmers, increasing their willingness to buy and consequently improving the economic sustainability of farmers and the entire Apulian olive oil sector. Moreover, considering that farmers play a strategical role in increasing consumers' trust in the Italian food market and the government, these actors could establish interventions capable of supporting farmers via better communication during a phytosanitary emergency. Specifically, governments could receive a two-fold effect from these types of actions, both improving consumers' perceived trust in them and helping to reinforce the economic sustainability of rural communities in their territory.

7. Conclusion: Closing Remarks and Limitations

This study investigated the capability of trust in farmers, the government and the Italian food market regarding its ability to influence the willingness to buy Apulian olive oil among consumers within the territory affected by the *X. fastidiosa* emergency. Specifically, the study tested five hypotheses, and the results were summarized in Table 7.

Table 7. *Synthesis of the results of hypotheses tests*

Hypotheses	Hypotheses' test
H_1: trust in farmers increases trust in the Italian food market	Verified
H_2: trust in the Italian food market improves the WTB Apulian OO produced after *X. fastidiosa*	Verified
H_3: trust in farmers influenced the WTB Apulian OO produced after *X. fastidiosa*	Not verified
H_4: trust in farmers enhanced trust in government policies that deal with the *X. fastidiosa* emergency and its consequences	Verified
H_5: trust in government policies boosts the WTB Apulian OO produced after *X. fastidiosa*	Not verified

Although the present study offers several important insights for actors involved in the management of the *X. fastidiosa* emergency, different methodological and theoretical limitations must be considered. While PLS-SEM allows predictive models to infer even in the presence of a limited sample size, these techniques do not yet have a global measure of goodness of fit (Hair Jr et al., 2021). The small sample size imposes caution in generalizing the results. Further studies may or may not confirm the obtained results by enlarging the current sample. Moreover, the selected measures represent self-reports and therefore do not correspond to objective measures but to subjective perceptions of reality. Finally, the cross-sectional research design requires further longitudinal studies to establish more robust causal links between the identified variables.

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THE SIGNIFICANCE OF REMITTANCE IN FOSTERING ECONOMIC GROWTH: A BIBLIOMETRIC AND SYSTEMATIC LITERATURE REVIEW

Maja NIKŠIĆ RADIĆ

Associate professor, Faculty of Tourism and Hospitality, University of Rijeka
Address: Primorska 46, P.O. Box 97, 51410 Opatija, Croatia
majanr@fthm.hr
ORCID: https://orcid.org/0000-0002-8871-6833

Siniša BOGDAN[1]

Associate professor, Faculty of Tourism and Hospitality, University of Rijeka
Address: Primorska 46, P.O. Box 97, 51410 Opatija, Croatia
sinisab@fthm.hr
ORCID: https://orcid.org/0000-0001-6649-5980

Sabina TAŠKAR BELOGLAVEC

Senior lecturer, Faculty of Economics and Business, University of Maribor
Address: Razlagova 14, 2000 Maribor, Slovenia
sabina.beloglavec@um.si
ORCID: https://orcid.org/0000-0002-0301-0349

Abstract

Purpose: The purpose of this study was to examine the bibliographic corpus pertaining to the investigation of the impact of remittances on economic growth. Bibliometric analysis was utilized to evaluate the current state of the art and the dynamics of research papers published on the subject matter. Conversely, the Systematic Literature Review (SLR) method sought to scrutinize selected research papers to ascertain whether remittances play a contributory role in economic growth and whether this impact is contingent upon country-level developments.

Design: This study employed a mixed-methods approach, combining bibliometric analysis and SLR to address literature review questions which were formulated using the PICO

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1   *Corresponding author*

framework. *The study utilized the Web of Science database (WoS). Bibliometric analysis was conducted using VOSViewer and Biblioshiny. The second part of the study involved SLR, following the PRISMA-2020 protocol, to further refine the selection of papers.*

Findings: The findings suggest that a large proportion of published papers do not come from countries with a high share of remittances in GDP, and the number of published research papers is not dependent on the income level of the country. The results indicate that there is a positive relationship between remittances and economic growth, and that this nexus varies depending on a country's income level. More developed countries tend to utilize remittances more efficiently in their economies.

Originality: To the best of the authors' knowledge, the present study represents a novel investigation of the literature pertaining to the topic, utilizing the WoS database as a primary source. Moreover, the authors have advanced the methodological approach by employing a synthesis of both bibliometric analysis and SLR.

Keywords: *economic growth, remittance, country development level, bibliographic corpus*

JEL: *F24, F43, G18*

Introduction

Today, the inflow of remittances is a significant development factor related to migration processes. Since the late 1990s, they have become a factor that promotes development and reduces poverty (Kunz et al., 2022). Remittances strongly impact recipient households' standard of living, as they enable households to achieve a standard of living several quintiles above what they would have achieved in the absence of remittances (Medina & Cardona, 2010). According to the World Economic Forum (2018), the world still faces major challenges in harnessing the real development benefits of remittances. It is well known that remittances are an important link between migration and development. It can be argued that remittances are the hidden driver of global connectivity. It is estimated that the average multiplier for remittances is comparable to or higher than the multiplier for foreign direct investment and official development assistance. The United Nations Sustainable Development Goals recognize remittances as a life-saving tool for many poor families. According to World Bank (n.d.) projections, remittance flows to low- and middle-income countries will increase by 4.2% to $630 billion by 2022. One in seven people in the world is involved in remittances. According to the same source, personal remittances have grown exponentially since 1990. In the last 20 years alone, they have increased by 440.42%. Obviously, remittances are becoming increasingly important in the economy, and their growing value can no longer be ignored.

