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Session FINANCE

LEGAL AND ACCOUNTING CONSIDERATIONS FOR NON-PROFIT ORGANIZATIONS: A COMPARATIVE STUDY OF MACEDONIAN AND CROATIAN REGULATIONS

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ABSTRACT
Non-profit organizations play a critical role in addressing societal needs and fostering social welfare. They depend on robust accounting frameworks to ensure transparency, accountability, and effective financial management. However, the legal and regulatory environments governing NPO accounting practices vary internationally, impacting operational and reporting requirements. In recent years, North Macedonia and Croatia have witnessed substantial growth in their non-profit sectors, spanning education, healthcare, environment, and social development. With an increasing number and complexity of NPOs, it is essential to analyze the legal frameworks shaping their accounting practices to ensure reliable and comparable financial data. This study conducts a comparative analysis of the legal frameworks and accounting regulations governing NPOs in North Macedonia and Croatia. It examines aspects such as registration procedures, tax regulations, financial reporting, and governance requirements. The comparative analysis in this research paper provides insights into the intricacies of legal, taxation, and accounting aspects within NPOs in North Macedonia and Croatia. It underscores the need for NPOs to navigate specific regulations governing their operations in each country. Researchers, policymakers, and practitioners can draw valuable insights from this study to gain a deeper understanding of challenges and opportunities within the non-profit sector in these contexts. Significant potential exists for future comprehensive analysis utilizing a quantitative methodology coupled with a meticulously crafted questionnaire. This survey instrument could be systematically distributed to a purposive sample of NPOs in both countries under investigation. Furthermore, interviews with duly authorized representatives of NPOs, strategically scheduled in the research timeline, hold promise for enriching our comprehension of the responses garnered through the administered questionnaires.

Keywords: *Non-profit organizations, Accounting, North Macedonia, Croatia*

JEL classification: L31, M41

1. INTRODUCTION

Non-profit organizations (NPOs) play a vital role in fostering social welfare and addressing various societal needs. As crucial pillars of civil society, these organizations rely on robust accounting frameworks to ensure transparency, accountability, and sound financial management. The legal and

regulatory frameworks that govern accounting practices for NPOs differ across countries, influencing their operational and reporting requirements.

In recent years, both North Macedonia and Croatia have experienced significant growth in their non-profit sectors, with organizations actively engaged in diverse fields such as education, healthcare, environment, and social development. As the number and complexity of these organizations increase, it becomes imperative to examine the legal frameworks that shape their accounting practices, ensuring the reliability and comparability of financial information.

Understanding the legal frameworks in these countries is crucial for policymakers, regulators, practitioners, and researchers to enhance the transparency, accountability, and financial sustainability of non-profit organizations. It provides valuable insights into the challenges faced by these organizations and paves the way for the development of more effective regulatory mechanisms, streamlined reporting practices, and improved financial management strategies.

This paper aims to conduct a comparative analysis of the legal frameworks and accounting regulations for NPOs in North Macedonia and Croatia, shedding light on the similarities, differences, challenges, and opportunities within these two contexts. The research explores various dimensions of the legal frameworks, including registration procedures, tax regulations, financial reporting, and governance requirements. Through the implementation of a comprehensive comparative analysis, the primary objective of the paper is to elucidate the inherent merits and limitations of the extant frameworks. Moreover, this research seeks to discern prospective avenues for enhancement while fostering a more profound comprehension of the overarching accounting landscape for nonprofit entities in North Macedonia and Croatia.

To conduct the comparative analysis within this research paper, a qualitative research approach is utilized. The research entails an exhaustive examination of pertinent scholarly literature, encompassing legal enactments, accounting guidelines, and academic investigations. Additionally, as part of the research endeavor, a meticulously designed questionnaire will be formulated, which will subsequently be distributed to NPOs in North Macedonia and Croatia. Furthermore, arrangements are in place for conducting interviews with authorized representatives of these institutions to facilitate a more profound comprehension of the responses garnered from the questionnaire.

2. LITERATURE REVIEW

Financial accounting plays a critical role in NPOs by ensuring transparency, accountability, and effective financial management. This literature review examines the various accounting frameworks and practices employed in NPOs, focusing on money accounts versus profitability accounts, commercial accounting, and fund accounting.

Monsen (2009) discussed the distinction between money accounts and profitability accounts which are two key aspects of financial accounting in NPOs. Revenues, representing returns from any source, and expenditures, reflecting the act of spending, form the basis of financial transactions. Money accounts capture the immediate or future cash flows of an organization, influencing its working capital. On the other hand, profitability accounts measure the impact of revenues earned and expenditures incurred on an organization's equity Monsen (2009).

Commercial accounting, also known as accrual accounting, emphasizes performance rather than the immediate money effect. It is widely used by profit-making entities and influences the accounting practices of NPOs. Commercial accounting employs modern double-entry bookkeeping, facilitating the presentation of performance results by comparing earned revenue and incurred expenses within

a specific period. This approach allows for a comprehensive view of financial performance, irrespective of cash inflows and outflows. The merchants' double-entry bookkeeping method, as highlighted by Walb (1926), has been instrumental in this regard.

Fund accounting is a specialized system that addresses the unique financial transactions of NPOs. Funds and monetary resources established to support specific activities are independently operated and accounted for. The purpose of fund accounting is to present financial transactions in a manner that reflects accountability. It involves separate record-keeping for various activities, including restricted resources donated for specific reasons, portions of unrestricted resources set aside by the board for future use, and all other unrestricted amounts. The double-entry bookkeeping system is employed in fund accounting, focusing on revenues, expenditures, and the specific allocation of funds (Herzlinger & Sherman, 1980).

The pivotal role of financial resources in driving the operations and social mission of NPOs cannot be understated. Despite limited empirical research on NPOs' capital structure and debt ratio, existing findings consistently indicate a prudent reliance on credit financing, particularly financial debt (Jegers, 2011; Jegers & Verschueren, 2006; Smith, 2012; Trussel, 2012; Turner et al., 2015). Comparative studies further underscore NPOs' relatively modest use of credit financing compared to their for-profit counterparts (Trussel, 2012; Turner et al., 2015).

The theoretical underpinning of NPOs' capital structure decisions often mirrors frameworks applied in the for-profit context, chiefly the trade-off theory, pecking order theory, and agency theory. The static trade-off theory posits an optimal capital structure resulting from a nuanced balance between credit-related costs and benefits (Modigliani & Miller, 1958). Conversely, the pecking order theory posits a finance hierarchy influenced by information asymmetry and adverse selection costs, favoring internal financing over external debt (Myers, 1984; Myers & Majluf, 1984; Van Caneghem & Van Campenhout, 2012).

Furthermore, the measurement and analysis of earnings management (EM) in the financial reporting process have been subject to various definitions. Schipper (1989) defines EM as a voluntary act of intervening in the financial reporting procedure to obtain private advantages. This perspective is supported by Healy and Wahlen (1999), who describe EM as the use of managerial judgment in financial reporting and structuring transactions to alter financial reports, either to mislead stakeholders about the company's economic performance or to influence contractual outcomes dependent on reported accounting figures (Healy & Wahlen, 1999, p. 368). This definition has spurred numerous studies on EM, forming the basis for researchers exploring EM in both profit and non-profit settings (Dechow & Skinner, 2000; Dechow & Dichev, 2002; Klein, 2002; Leuz et al., 2003; Ballantine et al., 2007; Xu et al., 2007; Verbruggen et al., 2008; Verbruggen & Christiaens, 2012).

To identify the phenomenon of EM in the non-profit context, researchers have employed different measurement techniques. These include the allocation of costs to report zero fundraising costs despite significant contributions and zero administrative expenses (Yetman, 2001; Krishnan et al., 2006; Yetman, 2011), manipulation of program ratios through cost-shifting (Jones & Roberts, 2006; Keating et al., 2008), discretionary use of accruals accounting and the distribution of zero earnings (Omer & Yetman, 2003; Leone & Van Horn, 2005; Ballantine et al., 2007; Verbruggen & Christiaens, 2012; Jegers, 2013).

Previous studies have revealed that NPOs engage in EM for various reasons. These include executive compensation and reputation (Gaver et al., 1995; Guidry et al., 1999; Myung Seok & Taewoo, 2004; Bergstresser & Philippon, 2006; Chava & Purnanandam, 2010), debt covenants (Jaggi & Lee, 2002; Saleh & Ahmed, 2005), capital market motives (Friedlan, 1994; Teoh et al.,

1998; Godfrey & Koh, 2003; DuCharme et al., 2004), and political costs motives (Sivakumar & Waymire, 2003; Wilson & Shailer, 2007). Study by Verbruggen and Christiaens (2012) in the non-profit sector support the notion that EM may be employed to mislead stakeholders who rely on financial information for performance assessment and grant decision-making. Consequently, it is argued that NPOs engage in EM to report higher efficiency ratios, enhance public accountability for fund management, attract further donations, manipulate income and expenses to minimize tax liability, respond to pressure from regulators and monitoring organizations, meet operational targets, and achieve financial incentives (e.g., cost of debt, compensation) (Khumawala et al., 2005) Accounting serves the purpose of recording and tracking an organization's financial activities, including assets, liabilities, sales, and purchases. In the context of non-profit organizations (NPOs), establishing accurate financial systems and adhering to accounting norms are crucial for ensuring performance.

Governments worldwide have scrutinized accountability issues and governance in the non-profit sector due to financial reporting problems faced by NPOs (Vermeer et al., 2009). NPOs heavily rely on donations, government grants, and volunteerism, which has led to arguments that accountability in these organizations needs significant improvement. However, the precise definition of accountability remains elusive and varies across different sources (Patton, 1992). Among the various definitions, accountability is often associated with transparency regarding an organization's activities and performance in fulfilling its mission. Additionally, accountability enhances an NPO's legitimacy and reduces the risk of sanctions (Cordery & Baskerville, 2007).

Different user groups have distinct needs and preferences when it comes to accountability, leading to various accountability bases. This diversity of user groups and accountability bases poses challenges in identifying the necessary information required for accountability purposes (Connolly & Hyndman, 2004). Recognizing the importance of improving accountability, public officials advocate for increased regulation of financial disclosures from NPOs (Calabrese, 2011). Accounting information is considered a significant mechanism for achieving accountability, as it facilitates the flow of crucial information (Calabrese, 2011). According to the National Council of Nonprofits (2021), financial transparency in NPOs is essential for legal compliance and ethical leadership. It preserves the trust donors place in NPOs and fosters a positive workplace culture among employees. Many NPOs demonstrate their commitment to transparency by publishing their financial statements or reports on their websites, providing easy access to financial information for interested parties.

Financial statements play a crucial role in assessing the financial position of NPOs by providing information about their fund acquisition and expenditure. However, it has been argued that financial statements offer only a partial understanding of an organization. They provide limited insights into the impact on performance and success in the non-profit sector. To address NPOs' accountability, accounting narratives are introduced to communicate achievements, performance, and future plans to stakeholders, including strategies, activities, and objectives. Donors often seek non-financial information such as efficiency, goals, and output. Therefore, it is important to consider both financial and non-financial information in reporting.

Empirical studies emphasize the need for regular forecasted financial statements and timely reporting. Financial records hold valuable insights into social and economic history, but extracting relevant information can be challenging. Information technology has been recognized as a facilitator of management accounting procedures, managing, analyzing, and aiding decision-making through accounting information systems (Mahdi et al., 2010). Effective accounting systems significantly impact the performance and survival of organizations, especially small and medium-

sized enterprises. The quality of accounting information systems is evaluated based on criteria such as security, reliability, compatibility with other software, and simplicity.

The auditing process serves as a defensive measure against the improper utilization of funds in NPOs. NPOs face significant financial challenges in implementing program procedures and meeting their financial requirements. The scrutiny of NPOs considers their unique nature, their relationship with the environment, the complexity of their operations, and the difficulties in defining the boundaries of their activities and establishing clear distinctions between non-profit organizations and other entities (Helmig et al., 2004). Two types of audits can be distinguished: internal audits and external audits.

3. METHODOLOGY

This research employs a qualitative and comparative research design to examine the legal frameworks, taxation policies, and accounting regulations governing NPOs in North Macedonia and Croatia. The study commences with an in-depth documentary analysis of legal documents, tax codes, accounting regulations, and relevant government publications from both countries. This qualitative analysis unveils key provisions, similarities, and distinctions in the legal frameworks of North Macedonia and Croatia, shedding light on the structural and functional aspects of these regulatory environments.

Qualitative analysis is fundamental in providing an insightful foundation for the comparative research. By delving into the specifics of each country's legal and regulatory landscape, the study elucidates the intricacies and nuances of NPO governance in these regions. This detailed understanding is crucial for discerning the operational and reporting requirements placed on NPOs by their respective legal and regulatory contexts.

The research further engages in a comparative analysis, systematically contrasting the legal and regulatory frameworks of North Macedonia and Croatia. It highlights areas of alignment and divergence, enabling a nuanced evaluation of the challenges and opportunities faced by NPOs in these distinct contexts.

While this research currently focuses on qualitative analysis and comparative assessment, it is poised for the development of a quantitative methodology in the future. This expansion may involve the creation of a structured questionnaire to collect data from NPOs in both countries, enhancing the depth of analysis and providing a more comprehensive understanding of the experiences and challenges faced by these organizations. For now, the qualitative and comparative methods serve as a robust foundation for this study, offering essential insights into the legal and regulatory landscapes that shape NPO operations in North Macedonia and Croatia.

4. RESULTS AND DISCUSSION: COMPARATIVE ANALYSIS OF LEGAL FRAMEWORKS, TAXATION, AND ACCOUNTING POLICIES IN NORTH MACEDONIA AND CROATIA

The legal frameworks governing NPOs in North Macedonia and Croatia play a crucial role in regulating their establishment, operation, and financial management. In North Macedonia, *the Law on Associations and Foundations* serves as the primary legislation, providing comprehensive guidelines for the establishment, registration, and termination procedures of associations, foundations, and foreign organizations. It covers essential aspects such as property ownership, supervision mechanisms, status changes, and the recognition of organizations of public interest. In

Croatia, the legal framework for NPOs is primarily governed by the *Law on Associations,* which addresses the establishment, legal position, operation, registration, financing, liability, and termination of associations with legal entity status. Additionally, it also encompasses the registration and termination procedures for foreign associations operating within the country. This law provides a comprehensive regulatory framework ensuring the effective functioning of NPOs in Croatia (see table 1).

Table 1: NPOs Legal Frameworks in North Macedonia and Croatia

NORTH MACEDONIA		CROATIA	
Act	**Explanation**	**Act**	**Explanation**
Law on Associations and Foundations	Regulates the manner, conditions and procedure for establishment, registration and termination of associations, foundations, alliances, organizational forms of foreign organizations in the Republic of North Macedonia, the property they have, supervision, status changes and the status of organizations of public interest.	**Law on Associations**	Regulates the establishment, legal position, operation, registration, financing, property, liability, status changes, supervision, termination of the existence of an association with the status of a legal entity, and the registration and termination of the operation of foreign associations in the Republic of Croatia.
Law on Accounting for Non-Profit Organizations	Regulates the management of accounting, business books, accounting documents and data processing, recognition of income and expenses, assessment of balance sheet positions, revaluation, financial statements, submission of financial statements and other issues related to the accounting of the economic interest community, associations of citizens and foundations, other forms of association, political parties, religious communities, religious groups and others, the Red Cross of the Republic of North Macedonia, associations of foreigners, foreign and international non-governmental organizations, humanitarian organizations and associations, trade unions and other legal entities established with special regulations from which it follows that they are non-profit organizations, unless otherwise regulated by another regulation.	**Act on financial operations and accountancy of non-profit organizations**	Regulates the framework for financial operations and the elements of the accounting system of non-profit organisations, which includes principles of financial management system, preparation and execution of financial plans, reporting on budget funds spending, accounting principles and activities, business records and accounting documents, list of assets and liabilities, principles of declaring asset, commitments and own resources and principles of recognizing revenues, expenditures, receipts and expenses, financial reporting, audit of annual financial statements, publication of annual financial statements, supervision of financial transactions and accounting, and other areas related to financial operations and accountancy of non-profit organisations
		The ordinance on non-profit accounting and the chart of accounts	Regulates the layout, content and application of accounts in the chart of accounts, the method of keeping simple bookkeeping and the application of the monetary accounting principle, the minimum content of the business books of simple bookkeeping and depreciation rates are defined
A Guide to Accounting for a Nonprofit	Prescribes the management of accounting, business books, accounting documents and data processing, the organization of accounting, the	**The ordinance on reporting in non-profit accounting**	Prescribes the form and content of financial statements and declarations of inactivity, the periods for which the financial statements are drawn up, and

Organization	recognition of income and expenses, the assessment of balance positions, the revaluation and the inventory of non-profit organizations determined by the Law on Accounting for Non-Profit Organizations.	and the Register of Non-Profit Organizations	the obligations and deadlines for their submission. Regulates the minimum content and deadlines for submission of reports on the use of budget funds, as well as the method of keeping, entering, deleting and changing data in the Register of Non-Profit Organizations
Rulebook on the content of separate accounts in the chart of accounts for non-profit organizations	Prescribes the content of the separate accounts in the chart of accounts for non-profit organizations.	**The Ordinance on the system of financial management and control, and the preparation and execution of financial plans of non-profit organizations**	Determines the method of conducting a self-assessment of the functioning of the financial management and control system of a non-profit organization, and prescribes the methodology for creating a financial plan, amending and supplementing the financial plan, as well as the method and conditions for executing the financial plan

(Source: Adopted to the NPOs Legal Regulation in North Macedonia and Croatia)

The Law on Accounting for Non-Profit Organizations in North Macedonia outlines the specific requirements for managing accounting practices within the non-profit sector. It encompasses various elements, including the recognition of income and expenses, assessment of balance sheet positions, financial statement preparation, and submission procedures. This law applies to a wide range of non-profit entities, including economic interest communities, associations of citizens, foundations, political parties, religious communities, and international non-governmental organizations. To complement the Law on Accounting for Non-Profit Organizations, a *Guide to Accounting for a Nonprofit Organization* offers detailed instructions and guidelines on accounting management tailored specifically for non-profit organizations in North Macedonia. It covers various aspects, such as accounting procedures, income and expense recognition, balance sheet assessment, revaluation, and inventory processes. This guide serves as a valuable resource to ensure compliance with accounting standards and practices within the non-profit sector.

The Act on Financial Operations and Accountancy of Non-Profit Organizations in Croatia establishes the framework for financial operations and the accounting system specific to non-profit organizations. It encompasses various aspects, including financial management principles, financial planning, reporting on budget funds spending, accounting principles and activities, business records and accounting documents, asset and liability management, revenue recognition, financial reporting, audit requirements, and supervision of financial transactions. This act ensures transparency, accountability, and sound financial management within the non-profit sector in Croatia. To further support financial operations and accounting practices, the Croatian legal framework includes the *Ordinance on Non-Profit Accounting and the Chart of Accounts*. This ordinance defines the layout, content, and application of accounts within the chart of accounts for non-profit organizations. It specifies the method of keeping simple bookkeeping records, the minimum content requirements for business books, and depreciation rates. By adhering to this ordinance, non-profit organizations can ensure standardized accounting practices and facilitate accurate financial reporting. Moreover, the *Ordinance on Reporting in Non-Profit Accounting and the Register of Non-Profit Organizations* in Croatia establishes guidelines for financial statement reporting and the submission of declarations of inactivity. It defines the form and content

requirements for financial statements, the reporting periods, and the obligations and deadlines for submission. This ordinance also regulates the reporting of budget fund usage and the maintenance of the Register of Non-Profit Organizations, including the method of data management and the procedures for entering, deleting, and modifying organization data.

In North Macedonia, the taxation of non-profit organizations is determined based on their status as taxpayers or non-taxpayers. Non-profit organizations, such as associations of citizens, foundations, political parties, religious communities, and humanitarian organizations, are exempt from profit tax if their income is generated from various sources such as membership fees, voluntary contributions, donations, grants, gifts, legacies, dividends from trading companies established with association funds, and revenues from government-approved programs. However, if these organizations engage in economic activities within the framework of their non-profit activities and their total annual income from such activities exceeds 1,000,000 denars, they become liable for the calculation and payment of tax on total income. The tax rate for non-profit organizations in Macedonia is set at 1% of the total income from economic activity (see table 2).

In Croatia, non-profit organizations are not considered taxpayers under the Profit Tax Act. However, if they engage in economic activities that provide them with unjustified privileges in the market, they are required to register in the register of taxpayers. The taxation of non-profit organizations in Croatia differs depending on the type of tax. Regarding profit tax, non-profit organizations performing specific economic activities that lead to unjustified market power are obliged to register as taxpayers within eight days from the start of such activities. The profit tax rate is either 10% or 18%, depending on the income from economic activity in the tax period. As for value-added tax (VAT), non-profit organizations are usually not liable for VAT, but they become taxpayers if the value of their delivered goods and performed services, not exempt from VAT, exceeds a certain threshold per year. The VAT tax rate in Croatia is either 25%, 13%, or 5%, depending on the category of goods or services (see table 2).

Table 2: Taxation of NPOs in North Macedonia and Croatia

	NORTH MACEDONIA	CROATIA
Who is NOT a taxpayer?	Associations of citizens and foundations as well as their alliances and other forms of association or connection, the economic interest community, political parties, religious communities, religious groups, the Red Cross of the Republic of North Macedonia, associations of foreigners, foreign and international non-governmental organizations, humanitarian organizations and associations, trade unions, chambers and other legal entities established by special regulations from which it follows that they are non-profit organizations, **are not liable for profit tax** if they generate income from: • membership fees, • voluntary contributions, • donations, • grants, • gifts (in money, goods, property rights), • legacies, • income from dividends from the trading companies established with the funds of the association and • revenues from the Budget of the Republic, the budgets of the local self-government units and the Budget of the City of Skopje based on previously prepared programs (projects) approved by the Government	**Profit tax:** Non-profit organizations, although they are not considered taxpayers following the Profit Tax Act, are obliged to register in the register of taxpayers if they perform an economic activity by which they acquire unjustified privileges on the market. The difference between income and expenses as a starting point does not represent the difference between the non-profit organization's total income and expenses, but only the part related to economic activity. **Value-added tax:** As a rule, non-profit organizations do not engage in entrepreneurial activity, so they are usually not liable for value-added tax (VAT). A non-profit organization becomes liable for value-added tax if the value of delivered (sold) goods and performed services that are not exempt from VAT exceeds the amount of EUR 30,526.25 per year. Donations, gifts, grants, and membership fees are not included in the criteria for determining taxation. Regarding the tax status of certain entities that perform activities of public interest, the Ministry of Finance, among others,

	of the Republic of North Macedonia, i.e. the competent ministries, the councils of the local self-government units and the Council of the City of Skopje .	took the position that, for example, the activity of the Red Cross belongs to entrepreneurial activity and is not subject to taxation.
Who is a taxpayer?	Associations of citizens and foundations as well as their alliances and other forms of association or connection, the economic interest community, political parties, religious communities, religious groups, the Red Cross of the Republic of North Macedonia, associations of foreigners, foreign and international non-governmental organizations, humanitarian organizations and associations, unions, chambers and other legal entities established by special regulations from which it follows that they are non-profit organizations that realize income from performing economic activity within the framework of their non-profit activity, for the purpose of avoiding unfair competition with entities to whom the profit made from performing economic activity is taxes, become liable for calculation and payment of tax on total income, if the total annual income from economic activity is greater than 1,000,000 denars.	**Profit tax:** Non-profit organizations that perform a specific economic activity that would gain unjustified market power are obliged to register in the register of taxpayers within eight days from the start of that activity. In determining economic activity, it is necessary to decide whether non-taxation leads to unjustified privileges on the market and whether this activity is performed independently, permanently, and to achieve profit or other economically estimable benefits. The obligation to pay profit tax is determined in some instances, namely the permanent performance of activities for a fee, such as the provision of catering services, provision of services for the use of recreation areas, provision of accounting-bookkeeping, administrative-financial, information-communication and/or consulting services to other physical and/or legal persons for a fee, leasing for a fee business, residential or other premises, equipment and means of work. **Value-added tax:** The entrepreneurial activity of a non-profit organization can have the status of taxable activity with the right to deduct input tax and the status of activity exempt from VAT without the right to deduct input tax. Non-profit organizations that perform taxable supplies provided that the value of taxable supplies in the previous year was greater than EUR 39,816.84, become a taxpayer. The economic activity of non-profit organizations can be, for example, the rental of office space, the organization of courses, seminars, events, publishing activities, and the like.
Tax Rate	The total income tax for non-profit organizations is calculated and paid in the amount of 1% of the amount of the total income from economic activity.	**Profit tax** is calculated on the established tax base at the rate of: • 10% if, in the tax period, the income from the economic activity was up to EUR 995,421.06, or • 18% if, in the tax period, the income from economic activity is equal to or greater than EUR 995,421.06. **Value-added tax (VAT)**: The VAT tax rate is 25%, or 13% or 5%.

(Source: Adopted to the NPOs Legal Regulation in North Macedonia and Croatia)

It should be noted that NPOs in both Macedonia and Croatia may have specific conditions and exemptions regarding their tax obligations. For example, in Macedonia, the Ministry of Finance has taken the position that certain activities of the Red Cross belong to entrepreneurial activity and are not subject to taxation. Similarly, in Croatia, the determination of economic activity and the

obligation to pay profit tax depend on factors such as the nature and duration of the activity, profit generation, and market power. These taxation regulations aim to strike a balance between promoting the non-profit sector's activities and ensuring fairness in the market. By exempting non-profit organizations from certain taxes or imposing tax obligations based on their economic activities, these regulations encourage the growth and sustainability of non-profit organizations while preventing unfair competition and maintaining tax revenues.

Finally, a comparative analysis was made of the accounting regulations of NGOs in North Macedonia and Croatia (see table 3).

Table 3: NPOs Accounting

	NORTH MACEDONIA	CROATIA
Type/System of accounting used	Double-entry accounting.	Double-entry accounting. As an exception, the legal representative of a non-profit organization may make a Decision on maintaining the simple-entry bookkeeping and on the application of the cash accounting principle if: the value of the asset of a non-profit organization, at the end of each of the previous three years, was successively lower than 30.526,25 euro, and if the annual income of a non-profit organization in each of the previous three years is successively lower than 30.526,25 euro per year. During the first three years from its establishment, a non-profit organization shall be obliged to maintain double-entry bookkeeping.
Revenues and expenses recognition	Modified accrual accounting principle	The accrual accounting principle
Assessment of balance sheets positions	Modified accrual accounting principle	The accrual accounting principle.
Financial Statements	Balance sheet, Income and Expenses Statement and notes to the financial statements	Balance sheet, Income and Expenses Statement and notes to the financial statements. Financial statement of a non-profit organization that apply the simple-entry bookkeeping: annual financial statement on receipts and expenditures and notes to the financial statements.
Audit of annual financial statements	/	Financial statements of a non-profit organization which in the previous year had a profit of 398.168,43 euros to 1.327.228,08 euros (included) -subject to an audit insight. Financial statements of a non-profit organization which in the previous year had total revenue higher than 1.327.228,08 euros - subject to the audit.

(Source: Adopted to the NPOs Legal Regulation in North Macedonia and Croatia)

In North Macedonia, NPOs follow the double-entry accounting type, where the financial transactions are recorded using debit and credit entries. The recognition of revenues and expenses is based on the modified accrual accounting principle. Under this principle, reciprocal revenues (revenues based on delivered goods and services) are recognized in the reporting period to which

they relate, regardless of collection. Un-reciprocal revenues (revenues from special regulations, membership fees, grants, contributions, and similar sources) are recognized in the reporting period if they are available (collected) during that period. Donations related to contracted programs are recognized as postponed revenue and proportionally as revenues based on the costs of program implementation. Expenses are recognized in the reporting period to which they relate, regardless of payment. The assessment of balance sheet positions also follows the modified accrual accounting principle. The financial statements prepared by non-profit organizations in Macedonia include the balance sheet, income and expenses statement, and notes to the financial statements.

In Croatia, non-profit organizations generally follow the double-entry bookkeeping principle. However, as an exception, a legal representative of a non-profit organization may decide to maintain simple-entry bookkeeping and apply the cash accounting principle if certain conditions are met regarding the value of assets and annual income. The recognition of revenues and expenses in Croatia is based on the accrual accounting principle. Reciprocal revenues are recognized in the reporting period, measurable irrespective of collection, while un-reciprocal revenues are recognized if they are available (collected) within the reporting period. Donations related to contracted programs are recognized as postponed revenue and proportionally as revenues based on the costs of program implementation. Expenses are recognized in the reporting period, irrespective of payment. The assessment of balance sheet positions also follows the accrual accounting principle. The financial statements for non-profit organizations in Croatia vary based on the accounting type used. For those using double-entry bookkeeping, the financial statements include the balance sheet, income and expenses statement, and notes. For those using simple-entry bookkeeping, the financial statements consist of an annual financial statement on receipts and expenditures and accompanying notes. Non-profit organizations meeting specific profit and revenue thresholds are subject to an audit of their annual financial statements, and the financial statements must be published in the Register of Non-Profit Organizations. Additionally, special reporting requirements include the financial plan and a report on the spending of budget funds.

5. CONCLUSION

The research entails a thorough investigation into the legal frameworks, taxation policies, and accounting practices governing NPOs in North Macedonia and Croatia. The paper aims to uncover noteworthy parallels and distinctions between the two countries, shedding light on their respective approaches to NPO governance.

In North Macedonia, the legal framework is governed by the Law on Associations and Foundations, which regulates the establishment, registration, and termination of NPOs. Additionally, the Law on Accounting for Non-Profit Organizations provides guidelines for accounting management, recognition of income and expenses, and financial reporting. The taxation system in North Macedonia exempts certain NPOs from profit tax if their income is derived from specific sources such as membership fees, donations, and government budgets. However, NPOs engaging in economic activities may be subject to total income tax at a rate of 1% if their annual income exceeds a specified threshold.

On the other hand, in Croatia, the Law on Associations regulates the legal status, registration, and operation of NPOs. Non-profit organizations that engage in economic activities with potential market advantages are required to register as taxpayers. Profit tax may be applicable based on the income generated from economic activities, while value-added tax (VAT) obligations depend on

the value of goods and services provided. The tax rates for profit tax range from 10% to 18%, and the standard VAT rate is 25%.

Regarding accounting practices, both countries predominantly follow the double-entry bookkeeping principle, although simplified bookkeeping options are available under certain conditions. In North Macedonia, modified accrual accounting principles are employed for recognizing revenues and expenses and assessing balance sheet positions. In Croatia, the accrual accounting principle is applied for revenue and expense recognition, and the assessment of balance sheet positions aligns with the accrual accounting principle as well.

Financial statements play a crucial role in both countries for NPOs' reporting obligations. In North Macedonia, NPOs that adopt double-entry bookkeeping prepare balance sheets, income and expense statements, and accompanying notes. Those following simplified bookkeeping maintain annual financial statements on receipts and expenditures. In Croatia, NPOs utilizing double-entry bookkeeping produce balance sheets, income and expense statements, and notes to financial statements. NPOs with simplified bookkeeping provide an annual financial statement on receipts and expenditures along with accompanying notes.

This comparative analysis sheds light on the complexities and nuances surrounding the legal, taxation, and accounting aspects of NPOs in North Macedonia and Croatia. It underscores the need for NPOs to navigate and comply with the specific regulations governing their operations in each country.

REFERENCES

Ballantine, J., Forker, J., and Greenwood, M. (2007). "Earnings Management in English NHS Hospital Trusts", *Financial Accountability and Management*, vol. 23, no. 4, pp. 421-440, https://doi.org/10.1111/j.1468-0408.2007.00436.x

Bergstresser, D., and Philippon, T. (2006). "CEO incentives and earnings management", *Journal of Financial Economics*, vol. 80, no 3, pp. 511-529 https://doi.org/10.1016/j.jfineco.2004.10.011

Calabrese, T., D. (2011). "Do Donors Penalize Nonprofit Organizations with Accumulated Wealth?" *Public Administration Review*, vol. 71, no.6 https://doi.org/10.1111/j.1540-6210.2011.02420.x

Chava, S., and Purnanandam, A. (2010). "Is Default Risk Negatively Related to Stock Returns?" *The Review of Financial Studies*, vol. 23, no. 6, pp. 2523–2559, https://doi.org/10.1093/rfs/hhp107

Connolly, C. and Hyndman. N. (2004). "Performance reporting: a comparative study of British and Irish charities." *The British Accounting Review*. vol. 36, no. 2, pp. 127-154. https://doi.org/10.1016/j.bar.2003.10.004

Cordery, C., J. and Baskerville, R. F. (2007). "Charity Financial Reporting Regulation: A Comparative Study of the UK and New Zealand". *Accounting History*, vol. 12, no. 1, pp. 7-27 doi: 10.1177/1032373207072806

Dechow, P., and Dichev, I., D. (2002). "The quality of accruals and earnings: The role of accrual estimation errors". *The Accounting Review* (Supplement)

Dechow, P., and Skinner, D. (2000). "Earnings Management: Reconciling the Views of Accounting Academics, Practitioners, and Regulators," *Accounting Horizons*, vol. 14, no. 2, pp. 235-250. http://dx.doi.org/10.2308/acch.2000.14.2.235

DuCharme, L. L; Malatesta, P. and Sefcik, S., E. (2004). "Earnings Management, Stock Issues, and Shareholder Lawsuits". *Journal of Financial Economics,* vol 71, no. 1, pp. 27-49 doi: 10.1016/S0304-405X(03)00182-X

Friedlan, J., M (1994). "Accounting Choices of Issuers of Initial Public Offerings", *Contemporary Accounting Research*, vol. 11, no. 1. https://doi.org/10.1111/j.1911-3846.1994.tb00434.x

Gaver, J. J., Gaver, K. M. and Austin, J. R. (1995). "Additional evidence on the association between income management and earnings-based bonus plans". *Journal of Accounting and Economics*, vol. 19, no. 1. https://doi.org/10.1016/0165-4101(94)00358-C

Godfrey, J. M., and Koh, P.S. (2003). "The association between firms' public finance issues and earnings management". *Accounting Research Journal*, vol. 16, no. 2, pp. 102 - 116.

Guidry, F., Leone, J., A., and Rock, S. (1999). "Earnings-based bonus plans and earnings management by business-unit managers" *Journal of Accounting and Economics*, vol. 26, no. 1-3, pp. 113-142

Healy, P.M. and Wahlen, J.M. (1999). "A Review of the Earnings Management Literature and Its Implications for Standard Setting". *Accounting Horizons*, vol 13, pp. 65-383. http://dx.doi.org/10.2308/acch.1999.13.4.365

Helmig, B., Jegers, M., and Lapsley, I. (2004). "Challenges in Managing Nonprofit Organizations: A Research Overview". *International Journal of Voluntary and Nonprofit Organizations* vol. 15, no. 2, pp.101-116 doi: 10.1023/B:VOLU.0000033176.34018.75

Herzlinger, R.E. and Sherman, H.D. (1980). "Advantages of fund accounting in „nonprofits". *Harvard Business Review*, pp.94-105

Jaggi, B., and Lee, P. (2002). "Earnings Management Response to Debt Covenant Violations and Debt Restructuring". *Journal of Accounting, Auditing and Finance*, vol. 17, no. 4. doi: 10.1177/0148558X0201700402

Jegers, M. (2011). On the capital structure of non-profit organisations: A replication and extension with Belgian data. *Financial Accountability & Management*, vol. 27, no. 1, pp. 18–31.

Jegers, M. (2013). "Do Nonprofit Organisations Manage Earnings? An Empirical Study", *International Journal of Voluntary and Nonprofit Organizations,* vol. 24, no. 4. doi: 10.1007/s11266-012-9291-z

Jegers, M., & Verschueren, I. (2006). On the Capital Structure of Non-Profit Organisations : an Empirical Study for Californian Organisations. Financial Accountability & Management, 22, 309–329. https://doi.org/10.1111/j.1468-0408.2006.00428

Jones, C, and Roberts, A., A. (2006). "Management of financial information in charitable organizations: The case of joint cost allocations". *The Accounting Review*, vol. 81, no. 1, pp. 159-178.

Keating, K., E., Parsons, M., L., and Roberts, A., A. (2008). "Misreporting Fundraising: How Do Nonprofit Organizations Account for Telemarketing Campaigns?", *The Accounting Review*, vol. 83, no. 2, pp. 417-446

Khumawala, S. (2005), "Corruption on the global front: symposium introduction", *Journal of Public Budgeting, Accounting & Financial Management,* vol. 17, no. 3, pp. 311-312. https://doi.org/10.1108/JPBAFM-17-03-2005-B003

Klein, A., (2002). "Audit committee, board of director characteristics, and earnings management". *Journal of Accounting and Economics*, vol. 33, no. 3, pp. 375-400 https://doi.org/10.1016/S0165-4101(02)00059-9

Krishnan, R., Yetman, H., M., and Yetman, J., R. (2006). "Expense Misreporting in Nonprofit Organizations", *The Accounting Review*, vol. 81, no. 2, pp. 399-420

Leone, J., A., and Van Horn, L. (2005). "How Do Nonprofit Hospitals Manage Earnings?". *Journal of Health Economics,* vol. 24, no.4, pp. 815-837 doi: 10.1016/j.jhealeco.2005.01.006

Leuz, C., Nanda, D., and Wysocki, D., P. (2002). "Earnings Management and Investor Protection: An International Comparison". *Journal of Financial Economics*, vol. 69, no. 3, pp. 505-527 doi: 10.1016/S0304-405X(03)00121-1

Mahdi, S., Rostami, V., and Abdolkarim, M. (2010). "Usefulness of Accounting Information System in Emerging Economy: Empirical Evidence of Iran". *International Journal of Economics and Finance*, vol. 2, no. 2. doi: 10.5539/ijef.v2n2p186

Modigliani, F., & Miller, M. (1958). "The Cost of Capital, Corporation Finance and the Theory of Investment", *The American Economic Review*, vol. 68, no. 3, pp. 261–297. https://doi.org/10.4013/base.20082.07

Monsen, N. (2009). "Accounting for nonprofit organizations: A case study of a housing cooperative" (Working paper)

Myers, S. C. (1984). "The Capital Structure Puzzle", *The Journal of Finance*, vol. 39, no. 3, pp. 574–592. https://doi.org/10.1111/j.1540-6261.1984.tb03646

Myers, S. C., & Majluf, N. (1984). "Corporate financing and investment decisions when firms have information that investors do not have", *Journal of Financial Economics*, vol. 15, no. 2, pp. 81–102. https://doi.org/10.1016/0304-405X(84)90023-0

Myung Seok, P., and Taewoo P. (2004). "Insider sales and earnings management". *Journal of Accounting and Public Policy*, vol. 23, no. 5, pp. 381-411 doi: 10.1016/j.jaccpubpol.2004.07.003

National Council of Nonprofits. (2021). "Financial Transparency and Public Disclosure Requirements", available online at: https://www.councilofnonprofits.org/running-nonprofit/ethics-accountability/financial-transparency-and-public-disclosure-requirements

Omer, C., T., and Yetman, J., R. (2003). "Near Zero Taxable Income Reporting by Nonprofit Organizations", *Journal of the American Taxation Association*, vol. 25, no. 2. doi: 10.2308/jata.2003.25.2.19

Patton, M., J. (1992). "Accountability and governmental financial reporting". *Financial Accountability & Management*. vol. 8, no. 3, pp. 165-180 https://doi.org/10.1111/j.1468-0408.1992.tb00436.x

Saleh, M., N., and Ahmed, K. (2004). "Earnings management of distressed firms during debt renegotiation", *Accounting and Business Research,* vol. 35, no. 1. pp. 69-86 https://doi.org/10.1080/00014788.2005.9729663

Schipper, K. (1989). "Commentary on Earnings Management". *Accounting Horizons*, vol. 3, pp. 91-102.