In addition to being a poorly researched topic, this area also exhibits a multitude of contradictory research outcomes. In the current literature, some authors argue for the positive effects of remittances on economic development (Eggoh et al., 2019; Islam, 2022; Singh &

Mehra, 2014), while some authors (Matuzeviciute & Butkus, 2016; Dujava & Kalovec, 2020; Yadeta & Hunegnaw, 2021; Chirila & Chirila, 2017) claim that remittances have no impact on economic growth. There is also a third opinion, according to which authors claim that remittances have a negative impact on economic growth (Karadag et al., 2019; Didia et al., 2018; Bird & Choi, 2020). Remittances hold significant economic importance for relatively small countries with relatively large diasporas (Desilver, 2018). Some authors (Matuzeviciute & Butkus, 2016) have concluded that the impact of remittances varies depending on the country's level of economic development. According to Vasile et al. (2020), remittances contribute to economic growth and are mainly intended for consumption in less developed countries. Khurshid et al. (2020) found that causality between remittances and economic growth exists for low- and lower-middle-income countries, while the evidence is weak for middle-income countries. The primary aim of this study is to identify and analyze the existing academic literature on the relationship between remittances and economic growth by addressing three review questions using a combined approach of bibliometric and systematic literature review (SLR) analyses. The PICO structure (population, intervention, comparison and outcome) is highly relevant in formulating review questions, as Dekkers et al. (2022) emphasized. Notably, the use of PICO structure is deemed imperative not only in systematic literature analysis, but also in bibliometric analysis, as underscored by Martínez-Heredia et al. (2022) and Azmi et al. (2023).

The main objective of the bibliometric analysis was to comprehensively examine the corpus of literature on the subject of remittances and economic growth, intending to probe the developmental dynamics and the contemporary status of this domain. Furthermore, special attention was directed toward exploring whether the dynamics of academic research interest focused on the topic of remittances and economic growth follow the growth dynamics of the global level of remittances. This involved examining whether most studies that focus on the topic of remittances and economic growth come from countries with higher remittance-to-GDP ratios or whether this depends on income levels, and determining the top authors, sources, keywords, countries, and their relations. A bibliometric analysis was conducted using the Biblioshiny (Aria & Cuccurullo, 2017) and VosViewer (Van Eck & Waltman, 2010) programs. In addition to the bibliometric analysis, an SLR was conducted using the PRISMA-2020 protocol (preferred reporting items for systematic review and meta-analysis) developed by Page et al. (2021) to screen the literature and select all papers closely related to the study of the impact of remittances on economic growth in order to obtain objective and reproducible results. The aim of the SLR was to scrutinize the impact of remittances on economic growth within the corpus of literature pertaining to this subject matter. Review questions arose by following the PICO structure: P – remittance; I – economic growth; C – countries with different income levels; and O – understanding that the relationship between remittance and economic growth can be significantly enhanced through the implementation of an SLR. Therefore, the following review questions arose:

RQ1: "Do remittances affect economic growth?"

RQ2: "Do the effects of remittances on economic growth differ by country income level, as classified by the World Bank?"

RQ3: "Do the effects of remittances on economic growth differ according to the share of migrant remittances in GDP?"

To the authors' knowledge, it should be emphasized that this is the only study besides that of Cazachevici et al. (2020) that deals with a detailed examination of the current scientific evidence on remittances and economic growth. Unlike the aforementioned study, which relied on a search of the Scopus database, in this study the Web of Science (WoS) database was included in the analysis since it is a database characterized by the highest quality of publications and provides multidisciplinary bibliographic data (Raghuram et al., 2019, Bramer et al., 2017; Gusenbauer & Haddaway, 2019). This study went a step further and used a combination of two methods to review existing research and provide a more comprehensive overview of the topic. The results of this research have practical implications as they can serve as a crucial reference point for policymakers in formulating future developmental strategies. In addition, this study aims to assess the current understanding of the impact of remittances on economic development, which will lead to conclusions based on a rigorously scientific, systematic protocol that will further expand the knowledge base. The conclusions derived from the employed methodology will be of utmost significance to the academic community, given that, to the best of the authors' knowledge, no prior joint SLR and bibliometric analysis has been conducted in the domain of remittances and economic development. The remainder of the paper has the following structure: Section 2 describes the data collection and the methodology used; Section 3 contains the results of the bibliometric and SLR; and the final Section contains a discussion and concluding remarks.

1. Data and Methodology

WoS was used to answer the literature review questions. An extensive literature search was conducted using the following indexes: Social Sciences Citation Index (SSCI), Emerging Sources Citation Index (ESCI), and Science Citation Index Expanded (SCI-EXPANDED). The literature search was conducted on October 5, 2022. The search terms were "remittance" and "economic growth," and were combined with the Boolean operators "AND" and "OR." The "AND" operator identified the article title, abstract, and keyword of each document published in the field (Farid et al., 2016), and was used to narrow the search results to include all search terms that needed to be present in the resulting records. In addition to "AND," the "OR" Boolean operator was used to expand the search results to include synonyms in the resulting datasets. The final form of the search terms, along with the Boolean operators, was:

"Remittances" AND ("Economic Growth" OR "GDP" OR "Economic Development") AND ("Causality" OR "Impact" OR "Affect").

The following restrictions were applied to the search: only articles were considered in terms of the document type, and the search was limited to English-language publications. In terms of WoS categories, the following were considered: Economics; Development Studies; Business; Demography; Business Finance; Social Sciences Interdisciplinary; So-

cial Sciences Mathematical Methods; or Social Issues or Multidisciplinary Sciences. A total of 413 papers were found in this search.

The analysis in this study is based on the VOSViewer version 1.6.18 software (Van Eck & Waltman, 2022). For a more in-depth bibliometric analysis, Biblioshiny, an R-based application based on Bibliometrix, was also used (Aria & Cuccurullo, 2017).

This research also utilized an SLR to identify assessments of the current state of knowledge on the relationship between remittances and economic growth. The research was conducted in accordance with the PRISMA-2020 framework and the guidelines for SLRs developed by Page et al. (2021). A review of existing research is the basis for correct conclusions, the identification of gaps, and the outlining of further research that is necessary on a research topic (Davies & Nutley, 1999; Tranfield et al., 2003; Petticrew & Roberts, 2006; Weed, 2006; Grant & Booth 2009; Fink, 2019). To collect literature data in the WoS database, a systematic search was conducted.

2. Research results

2.1. Bibliometric results

A total of 413 works were collected and analyzed to find answers to the main objective of bibliometric analysis. A summary of the data analyzed by bibliometric literature review is provided in Table 1 alongside descriptive statistics.