Sivakumar, K., and Waymire, G. (2003). "Enforceable Accounting Rules and Income Measurement by Early 20th Century Railroads", *Journal of Accounting Research*, vol. 41, pp. 397-432. https://doi.org/10.1111/1475-679X.00110

Smith, G. P. (2012). "Capital Structure Determinants for Tax-Exempt Organisations: Evidence from the UK", *Financial Accountability and Management*, vol. 28, no. 2. https://doi.org/10.1111/j.1540-6288.2010.00274

Teoh, H., S.; Welch,I., and Wong, T., J. (1998). "Earnings Management and the Long-Run Market Performance of Initial Public Offerings". *The Journal of Finance*, vol. 53, no. 6, pp. 1935-1974 . https://doi.org/10.1111/j.1911-3846.1994.tb00434.x

Trussel, J. (2012). "A comparison of the capital structures of nonprofit and proprietary health care organizations", *Journal of Health Care Finance*, vol. 39, no. 1, pp. 1–11.

Turner, J. S., Broom, K., Elliot, M., Lee, J., Turner, J. S., Author, C., & Lee, J. (2015). "A Comparison of Capital Structure: The Use of Debt in Investor Owned and Not-For-Profit Hospitals", *Journal of Health Care Finance*, pp. 1–17.

Van Caneghem, T., & Van Campenhout, G. (2012). "Quantity and quality of information and SME financial structure", *Small Business Economics*, vol. 39, no. 2, pp. 341–358. https://doi.org/10.1007/s11187-010-9306-3

Verbruggen, S., and Christiaens, J. (2012). "Do Non-profit Organizations Manage Earnings toward Zero Profit and Does Governmental Financing Play a Role?" *Canadian Journal of Administrative Sciences*, vol. 29, no. 3. https://doi.org/10.1002/cjas.1219

Verbruggen, S., Christaens, J., and Milis, K., (2008). "Earnings Management: a Literature Review", *HUB Research paper*, p. 14.

Vermeer, T., E.; Raghunandan, K., and Forgione, D. (2009). "Audit Fees at U.S. Non-Profit Organizations". *Auditing A Journal of Practice & Theory*, vol. 28, no. 2, doi: 10.2308/aud.2009.28.2.289

Walb, E. (1926). "Die Erfolgsrechnung privater und őffentlicher Betriebe". *Eine Grundlegung. Berlin: Industriverlag Spaeth & Linde.*

Wilson, M., and Shailer, G. (2007). "Accounting manipulations and political costs". *Accounting and Business Research*, vol. 37, no. 4, pp. 247-266, doi: 10.1080/00014788.2007.9663311

Yetman, H., M., and Yetman, J., R. (2011). "The Effects of Governance on the Accuracy of Charitable Expenses Reported by Nonprofit Organizations", *Contemporary Accounting Research*, vol. 29, no 3. https://doi.org/10.1111/j.1911-3846.2011.01121.x

Yetman, Robert and Omer, and Thomas C. (2001). "Taxable Income Management by Nonprofit Organizations". Available online at SSRN: https://ssrn.com/abstract=294748 or http://dx.doi.org/10.2139/ssrn.294748

NON-FINANCIAL REPORTING IN A FUNCTION OF GROWING SOCIAL AND ENVIRONMENTAL RESPONSIBILITY - A CHALLENGE FOR ACCOUNTING AND AUDITING

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ABSTRACT
Corporate sustainability and successful long-term business are contributed by the orientation towards achieving economic and financial performance, taking into account social and environmental aspects. On the part of society, there has been a tightening of environmental requirements. The management of a modern company, through achieved economic and environmental performances, indicates that these two interests do not have to be in conflict. Rational use and adequate management of resources reduces operating costs and future liabilities, increases the company's image through increased social responsibility towards the environment. In the process of business decision-making, the importance of environmental accounting and environmental auditing is pointed out, which is based on the measurement of environmental costs and benefits. Environmental accounting represents a very important source of information in the process of managing environmental protection.

Modern non-financial reporting has the informational power to incorporate information provided by environmental accounting, and provides added value with financial information, in order to make adequate business decisions in the function of reconciling two goals - making a profit and protecting the environment.

The aim of the paper is reflected in the theoretical presentation of non-financial reporting with an emphasis on social and environmental responsibility, and on the review of non-financial information contained in the annual reports of certain companies in the Republic of Serbia whose shares are listed on the Belgrade Stock Exchange. The practical part of the paper refers to the presentation of the methodology and the quality of the non-financial information provided in the reviewed annual reports.

Keywords: environmental accounting, non-financial reporting, annual reports, environmental audit, environmental protection

JEL classification: Q56, M41, M42

1. INTRODUCTION

The survival of companies on the competitive global market is increasingly difficult due to the financial and energy crisis, the present elements of the economic recession, as well as the increasingly prominent environmental problems in the modern business world. In such conditions, the management of the company becomes more and more complex. This is because the increasing environmental demands pressure the company to adapt its management process to the requirements of the environment. Companies are therefore increasingly introducing the practice of environmental protection management, i.e. introduce the practice of corporate regulation.

Management very often, in an effort to maximize profits, overlooks the very important fact that natural resources are not unlimited and cannot be used indefinitely. The ecological aspect, if it is neglected, leads to an increase in the risk between natural resources and their availability and their consumption. Insufficient commitment to the environmental problem itself and ignoring them cannot ensure the business perspective of the company.

A very important challenge for companies is the inclusion of environmental requirements in the process of both strategic and operational management. In the process of making business and financial decisions, companies must also take into account environmental requirements. They should pay attention to developing adequate concepts that offer a methodological framework, instruments and measures for the successful operation of the concept of sustainable development, as well as increasing responsibility. In every strategy, the basic element for achieving the goal of sustainable development is actually awakening the responsibility of the company.

Although non-financial reporting began to develop in the early 1970s, it experienced expansion only after the adoption of the European Union (EU) Directive (2014/95/EU). The Republic of Serbia undertook the obligation to harmonize with European Union law with the signing of the Stabilization and Association Agreement. There are quite a number of standards that contain principles and recommendations related to reporting. Some principles are universally prescribed in standards and codes of corporate governance, and therefore accepted in practice.

In the process of managing environmental protection, environmental accounting (which deals with identifying, collecting, evaluating, allocating and analyzing environmental costs, related to energy and material flows) and environmental auditing (which should check the compliance of the company's operations with environmental standards and regulations, as well as to assess the effectiveness of environmental protection management) play a very important role.

In addition to financial information and indicators, there is a need to publicly present non-financial information in order to gain an idea of business operations and the impact that a company has on the environment and society. Non-financial information includes information on environmental protection, social and management aspects of business. Mandatory sustainability reporting in the Republic of Serbia applies to reports for 2021. The obligation to publish non-financial information applies to companies of public interest that are classified as large legal entities and that have an average of over 500 employees on the balance sheet date. By introducing the aforementioned obligation, the national legal accounting regulation is harmonized with the requirements of the European Union Directive 2014/95/EU through the publication of non-financial information and information on the diversity of certain large companies.

Compiling a non-financial report and publishing qualitative and quantitative information on generated waste, recycling, air emission measurements and moving beyond the framework of limit values is relevant for those companies whose technologies and production processes have negative consequences for the environment. The obligation to prepare a non-financial report is a novelty for the majority of companies that become obligees for non-financial reporting. One of the most commonly used methodologies for creating reports is promoted by the Global Reporting Initiative as an independent international organization that helps companies take responsibility for the impact of business activities on the environment and society.

The papar deals with the issues of non-financial reporting, social responsibility, and environmental accounting and auditing through the following chapters: a brief review of the literature, the importance of environmental management, the normative base of non-financial reporting with reference to reporting on environmental issues, environmental accounting and auditing in the function of environmental protection and finally, the chapter with the research part deals with an example of information on non-financial information and environmental protection in the annual reports of selected companies in the Republic of Serbia.

The goal of the practical research in this paper is to present a realistic picture of the quality of non-financial reporting in terms of volume and quality of information in companies with a total of over 500 employees, mostly. The first year with a legal obligation was 2021, and the reporting year 2022 was taken into consideration in order to review the most current data. Since it was the most challenging for companies to present non-financial information for the first time, i.e. in 2021 (although many companies previously presented non-financial information, even though it was not a legal obligation), a higher quality was expected for 2022, but unfortunately some companies have only fulfilled the formal minimum, or did not adequately pay attention to non-financial information.

2. BRIEF LITERATURE REVIEW

There is a growing understanding that environmental policy should be incorporated into the company's business policy (Gallhofer and Haslam, 1997). The concept of ecological innovation becomes the overview of public debate in the nineties and represents a global approach to ensure the sustainable development of companies (Park *et al*., 2017). "The issue of environmental protection, i.e. the impact of companies on the environment, is becoming one of the dominant factors of possible business risk in all areas of human activity due to the constant deterioration of the general state of the environment and the strengthening of responsibility for environmental damage" (Janjić and Jovanović, 2015).

Environmental accounting is developed as a result of the need for systematic monitoring of the impact of changes in the ecological environment on economic, social and political circumstances. (Zhom *et al.*, 2016). Environmental requirements are becoming a significant factor that entities must take into account in the process of making business and financial decisions (Radukić and Stevanović, 2011). The introduction of environmental accounting at entities affects the better connection of the business entity's environmental strategy, which has positive long-term consequences for environmental protection (Jovanović and Ljubisavljević, 2017).

The redefinition of the concept of accounting as a technical, social and moral practice that deals with the sustainable use of resources and appropriate accountability to stakeholders, in order to enable the flourishing of organizations, people, and nature has led to an increasing and increasing importance of environmental accounting in recent years. (Carnegie *et al.*, 2021).

The intention is to highlight the importance of applying the principles of sustainable development in the construction and maintenance of environmental protection, in achieving environmental protection and resource management, to exchange experiences and achieve communication between different professions and to promote a comprehensive approach to environmental protection in all phases of socially responsible business (Mizdraković *et al.*, 2016). In terms of non-financial disclosures, EU requirements for large entities are mostly dictated by how they operate and their environmental and social engagement (Vićentijević, 2021).

Although the legal obligation of non-financial reporting begins to apply to reports for 2021, some companies in the Republic of Serbia have recognized a long time ago the importance of the concept of sustainable development and included not only economic, but also social, cultural and environmental aspects in the decision-making and reporting process (Marinković, 2021).

3.   THE IMPORTANCE OF ENVIRONMENTAL MANAGEMENT

The impact of companies on the environment is becoming more and more crucial, which means that, first of all, a clear strategy should be set, and not just formal compliance with environmental laws, but compose a good environmental policy (Rondinelli and Vastag, 2000). One of the significant business risk factors in all areas of business is related to environmental issues. This is because we are witnessing the continuous deterioration of the environment and therefore, should come to the fore increased responsibility for the so-called environmental damage. Management should focus more on preventing pollution, which can be quantified ie. measure. (Shen, 1995).

The task of environmental management is to predict, determine and analyze all possible social, economic and environmental impacts that the company itself can cause and in that way endanger business, and therefore the environment. The duty of environmental management is to coordinate and integrate a multitude of disciplines in every company.

Performing activities in accordance with social, economic, legal, ecological, ethical and cultural requirements creates cost-effective systems. In this way, it provides a competitive advantage, protection from court proceedings, and very importantly, it provides savings.

Managers should ensure environmentally responsible companies by directing and monitoring projects, programs and encouraging environmental actions in an appropriate direction. Company management should consider all environmental impacts before making a decision to adopt and implement an environmental policy (Janjić and Jovanović, 2015).

Integrating environmental management into the company's management activities, i.e. the inclusion of environmental policy in business policy, requires the inclusion of a number of multifunctional activities: capital budgeting and cost budgeting, measuring financial and non-financial performance, budget control and product costing. Multidisciplinary teams have a clear allocation of tasks and functions at the institutional and operational level (Yakhou and Dorweiler, 2004).

Reducing the negative impact of companies on the environment and increasing environmental performance is actually the goal of integrating environmental management into the company's management activities. By integrating, environmental interests are included in everyday decisions within every management activity of the company. Successful management of a company in changing business conditions requires environmental management to choose an original way of working, behavior and proactive thinking.

Company management has a very important role in the implementation and realization of proactive environmental strategies, because it needs to think globally and act locally, to adopt long-term perspectives, that is, concepts and tools at the level on which environmental management is based. Environmental management tools and concepts are subject to change and continuous evolution of knowledge. Environmental management requires a multidisciplinary and interdisciplinary approach. Management of environmental protection is based on: sustainable development, eco-efficiency and cleaner production:

1)   The starting point of the concept of sustainable development is to integrate environmental protection into the process of making development and general social decisions. Assortments of products that are essential and harmless to the environment, whose production is characterized by low consumption of resources and the smallest amount of waste materials should contain a production program that is in line with sustainable development.

2)   In professional literature, the concept of eco-efficiency was introduced at the end of the eighties of the twentieth century (Schaltegger and Burritt, 2000). Efficiency is achieved by delivering products and services at competitive prices that satisfy human needs and contribute to the quality of life, while gradually reducing environmental impacts, as well as the intensity of resource use during the life cycle to a level that is consistent with the estimated carrying capacity of the earth (Schaltegger and Burritt, 2000).

Corporate eco-efficiency represents a revolutionary step forward and an opportunity to build a new sustainable development in relation to the operations of corporations, especially multinational ones,

which were completely ecologically and socially insensitive and irresponsible. By including eco-efficiency in the company's strategic planning, management establishes a direct link between the goals, protection, environment of the company and its profitability (Sinkin *et al.*, 2008).

3)   The concept of cleaner production is defined by the United Nations Environment Program (UNEP). Cleaner production represents the application of a comprehensive preventive environmental protection strategy to production processes, products and services with the aim of increasing overall efficiency and reducing risks to human health and the environment. Cleaner production is directed towards the operational side of business, i.e. production. In contrast to this concept, eco-efficiency focuses on the strategic aspect of the company's operations. It is noticeable that the aforementioned concepts are complementary for the successful management of environmental protection and benefit the company with the use of numerous tools.

4.   NORMATIVE BASE OF NON-FINANCIAL REPORTING WITH REFERENCE TO REPORTING ON ENVIRONMENTAL ISSUES

The need to publicly display non-financial information, in addition to financial information and indicators, with the aim of completing information about business operations and the impact that a company has on the environment and society, has conditioned the progressive growth of the importance of environmental protection. Information on environmental protection, social, societal and management aspects of business is incorporated into non-financial information.

Research is being conducted that is focused on non-financial reporting as a form of communication between companies and stakeholders, as well as an analysis of the relationship between the degree of disclosure of environmental information and the financial performance of companies, due to the great interest of the professional, academic and general public in environmental issues (Stevanović *et al.*, 2019).

In the Republic of Serbia, mandatory sustainability reporting applies to reports for 2021. Companies of public interest that are classified as large legal entities and that have an average of over 500 employees on the balance sheet date, have an obligation to publish non-financial information (Official Gazette of RS No. 73/2019). Also, the national legal accounting regulation was harmonized with the requirements of the European Union Directive, 2014/95/EU (European Union, 2014). Obligees of non-financial reporting provide objective and unbiased information on policies, risks and results of activities related to social and personnel issues, respect for human rights, environmental protection and the fight against corruption and bribery in the non-financial report, either in the form of an independent document or as part of annual report on operations. (European Union, 2014).

For those companies whose technologies and production processes have negative consequences for the environment, it is relevant to draw up a non-financial report and publish qualitative and quantitative information about waste, recycling, air emission measurements and movements within or outside defined limit values (Marinković, 2021).

The novelty for most companies that become obligees for non-financial reporting is the obligation to prepare a non-financial report. Dilemmas can be related to the form of the report and the details that need to be published, as well as the methodology to be applied in the process of creating the report. One of the most commonly used methodologies is promoted by the Global Reporting Initiative (GRI), which as an independent international organization helps companies to take responsibility for the impact of business activities on the environment and society.

The GRI methodology is internationally recognized. It includes the calculation and display of specific measurable indicators, and they relate to economic performance, labor and human rights, responsibility for the product, for the environment. Companies that have opted for the GRI methodology when creating a non-financial report adhere to the Guidelines in the GRI Standards (GRI, 2022). The feature of the GRI standard is comprehensiveness in the preparation of

sustainability reports, and they represent one of the best ways to show the impact of a company's business activities on the environment (Berber *et al.*, 2018).

An important instrument for informing interest groups about activities and risks related to pollution and environmental protection have reports (whether they comply with GRI standards or not), such as an environmental protection report, a report on sustainable business or a sustainable development, the report on corporate responsibility. They are a very important instrument for informing companies about activities and risks, and are related to environmental protection and pollution (Stevanović, 2018).

In the group of the most represented frameworks for the preparation of non-financial reports, in addition to the GRI standards, there are the SASB standards, the Committee for Standards on Sustainability in Accounting and the International Framework for Integrated Reporting. Sustainability Accounting Standard Board SASB created and adopted 77 sector standards. Companies from different industries follow the guidelines from the standards related to their field of business. The International Integrated Reporting Framework (IIRF) (Damnjanović, 2021) contains the concepts and principles that are relevant for the preparation and disclosure of an integrated report.

The ISO 14001 Environmental Management System standard represents a systemic approach to managing environmental protection, monitoring the implications of pollution, and identifying the production and business activities of certain companies on the environment.

In modern conditions, the main challenge for companies is to develop their accounting as an information system with the aspiration that it displays information about environmental protection, i.e. ecology and information on social responsibility in both the micro (local) and macro (global) environment.

5.   ENVIRONMENTAL ACCOUNTING AND AUDITING IN THE FUNCTION OF ENVIRONMENTAL PROTECTION

Adequate management of natural resources is a necessity in modern conditions, because there is an escalation of environmental problems and uncontrolled exploitation of natural resources. With the increase in the level of awareness of the importance of sustainable development on the part of company management, investments are made in environmental protection. Management of natural resources in a new way, ie. new approaches require adequate planning, monitoring, recording as well as reporting on investments and project effects by environmental management.

In modern conditions, the main challenge for companies is to develop their accounting as an information system with the aspiration that it displays information about environmental protection, i.e. ecology and information on social responsibility in both the micro (local) and macro (global) environment.

The interest in information about the pollution of natural resources and the working environment itself, their depletion, sets new tasks before accounting and financial reporting itself. Traditional accounting is expected to adapt to the modern, i.e. to the new business philosophy of a modern company, thinking about the importance of the environment and sustainable development. There is a need to develop specific methodological bases in order to determine the costs of environmental protection. This means that traditional accounting should be modified, as already mentioned, and adapted to the business philosophy of a modern company, by incorporating an ecological aspect in addition to an economic one. Developing a specific methodological base is necessary in order to determine the costs of environmental protection, and measure them on the investments made and the benefits obtained.

The discipline that records the flows and values that result from the interaction between economic and ecological systems is actually environmental accounting. It is based on the principles of continuous wealth growth for future generations and on the principle of sustainability.

Environmental accounting arose as a result of the need to constantly monitor the impact of changes in the ecological environment on economic, political and social circumstances (Zhou *et al.*, 2016). Natural resources include land, minerals, forests, water and oceans. The ecological system includes three systems: the land surface system, the water system and the atmospheric system.