Table 1. *A summary of the analyzed data*

Description	Results	Description	Results
Timespan	1991–2022	Authors	809
Sources (journals, books, etc.)	191	Authors of single-author docs	103
Documents	413	AUTHOR COLLABORATION	
Annual growth rate %	13.22	Single-author docs	117
Average age of document	5.06	Co-authors per doc	2.34
Average citations per doc	14.27	International co-authorships %	28.81
References	14,015	DOCUMENT TYPES	
DOCUMENT CONTENTS		article	392
Keywords plus (ID)	542	article; book chapter	1
Author's keywords (DE)	798	article; early access	16
		article; proceedings paper	4

Source: *compiled by the authors*

The analysis covers the period from 1991 to 2022 and involves 413 papers, which is a sufficient sample size. Rogers et al. (2020) suggest 200 papers as an analytical minimum. This is a relatively new area of research interest; nonetheless, it is still extensive, considering that the average number of citations of works in this area is more than 14. Moreover,

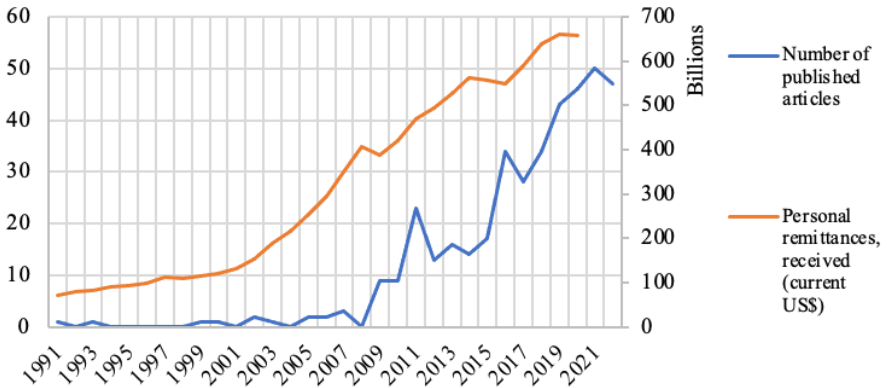the average annual growth of interest is more than 13%, which is illustrated in more detail in Figure 1.

Figure 1. *Comparison between personal remittances and academic research interest focused on the topic of remittances and economic growth*
Source: *compiled by the authors, data retrieved from the World Bank (n.d.)*

Note that the primary axis in Figure 1 indicates the number of published studies, while the secondary axis indicates the personal remittances received in billions of US$. The calculated correlation coefficient between the number of published studies and the total amount of remittances received yielded a value of 0.86, according to which it can be concluded that the dynamics of academic research interest in the topic of remittances and economic growth follows the growth dynamics of global remittances. Furthermore, bibliometric analysis examined whether most studies dealing with remittances and economic growth come from countries with a higher share of remittances in GDP,[2] or whether this depends on income level. The following criteria were analyzed: the scientific production of countries based on the affiliation of all authors, the scientific production of countries based on the country of corresponding authors, and international cooperation.

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2   According to the World Bank (2022), the countries with remittances exceeding 20% of GDP are as follows: Tonga, Kyrgyz Republic, Tajikistan, Lebanon, Samoa, Somalia, Nepal, El Salvador, Haiti, Honduras, Bermuda, Gambia, Jamaica, and Lesotho. Countries with more than 10% and less than 20% of remittances to GDP are: Kosovo, Comoros, West Bank and Gaza, Moldova, Nicaragua, Guatemala, Cabo Verde, Dominica, Georgia, Marshall Islands, Montenegro, Guinea-Bissau, Uzbekistan, Jordan, Liberia, Vanuatu, Dominican Republic, Armenia, Senegal, French Polynesia, and Zimbabwe.
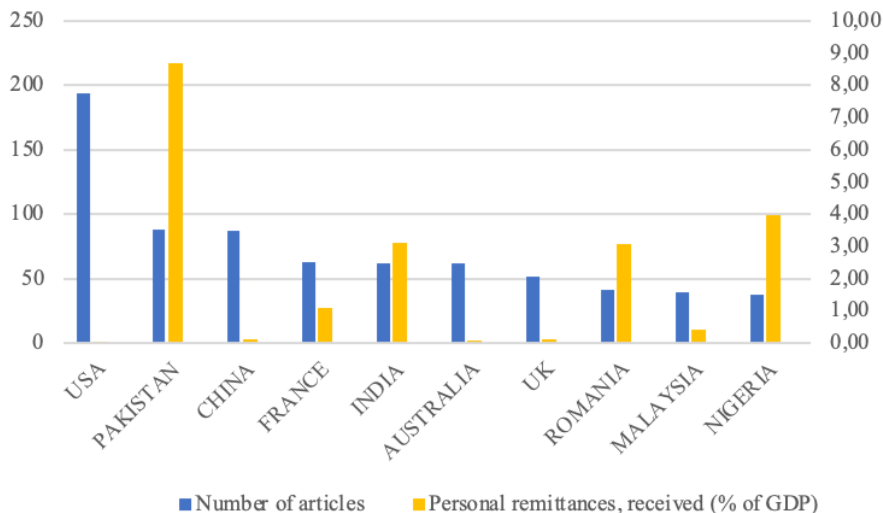
Figure 2. *The 10 countries with the largest number of published articles*
Source: *compiled by the authors, data retrieved from the World Bank (n.d.)*

Figure 2 shows the clustered charts of the top 10 countries (based on the affiliations of all authors) according to the criterion of the total number of articles published on remittances and economic growth. The total number of published articles is shown on the primary axis, while the share of remittances in GDP is shown on the secondary axis. According to the results, the United States is the country with the most articles published (194), followed by Pakistan (88) and China (87). All three countries are strongly associated with remittances. The United States and China are the countries sending the largest amount of remittances. Pakistan ranks third in scientific productivity, with remittances as a share of GDP at 8.69%; Nigeria ranks 10th, at 3.98%; and Romania and India rank 4th and 8th, respectively. Their share of remittances as a share of GDP are both just over 3%.