Environmental accounting (or Green accounting) represents a segment of modern accounting, it implies a special way of collecting, systematizing, recording and reporting on investments made to preserve natural resources and the environment itself. Environmental accounting should provide an adequate information base as a basis for the analysis of costs and realized benefits, as well as an overview of future economic activities with an economic calculation.

Back in 1995, the Environmental Protection Agency, the so-called EPA (United States Environmental Protection Agency) published a document (USEPA, 1995) in which the basics of accounting are given with a focus on the environmental aspect of the company's business activities. It is considered to be an important management instrument with the aim of controlling investment costs, investing in clean technologies, achieving environmental performance and developing green production processes and performance. Environmental accounting can be organized at the national level, or at the company level. The result of increased responsibility towards the environment, not only from the perspective of the company but also of society as a whole, is carried out when there is a need to assess investments and environmental performance at the national, regional and company level. The aforementioned indicates the preservation of natural resources and the importance of sustainable development for current and future generations.

Figure 1: The structural elements of environmental accounting
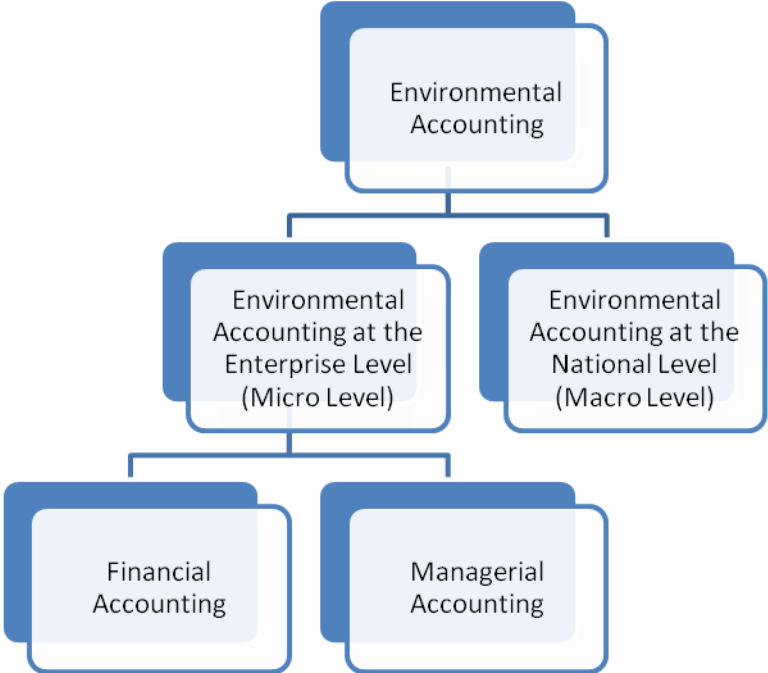
(Source: USEPA, 1995)

Disclosure of information on the movement and use of renewable and non-renewable natural resources at the country level is actually a macro-level accounting task. Users show an interest in global reporting for the most efficient management of the environment and national resources, which indicates an external orientation of the approach. The responsibility of environmental accounting at the microeconomic level is to report on the impact of business processes and company activities.

The development of financial and management accounting as structural segments of environmental accounting at the company (business system) level is conditioned by the increased demands of

external and internal interest groups related to environmental projects, in terms of the cost-benefit ratio.

Society increasingly expects from companies to take responsibility for a wider range of sustainability. It means the social and environmental aspect, which will affect the financial performance, ie. the result and the ability of the company to create value over time. An important indicator that companies should take into account in the process of making business and financial decisions are actually environmental requirements.

The adoption of proactive corporate strategies based on sustainable development by companies has a great impact on the development and implementation of environmental accounting. In 2006, PricewaterhouseCoopers conducted a study on large international corporations. The research showed that 79% of general managers believe that from of vital importance to sustainability, while 71% are willing to sacrifice short-term profitability for long-term shareholder gains (Aurelia-Aurora and Sorina-Geanina, 2012). Environmental accounting refers to the assessment and public reporting of financial, material, environmental costs, as well as public reporting on environmental responsibilities.

Financial accounting enables businesses to prepare financial statements from which information would be used by investors, creditors, customers and others. The basic purpose of management accounting is to provide data for making business decisions by management. The necessity of auditing non-financial statements is crucial, in order to assure stakeholders that the information of this type is correct.

In the initial phase, the environmental audit was legally focused on technical issues, and objectivity ie. legal compliance. Over time, the environmental audit changed and developed, and accordingly the auditor's role changed, and the crucial goal was shifted to management control.

As environmental accounting can provide useful information should separate internal from external environmental auditing (Letmathe and Doost, 2000). An extended hand to the management with the basic task of fulfilling the requirements of the company's management in the realization of the goals defined by the environmental protection and improvement policy is represented by the ecological internal audit. In modern conditions, a large number of companies have begun to educate, train and use internal financial auditors to perform environmental audits of companies as an extension of the annual regular operational audit. It ensures timely compliance with eco standards, policies, measures, regulations and stimulates management to incorporate an eco perspective in all processes and activities of the company and its environment.

Table 1: Advantages and disadvantages of internal and external environmental auditing

Internal environmental audit	External environmental audit
Advantages	Advantages
Increases the image and reputation of the company in the environment	Increases the image and reputation of the company in the environment
Contributes to more efficient execution of internal work processes and cost savings	Increases the credibility of information in published reports
Contributes to the reduction of insurance premiums for possible damages	Reduces the risk of non-compliance with eco regulations
Improves the operation of EMS	Reduces the risk of disputes due to wrong information about the environment
Contributes to better management results	Accelerates the making of business decisions by investors
It ensures a higher level of satisfaction and eco-communication with customers	It encourages the development of an internal environmental audit

Disadvantages	Disadvantages
High requirements for personnel and other resources	Published information in eco reports can lead to a negative reaction from the environment
Conflicting situations during the audit of individual business segments	High costs of the implementation and reporting process
Retroactive action of previously undetected negative impacts on the environment	Inconsistency of performance and reporting procedures

(Source: Porter et al., 2014.)

If there is cooperation between company management and environmental accounting, on the one hand, and internal and external environmental audits, on the other hand, it is possible to reduce and overcome the mentioned shortcomings of internal and external environmental audits. Improving environmental protection is a teamwork of environmental auditors, accountants and company management that can greatly contribute to improving environmental protection. In the process of managing environmental protection, company management should adhere to the concept of sustainable development, cleaner production and eco-efficiency, because in this way numerous advantages are achieved, such as reducing costs, reducing environmental risks, complying with regulations and improving public image. It is necessary to examine changes in environmental business, determine critical information, and take care of compliance with regulatory regulations.

6. AN OVERVIEW OF INFORMATION ON ENVIRONMENTAL PROTECTION AND OTHER IMPORTANT NON-FINANCIAL ISSUES IN THE ANNUAL REPORTS OF SELECTED COMPANIES IN THE REPUBLIC OF SERBIA

The research part of the work is an analysis of the annual reports of certain large companies operating in the Republic of Serbia, whose shares are listed on the Belgrade Stock Exchange, and which generally have more than 500 employees. Since the legal regulations in the Republic of Serbia require that from 2021 non-financial information be presented according to the current Accounting Law from 2019, 2022 was taken into consideration, as the year with the most recent information. The first reporting year is always an adjustment process, although some companies provided non-financial information in earlier annual reports. In tis paper 14 companies whose shares are listed on the Belgrade Stock Exchange and whose annual reports for 2022 were available on the Internet were considered.

NIS - Petroleum Industry of Serbia - The annual report of the Petroleum Industry of Serbia NIS is presented on 445 pages, and non-financial reporting is included on about 200 pages. In the sample taken, this is by far the highest quality annual report, and it also devotes the most attention and space to non-financial information.

A section on environmental protection, in addition to human resources, safety and health at work, and industrial safety is presented. In addition, social responsibility, as well as the fight against corruption and fraud, which is legally required as part of non-financial reports, is shown. Among other things, the green transition was presented as a new step towards green energy. The environmental protection strategy until 2030 was given, revised in 2022. It is also stated that environmental protection is one of the company's management priorities.

The company works on permanent improvement of the ecological elements of activities and processes. It invests in creating environmental awareness among employees. The company's goal is that the focus of investment projects should be direct or indirect impact on the environment. In 2022, 314.6 million dinars (about 2.7 million EUR) were invested for the implementation of ecological projects, and the plan is to continue this investment trend in order to reduce the negative impact on the environment (protection of air, water, soil and management waste).

The focus is also on energy efficiency (reducing consumption and losses of energy resources: electricity, steam, gas), and on renewable energy sources, CO_2 utilization. With these

environmental actions, the level of compliance with state legislation has been raised to a higher level, and thus the management of the company's environmental system, and it is commendable that a positive trend in the field of environmental protection can be seen.

Nikola Tesla Airport - In the annual report of Nikola Tesla Airport for the year 2022, which is shown on 195 pages, minor information about investments aimed at environmental protection is presented, without specific elements.

Philip Morris Operations Niš – The annual report of Philip Morris Operations a.d. Niš is presented on 166 pages, and it is commendable that the company has published a separate non-financial report for the year 2022 on 40 pages. The same policy was for the previous year, which was the first with added requirements on mandatory non-financial reporting. The concept of sustainable business, research and development, and innovation for the development of better products is presented. The focus is also on respect for human rights (health, safety and well-being of employees, recognition and retention of talents, training and development, respect for diversity and inclusion, employee benefits, collection of employee feedback, projects focused on caring for the local community, etc.), and preventing corruption. As part of the chapter on environmental protection, climate change, water management, decarbonization of operations, waste management and prevention of improper disposal of products after use are discussed.

Putevi Užice - The company Putevi Užice presented its annual report for 2022 on 134 pages. Non-financial information regarding research and development, as well as information on investments aimed at environmental protection, are presented very sparingly. The corporate governance code, a description of the company's expected development, and changes in the company's business policies based on non-financial information are briefly presented.

Impol Seval aluminum rolling mill Sevojno - The annual report of Impol Seval aluminum rolling mill for 2022 is presented on 209 pages. It is stated that the basic motives for the development of the progress plan (as early as 20 years ago) included ecological protection of the environment and humanization of work. In the section on human resources affairs, they mention, among other things, the personnel structure, the improvement of the Rulebook on the organization and systematization of jobs, the development and implementation of the Personnel Education Plan, taking into account the labor legal status of employees with health disorders, the development of the policy of attracting personnel, and the publication of an information sheet and newsletter (6 and 12 issues per year, respectively).
It is emphasized that safety and health at work should be taken care of, to innovate and follow Act on risk assessment in the workplace and the working environment, the Instructions for safe and healthy work, and training and supervision for their implementation and application. Testing of the working environment and periodic inspection of work equipment is carried out. Control and targeted medical examinations for employees are organized.
The non-financial report is presented as part of the annual business report, while reports on corporate management, personnel, and very briefly actions in the area of research and development are presented separately. The business model of the company is also presented in the non-financial report. Emphasis is placed on the commitment to create good working conditions for employees, as well as care for the safety and health of employees, encouraging motivation and commitment to work and establishing a fair relationship with co-workers. Socially responsible cooperation with the local community and contribution to a better quality of life are mentioned.
One chapter is dedicated to the environment, which includes the basic principles of environmental protection, and obligations regarding the prevention of pollution. The main guidelines are the environmental protection policy, quality system documents and adopted planning documents. The emphasis is on following legal regulations and undertaking measures and activities aimed at reducing emissions of waste gases into the air, preventing water pollution, controlled use of

hazardous materials, and improving energy efficiency. The program of dealing with the environment with new goals and risks is stated. In the category of key indicators of success, they emphasize taking into account the emission of substances into the air and water, the emission of carbon dioxide, the consumption of technological water, hazardous waste, energy efficiency, biodiversity, fire protection, etc.

The part about caring for employees includes personnel and social issues and respect for human rights. As part of the presentation of the age and gender structure of employees, the gender structure from the point of view of management and executive positions is also presented. Employee turnover, qualification and educational structure, the number of employees with disabilities and health problems, and the number of incidents and accidents at work are analyzed. The presentation of employee training and professional training is also included.

As part of non-financial information, attention is paid to belonging to the company, socially responsible cooperation with the local community, and the fight against corruption. The personnel structure is presented in detail, as well as the average gross salary by job category.

Transport company Lasta Belgrade - The company's annual report for 2022 includes 171 pages. In terms of non-financial information, the number of employees by professional qualification is shown. Briefly presented information on investments related to environmental protection (examination of pollutant emissions into the air from emitters of boiler houses, examination of the quality of discharged waste water, and delivery of hazardous and non-hazardous waste).

The investment plan aimed at protecting the environment for the year 2023 was presented. The presented plan, in addition to the actions mentioned in the previous paragraph, also incorporates the delivery of hazardous waste, procurement of various absorbers and filters, and the amount of additional investments. The management report briefly presents the diversity policy in the company's management bodies (emphasized presence of both sexes, and differences in the level of education and types of qualifications).

GOŠA FOM Smederevska Palanka - The company presented its annual report for 2022 on 114 pages. The business report contains a segment on quality management, investment in environmental protection and employee safety. The report points out that the introduction of an integrated management system is expected to contribute to the company's work improvement in order to improve the quality of products, a higher level of care for the health and safety of employees, and environmental protection.

It is emphasized that the company has certificates and applies standards. Indirect costs related to environmental protection are listed: fees for managing special waste streams, fees for the protection and improvement of the environment according to the decisions of the local tax administration, for the transport of discarded computer equipment to the recycling center, costs for air quality testing that are releases into the atmosphere, costs of storage and destruction of hazardous waste.

Podunavlje Bačka Palanka - This company presented its annual report for the year 2022 on 109 pages. A business report with an integrated corporate governance report and a non-financial report are presented. The company's expected development, changes in business policies, and the company's exposure to the main risks and threats are briefly presented. The non-financial report includes the company's vision, mission and strategy, environmental protection activities, social and personnel issues, respect for human rights, but all the mentioned elements are presented very modestly.

TRAYAL corporation Kruševac - Annual report for 2022 includes 163 pages. The tabulated qualification structure of employees and information on investments in environmental protection are part of the notes to the financial statements. The annual report includes research and development activities.

It is stated that during the reporting year, the company invested 16.5 million dinars (about EUR 140,000) in energy efficiency, for protection against major chemical accidents, protection against ionizing radiation, prevention of pollution during the production process in the area of waste management, compliance and acquisition processes approvals from the Ministry of Environmental Protection for environmental impact assessment studies, sampling - analysis of hazardous substances (waste), waste disposal services, industrial wastewater testing services, use of the city's wastewater treatment plant, wastewater treatment plant efficiency testing services, air emissions measurement services and employee education on environmental protection.

In the non-financial report, care for employees (jubilee awards, preventive systematic medical examinations, mitigation of uneven gender representation), activities related to care for environmental protection and improvement of cooperation with the local community are highlighted. The established and certified Integrated Management System (IMS), compliance with legal regulations and application of ISO standards were emphasized.

The company emphasizes that it pays attention to the control and measures to reduce: air, soil and water pollution, waste and prevention measures, use of dangerous chemicals, danger to animal and plant life, negative impacts on natural assets of special value, danger of fire, accidents or explosions.

Tigar Pirot - The company presented its 120 page annual report for 2022. The company's business report includes a section on sustainable development where only general information on environmental protection, social responsibility, employees, employee safety and health, integrated management system, corporate governance and information technologies is presented.

Simpo Vranje - The company's annual report for 2022 is displayed on 197 pages. The report includes an overview of certificates and awards, age, gender and qualification structure of employees, information on investment in environmental protection. It is stated that the company is committed to sustainable development and employee care (health protection and safety at work). Also, a series of laws and by-laws that are respected for the purpose of protecting the environment and protecting health and safety at work (Law on Safety and Health at Work, Law on Environmental Protection, Law on Air Protection, Law on Waste Management, Law on Packaging and Packaging Waste, the Law on Environmental Noise Protection, the Law on Chemicals, the Law on Water, the Law on Fire Protection, and the Law on Explosive Substances, Flammable Liquids and Gases).

The report points out that the processes of environmental protection and employee health and safety protection are fully compliant with the legal regulations, which is confirmed by reports from external checks in front of the republican inspectors of the competent ministries. Employee satisfaction is incorporated into the plan of future actions. A brief description of the business model with the organizational structure is presented as part of the non-financial reporting, in which care for employees and care for the preservation of the environment in accordance with standards are highlighted.

BAS Belgrade - The annual report includes 99 pages. The annual business report contains information that the company did not invest in environmental protection in the 2022 reporting year, nor did it develop research and development. The modest part dedicated to non-financial reporting includes a statement that the company is aware, as it falls into the category of over 500 employees, that it should present non-financial information, but which has not been done.

It is stated that the business model has not been defined, but it is emphasized that the business is harmonized according to legal norms. It was also pointed that the business is fully compliant with all legal norms regarding environmental protection. It was emphasized that the company harmonized its own internal acts in accordance with the Labor Law and other relevant regulations in the field of personnel and social policy. It is pointed that there is no discrimination during

employment in terms of gender, age, religion or nationality. It is also stated that the issue of the fight against corruption is not defined by internal acts, nor has a model been adopted.

Jugoprevoz Kruševac – The annual report for 2022 is shown on 98 pages. In the report, questions about employees are condensed (structure, costs, personnel optimization, employee training). In the section for the protection of the environment, safety and health of employees, it is emphasized that the activities of waste management, pollutant emission measurement, fire protection, and that waste water sampling and noise measurement in the environment are carried out. The section on social responsibility includes a socially responsible concept of business, improvement of environmental awareness, care for the community (helping vulnerable groups), assistance in education and participation in the local community through financial support of sports activities.

PPT Armature Aleksandrovac – The annual report for 2022 includes 91 pages. Only one section is dedicated to environmental protection, where it is basically stated that the company's work complies with the requirements of the SRPS ISO 14001:2015 standard. In a separate section, there is a minimal text dedicated to research and development.

A small research contribution on the image of important companies for the Republic of Serbia leads to the conclusion that non-financial reporting has not been developed and that it does not meet the legal regulations. Although only the second reporting year is available (which is being analyzed in the work), it is clear that companies did not pay enough attention, globally, to show the legally required non-financial information about environmental protection, employee care, and anti-corruption policy. The sample is small, but in the Republic of Serbia, according to this criterion, there are not a large number of companies, and the limiting factor was the unavailability of the requested information on the Internet. The website of the Belgrade Stock Exchange includes annual reports in the news section, but they are often not found on company websites, which is also a complaint.

It is concluded that there are extremes in this type of non-financial reporting, from a detailed and high-quality presentation on 200 pages (which also meets the strict GRI standards that were not taken into account in this review) to almost one sentence, or with an honest acknowledgment that they are not presented in the annual report non-financial information, although there is a legal requirement for it. Despite the fact that the legal provision covered only the second reporting year, examples of good practice could be motivators for companies that did not pay attention to non-financial information, so that the extremes would not be obvious, since everyone should respect the laws equally.

7. CONCLUSION
Great importance when making business decisions related to the company's operations have financial and non-financial information, i.e. financial and non-financial reports. In recent years, environmental protection and information about it has become increasingly important. Companies, some more and some less, use different types of investment in environmental protection, which brings short-term and very often long-term benefits. The aforementioned manifests itself in companies through a reduction in costs and an increase in profits.

Since the legal obligation of non-financial reporting has started to be applied for reports for the year 2021 in the Republic of Serbia, future research can deal with analyzes to what extent it is respected, i.e. respects environmental protection reporting. With the implementation of the obligation of non-financial reporting on environmental protection, significant growth in environmental protection is expected, as well as increased transparency.

At the end of the paper, a study of the annual reports of important large companies in the Republic of Serbia was carried out, which concluded that the participation of non-financial information, globally, is not at a satisfactory level, and there is enough space for prompt improvement in order to

comply with legal regulations, but also to improve awareness of the importance information of this type that especially relates to the care of personnel and environmental protection.

REFERENCES

An Introduction to Environmental Accounting as a Business Management Tool, Key Concepts and Terms, United States, Environmental Protection Agency, 1995, p.5. available at: https://www.epa.gov/sites/default/files/2014-01/documents/busmgt.pdf

Audit Law (Official Gazette of RS No. 73/2019) available at: https://www.paragraf.rs/propisi/zakon_o_reviziji.html

Aurelia-Aurora, D. and Sorina-Geanina, M.S. (2012), "Perspectives of Environmental Accounting in Romania", *Procedia - Social and Behavioral Sciences*, 62, 610-614.

Berber, N., Slavić, A. and Aleksić, M. (2018), "Measuring Corporate Social Responsibility: The GRI Approach", *49th International Scientific Conference Quantitative and Qualitative Analysis in Economics*, Faculty of Economics, University of Niš, pp. 145-154, available at: https://isc2018.ekonomskifakultetrs/ISCpdfs/ISC2018-15.pdf.

Carnegie, G., Parker, L. and Tsahuridu, E. (2021), "Redefining Accounting for Tomorrow, available" available at: https://www.ifac.org/knowledge-gateway/preparing-future-ready-professionals/discussion/redefining-accounting-tomorrow

Damnjanović, S. (2021), "Korak po korak do nefinansijskog izveštavaja" in Mišković, M. (Ed.), *Forum za odgovorno poslovanje Smart kolektiv*, avaliable at: https://smartkolektiv.org/wp-content/uploads/2021/12/Prirucnik_Korak-po-korak-do-nefinansijskog-izvestaja.pdf

EPA "An Introduction to Environmental Accounting As A Business Management Tool: Environmental As A Business Management Tool: Key Concepts And Terms", United States Environmental Protection Agency, Office of Pollution Prevention And Toxics (MC 7409), Washington, D.C. 20460, EPA 742-R-95-001, June 1995, available at: https://www.epa.gov/sites/default/files/2014-01/documents/busmgt.pdf (accessed 10 July 2023)

European Union (2014) Directive 2014/95/EU of the European Parliament and of the Council of 22. October 2014. Amending Directive 2013/34/EU as Regards Disclosure of Non-financial and Diversity Information by Certain Large Undertakings and Groups. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014Loo95&from=EN). (accessed 10 July 2023)

Gallhofer, S. and Haslam, J. (1997), "The direction of green accounting policy: critical reflections". *Accounting, Auditing and Accountability Journal*, Emerald Group Publishing Limited 10(2), pp. 148-174. (doi: 10.1108/09513579710166703)

Global Reporting Initiative (2022), "The Global Standards for Sustainability Reporting". Available at: https://www.globalreporting.org/standards.

Janjić, V. and Jovanović, D. (2015), "Uloga računovodstva u implementaciji sistema za upravljanjem zaštite životne sredine", in Jakšić, M., Stojanović-Aleksić, V. and Mimović, P. (Ed.), *Ekonomsko-socijalni aspekti priključivanja Republike Srbije Evropskoj uniji*, Kragujevac: Ekonomski fakultet Univerziteta u Kragujevcu, pp. 392-402.

Jovanović, D. and Ljubisavljević, S. (2017), "Ekološko računovodstvo i revizija kao alati upravljanja zaštitom životne sredine", in *Uticaj globalizacije na poslovno upravljanje i ekonomski razvoj Šumadije i Pomoravlja*, Kragujevac, Ekonomski fakultet Univerziteta u Kragujevcu, 521-530.

Law on Accounting (Official Gazette of RS No. 73/2019, 44/2021), available at: https://www.paragraf.rs/propisi/zakon-o-racunovodstvu-2020.html (accessed 10 July 2023).

Letmathe, P. and Doost, R. K. (2000), "Environmental Cost Accounting and Auditing". *Managerial Auditing Journal*, 15 (8), pp. 424-431.

Marinković, G. (2021), "Izveštavanje o zaštiti životne sredine u savremenom poslovnom ambijentu (praksa u Srbiji)", *Ecologica*, 28 (102), pp. 173-179, available at: https://doi.org./10.18485/ecologica.2021.28.102.5.

Mizdraković, V., Džamić, V. and Mizdraković, M. (2016), "Ekološki aspekti otvaranja stečajnog postupka", *Ecologica*, 23 (81), pp. 68-72.

Park, M. S., Bleischwitz, R., Han, K. J., Jang, E. and Joo, J. H. (2017), "Ecco-innovation Indices as Tools for Measuring Ecco-innovation". *Sustainability*, 9 (12), 2206, available at: https://doi.org/10.3390/su9122206

Porter, B., Simon, J. and Hatherly, D., (2014), *Principles of External Auditing* (4th ed.) UK: John Wiley & Sons Ltd.

Radukić, S. and Stevanović, T., (2011), "Ekološki zahtevi i njihov računovodstveni tretman", *Ekonomske teme*, 49 (1), pp. 111-121.

Rondinelli D., Vastag, G. (2000), "Panacea, Cammon, Sense or Just a Label? The Value of ISO 14001 Environmental Management Systems", *Environmental Management Journal*, 18 (5), pp. 499-510.

Schaltegger, S. and Burritt, R. (2000), *Contemporary Environmental Accounting – Issues, Concepts and Practice*, Shefield: Greenleaf Publishing Limited, p. 49, available at: https://doi.org/10.4324/9781351282529

Shen, T.T. (1995), "Industrial Pollutions Preventions", *Environmental Engineering*, Berlin, Springer-Verlag, pp. 15–35.

Sinkin, C., Wright, C.J. and Burnett, R.D., (2008), "Eco-eficiency and Firm Value", *Journal of Accounting and Public Policy*, 27, pp. 167-176.

Stevanović, S. (2018), "Izveštavanje o zagađenju životne sredine: praksa velikih zagađivača i preduzeća u Novom Sadu, pravni i ekonomski aspekti primene principa i zagađivač plaća", *Institut ekonomskih nauka*, Beograd, pp. 51-75.

Stevanović, S., Jovanović, O. and Hanić, A. (2019), "Environmental and Financial Performance: Review of Selected Studies". *Economic Analysis*, 52 (2), pp. 113-127, https://doi.org/10.28934/ea.19.52.2.pp113-127.

Vićentijević, K. (2021), "Izazovi računovodstva u savremenom digitalnom okruženju", *Revizor*, XXIV, 93, pp. 27-36, doi:10.5937/rev2193027V

Yakhou, M. and Dorweiler, V. P. (2004), "Environmental Accounting: An Essential Component of Business Strategy", *Business Strategy and the Environment*, 13, pp. 65-77.

Zhou, Z., Jing, O., Li, S. (2016), "Ecological Accounting: A Research Review and Conceptual Framework", *Journal of Accounting Protection*, Vol. 7, No. 5, doi: 10.4236/jep.2016.75058.

Websites of annual reports of companies:

https://www.antb.rs/images/documents/godisnji_izvestaj_za_2022_godinu_759141584655697.pdf (accessed 15 June 2023)

https://www.belex.rs/data/2023/05/00132064.pdf (accessed 15 June 2023)

https://www.belex.rs/data/2023/05/00132418.pdf (accessed 17 June 2023)

https://www.din.co.rs/wp-content/uploads/2023/04/PMOP-Izvestaj-o-nefinansijskom-poslovanju-za-2022.pdf (accessed 17 June 2023)

https://www.impol.rs (accessed 18 June 2023)

https://www.belex.rs/data/2023/05/00132334.pdf (accessed 20 June 2023)

https://www.belex.rs/data/2023/05/00132154.pdf (accessed 15 June 2023)

https://www.belex.rs/data/2023/05/00132448.pdf (accessed 18 June 2023)

https://xn--80abmi8b.xn--90a3ac/data/2023/04/00131928.pdf (accesed 2 July 2023)

https://www.tigar.com/files/godisnji_izvestaj_za_2022.godinu.pdf (accessed 18 June 2023)

https://www.tigar.com/files/godisnji_konsolidovani_izvestaj_za_2022.godinu.pdf (accessed 2 July 2023)

https://www.belex.rs/data/2023/05/00132252.pdf (accessed 20 June 2023)

https://www.belex.rs/data/2023/05/00132258.pdf (accessed 25 June 2023)

http://www.bas.rs/wp-content/uploads/2023/05/2-Prilog-Finansijski-izvestaj-2022.-godina.pdf (accessed 25 June 2023)

https://www.belex.rs/data/2023/05/00132064.pdf (accessed 20 June 2023)

https://www.belex.rs/data/2023/05/00132030.pdf (accessed 25 June 2023)

https://www.tigar.com/files/godisnji_izvestaj_za_2022.godinu.pdf (accesse 23 June 2023)

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EVALUATING THE PERFORMANCE OF CHATGPT IN ACCOUNTING AND AUDITING EXAMS: AN EXPERIMENTAL STUDY IN NORTH MACEDONIA

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ABSTRACT

In the ever-evolving landscape of education, the integration of artificial intelligence (AI) has emerged as a transformative force, reshaping conventional pedagogical methods and assessment approaches. The domains of accounting and auditing, integral for preparing future professionals, have not remained immune to this technological revolution. As AI, including ChatGPT, gains prominence, it offers the potential to enhance learning and examination experiences within these disciplines.

This paper presents a pioneering North Macedonian experimental research evaluating the performance of ChatGPT's effectiveness in exam performance in accounting and auditing. Leveraging 11 subject exams comprising a total of 401 questions, this research assesses ChatGPT's proficiency in addressing intricate, context-specific questions within these domains.

ChatGPT 3.5 demonstrated its reliability as a "student" by successfully passing 8 out of the 11 subjects, achieving a pass rate of 73%. The findings reveal that ChatGPT 3.5 excels in responding to qualitative open-ended questions, true/false assessments, and multiple-choice questions with a single correct answer, effectively streamlining routine tasks and offering comprehensive explanations. However, it faces challenges when dealing with quantitative calculations and complex multiple-choice questions with multiple correct answers.

This study contributes to the ongoing discourse on AI's role in education, sparking discussions about student access to AI tools, the balance between memorization and referencing, the potential for AI to enhance learning experiences, and the unique contributions of educators that surpass AI capabilities. As AI continues to disrupt traditional practices across professions, including education, its responsible integration promises to enhance the educational process and deliver substantial value. ChatGPT, as a versatile AI language model, stands as a powerful tool in this

endeavor, offering educators and students the potential to enrich their learning journeys while recognizing the need for judicious application within its defined constraints.

1. INTRODUCTION
In the rapidly evolving field of education, the incorporation of artificial intelligence (AI) has become a transformative force, redefining traditional teaching methods and evaluation strategies. Education in accounting and auditing, crucial for preparing future professionals, has not remained untouched by this AI technological surge. The accounting profession often perceived as a domain of numbers and financial data, has undergoing a profound transformation and expansion of the domain in analysis, interpretation, and providing support for informed decision-making. AI is emerging as a disruptive technology that is reshaping the way accountants work, manage and analyze data, and provide insights.

The incorporation of AI-driven tools, such as ChatGPT (Generative Pre-trained Transformer), offers a potential for enhancing the learning and examination experience in these disciplines.

ChatGPT is a large language-learning model that employs machine learning to produce human-like text in natural language (Susnjak 2022). It represents a "General Purpose Technology", as typically defined in broader economic or technological contexts (Wood et al., 2023).

When asked "What are you and how are you designed", the answer was as follows:

"*I am ChatGPT, a computer program developed by OpenAI. I'm designed to understand and generate human-like text based on the input provided to me. My purpose is to assist with answering questions, providing information, generating text, and engaging in text-based conversations on a wide range of topics.". He also emphasizes that he is a machine learning model and not a sentient being: "My responses are generated based on patterns in the data I was trained on, and I don't possess consciousness, emotions, or personal experiences*".

About the way Chat GPT works indicates that it is trained in two stages, namely: (1) Pre-training phase: "*I learn from a vast amount of internet text data, focusing on predicting the next word in a sentence to grasp language patterns, grammar, facts, and common sense*", and (2) Fine-tuning, which is after the pre-training phase: "*I'm refined for specific uses. I'm trained on a curated dataset with human reviewers following guidelines. This customizes my behavior, aligns it with specific applications, and ensures safety and appropriateness*".

Large language models (LLMs) are a category of language models known for their exceptional performance in various natural language processing (NLP) tasks (DAIR.AI, 2023). They have gained significant attention in research due to their capacity to produce human-like language and their potential to bring about transformative advancements in science and technology.

Brownlee (2023) emphasized that AI chatbots, like ChatGPT, mark a significant departure from "traditional" search engines (e.g. Google), as they have the capacity to read a lot of pages and generate answers from reliable web content, a development poised to bring increased sophistication to the accounting profession, underscoring the importance of understanding how to effectively harness this technology.

Based on initial evaluations by both users and experts, ACPM (2023) observes that ChatGPT has the potential to assist accountants by automating various tasks in the future. These tasks encompass

tasks like formulating Excel, Power BI, Tableau, and similar formulas, transactional accounting, low-level computer programming, as well as the interpretation of specific accounting standards and valuation. Nonetheless, it's essential to note that any accounting data generated by Chat GPT should be subject to expert verification (ACPM, 2023).

This paper presents qualitative and experimental research on the performance of the ChatGPT chatbot "in the exam room". The research aims to perceive the performance in ChatGPT responses by conducting 11 subject exams i.e. 401 variously structured questions in total. These subjects are integral to the accredited Accounting and Auditing curriculum at the undergraduate level of the Faculty of Economics-Skopje, part of the Ss. "Cyril and Methodius" University in Skopje. ChatGPT's training encompasses a broad range of topics, and while it does contain information related to accounting and auditing, its performance in these specific fields can be suboptimal. This is because faculty professors and textbook authors usually design questions that require nuanced understanding from students, a level of understanding that AI algorithms may struggle to grasp. Consequently, this paper seeks to provide empirical evidence regarding ChatGPT's proficiency in tackling challenging and context-specific questions within the domains of accounting and auditing.

The paper is structured into five conceptual parts. In the introductory section, we provide a concise overview to enhance comprehension of ChatGPT chatbot 3.5 - an exceptionally fast-growing and extensively applied AI technology platform. In the literature review section, we endeavor to summarize the most pertinent and up-to-date findings concerning ChatGPT, with a particular focus on its role in education, specifically within the realm of accounting and auditing. Then, the methodology of the experimental research is presented, followed by the results and a discussion of the findings. We also candidly address any limitations encountered during the study and offer recommendations for future research endeavors. In the last section, we present a comprehensive summary of all the conclusions derived from the conducted research.

To our knowledge, this study represents a pioneering effort in North Macedonian higher education by evaluating ChatGPT's effectiveness in enhancing exam performance. Our findings have the potential to revolutionize how students approach and excel in these challenging subjects, making a significant contribution to the ongoing discussion about AI's role in education. Such experimental research should raise debates about the use of AI tools in higher education and develop a larger level discussion on the following questions, raised by Wood et al., (2023): In what ways should students be granted access to AI? Which material should be memorized versus referenced? Can engaging with AI improve students' learning experiences, and if so, how? What unique contributions do professors and accountants offer that go beyond the capabilities of AI?

Scholars are progressively embracing AI as a disruptive technology and analyzing its implications across various professions, including education. Consequently, it's merely a matter of when and how this technology will be harnessed, with a keen consideration of its pertinence and adaptability to enhance the educational process and deliver added value.

2. LITERATURE REVIEW

AI academic research has a diverse and extensive historical background, spanning various fields, which include education, and also accounting and auditing as professions/fields.

Beerbaum (2023) explores the transformative potential of generative AI technology in the field of accounting, particularly in automating tasks and data generation. A notable application of generative AI within accounting lies in enhancing financial statement analysis. By training on extensive financial datasets, generative AI algorithms acquire the ability to discern patterns and correlations among diverse financial metrics (Beerbaum, 2023). This proficiency empowers

accountants and financial analysts to detect anomalies, trends, and potential risks, thereby facilitating more informed and strategic decision-making processes.

Frey and Osborne (2017) assess the vulnerability of job roles to automation, highlighting a significant likelihood of AI taking over accounting positions. In this context, Wood et al. (2023) suggest that the AI chatbots' accuracy in responding to accounting assessment questions may have implications for how AI's capacity to substitute accountants in practical applications is perceived.

Due to the extensive incorporation of contemporary information technologies (IT) in the accounting, including big data, data analytics, AI, blockchain, cloud computing, and others, there has been a shift in market demands for accounting proficiency.

Numerous authors, including Huq, (2014), Faggella, (2020), Han et al., (2023), Yan et al., (2022), Al Ghatrifi et al., (2023), examine and engage in discussions regarding the utilization of these aforementioned disruptive technologies. They assert that AI, whether employed as a distinct tool or integrated technology, holds the potential to substantially enhance accounting procedures and the audit process. These authors underscore, either explicitly or implicitly, the substantial influence of AI on the accounting field and promote the importance of adapting educational systems to equip new generations in addressing this challenge.

Accounting education must evolve in tandem with these changing expectations, emphasizing the need for integrating IT advancements into curricula (Yan et al., 2022). The inclusion of the latest technologies within accounting programs becomes imperative to equip students with the required skills for a constantly evolving field of accounting (Al Ghatrifi et al., 2023).

ChatGPT, as AI tool, has not only garnered significant public attention since its launch in November 2022 but has also piqued academic interest (George & George, 2023, Mathew, 2023). The research findings of Elbanna & Armstrong (2023) suggest that ChatGPT can be efficiently incorporated into education to automate repetitive tasks, improve the overall student learning experience, and consequently enhance productivity and efficiency while promoting adaptive learning. Nevertheless, it is crucial to acknowledge and be mindful of ChatGPT's limitations, even with updates. These limitations encompass factual inaccuracies, the potential for promoting biases, limitations in comprehensive understanding, and concerns related to safety (Elbanna & Armstrong, 2023).

In the realm of education, there exist remarkable prospects as well as formidable obstacles, ushering in a swift transformation from conventional teaching approaches to intelligent ones (Tan, 2023). Tan (2023) in his research quotes Adam Stevens who cautioned against prioritizing scores over knowledge in the education system, emphasizing that while ChatGPT offers tremendous potential as an auxiliary tool, it can also pose threats. Standardizing its use to avoid student over-dependence, improving security, accuracy, and reliability, and exploring broader educational applications are key steps for ChatGPT's development, leading to more comprehensive evaluation and oversight measures as all aspects progress (Tan, 2023, Elbanna & Armstrong, 2023). It is noteworthy that, despite various controversies and ethical considerations, ChatGPT has garnered significant interest from academia, research, and industries within a remarkably brief timeframe (Ray, 2023). In a survey carried out by Constantz (2023), approximately 30% of the participants reported attempting to utilize ChatGPT in their workplace.

Wood et al. (2023) present valuable insights into ChatGPT's performance in accounting education, utilizing a vast dataset contributed by a diverse team of 327 coauthors from 186 educational institutions worldwide. Their study encompassed an impressive 25,817 questions drawn from 869 distinct class assessments, along with an additional 2,268 questions sourced from textbook test

banks, spanning topics like accounting information systems, auditing, financial accounting, management accounting, and tax.

The research conducted by Wood et al. (2023) yielded the following findings:

- ChatGPT's performance varies depending on the subject area being assessed. Notably, it exhibited comparatively stronger performance in assessments related to accounting information systems (AIS) and auditing when compared to assessments related to tax, financial accounting, and management accounting.
- ChatGPT displayed higher accuracy rates in answering true/false and multiple-choice questions, achieving rates of 68.7 percent and 59.5 percent, respectively.
- Conversely, ChatGPT encountered challenges when dealing with practice questions and providing short answers, achieving lower accuracy rates of 28.7 percent and 39.1 percent, respectively.