It must be emphasized that only Pakistan, India and Nigeria belong to the group of lower-middle-income countries, while the others are classified as middle- or high-income countries. Figure 3 shows the scientific production of countries in terms of the number of publications by the corresponding author. On this basis, it is possible to analyze the proportion of published papers related to single-country publications (SCP) and the proportion related to multiple-country publications (MCP).
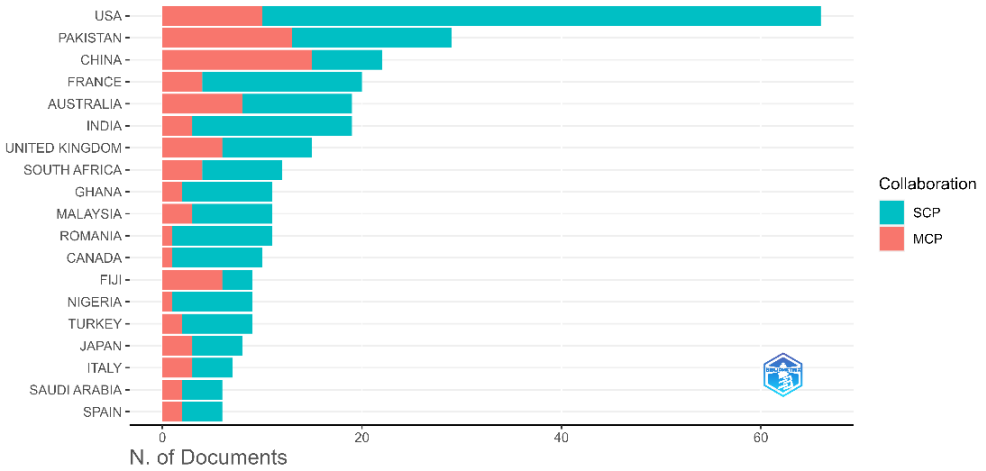
Figure 3. *The top 10 countries of publication based on the corresponding author*
Source: *compiled by the authors. Note: SCP – single-country publications;*
MCP – multiple-country publications

According to the corresponding author criteria, the situation in the top 10 countries does not change significantly compared to the previous figure, with only the addition of the South African Republic and Canada. These countries are middle- and high-income countries, where the share of remittances in GDP is 0.24% and 0.05%, respectively. It can also be concluded from Figure 3 that China, Pakistan and the USA are the countries that have achieved higher international cooperation compared to other countries.

From all of these facts and the data analyzed, it cannot be concluded that most studies on remittances and economic growth come from countries with a higher share of remittances in GDP, or that this depends on income levels.

Finally, bibliometric analysis is directed towards recognizing the most relevant authors, sources and keywords and their relations by using network analysis. Figure 4 shows the most relevant authors in this field according to the number of articles published.
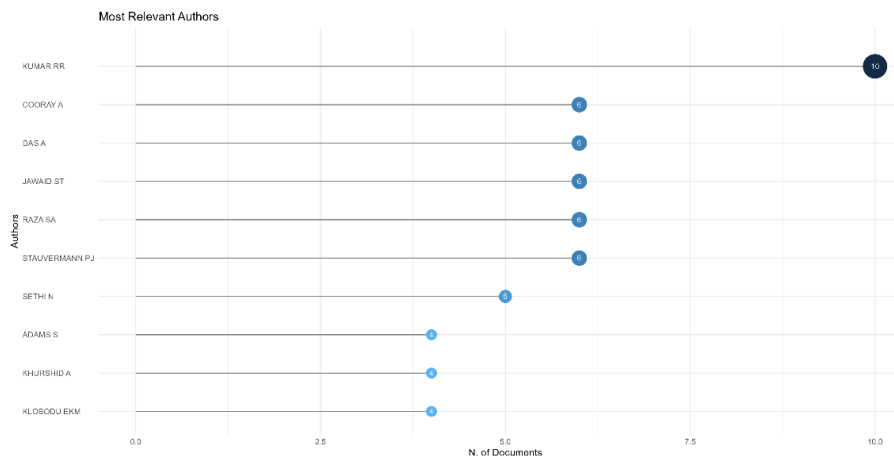
Figure 4. *Most relevant authors according to the number of published papers*
Source: *compiled by the authors, data retrieved from the World Bank (n.d.)*

Ronald Ravinesh Kumar is the most productive author, and also has the most published manuscripts (Jayaraman et al., 2011; Kumar, 2013, 2014; Kumar & Stauvermann, 2014, 2021; Kumar & Vu, 2014; Kumar et al., 2016; Kumar et al., 2018a; Kumar et al., 2018b; Stauvermann et al., 2018). They are followed by Arusha Cooray, Anupam Das, Syed Tehseen Jawaid, Syed Ali Raza, and Peter Josef Stauvermann, with six published manuscripts. Narayan Sethi has published five, while Samuel Adams, Adnan Khurshid and Edem Kwame Mensah Klobodu have published four manuscripts. Another criterion for measuring the top 10 most prolific scholars in the field is presented in Table 2.

Table 2. *Top 10 authors in terms of local impact*

	Prolific Scholars	h_index	g_index	m_index	TC	NP	PY start
1.	KUMAR R.R.	8	10	NA	158	10	NA
2.	JAWAID S.T.	5	6	0.455	97	6	2012
3.	RAZA S.A.	5	6	0.455	99	6	2012
4.	STAUVERMANN P.J.	5	6	NA	75	6	NA
5.	ADAMS S.	4	4	0.571	66	4	2016
6.	COORAY A.	4	6	NA	71	6	NA
7.	DAS A.	4	4	0.364	21	6	2012
8.	KLOBODU E.K.M.	4	4	0.571	66	4	2016
9.	ADAMS R.H.	3	3	0.094	242	3	1991
10.	AKCAY S.	3	3	0.375	23	3	2015

Source: *compiled by the authors*

The primary criteria for ranking authors are the h-index, the g-index, the m-index, total number of citations (TC), net production (NP), and starting year (PY start). From the data presented, it can be concluded that the list of the 10 most influential authors according to the proposed criteria is very similar to that in Figure 4. After analyzing the most influential authors, the most influential journals were analyzed based on several criteria. The first criterion for ranking journals was the total number of publications on the topic of remittances and economic growth (NP), and the other criteria were the h-index, the g-index, the m-index, the total number of citations (TC), and the year in which the first issue of the journal was published (PY start).