Eulerich et al. (2023) conducted an investigation into the potential of newly released ChatGPT models and their capabilities to successfully pass major accounting certification exams, including the CPA, CMA, CIA, and EA certification exams. Their findings indicate that the initial release of ChatGPT 3.5 was unable to achieve a passing score on any of these exams, with an average score of 53.1 percent across all assessments. However, through additional refinements and enhancements, including the transition to the ChatGPT 4 model, 10-shot training, and permitting the model to use reasoning and external resources, ChatGPT demonstrated significant improvement, achieving an average score of 85.1 percent across all exam sections and successfully passing all exams (Eulerich et al., 2023).

Bommarito et al. (2023) conducted a thorough assessment of professional knowledge worker readiness using the Uniform CPA Examination from AICPA as a benchmark. They used OpenAI's text-davinci-003 model and earlier GPT versions to evaluate a sample REG exam section and 200+ multiple-choice questions covering various domains. Here are the main findings:

- Text-davinci-003 had a 14.4% accuracy rate in the sample REG exam section, indicating limitations in quantitative reasoning with zero-shot prompts.
- Text-davinci-003 showed promising performance, approaching human-level abilities, particularly in Remembering & Understanding and Application skills. With optimal prompts and settings, it answered 57.6% of questions correctly, surpassing random guessing, and its top two responses were accurate 82.1% of the time, demonstrating strong non-entailment reasoning.
- Recent iterations of GPT-3, including text-davinci-003, significantly improved performance, with the correct answer rate increasing from 30% for text-davinci-001 to 57% for text-davinci-003.

These findings highlight the potential of large language models to enhance the quality and efficiency of future knowledge work, suggesting that when optimized appropriately, these models can match or even surpass human-level performance in specific professional fields.

Nunes et al. (2023) anticipate significant impacts of LMs on education, potentially leading to AI-powered tools for psychometric exam analysis. In this regard, Kolade et al. (2023) suggest several propositions:

i. Chatbots can provide instant formative text feedback to learners.
ii. Automated essay scoring systems can assess summative assessments, saving staff time.
iii. Computerized adaptive feedback (CAF) with AI can offer personalized assistance, enhancing engagement and study habits.
iv. AI-driven computerized adaptive testing can adapt to learners' competence and personalized learning for summative assessment.

v.   Computer serious games provide unlimited formative feedback in real-life contexts.

In the study conducted by Newton & Xiromeriti (2023), it was observed that older and free versions of ChatGPT, based on GPT3 and GPT3.5, displayed rather modest performance levels. These earlier iterations struggled to pass most exams and consistently underperformed when compared to the average student. In stark contrast, ChatGPT4 (currently paid chatbot product ChatGPT Plus) exhibited a remarkable improvement in performance, surpassing its predecessors by a significant margin of 25 percentage points (Newton & Xiromeriti, 2023). This notable enhancement allowed ChatGPT4 to successfully pass the majority of the exams assessed.

These findings hold profound implications for the validity of current Multiple-Choice Question (MCQ)-based assessments within Higher Education. They challenge the efficacy of unproctored online exams as a reliable summative assessment method (Newton & Xiromeriti, 2023). Therefore, it is imperative to reconsider the appropriateness of such assessment methods in light of these new insights.

3. RESEARCH METHODOLOGY

The experimental research encompassed 11 compulsory subjects within the Bachelor's degree program in the Accounting and Auditing department at the Faculty of Economics – Skopje, Ss. Cyril and Methodius University in Skopje (https://eccf.ukim.edu.mk/en/studies/first-cycle-studies/accounting-and-auditing-programme/accounting-and-auditing-first-cycle-study-program-2022-23/). It is noteworthy that this program holds accreditation from the Association of Chartered Certified Accountants (ACCA), highlighting its relevance and importance in the accounting field. Notably, students in this program receive recognition for seven out of a total of nine ACCA courses during their academic journey, underscoring the program's significance.

ChatGPT was tested on the following subjects (see Table 1):

Table 1: Accounting and Auditing Exams – Sample Research

1) Principles of Accounting	7) Governmental Accounting and accounting of non-profit organizations
2) Financial Accounting	8) Financial statements analysis
3) Corporate Financial Reporting	9) International accounting
4) Management Accounting 1	10) Auditing
5) Management Accounting 2	11) Internal auditing
6) Accounting Information Systems	

(Source: Author's text)

The experimental design entailed assessing each of the 11 subjects by employing ChatGPT 3.5 (free version), functioning akin to a student, to answer exam questions. The questions' structures vary, mirroring the diverse assessment methods employed in the program. These assessment methods include i) true/false questions, ii) multiple-choice questions (encompassing various correct answer options), iii) open-ended short questions, and iv) essay questions (case studies). The scoring process for these questions aligns with the manual evaluation criteria applied in standard student assessments. Partial scoring was implemented for open-ended short questions and essay questions (including case studies). In these cases, points were granted for partially solved tasks or partially answered questions. Conversely, for true/false questions and MCQs, points were exclusively awarded for completely correct answers, with no points given for incorrect responses.

Data collection primarily revolves around the design and administration of exams across the 11 subjects. The methodology applied in the research is consistent with the experiments conducted by Wood et al., (2023), Eulerich et al. (2023) and Bommarito et al. (2023).

This experiment involves a qualitative assessment of ChatGPT 3.5's readiness to tackle exams in the domain of accounting and auditing. It delves into an analysis of ChatGPT's capacity to respond to various question categories, shedding light on both its strengths and limitations as an AI tool. Additionally, the paper explores the potential and opportunities presented by ChatGPT and other AI tools/LLMs in enhancing education through interactive learning.

4. RESULTS AND DISCUSSION

ChatGPT 3.5, functioning as a freely accessible AI tool, demonstrated a commendable level of performance when taking on the role of a student in accounting and auditing subjects. Table 2 provides a summary of its responses to all exam questions. Our evaluation considered two key aspects: the number of correct answers provided and the points earned, aiming to gauge the depth and precision of its responses.

Table 2: Overall evaluation of ChatGPT 3.5 Performance in Accounting and Auditing Exams

Questions types:	No. of questions	ChatGPT overall response rate (correct answers)	ChatGPT overall response rate (grade points)
True/False questions - (T/F)	80	65%	65%
Multiple choice questions (MCQ) with 1 correct answer	114	72%	60%
Multiple choice questions (MCQ) with multiple correct answer (1-5)	120	48%	48%
Open-ended short questions - (SQ)	60	78%	78%
Essay questions (case studies) - (EQ)	27	7%*	55%
Total	*401*	*60%*	*57%*

*Fully correct answer

(Source: Author's calculation)

Notably, ChatGPT performed most proficiently in open-ended short questions while facing more challenges in multiple-choice questions (MCQ) with multiple correct answers (1-5). It is worth highlighting that ChatGPT provided fully correct responses to only 2 out of 27 essay questions (case studies), yet it addressed all questions partially correctly, offering detailed explanations and establishing logical connections. If partial scoring were not applied to essay questions (case studies), it would result in the lowest scores for this type of question.

Regarding MCQ questions with a single correct answer, ChatGPT's performance was more favorable compared to those with multiple correct answers. As partial scoring was not applied to the latter, no points were awarded when ChatGPT answered these questions partially correctly.

In sum, based on the compiled results, it can be concluded that ChatGPT provided correct responses to 60% of the questions, equivalent to 241 out of a total of 401 questions. However, when considering the weight and scoring of the questions, it earned 57%, equating to 570 out of a possible 1000 grading points.

Table 3 provides a comprehensive breakdown of information for each subject individually. The overall pass rate for the analyzed subjects stands at 73% (8 out of 11 subjects), with a passing grade defined as achieving a minimum score of 50%.

Table 3: Detailed evaluation of ChatGPT 3.5 Performance in Accounting and Auditing Exams

	T/F		MCQ (1)		MCQ (1-5)		SQ		EQ (CS)		Total score	
	Q	R %	Q	R %	Q	R %	Q	R %	Q	R %	R%	G
Principles of Accounting	10	60%	20	80%	/	/	/	/	2	92%	81,5%	9 (B)
Financial Accounting	/	/	12	67%	/	/	/	/	5	62%	64%	7 (D)
Corporate Financial Reporting	/	/	12	58%	/	/	/	/	3	46%	52%	6 (E)
Management Accounting 1	10	60%	20	86%	/	/	/	/	5	35%	63%	7 (D)
Management Accounting 2	10	50%	20	56%	/	/	/	/	5	35%	46%	5 (F)
Accounting Information Systems	10	70%	/	/	30	47%	/	/	/	/	52,5%	6 (E)
Governmental Accounting and accounting of non-profit organizations	10	50%	/	/	30	40%	/	/	/	/	42,5%	5 (F)
Financial statements analysis	10	80%	/	/	30	67%	/	/	/	/	70%	7 (D)
International accounting	10	60%	/	/	30	37%	/	/	/	/	42,5%	5 (F)
Auditing	5	100%	15	80%	/	/	30	77%	4	63%	74%	8 (C)
Internal auditing	5	80%	15	73%	/	/	30	80%	3	64%	72%	8 (C)

"Q" refers to number of questions
"R %" refers to the response rate based on grade points (achieved points / max. total points)
"G" refers to grade (according to the official grading system for European Educational Institutions – ECTS grading scale)

(Source: Author's calculation)

ChatGPT exhibited its highest performance in the subject of Principles of Accounting, followed closely by Auditing and Internal Auditing. However, it failed to attain a satisfactory passing score, falling below 50%, in subjects such as Management Accounting II, Governmental Accounting and Accounting of Non-Profit Organizations, and International Accounting.

Drawing preliminary conclusions from our research and in-depth analysis, several key observations emerge:

- ChatGPT, functioning as a language model, excels in providing well-structured responses to both short and extensive qualitative questions, but exhibits comparatively weaker performance when dealing with quantitative calculations.
- ChatGPT demonstrates remarkable proficiency in handling true/false questions and MCQs with a single correct answer.

- It performs better in multiple-choice questions (MCQs) with a single correct answer, as opposed to MCQs with multiple correct answers.

An intriguing observation is that ChatGPT's performance aligns with or mirrors student performance in some subjects, while showcasing starkly contrasting outcomes in others.

This study marks a pioneering endeavor in the realm of higher education in North Macedonia, representing the first of its kind in this context. The research outcomes are substantiated through empirical evidence and align with previous global research findings, as exemplified by Wood et al. (2023). Nevertheless, it serves as an inaugural exploration within a series of such studies. These preliminary findings establish a robust foundation for subsequent research endeavors, particularly in the context of individual subjects.

The research's overarching goal was to pinpoint initial reference points, which serve as the departure point for all forthcoming experiments. These points hold significant prominence due to the inherent dichotomy of AI tools—they pose substantial risks on one hand while simultaneously presenting significant opportunities and potential on the other. As such, they remain highly pertinent, current, and thought-provoking, underscoring the critical need for ongoing research and exploration in this dynamic field.

Limitations of the conducted experimental research warrant attention. Firstly, ChatGPT 3.5, utilized in the study, is a free tool, while research highlights the advancements in the latest version, ChatGPT 4 (as of September 2023), which offers enhanced capabilities. Additionally, ChatGPT's algorithm is based on information available only up to September 2021, while many curricula and exam questions in the analyzed subjects, such as accounting and auditing standards and interpretations, undergo continual updates. It's crucial to note that the evaluation and point allocation for open-ended short questions and essay questions (case studies) possess an inherent level of subjectivity, incorporating partial scoring.

For future research, we recommend a more focused exploration within specific areas. Furthermore, testing ChatGPT 4, which boasts documented empirical improvements, should be a priority. As educators, harnessing the latest AI tools to enhance the educational process is essential. Our recommendations align with those presented by Nunes et al. (2023) and Kolade et al. (2023), suggesting opportunities for educational improvement through participatory learning, personalized support, increased engagement, and thoughtful exam design that emphasizes logical thinking and comprehensive understanding over rote memorization and selective learning.

5. CONCLUSION

In the swiftly changing terrain of education and technology, the fusion of AI, with ChatGPT serving as a notable example, stands out as a potent catalyst for transformation. Our research, the first of its kind in higher education in North Macedonia, has ventured into uncharted territory to assess ChatGPT's efficacy in enhancing exam performance within the realm of accounting and auditing.

Through rigorous experimentation and analysis, we have uncovered both the potential and limitations of ChatGPT in the context of exam questions in higher education. It has demonstrated commendable capabilities in answering qualitative questions, true/false inquiries, and multiple-choice questions with single correct answer, effectively automating routine tasks and providing detailed explanations. However, it faces challenges in handling quantitative calculations and complex MCQs with multiple correct answers.

ChatGPT transcends its role as a tool exclusively designated for higher education, accounting, and auditing. Instead, it stands as a cutting-edge AI language model with versatile capabilities, apt for

an expansive array of natural language processing tasks, including question answering, text generation, explanation provision, and more. Consequently, due to its extensive knowledge base, ChatGPT offers robust explanations and responses to open-ended questions. In the domain of quantitative tasks, ChatGPT adeptly formulates and furnishes information on executing specific calculations. However, it falls short in delivering fully computed results.

Our findings align with broader discussions about AI's role in education worldwide. ChatGPT, as a free tool with certain constraints, serves as a valuable assistant rather than a complete replacement for traditional teaching and evaluation methods. It offers educators an opportunity to leverage technology to engage students more effectively and encourage logical thinking and deeper understanding.

ChatGPT represents a promising addition to the educational toolkit. While it is not without its limitations, its potential to augment the learning experience and assist both students and educators is undeniable. As the fields of AI and education continue to evolve, embracing these technologies thoughtfully can pave the way for more engaging and effective educational practices.

REFERENCES

ACPM. (2023). Does Chat GPT threaten the accounting profession?, available at: https://acpmglobal.co.uk/blog/item/46-chi-zagrozhuye-chat-gpt-profesiyi-buhgaltera (accessed at August 6, 2023).

Al Ghatrifi, M. O. M., Al Amairi, S. S. J. & Thottoli, M. M. (2023). Surfing the technology wave: An international perspective on enhancing teaching and learning in accounting, Computers and Education: Artificial Intelligence, Vol. 4. https://doi.org/10.1016/j.caeai.2023.100144

Beerbaum, O. D. (2023). Generative Artificial Intelligence (GAI) with Chat GPT for Accounting – a Business Case, *Special Issue on Generative Artificial Intelligence (GAI) and Accounting.* http://dx.doi.org/10.2139/ssrn.4385651

Bommarito, J., Bommarito, J. M., Katz, J. & Katz. M. D. (2023). GPT as Knowledge Worker: A Zero-Shot Evaluation of (AI) CPA Capabilities, available at: https://arxiv.org/pdf/2301.04408.pdf (accessed August 15, 2023).

Brownlee, M. (2023). What ChatGPT can do for accountants, Accounting Times, available at: https://www.accountingtimes.com.au/technology/what-chat-gpt-can-do-for-accountants (accessed at August 5, 2023).

Constantz, J. (2023). Almost 30% of professionals say they've tried ChatGPT at work, available at: https://www.bnnbloomberg.ca/almost-30-of-professionals-say-they-ve-tried-chatgpt-at-work-1.1872520 (accessed at August 24, 2023).

DAIR.AI. (2023). Prompt Engineering Guide, available at: https://www.promptingguide.ai/ (accessed at July 3, 2023).

Eulerich, M., Sanatizadeh, A., Vakilzadeh, H. & Wood, D. A. (2023). Can Artificial Intelligence Pass Accounting Certification Exams? ChatGPT: CPA, CMA, CIA, and EA?, available at http://dx.doi.org/10.2139/ssrn.4452175 (accessed august 25).

Faggella, D. (2020). AI in the accounting big four - comparing Deloitte, PwC, KPMG, and EY" [WWW Document], *Emerj, The AI Research and Advisory Company*, available at: https://emerj.com/ai-sector-overviews/ai-in-the-accounting-big-four-comparing-deloitte-pwc-kpmg-and-ey/ (accessed at July 26, 2023).

Frey, C. B., and M. A. Osborne. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting and Social Change,* Vol. 114, pp. 254–280. https://doi.org/10.1016/j.techfore.2016.08.019

George, S. A. & GEORGE, H. S. A. (2023). A Review of ChatGPT AI's Impact on Several Business Sectors, *Partners Universal International Innovation Journal*, Vol. 1, No. 1, pp. 9-23. https://doi.org/10.5281/zenodo.7644359

Han, H., Shiwakoti, K. R., Jarvis, R., Mordi, C. & Botchie, D. (2023). Accounting and auditing with blockchain technology and artificial intelligence: A literature review, *International Journal of Accounting Information Systems*, Vol. 48. https://doi.org/10.1016/j.accinf.2022.100598

Huq, U. S. (2014). The Role of Artificial Intelligence in the Development of Accounting Systems: A Review, *The IUP Journal of Accounting Research & Audit Practices*, Vol. 13, No. 2, pp. 7-19, https://ssrn.com/abstract=2508591

Kolade, O., Owoseni, A. & Egbetokun, A. (2023). Assessment on trial? ChatGPT and the new frontiers of learning and assessment in higher education, available at: https://doi.org/10.13140/RG.2.2.32665.49768 (retrieved August 17, 2023).

Mathew, A. (2023). Is Artificial Intelligence a World Changer? A Case Study of OpenAI's Chat GPT. *Recent Progress in Science and Technology,* Vol. 5, pp. 35-42. https://doi.org/10.9734/bpi/rpst/v5/18240D

Newton, M. P. & Xiromeriti, M. (2023). ChatGPT Performance on MCQ Exams in Higher Education. A Pragmatic Scoping Review, available at: https://edarxiv.org/sytu3 (accessed August 20, 2023).

Nunes, D., Primi, R., Pires, R., Lotufo, R. & Nogueira, R. (2023). Evaluating GPT-3.5 and GPT-4 Models on Brazilian University Admission Exams, available at: https://arxiv.org/pdf/2303.17003.pdf (accessed August 15, 2023).

Ray, P. P. (2023). ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope, *Internet of Things and Cyber-Physical Systems*, Vol. 3, pp. 121-154. https://doi.org/10.1016/j.iotcps.2023.04.003

Susnjak, T. (2022). CHATGPT: The end of online exam integrity?, available at: https://arxiv.org/abs/2212.09292 (accessed at July 8, 2023).

Tan, X. (2023). The Impact of ChatGPT on Education and Future Prospects, Highlights in Science, Engineering and Technology, Vol. 61, pp. 138-143. https://doi.org/10.54097/hset.v61i.10285

Wood, A. D., et al. (2023). The ChatGPT Artificial Intelligence Chatbot: How Well Does It Answer Accounting Assessment Questions?, *Issues in Accounting Education,* Vol. 38, No. 4, pp. 1-28. https://doi.org/10.2308/ISSUES-2023-013

Yan, X., Li, H. & Pratap, O. (2022). Informatization Teaching Reform of Accounting Courses Under Modern Information Technology, In: Sun, S., Hong, T., Yu, P., Zou, J. (eds) Signal and Information Processing, Networking and Computers. ICSINC 2021. Lecture Notes in Electrical Engineering, vol 895. Springer, Singapore. https://doi.org/10.1007/978-981-19-4775-9_84

THE IMPACT OF INFLUENCERS AND INFLUENCER MARKETING ON THE FORMATION OF PUBLIC OPINION: PERCEPTIONS OF CROATIAN STUDENTS

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ABSTRACT
The terms influencer and influencer marketing are relatively new. However, they have raised research issues and gained a lot of attention in various research areas, ranging from social psychology, information and communication technology to marketing. Nevertheless, the impact of influencers on the adoption of new products and services, brand awareness and brand recognition is undeniable. Despite the impressive growth and popularity of influencers and influencer marketing in general, there is a lack of academic and practitioner research on the impact influencers have on the formation of public opinion. This study attempts to provide better insight and understanding of this subject as well as to represent a stepping stone for future research in this area. The theoretical starting points of this paper accentuate the knowledge based on influencers and influencer marketing, the formation of public opinion and the role of media in the formation of public opinion. The main objective of this paper is to determine the impact of influencers and influencer marketing on the formation of public opinion on everyday topics among a sample of 142 students from University North in Croatia from May to July 2022. The paper examines the differences in students' perception of influencers and influencer marketing on the formation of public opinion with regard to gender, age, level of study and type of study. The obtained results indicate that there is a statistically significant difference in the surveyed students about the influence of influencers and influencer marketing on the formation of public opinion according to the level and type of study and provide new insights for marketing and media practitioners.

Keywords: *influencer, influencer marketing, public opinion*

JEL classification: *M31*

1. INTRODUCTION
The Internet has changed the world of computers and the way people communicate more than any innovation and technological achievement ever before in history. The telegraph, telephone, radio and computers in some way paved the way for the development of the Internet. Due to the many positive changes it brought shortly after its appearance, such as the fact that it enabled broadcasts all over the world and it serves it is an exceptional mechanism for the dissemination of information and interaction between individuals regardless of their geographical location, the Internet became very popular very quickly (Leiner *et al.*, 2009).

Since it has supplanted all other mass media, the Internet can be considered as the strongest and most important mass media in the world today. It is nowadays used through social media as a cultural venue and a main tool for marketing, spreading marketing and political messages, engaging the public and raising public awareness towards culture. Social media (otherwise known as social networking sites) became very popular in the past decade due to the "increasing proliferation and affordability of internet-enabled devices such as mobile devices and tablets" (Gandhi *et al.*, 2015).

There are many scholarly articles that tackle the issue of public opinions and the impact of influencers through the social media. For example, Moukarzel *et al.* (2021) tackled the issue of influencers' impact on public opinion regarding the issue of breastfeeding, while Spálová *et al.* (2021) focused on the impact of influencers on public's opinion on brands, finding significant distrust of politicians and political communication on brands, and a very significant impact of influencers on the public's opinion. Moreover, Evans & Fill (2000) claim influencers to be „opinion formers and opinion leaders in the marketing communications process". In their study, they focus on the UK motor market and explore the opinion formers and opinion leaders in the market, the utilization of press releases and events, the degree of objectivity of the messages and opinions conveyed through this influencing process as well as the measurement and evaluation methods regarding the effectiveness of PR activities. Social media is proven to be a very "powerful platform through which people's attitudes and behaviours may be influenced both positively and negatively in relation to socio-political issues" (Haase & Worthington, 2023) and the consumption of influencers' social media and content/opinion can provide "the same cultivation impact as consuming news on any offline platform, particularly during times of threat" (Omar & Casero-Ripollés, 2023).

The main objective of this paper is to present the concept of influencer marketing and to empirically assess the students' attitudes about influencers and influencer marketing on social media. Namely, the authors have surveyed a sample of 142 students from the University North in Croatia, in the period May – July 2022. This is one of the first empirical studies that assess the impact of influencers and influencer marketing in Croatia for that matter.

This paper is organized as follows: the second section provides a theoretical background and literature review on influencers and influencer marketing, the formation of public opinion and the role of media in the formation of public opinion. The third section presents the surveyed sample and used methodology. Empirical results from the study have been laid out in Section 4, together with a discussion of the results. The last, Section 5 concludes the paper.

2. THEORETICAL OVERVIEW
2.1. Influencers and influencer marketing
Interestingly, there is still a lack of universal criteria of influence in the literature (Zhuang *et al.*, 2021). However, social influence refers to the "behavioural change of individuals affected by others in a network", and represents "an intuitive and well-accepted phenomenon in social networks" (Gandhi *et al.*, 2015).

Influencer marketing is rapidly growing and its global market size "more than tripled between 2017 and 2020, from three billion to 9.7 billion U.S. dollars in the three years alone". Influencers are operating virtually in very different industries, starting with the cosmetics, apparel and shoe industry, to the fitness and electronic gaming industries (Nafees *et al.*, 2021).

The basic definition of the concept of influencers and influencer marketing lies in the etymological analysis of the term itself, and this term could be referred to as opinion leader and brand ambassador (Spalova *et al.*, 2021).

The influencer profession is enlisted nowadays as a modern profession. An influencer is a person who has an impact on other people's opinions, attitudes and willingness to purchase a recommended product or a service. Moreover, an influencer is a person who "has the power to influence the purchase of others due to their knowledge, authority, position, relationship with their audience or some other characteristic" (Keček *et al.*, 2022). The role of social media influencers (otherwise known as SMI) is becoming more and more essential to the processes of branding, brand management and shaping of consumer brand attitudes (Nafees *et al.*, 2021).

In regard to their number of followers, influencers are divided into six types of influencers (Mesarić and Gregurec, 2021):

1) Social Butterflies
2) Reporters
3) Citizens
4) Brand Ambassadors
5) Authority
6) Activists

The social butterflies are present at many social events and know many important people. They are more popular than influential, and their influence is indirect. Reporters function like classic media. They share reliable information with friends and followers, and their posts are often shared and have a direct impact on other people. Citizens are influencers who are regular Internet users, but by commenting on social networks they leave reviews and have an influence on the increase or decrease of sales. Brand ambassadors are people who are respected in a certain area and want to monetize their knowledge and reputation through the transparent promotion of a service or product. If they are persuasive, the brand they are promoting will have more sales. Authoritative influencers are people who are an authority in a certain area, so a certain amount of people trust them. They influence the Internet, and mostly outside it. Influencer activists are the most influential, and the easiest to move other users to buy and participate in activities (Mesarić & Gregurec, 2021).

Through their relationship with their audience, influencers can shape behaviours and opinions, they are considered to be opinion leaders, and through communication through social networks, they can influence people who follow them so that they make a purchase decision (Szczurski, 2017). With their posts and content on social networks, influencers lead trends, promote ideas, promote products and services, and all this is very interesting to study since it is a new phenomenon. Moukarzel *et al.* (2021) explored the perspectives and impact influencers have on online breastfeeding communication strategies. They found that in such delicate and health-related subjects, the opinion and interpretation of the WHO code by influencers could reveal „deep ideological differences" and could possibly be dangerous to their followers. However, they found this to be a trigger for future constructive communication efforts with public health stakeholders.

2.2.   Formation of public opinion

The term public opinion has been in use for many years. Moreover, it has been in constant use since the 18th century. Shepard (1909) discusses the concept of public opinion more than a hundred years ago. He distinguished public opinion from the opinion of an individual and stated that even those positions on which the majority of society members can agree cannot always be considered public opinion. Public opinion is an opinion on which members of the public agree, but not in such a way that this agreement came about by chance. Public opinion implies the accumulation of individual views on a topic (Tanta, 2007). It represents a dynamic process of expressing, adapting or harmonizing ideas on the way to the collective

determination of the course of action (Cutlip, 2005). Attitudes and values are crucial in the development of public opinion on a topic (Encyclopaedia Britannica, 2023).

A public opinion is a form of social consciousness that differs from individual and can have three meanings (Tomić, 2008):

- Public opinion as all publicly expressed opinions
- Public opinion as all opinions related to a subject of public interest
- Public opinion as a group of generally accepted opinions in the general public

The influence of public opinion can be seen on many issues such as politics, elections, culture, fashion, literature, art, consumption, marketing and public relations (Encyclopaedia Britannica, 2023). Public opinion can be formed on all issues on which a part of the public may agree or disagree. Public opinion can be researched and its research has a great role in democratic societies, but it requires a responsible approach. The results of public opinion polls influence political decision-making, and because they are politically sensitive and have a social responsibility, public opinion polls are conducted following very strict criteria (Lamza Posavec, 2015).

2.3. The role of media in the formation of public opinion

The media influence people's way of thinking, their emotions and actions. There are two types of media influence – overt media influence and gradual media influence. The obvious influence of the media is easily noticeable because it refers to easily visible things. The gradual influence of the media is not as easily observed as the overt influence and it takes place continuously from the moment someone receives the media message. (Potter, 2011).

The media have an influence on different parts of a person's life, which Potter (2011) defines as four forms of influence:

1) Influence of the media on cognition
2) Influence of the media on attitudes
3) Influence of the media on the emotional state
4) Influence of the media on behaviour.

Regardless of whether the influence of the media is easy to see or whether a person needs to be observed in order to see that influence, today it is increasingly clear that the media has an increasing influence on the entire population. There is a thesis that many people invest large amounts of money in the media, so the media begin to play a huge role in the formation of public opinion. Due to the influx of money, the media get the feeling that their power has begun to grow and they begin to use their power in an egoistic and aggressive way, and anyone who has money can control the media and through media control could influence public opinion (Pavelić, 2021). The development of new media has caused a form of crisis, resulting in an unorganized and chaotic space in which traditional journalism has been suppressed and journalists have become like soldiers fighting for profit. For the owners of media companies, the profit of the portal is more important than the credibility of the information placed in the public (Kovačić and Baran, 2018). Influencers are opinion leaders on social networks (Szczurski, 2017). If they are seen as such, it is clear that they influence shaping public opinion. One can look at the example of influencers who promote a healthy lifestyle and exercise and the number of their followers on social networks. Among these followers, influencers shape attitudes and values and, through this process, influence public opinion.

3. RESEARCH DATA AND METHODOLOGY

In this research, the data were collected using an anonymous questionnaire. 142 undergraduate, graduate and postgraduate students of the University North in Croatia participated in the survey in the time frame of May – July 2022. Table 1 presents the distribution of respondents according to gender, age group, field of study and level of study.

Table 1: Distribution of respondents according to gender, age, field of study and level of study

		Number of respondents	Percentage
Gender	Male	49	35
	Female	93	65
Age groups	18-25	82	58
	26-55	60	42
Type of study	Social	92	65
	Technical	30	21
	Biomedicine and healthcare	20	14
Level of study	Undergraduate	75	53
	Graduate	32	23
	Postgraduate	35	24

(Source: Posavec (2022))

Female students predominated in the sample. The first age group, from 18 to 25 years old, surpassed the second age group, which consisted of 42% of respondents. Students in the social field of science responded the most to the survey, and students of biomedicine and healthcare the least. More than half of the respondents were undergraduate students.

Descriptive and inferential statistical methods were used in the data analysis. Basic descriptive statistical indicators were calculated to describe the basic features of the research data. The Kolmogorov-Smirnov test was used to examine the distribution of the data obtained from the research. It was observed that it deviates statistically significantly from the normal distribution, so the Mann-Whitney and Kruskal-Wallis tests were used to test the statistically significant differences between the groups of respondents. Multiple comparison tests detected samples that were statistically significantly different. Differences confirmed at the level $p<0.05$ were considered statistically significant.

4. RESULTS AND DISCUSSION

The conducted survey sought to examine whether influencers and influencer marketing on social networks have an impact on the formation of public opinion on everyday topics, for example, the emergence of the COVID-19 virus or the war in Ukraine among students of the University North in Croatia. Respondents evaluated their attitudes on a five-point scale (starting with 1 – they are not influential at all to 5 – they are extremely influential).

Table 2. Respondents' views on the influence of influencers and influencer marketing on the formation of public opinion by gender

Gender				Mann-Whitney test	
Male		Female			
Mean	Median	Mean	Median	Z	p
3,43	4	3,49	4	-0,187	0,849

(Source: Posavec (2022))

It is evident from Table 2 that slightly higher average value of the impact of influencers on the formation of public opinion on everyday topics was calculated for female students. The median value was the same for male and female respondents. According to the results of the Mann-Whitney test, no statistically significant difference was confirmed in the attitudes between male and female students about the influence of influencers and influencer marketing on the formation of public opinion. Since these are respondents who share the common feature of belonging to the student population, this group of respondents equally, regardless of gender, perceives the influence of influencers on the formation of public opinion.

Table 3. Students' attitudes about influencers and influencer marketing on the formation of public opinion by age groups

Age groups				Mann-Whitney test	
18-25		26-55			
Mean	Median	Mean	Median	Z	p
3,43	4	3,53	4	-0,436	0,659

(Source: Posavec (2022))

A slightly higher average value of the analyzed variable was calculated for students of the second age group, while the median for both age groups is the same. According to the results of the Mann-Whitney test, there is no statistically significant difference in the attitudes between students of the first and second age groups about the influence of influencers and influencer marketing on the formation of public opinion. Both age groups of students are equally exposed to the activities of influencers, and as today the boundaries between different age groups are shifted and mixed, it is understandable that there is not even a statistically significant difference in the influence of influencers on the formation of public opinion, which would depend on the age of the respondents.

Table 4. Students' attitudes about influencers and influencer marketing on the formation of public opinion by the level of study

Level of study						Kruskal-Wallis test	
Undergraduate		Graduate		Postgraduate			
Mean	Median	Mean	Median	Mean	Median	H	p
3,21	3	3,66	4	3,86	4	7765	0,020

(Source: Posavec (2022))

The lowest average grades and median values were detected among undergraduate students. According to the results of the Kruskal-Wallis test, there is a statistically significant difference between the surveyed students in their views on influencers and influencer marketing on the formation of public opinion. The test for multiple comparisons determined that, regarding the influence of influencers and influencer marketing on the formation of public opinion on everyday topics, undergraduate and postgraduate students differ statistically significantly.

Table 5. Students' attitudes about influencers and influencer marketing on the formation of public opinion by type of study

Type of Study				Biomedicine and healthcare		Kruskal-Wallis test	
Technical		Social					
Mean	Median	Mean	Median	Mean	Median	H	p
2,93	3	3,57	4	3,85	4,5	7159	0,028

(Source: Posavec (2022))

The highest average grades and median values were detected for students of biomedicine and healthcare. According to the results of the Kruskal-Wallis test, in the case of the influence of influencers on the formation of public opinion, there is at least one group of students that, considering the type of study, is statistically significantly different from the others. Regarding the impact of influencers on the formation of public opinion on everyday topics, statistically significant differences were confirmed between students of technical studies and biomedicine and healthcare.

5. CONCLUSION

The main objective of this study was to investigate and explore the opinions and views of students regarding the impact of influencers and influencer marketing on public opinion. A sample of 142 students from University North in Croatia during the period of May to July 2022 has been analyzed and surveyed with a structured questionnaire. The results reveal rather interesting insights. Namely, no statistically significant difference was confirmed in the attitudes between male and female students about the influence of influencers and influencer marketing on the formation of public opinion. In addition, the age of the students does not affect the impact of influencers in the formation of public opinion. However, the impact of influencers and influencer marketing on the formation of public opinion on everyday topics significantly differs among undergraduate and postgraduate students and among students of technical studies and biomedicine and healthcare.

The current study, however, has a few limitations which will be addressed in future work. Namely, the greatest limitation is the relatively small analyzed sample. For this reason, in future work, authors plan to incorporate a bigger sample and possibly even students from other universities in Croatia. Additionally, the research is limited to the impact of influencers and influencer marketing on the formation of public opinion regarding everyday topics and this could be extended to each area of interest, such as branding, brand management and even political elections.

From a practical perspective, the research results from this study could be used as a benchmark for launching new marketing strategies and enhancing the effectiveness and availability of existing marketing strategies. Moreover, the results revealed that influencers

and influence marketing do have a big impact on the formation of public opinion among students, which could also be applied to steer public opinion in certain directions, and possibly even to support decisions and impact opinions during political election processes. This is a subject the authors plan to cover in future research.

This study sheds light on a relatively new research field, i.e. influencer marketing and the impact influencers hold on the formation of public opinion. This is a topic that is topical and needs to be addressed, and this paper could represent a stepping stone for future research in this area and an incentive for other scholars to look into this subject more closely.

REFERENCES

Cutlip, S. M. (2005), *Odnosi s javnošću*, Mate, Zagreb.

Encyclopaedia Britannica (2023) "Public opinion", available at: https://www.britannica.com/topic/public-opinion (accessed 12 March 2023).

Evans M., Fill C. (2000). Extending the communication process: the significance of personal influencers in UK motor markets. International Journal of Advertising, 19 (3), pp. 377 – 396. DOI: 10.1080/02650487.2000.11104807

Gandhi, M. and Muruganantham A. (2015), "Potential Influencers Identification Using Multi-Criteria Decision Making (MCDM) Methods", Procedia Computer Science, Vol. 57, pp. 1179-1188. DOI: 10.1016/j.procs.2015.07.411

Haase R., Worthington R. (2023). "Influencers" – a study investigating the messages people receive about coercive control on social media. Journal of Forensic Practice, 25 (3), pp. 287 - 303, DOI: 10.1108/JFP-12-2022-0063

Keček, D., Fotova Čiković, K. and Posavec, J. (2022), "Students' Attitudes About Influencers and Influencer Marketing on Social Media", in Janjusevic, J., Hopkinson, P., Pandza Bajs, I. (eds.): Book of Proceedings Economic and Social Development – 88th International Scientific Conference on Economic and Social Development – "Roadmap to NetZero Economies and Businesses", Dubai, pp. 466-474.

Kovačić, S. and Baran, T. (2018), "Novi mediji – generator novih tehnika manipulacija", Hum, Vol. 13 No. 19, pp. 271-294.

Lamza Posavec, V. (2015), *Mjerenje javnosti, Metodologijski i analitički pristupi istraživanju javnog mnijenja*, Institut društvenih znanosti Ivo Pilar, Zagreb.

Leiner, B. M., Cerf, V. G., Clark, D. D., Kahn, R. E., Kleinrock, L., Lynch, D. C., Postel, J., Roberts, L. G. and Wolff, S. (2009), "A Brief History of the Internet", *ACM SIGCOMM Computer Communication Review*, Vol. 39 No. 5, pp. 22-31.

Mesarić, S. and Gregurec, I. (2021), "Utjecaj utjecajnih osoba na donošenje odluke o kupnji – viđenje hrvatskih utjecajnih osoba", *CroDiM*, Vol. 4 No. 1, pp. 107-120.

Moukarzel, S., Caduff, A., Rehm, M., del Fresno, M., Pérez-Escamilla, R. and Daly, A.J. (2021), "Breastfeeding Communication Strategies, Challenges and Opportunities in the Twitter-Verse: Perspectives of Influencers and Social Network Analysis", *Int. J. Environ. Res.Public Health*, Vol. 18, 6181. https://doi.org/10.3390/ijerph18126181

Nafees, L., Cook, C.M., Nikolov, A.N. and Stoddard, J.E. (2021), "Can social media influencer (SMI) power influence consumer brand attitudes?", *The mediating role of perceived SMI credibility. Digital Business*, Vol. 1 No. 2, 100008, https://doi.org/10.1016/j.digbus.2021.100008.

Omar R.G.A.S., Casero-Ripollés A. (2023). Impact of influencers' Facebook pages in cultivating fear and terror among youths during the COVID-19 pandemic. Online Journal of Communication and Media Technologies, 13 (2), e202314, DOI: 10.30935/ojcmt/13005

Pavelić, K. (2021), "Današnji mediji: problemi i manipulacije", *In medias res*, Vol. 10 No. 19, pp. 2959-2968.

Posavec, J. (2022), *Utjecaj influencera i influencer marketinga na javno mnijenje putem novih medija,* Bachelor thesis. Sveučilište Sjever, Koprivnica, Croatia.

Potter, J. (2011), *Medijska pismenost*, CLIO, Multimedija, Beograd

Shepard, W. J. (1909), "Public Opinion", *American Journal of Sociology*, Vol. 15 No. 1., pp. 32-60.