Table 3. *Top 10 sources based on local impact*

Element	h_index	g_index	m_index	TC	NP	PY_start
INTERNATIONAL MIGRATION	8	17	NA	664	17	NA
INTERNATIONAL JOURNAL OF SOCIAL ECONOMICS	5	7	0.625	64	13	2015
WORLD DEVELOPMENT	8	11	0.4	575	11	2003
JOURNAL OF INTERNATIONAL TRADE & ECONOMIC DEVELOPMENT	6	11	0.6	123	11	2013
ECONOMIC MODELLING	7	10	0.538	217	10	2010
AFRICAN DEVELOPMENT REVIEW-REVUE AFRICAINE DE DEVELOPPE-MENT	8	9	0.444	288	9	2005
JOURNAL OF ECONOMIC STUDIES	4	9	0.222	88	9	2005
JOURNAL OF DEVELOPMENT STUDIES	6	8	0.462	316	8	2010
ECONOMICS BULLETIN	4	4	0.5	24	8	2015
APPLIED ECONOMICS	5	7	0.417	112	7	2011

Source: *compiled by the authors*

According to Table 3, most articles on remittances and economic growth are found in: *International Migration* (17 articles), the *International Journal of Social Economics* (13 articles), the *Journal of International Trade & Economic Development*, and *World Development* (11 articles). *International Migration, World Development* and the *African Development Review* displayed the highest h-index and m-index of the journals. When analyzing the total number of journals cited, *International Migration* ranks first with a total of 664 citations, followed by *World Development* with 575 citations and the *Journal of Development Studies* with a total of 316 citations.

To determine the most frequently used words in the titles and keywords, a visual representation of word frequency in a word cloud was analyzed.

Figure 5. *Word cloud of the top 50 words in titles (left) and keywords (right)*
Source: *compiled by the authors*

Figure 5 shows a visual representation of the word cloud for titles on the left and for keywords on the right. Each word cloud contains the 50 most frequently used words in the respective area, and can potentially be used to establish the relationship between the most important words used by the authors. These words are scattered around the most important keyword: "remittances" in the titles, and "economic growth, impact, and migration" in the keywords. Other important words used in the titles are "economic," "countries," "evidence," "impact," and "development." Given the small size of the words "empirical" and "analysis," it can be concluded that further research on this topic needs to clearly emphasize the empirical analysis of the problem of remittances and economic growth in its titles. Other important words used in the keywords are "remittances," "international migration," "poverty," and "financial development." Considering that the words "causality," "unit root," "foreign direct investment," and "determinants" are extremely small, it is clear that these are areas of research that need further study.

In the last part of the bibliometric results, the relationships between countries were analyzed by bibliographic coupling and a three-field plot in order to visualize the interaction between countries, relevant scientific journals and keywords, and to determine their relationships.

In order to accurately determine the relationships between countries, the bibliographic coupling was analyzed. Kessler (1963) was one of the first authors to elaborate on the concept of bibliographic coupling. Later, this method was further applied by many other authors (Hummon & Doreian, 1989; Jarneving, 2007; Nicolaisen & Frandsen, 2015; Maseda et al., 2022; and others). Term coupling occurs when two articles cite an identical (third) article or other document. The strength of bibliographic coupling is determined by how often two other documents have cited an article or other document.
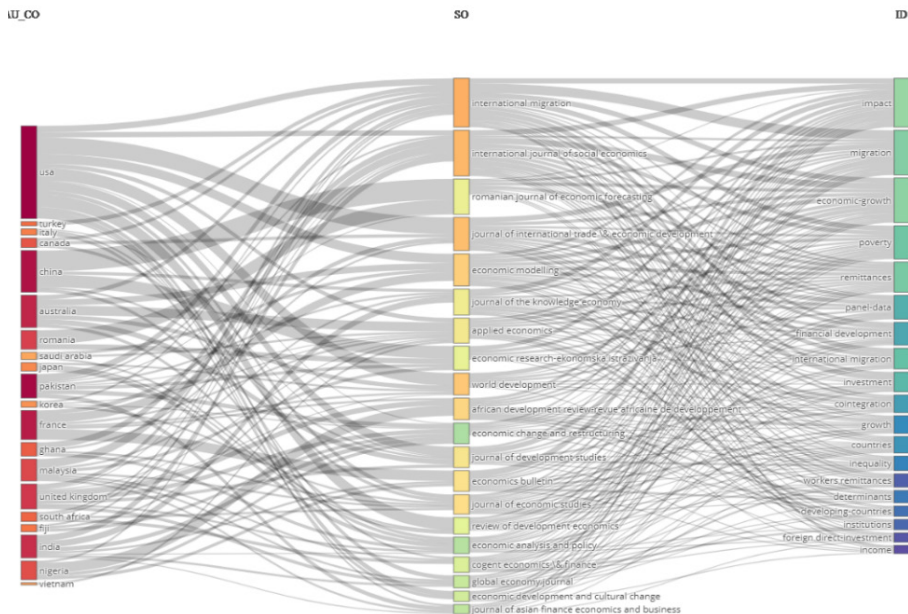
Figure 6. *Bibliographic coupling by countries*
Source: *compiled by the authors*

The minimum number of documents in a country was set at 5. Of all countries, 30 met this threshold. The results of the bibliographic coupling analysis are visually represented in Figure 6 using thematic clusters. The nodes (circles) represent countries whose color is used to group other countries in the same cluster. The size of the node depends on the strength of the bibliographic coupling. The visual representation shows that the USA, China, Pakistan, France, Australia, the UK and Malaysia have the largest nodes.

In the last part, a relation among countries, sources, and keywords will be illustrated by a three-field plot (Figure 7), also known as Sankey's flow chart – named after Captain Matthew Sankey in 1898 (Tsai et al., 2022).

Figure 7. *Three-field plot*
Source: *compiled by the authors*

The three-field diagram in Biblioshiny 2.0 visually evaluates the relationships between countries, sources, and keywords, and is used to highlight relevant elements with different colors. The perimeter of the rectangle shows the relationship between countries, journals and author keywords. The larger the perimeter of the rectangle, the more relationships between the selected components exist. In terms of countries, according to the graph shown, the United States, China, Australia and France dominate, while the leading journals are *International Migration* and the *International Journal of Social Economics*. Stronger relationships can be observed between the United States and the *Journal of International Trade & Economic Development*; China and the *Romanian Journal of Economic Forecasting*; Australia and *Applied Economics*; and France and the *Economic Bulletin*. In addition, a stronger relationship was observed between the *International Migration Magazine* and the keywords "migration" and "impact," and between the *International Journal of Social Economics* and the keywords "economic growth" and "impact."

2.2. Systematic Literature Review Results

The authors followed the PRISMA-2020 diagram shown in Figure 8 when conducting the SLR. A literature review question has to be defined to commence an SLR. Fink (2019) emphasized that the author(s) must be very specific when formulating the litera-

ture review question. The appropriate selection of the keywords that play a selective role in the literature review is also a crucial step in conducting the SLR. All of these mentioned points have already been explained in detail in Section 2.1.
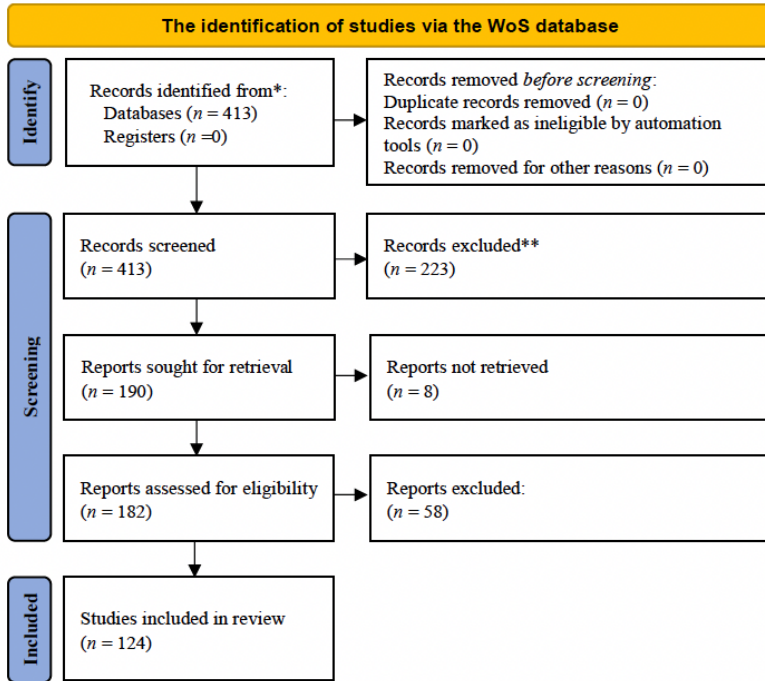

Figure 8. *A PRISMA-2020 diagram for a new systematic review*
Source: *compiled by the authors*

Besides the keywords to be used as search terms, it is imperative to define all of the inclusion and exclusion criteria in order to perform the selection process. During the selection process, the authors independently read each paper to select relevant papers and then discussed any disagreements regarding inclusion and classification until they reached a consensus, as suggested by Law et al. (2014). The authors established the following selection criteria for the relationship between remittances and economic growth. Specifically, the authors included all papers that addressed the causal relationship between the two observed variables and studies that examined the impact of remittances on economic growth, or vice versa. Papers which did not meet the eligibility criteria were excluded from further analysis. The authors first reviewed the titles and abstracts of the 413 identified papers. After the initial screening, 223 papers had to be excluded from the study due to not meeting the agreed-upon criteria. The authors did not use any automation tools to exclude

articles, and screening was conducted manually. Throughout the data collection process, eight papers could not be retrieved. The authors were able to download the full texts of the remaining 182 studies. Following Musinguzi's (2016) instructions, the authors read each paper very carefully and entered all relevant information (authors, year, subject, methods, and results) into a previously prepared Excel spreadsheet. Each author read and reviewed half of the papers independently. Papers that did not meet the criteria were excluded from the analysis. The authors re-evaluated the papers for which they had individual doubts, and then reached a joint consensus. After this detailed review, 124 papers were included in the final analysis. For the final stage of conclusions, the authors selected only papers that observed the impact of remittances on economic growth or papers that examined the causal relationship between the variables in question. A summary of the data analyzed in the SLR is included in the descriptive statistics in Table 4.

Table 4. *A summary of information on the analyzed data*

Description	Results	Description	Results
Timespan	2005–2022	Authors	253
Sources (journals, books, etc.)	78	Authors of single-author docs	31
Documents	124	AUTHOR COLLABORATION	
Annual growth rate %	14.5	Single-author docs	32
Average age of document	4.61	Co-authors per doc	2.27
Average citations per doc	12.1	International co-authorships, %	27.42
References	4137	DOCUMENT TYPES	
DOCUMENT CONTENTS		article	120
Keywords plus (ID)	183	article; early access	3
Author's keywords (DE)	294	article; proceedings paper	1

Source: *compiled by the authors*

The analysis covers the period from 2005 to 2022 and includes 124 papers, where the average number of citations was more than 12 and the average annual growth of interest was more than 14.5%.

The first question that the authors tried to answer through an SLR was **RQ1**: Do remittances influence economic growth? A detailed analysis of the selected papers produced the results shown in Table 5.

Table 5. *The impact of remittances on economic growth*

	IMPACT RESULTS				Total number of papers
	Positive impact	Negative impact	No impact	Mixed results (positive/negative)	
No. of papers	78	14	10	9*	**111**

Source: *compiled by the authors. Note: *different results with regard to the observed countries or measurements in different periods.*

The results of this study on the impact of remittances on economic growth show that 112 papers have addressed this issue. Of these, 78 papers have shown a positive impact, 14 papers have shown a negative impact, 10 papers have shown no impact, and 9 papers have shown a mixed result. The scholarly consensus is that remittances are positively associated with economic growth. However, a synthesis of the literature suggests that the magnitude and direction of this relationship is contingent on several key factors, including the level of financial sector development, the degree of economic openness, the allocation of remittances towards the education sector, and the use of remittances for investment purposes rather than personal consumption. Specifically, the authors contend that lower levels of financial sector development, greater economic openness, and directing remittances towards education and investment rather than personal consumption lead to a stronger positive association between remittances and economic growth (Sobiech, 2019; Cao & Kang, 2020; Ghosh, 2017; Zghidi et al., 2018; Barai, 2012; Incaltarau & Maha, 2011; Didia et al., 2018). Conversely, authors who identify a negative association between remittances and economic growth highlight the potential negative consequences of directing remittances towards meeting basic family needs (Karadag et al., 2019; Eftimoski & Josheski, 2021), particularly if they are not channeled towards investment and exceed a certain threshold of GDP (Jongwanich & Kohpaiboon, 2019; Hassan et al., 2016). Moreover, current research suggests that a significant influx of remittances can trigger the economic phenomenon known as "Dutch disease" (Polat & Andres, 2019; Paudel et al., 2022; Manic, 2019).

By analyzing the impact of remittances on economic growth, the authors confirmed the first question of the literature review – i.e., they proved that remittances positively affect economic growth. At the same time, it is essential to emphasize that the relationship between remittances and economic growth is far from fully explored (Fayissa & Nsiah, 2010; Siddique et al., 2012). The authors anticipate that the research momentum in this area will continue to grow in the coming decades, given its importance to the global economy. The volume of remittances and their resilience to shocks are becoming increasingly evident globally. According to the World Bank, remittance flows to low- and middle-income countries exceeded the sum of direct investment ($259 billion) and foreign aid ($179 billion) in 2020. Moreover, the power of remittances is becoming more dominant in the global economy, and they can no longer be considered small changes (World Bank 2021). In spite of the fact the number of studies examining the causal relationship between remittances and economic growth is extremely modest, the authors strongly suggest that it is important to highlight this fact, and that it is undoubtedly an area for future research.

Table 6. *Causality results*

	CAUSALITY RESULTS				
	Rem. => econ. growth	Econ. growth => rem.	Bidirectional causality	No causality	Mix results	Total
Number of papers	2	3	1	5	2*	**13** (Obs. sample 124)

Source: *compiled by the authors. Note: *different results concerning the observed countries.*

Thirteen papers dealt with the examination of the causal relationship between remittances and economic growth. A total of 2 papers proved that the causal relationship leads from remittances to economic growth, 3 papers proved that economic growth affects remittances, 1 paper proved bidirectional causality, 5 papers proved no causal relationship, and 2 papers showed mixed research results. Based on the findings of the bibliometric analysis and keyword analysis, it was identified that there is a need for more detailed investigation into the causal relationship between remittances and economic growth. This need was further substantiated through the use of an SLR analysis. It was revealed that there is a paucity of research studies that have used causal analysis to explore this relationship. The results obtained from the causality analysis were found to be inconclusive. Therefore, a synthesis of the existing literature suggests that the level of economic development is a key factor that determines the direction of causality, meaning that the nature of influence varies depending on the development level of countries.

The second literature review question – "Do the effects of remittances on economic growth differ according to the country's income level as classified by the World Bank?" – required a very detailed analysis of existing research in such a way that previous research results were classified or differentiated according to country income level, as classified by the World Bank. The next table shows the results of the analysis.

Table 7. *The influence of remittances on economic growth considering the country's level of development*

Sample involved	impact of remittance on economic growth			causality results			
	positive	negative	no impact	remm. on econ. growth	econ. growth on remm.	bidirectional	no causality
Low income	2	2					
Low-middle income	30	9	3	2		5	1
Upper-middle income	13	1		1		5	
High income	12		2	3		21	1

Source: *compiled by the authors*

It is possible to conclude that the impact of remittances on economic growth varies depending on the level of development of the country concerned, which confirms the second literature review question. The majority of research papers, 32 in total, demonstrate a positive relationship between foreign remittances and economic growth in low- and middle-income countries. However, it should be noted that 11 papers indicate a negative impact of remittances on economic growth in these countries. In contrast, for middle- and high-income countries, 25 papers suggest a positive impact of remittances on economic growth, with only 1 paper suggesting a negative impact. This implies that countries with a higher level of development have the capability to efficiently manage and utilize remittances received from foreign countries for their own economic advantage. A synthesis of the research indicates that one of the reasons for the slightly higher

proportion of papers indicating a negative impact of remittances on economic growth in low- and low-middle-income countries is that remittances are often utilized for personal consumption rather than directed towards investments.

The search for answers to the last literature review question – "Do the effects of remittances on economic growth differ according to the share of migrant remittances in GDP?" – required previous research findings to be classified in such a way that each country studied was categorized according to the share of remittances in GDP. The authors, therefore, classified countries into four categories using World Bank data, as shown in Table 8.

Table 8. *The effect of remittances on economic growth considering the share of migrant remittances in GDP*

REMM in GDP (%)	Impact of remittances on economic growth		
	positive	negative	no impact
51.0%	22	9	2
23.6%	7	0	2
22.9%	11	1	0
1.7%	2	1	
TOTAL	42	11	4

Source: *compiled by the authors*

The countries with the largest share of remittances in GDP (51%) showed the highest number of positive (22) but also negative impacts (9) of remittances on economic growth. In other groups of countries where the share of remittances in GDP ranged from 1.7% to 23.6%, there were 20 positive effects of remittances on GDP and only two adverse effects. Thus, the authors proved the last literature review question – i.e., the impact of remittances on economic growth differs depending on the share of remittances in GDP. Although previous research has mostly shown the positive impact of remittances on GDP regardless of the share of remittances in GDP, it is possible to see that the negative impact of remittances on economic growth mainly occurs in countries with the highest share of remittances in GDP. The reason for this may be that complementary policies and sound institutions play an essential role in increasing the impact of remittances on economic growth (World Bank, 2008; Catrinescu et al., 2009), which is not a typical characteristic of countries with a large share of remittances in GDP. Remittances are significant for developing countries in terms of size and in terms of being an important portion of GDP (UNCTAD, 2011). According to IFAD (2022), more than 70 countries in the world are heavily dependent on remittances (at least 4% of their GDP), and these remittances proved to be the driving force of socioeconomic growth for them.

Discussion and concluding remarks

According to UNESCAP (2022), remittances are the most measurable outcome of international migration. Remittances, an important source of foreign exchange earnings, can support a country's savings rate. Existing research suggests that there is no automatic mechanism through which migration and remittances affect the economic development of source countries (Rubenstein, 1992; Clement, 2011; Yang, 2011). Nonetheless, they rival foreign direct investment and official development assistance (ODA) in importance and strength (Depken et al., 2021). Today's migrations go a step further; they take new forms, so much so that the term "elite migration" has emerged, referring to the constant movement of highly skilled, well-educated specialists. It can be concluded that the world is facing a solid evolutionary leap in this field and it is difficult for researchers to obtain a constructive overview, especially when highlighting the diversity of evidence on remittances and economic growth.

The present study represents a pioneering effort, as far as the authors are aware, in utilizing the WoS database to conduct a comprehensive investigation of the existing literature. In addition, the authors have made significant contributions to the methodological framework by combining bibliometric analysis and SLR to provide a more rigorous and comprehensive approach. Both methodologies have gained prominence in recent times, owing to their practicality and utility for both established and emerging researchers.

The principal aim of this investigation was to comprehensively analyze the extant scholarly literature on the relationship between remittances and economic growth.

In order to comprehensively investigate the aforementioned aim of bibliometric analysis and review questions via SLR, a quantitative assessment of the existing literature on the topic of remittances and economic growth was conducted in order to provide a robust foundation for drawing meaningful conclusions and identifying key trends and knowledge gaps in the field. The purpose of the bibliometric analysis was to conduct a thorough investigation of the literature on the topic of remittances and economic growth in order to gain insights into the developmental patterns and current state of this field. Similarly, the goal of the SLR was to examine the influence of remittances on economic growth within the literature related to this topic.

Following bibliometric analysis, a total of 413 scholarly papers published between 1991 and 2022 and indexed in the WoS database were utilized for the purposes of this study. According to the bibliometric analysis, it was concluded that the dynamics of academic research interest in the topic of remittances and economic growth follow the growth dynamics of the global level of remittances based on the high positive correlation coefficient obtained. Parallel growth with the publication of papers on the topic of remittances and economic growth was shown graphically. It was found that most studies on remittances and economic growth are not from countries with a higher share of remittances in GDP, and this does not depend upon the income level. Eminent authors were examined according to the h-index and other criteria, with the first three places being occupied by the following authors: Kumar R.R., Jawaid S.T. and Raza S.A. According to the criterion of the number of published articles, the first three most significant journals are

International Migration, the *International Journal of Social Economics*, and *World Development*. The most frequent keywords are "impact," "economic growth," and "migration." Based on the bibliographic coupling method, four clusters of countries can be identified, with the following countries dominating each cluster: the USA, Australia, China and Pakistan, and the UK. A three-field diagram, also known as Sankey's Flow Chart, was used to identify the relationships between countries, journals, and keywords. According to the chart, stronger relationships can be seen between: the USA and the *Journal of International Trade & Economic Development*; China and the *Romanian Journal of Economic Forecasting*; Australia and *Applied Economics*; and France and the *Economic Bulletin*.

An SLR was conducted in the second part of the research, and 124 papers were included in the analysis. The first literature review question proved that remittances positively affect economic growth. Of the 111 papers analyzed, 78 papers indicated a positive relationship. Of these, 13 dealt with the causal analysis of the selected variables and 8 papers confirmed the corresponding relationship between remittances and economic growth. The study also confirmed the second literature review question, which examined whether the impact of remittances on economic growth varies by the country's level of development. Most papers showed the positive impact of remittances on economic growth using low- and middle-income countries and high- and middle-income countries as examples. It should also be noted that there is a modest amount of work in low- and middle-income countries showing the negative impact of remittances on economic growth, which only confirms that more developed countries use such financial inflows more efficiently in their economies. The same has also been confirmed by studies that have conducted causal analysis. The last literature review question was proven, as the existing studies showed the positive impact of remittances on GDP in countries with lower shares of remittances in GDP, while countries with higher shares of remittances in GDP recorded more mixed results – i.e., they showed both positive and negative impact of remittances on economic growth. The following conclusions can be drawn. Based on the above, according to the World Bank, there is no example of a country where remittances appear to have promoted economic development. The question of whether remittances promote economic growth then follows, to which neither theoretical nor empirical studies have provided a conclusive answer. While remittances raise income levels in the recipient country and plausibly contribute to poverty reduction (Adams & Page, 2005; Gupta et al., 2009), it is not evident that remittances increase output and promote long-term economic growth. However, what can be confirmed with certainty, taking into account the results of this study, is that remittances ultimately positively impact economic growth in most countries. These results also indicate that future research needs to focus on specific empirical analyses, particularly those that examine the causal relationship between remittances and economic growth, which has been largely neglected. There is also a need to further investigate their relationship with foreign direct investment. The extant literature on the impact of remittances on economic growth appears to be relatively limited. According to the authors' knowledge, only one study has conducted a literature review on this topic, which was undertaken by Cazashevici et al. (2020). In their investigation, the authors employed a meta-analytic approach and formulated cer-

tain conclusions based on geographic divisions. Their findings indicated that while the impact of remittances on economic growth is mixed, the predominant effect is positive, which aligns with the results of our study. However, this research focused specifically on the relationship between remittances and economic growth with respect to income level and the share of remittances in GDP.

Bearing in mind the research results that unequivocally indicate that the positive effects of remittances on economic growth are more prevalent in countries at a higher level of development, clear political implications emerge from the above. It is up to the holders of political power, especially in countries at a lower level of development, to design policies that will obtain greater benefits from the inflow of remittances, primarily to direct their use for investment purposes.

The limitations of this study must be addressed. Although the WoS has a greater depth of scientific citations and is the oldest scientific database, data from the Scopus database were not included in the analysis. It would certainly be advisable to include both databases simultaneously in future studies. This study was limited to the keywords "remittances" and "economic growth." From the bibliometric analysis, it can be concluded that it would be advisable to include the terms "impact" and "migration" in order to achieve greater relevance of the analyzed data. It must be mentioned, of course, that this analysis was conducted at a specific point in time, so search queries and citations will undoubtedly change in future.

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