Spalova, L., Mikulas, P. and Puchovska, O. (2021), "Attitudes Towards Different Influencer Categories -Exploration of Generation Z", *Communication Today*, Vol. 12, pp. 44-60.

Szczurski, M. (2017), "Social Media Influencer - a Lifestyle or a Profession of the XXIst Century?" available at: https://depot.ceon.pl/handle/123456789/15166 (accessed 12 March 2023).

Tanta, I. (2007), "Oblikovanje mnijenja ili nužnost manipulacije", *MediAnali: međunarodni znanstveni časopis za pitanja medija, novinarstva, masovnog komuniciranja i odnosa s javnostima*, Vol. 1 No. 2, pp. 13-32.

Tomić, Z. (2008), *Odnosi s javnošću, teorija i praksa*, Synopsis, Zagreb – Sarajevo.

Zhuang, Y-B., Li, Z-H. and Zhuang, Y-J. (2021), "Identification of influencers in online social networks: measuring influence considering multidimensional factors exploration", *Heliyon*, Vol.7 No. 4, https://doi.org/10.1016/j.heliyon.2021.e06472.

UNRAVELING INFLUENCER LOYALTY: EXAMINING THE IMPACT OF SOURCE CREDIBILITY

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ABSTRACT
With the emergence of social media, social media influencers have become a substantial alternative for brand promotion. Companies are dedicating an increasing portion of their overall marketing budget towards influencer marketing initiatives. To enhance the effectiveness of influencer marketing, companies and marketers should prioritize the credibility of the message source. The main motivation for the research lies in the modest research base regarding the effect of the multi-dimensional structure of source credibility on influencer loyalty. Grounded in source credibility theory, the subject of this paper is the source credibility four-dimensional construct: expertise, attractiveness, similarity, and trustworthiness of influencers aiming to investigate the impact of influencers' credibility on social media users' loyalty to influencers. By employing SPSS for multiple linear regression analysis on a dataset of 80 participants, the results reveal that the most influential factor positively affecting social media users' loyalty to influencers is the trustworthiness of the influencers, followed closely by the dimension of similarity. In conclusion, these research findings not only contribute to academic knowledge but also offer valuable guidance and insights for marketing managers in the selection of suitable social media influencers for collaboration.

Keywords: influencer marketing, social media, credibility, loyalty

JEL Classification: M31, M37

1. INTRODUCTION

With the rise of social media, social media influencers have developed as a significant alternative to brand promotion. Several sources posit the significance of utilizing influencers in marketing efforts (Leung *et al.*, 2022a; 2022b; Statista, 2023a; 2023b; 2023c). According to the most recent statistics, in 2022, the influencer market generated a total of $16.4 billion in revenue (Leung *et al.*, 2022a; 2022b). Furthermore, businesses are progressively allocating a larger portion of their overall marketing budget towards influencer marketing initiatives. As reported by Leung *et al.* (2022a; 2022b), over three-quarters of brands allocate a specific budget for influencer marketing, and in 2023, 23% of companies are dedicating up to 40% of their total marketing budget to influencer-related activities (Statista, 2023b). This marks a substantial increase, more than doubling the value of marketing efforts involving influencers compared to figures from 2019 (2023a).

Despite the widespread use of social media influencers as a communication tool for brands, research remains scarce addressing the influence these individuals have on their followers' perceptions of the brands they endorse (Castillo and Fernández, 2019). According to the elaboration likelihood model, the credibility of the information, which represents the degree to

which the recipient of the message perceives the information as reliable (McKnight and Kacmar, 2007), can be considered from three aspects: source credibility, message credibility, and medium credibility (Li and Suh, 2015; Eysenbach, 2008; Metzger *et al.*, 2003; Smith and Vogt, 1995). According to the market signaling theory, companies should convince consumers of the quality of their products (Erdem and Swait, 1998) through the so-called "signaling", that is, a process in which one side (the sender of the message) reliably transmits information (or signals) about itself to the other side (the receiver of the message) (Nafees *et al.*, 2020). Having in mind previously elaborated, the one presenting the product to others represents a marketing signal (Nafees *et al.*, 2020; Bloom and Reve, 1990). Hence, influencers, i.e. influential persons (Batra *et al.*, 1996) showing the use of the product (Spry *et al.*, 2011) represent the so-called marketing signal. The effectiveness of a marketing signal depends on the credibility of the sender of the signal (Herbig and Milewicz, 1996). In the case when the recipient of the message has little or no information about what the subject of advertising is, except for the message itself in the advertisement, the credibility of the influencers (Jain and Posavac, 2001), that is, the source of the message (Metzger *et al.*, 2003) is very important.

To increase the effectiveness of influencer marketing, companies, and marketers should focus on the credibility of the message source (Bower and Landreth, 2001; Munnukka *et al.*, 2016; Pornpitakpan, 2004). The credibility of the message source is related to the character and positive characteristics of the communicator which affects the persuasiveness of the message (Ohanian, 1990). Hovland and Weiss (1951) indicate the importance of source credibility for message persuasiveness. Source credibility consists of different dimensions, specifically, expertise and trustworthiness (Hovland *et al.*, 1953), along with attractiveness (McGuire, 1985). Ohanian (1990) defines source credibility as a construct with three aspects: trustworthiness, expertise, and attractiveness. In the view of Lou and Yuan (2019), credibility encompasses four dimensions: trustworthiness, expertise, attractiveness, and similarity. Similarly, Xiao *et al.* (2018) also employ a four-dimensional framework to evaluate source credibility, focusing on expertise, trustworthiness, likability, and homophily, which refers to similarity.

The motivation and primary goal of this research is to address a notable gap in the existing body of knowledge concerning the source credibility theory in the context of influencer marketing and influencer loyalty. While there have been numerous studies examining the impact of source credibility on consumer behavior (Lou and Yuan, 2019; Bower and Landreth, 2001; Munnukka *et al.*, 2016; Petty and Schumann, 1983; Pornpitakpan, 2004; La Ferle and Choi, 2005; Spry *et al.*, 2011; Wang *et al.*, 2017; Yoon *et al.*, 1998; Ananda and Wandebori; 2016; Rebelo, 2017; Weismueller *et al.*, 2020; Saima and Khan, 2020; Bogoevska-Gavrilova and Ciunova-Shuleska, 2022), as well as studies examining the influence of brand credibility on customer loyalty (Alam *et al.*, 2012; Rather *et al.*, 2022; Serman and Sims, 2022), there is a limited research base when it comes to understanding the impact of the multi-dimensional structure of source credibility on influencer loyalty (Kim and Kim, 2021; Gunnarsson *et al.*, 2018). Therefore, resting upon source credibility theory, the subject of this paper is the source credibility four-dimensional construct as used in the research of Lou and Yuan (2019) and Xiao *et al.* (2018), which is attractiveness, similarity, trustworthiness, and expertise of influencers aiming to investigate the impact of influencers' credibility on social media users' loyalty to influencers.

The remainder of the work is organized in the following sequence: first, an overview of the literature and development of hypotheses are presented; followed by methodology and analysis of data and results. Finally, the conclusions and applicability of the research are discussed.

2. LITERATURE REVIEW

Loyalty: Loyalty plays a crucial role in the connection between companies and consumers (Serman and Sims, 2022). Customer loyalty can be described as the dedication to a brand that encourages repeat purchasing behavior among customers (Alam *et al.*, 2012) and the favorable regard customers have for companies can only be controlled by improving the overall customer experience (Bilgihan, 2016; Chang, 2017). In psychological terms, attachment theories posit that individuals seek to form strong bonds with objects or individuals, leading to an increased sense of connection and commitment (Drigotas and Rusbult, 1992; Hazan and Shaver, 1994). In this paper, loyalty represents the relationship between influencers and social media users referring to the dedication of social media users to the brand-related posts of an influencer and the influencer itself.

Expertise: According to Hovland *et al.* (1953) and (Munnukka *et al.*, 2016) expertise refers to the degree to which a communicator is perceived as a reliable source of accurate statements. Additionally, Ohanian (1990), defines source expertise as the consumer's perception that the source possesses expertise, qualifications, skills, and relevant knowledge. In other words, the assessment of source expertise can be made by evaluating the quantity and quality of information presented, their level of proficiency, educational history, and professional achievements, along with the reliability of their judgment (Giffin, 1967; McGuire, 1968; Van der Waldt *et al.*, 2009).

Attractiveness: The attractiveness of a source enhances the effectiveness of communication by capturing significant attention and fostering engagement (Mills and Aronson, 1965; Sternthal and Samuel, 1982). As per McGuire (1985), source attractiveness pertains to the physical attributes of the source, including factors like familiarity, similarity, likability, and attractiveness. People who are physically attractive tend to be viewed as being friendly, intriguing, outgoing, confident, humble, and attentive (Dion *et al.*, 1972). This implies that these favorable perceptions of attractive communicators enhance their credibility and lead to greater acceptance of their message (Kim and Kim, 2021).

Similarity: Similarity refers to the perceived resemblance in beliefs, values, life experiences, and lifestyles between the communicator and the receiver (Gilly *et al.*, 1998; Lazarsfeld and Merton, 1954). Shared cultural background, demographics, and values between the message source (i.e., the influencer) and the recipient contribute to the credibility of the source (Munnukka *et al.*, 2016; Morimoto and La Ferle, 2008). When the recipient of the message perceives that the source shares similar attitudes, interests, beliefs, and emotions, then the recipient supports the source's opinion (Kim and Kim, 2021) thus influencing the effectiveness of advertising (Munnukka *et al.*, 2016).

Trustworthiness: Trust has been identified as a significant determinant of consumer behavior, as confirmed by studies (Hajli *et al.*, 2017; Chen and Shen, 2015). It arises when there is a belief in the reliability of the communication partner, that they will convey valid assertions (Moorman *et al.*, 1993; Munnukka *et al.*, 2016). Honest, believable, sincere, truthful (Giffin, 1967; Shimp, 2000; Van der Waldt *et al.*, 2009), reliable, and dependable source is trustworthy. Trustworthiness makes influencers more persuasive, especially when they demonstrate expertise in the product (Ohanian, 1990; Munnukka *et al.*, 2016). Past research has confirmed that bloggers are perceived as reliable providers of information (Djafarova and Rushworth, 2017; Sokolova and Kefi, 2020). Multiple research studies have affirmed the significance of source expertise and trustworthiness in shaping attitudes, behavioral intention, and the reception of information (Hovland and Weiss, 1951; Sussman and Siegal, 2003; Pornpitakpan, 2004; Cheung *et al.*, 2008; Jin *et al.*, 2009; Bogoevska-Gavrilova and Ciunova-Shuleska, 2022). Furthermore, Alam *et al.* (2012) illustrate

that credibility results in higher levels of customer loyalty. Recent studies conducted by Serman and Sims (2022) and Rather *et al.* (2022) also provide further evidence of the significant influence of credibility on loyalty. Gunnarsson *et al.* (2018) examined the trustworthiness, relatability, and authenticity of an influencer and proved that trustworthiness positively affects loyalty. Kim and Kim's (2023) recent findings indicate that similarity, social presence, and attractiveness contribute to a stronger attachment which, in turn, boosts the loyalty of followers towards the influencer. Given the prior research demonstrating that credibility, as a whole and as represented by its several dimensions, enhances loyalty, the following hypotheses are proposed:

H1: The expertise dimension of social media influencers' credibility positively affects social media users' influencer loyalty.

H2: The attractiveness dimension of social media influencers' credibility positively affects social media users' influencer loyalty.

H3: The similarity dimension of social media influencers' credibility positively affects social media users' influencer loyalty.

H4: The trustworthiness dimension of social media influencers' credibility positively affects social media users' influencer loyalty.

3. METHODOLOGY: SAMPLE AND MEASURES

An online questionnaire was sent to a purposive sample of social media users in North Macedonia. From the initial data set of 128 respondents, after data clean-up, responses from 80 respondents were subject to multiple linear regression analysis using the SPSS statistical software to prove that an influencer's expertise, attractiveness, similarity, and trustworthiness affect influencer loyalty. The sample size of 80 participants in this research exceeds the minimum threshold advised by Hair *et al.* (2010) for conducting multiple linear regression analysis. To perform the analysis, the following multiple linear regression equation was applied:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \varepsilon$$

where:

Y = influencer loyalty; x1 = expertise; x2 = attractiveness; x3 = similarity; x4 = trustworthiness; ε = standard error

When discussing the sample, considering their demographic and behavioral characteristics, it is evident that almost all respondents are active (80%) Instagram users (78.75%) and spend daily up to an hour and a half on social media (22.5%). Additionally, the questionnaire consisted of questions related to the four dimensions of influencer's credibility and social media users' loyalty to influencers they follow. Items regarding expertise (five items), attractiveness (five items), similarity (three items), and trustworthiness (five items) were adapted from the study of Lou and Yuan (2017). The degree of respondents' agreement with the statements regarding all variables above was captured by using a 7-point Likert scale (1 - strongly disagree and 7 - strongly agree). The influencer loyalty (4 statements) was adapted from Kim and Kim (2021) and measured also using a 7-point Likert scale (1 - strongly disagree and 7 - strongly agree).

4. RESULTS

4.1. Assessment of reliability and construct validity

Exploratory Factor Analysis (Principal Component Analysis with Promax rotation) validated the factors as conceptualized in the existing literature. Five factors were extracted (attractiveness – 5

items; similarity – 3 items; trustworthiness – 4 items, expertise – 5 items and influencer loyalty – 4 items) collectively explaining 88.299% of the variance. A specific item related to "dependable" from the trustworthiness dimension was deleted due to a cross-loading problem. Standardized factor loadings for all retained items in the EFA model surpassed the threshold value of .5 according to Hair et al. (2010) (refer to Table 1). Additionally, Cronbach's alpha coefficients for each construct: expertise (.959), attractiveness (.958), similarity (.899), trustworthiness (.960), and influencer loyalty (.959) confirm high internal scales' reliability by exceeding Hair et al. (2010)'s threshold of .7.

Table 1: Factor analysis results, factor loadings (N=80)

	Factor				
	1	2	3	4	5
Influencer loyalty					
I would recommend this influencer to someone who seeks my advice.			.946		
I say positive things about this influencer.			.966		
I intend to continue following this influencer.			.895		
I will continue to watch the postings of this influencer.			.961		
Expertise dimension					
Expert		1.033			
Experienced		.792			
Knowledgeable		.766			
Qualified		.962			
Skilled		.760			
Trustworthiness dimension					
Honest				.790	
Reliable				.877	
Sincere				.864	
Trustworthy				.831	
Similarity dimension					
The influencer and I have a lot in common.					.792
The influencer and I are a lot alike.					.905
I can easily identify with the influencer.					.952
Attractiveness dimension					
Attractive	.915				
Classy	.865				
Handsome	.939				

		.936				
Elegant						
Sexy		.920				

(Source: Authors' calculations)

4.2. Multiple linear regression method results

As previously mentioned, to examine the effect of social media influencers' multi-dimensional credibility construct on social media users' influencer loyalty, the multiple linear regression method was applied with the equation already explained in section 3 of the paper.

The overall model is statistically significant with a p-value=.000 and meets all the assumptions when it comes to normality, linearity, homoscedasticity, and the absence of multicollinearity. The values of R square and Adjusted R square (shown in Table 2) suggest that expertise, attractiveness, similarity, and trustworthiness collectively account for 32.7% and 29.1% of the variance in influencer loyalty, respectively.

Table 2: Model summary

R Square	Adjusted R Square	p-value	Durbin-Watson
.327	.291	.000	1.945

(Source: Authors' calculations)

From the coefficients table (see Table 3) a positive effect of two credibility dimensions on influencer loyalty can be confirmed (p-value less than the significance level). To be more precise, H3 and H4 are confirmed, and considering the standardized beta coefficients, the factor that exerts the most significant positive influence on social media users' loyalty to influencers is the trustworthiness of influencers, with the similarity dimension coming next in importance. The expertise and attractiveness of influencers are found not to have any effect on influencer loyalty thus resulting in rejection of H1 and H2.

Table 3: Linear regression model coefficients

Source credibility dimension	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.123	.538		5.808	.000
Expertise	-.016	.136	-.018	-.116	.908
Attractiveness	.014	.085	.018	.163	.871
Similarity	.237	.092	.293	2.582	.012
Trustworthiness	.346	.145	.372	2.386	.020

(Source: Authors' calculations)

5. CONCLUSIONS AND IMPLICATIONS

As already elaborated there exist numerous studies examining the impact of source credibility on consumer behavior (Lou and Yuan, 2019; Bower and Landreth, 2001; Munnukka *et al.*, 2016;

Petty and Schumann, 1983; Pornpitakpan, 2004; La Ferle and Choi, 2005; Spry *et al.*, 2011; Wang *et al.*, 2017; Yoon *et al.*, 1998; Ananda and Wandebori, 2016; Rebelo, 2017; Weismueller *et al.*, 2020; Saima and Khan, 2020; Bogoevska-Gavrilova and Ciunova-Shuleska, 2022), and the impact of brand credibility on customer loyalty (Alam *et al.*, 2012; Rather *et al.*, 2022; Serman and Sims, 2022), yet the body of research on the influence of the multi-dimensional structure of source credibility on influencer loyalty is comparatively limited (Gunnarsson *et al.,* 2018, Kim and Kim, 2021; Jun and Yi, 2020). Furthermore, past research focusing on loyalty mostly analyzed the influence of credibility without unraveling it through several dimensions (Alam *et al.*, 2012; Serman and Sims, 2022; Rather *et al.* 2022). Considering the limited existing research, this paper represents the author's initial endeavor to encompass the four-dimensional credibility construct. It seeks to directly assess the influence of each dimension on influencer loyalty, which constitutes the main research goal. The research outcomes can be explained by the findings of Munnukka *et al.* (2016) which indicate that when consumers perceive an endorser as trustworthy, they also perceive the endorser as similar to them. The results regarding the influence of trustworthiness and similarity partly align with conclusions drawn from two studies conducted by Kim and Kim (2021, 2023) which among other factors, prove that similarity affects loyalty through trust (2021) and attachment (2023). On the other hand, Gunnarsson *et al.* (2018) also proved that the trustworthiness of an influencer affects loyalty.

5.1. Theoretical contributions

The results offer a comprehensive insight into the multi-dimensional concept of credibility and its direct impact on influencer loyalty. This is significant as many prior studies have either examined credibility from a limited perspective (Alam *et al.*, 2012; Serman and Sims, 2022; Rather *et al.* 2022) or assessed its influence on loyalty through intermediary factors like trust and attachment (Kim and Kim, 2021; 2023). By filling this knowledge gap, the findings offer a clear overview of the specific factors related to social media influencers that influence the loyalty of their followers.

5.2. Practical implications

The research findings so far hold importance not only in contributing to academic knowledge concerning the four-dimensional nature of source credibility and its impact on influencer loyalty but also for the practical realm of businesses and marketing managers. These results provide guidance and valuable insights for marketing managers in selecting appropriate social media influencers, particularly when the company's target audience consists of social media users who exhibit loyalty to the influencers they follow. Therefore, it is advisable for companies to partner with social media influencers who share similarities with their followers and are deemed trustworthy.

6. LIMITATIONS AND FUTURE RESEARCH

The research holds particular importance for the academic community and marketing practitioners due to its insight into the four-dimensional social media influencers' credibility construct when aiming to raise influencer loyalty. Given that this study is not devoid of human factors, there are still several limitations that can serve as a basis for future research to provide a more in-depth understanding of this topic. Firstly, it involves a relatively small sample size, albeit sufficient for conducting regression analysis. In this regard, future research on this topic can be based on larger samples to apply different statistical methods such as structural equation

modeling. Furthermore, as previously mentioned, according to the elaboration likelihood model, credibility can be assessed from three perspectives: source credibility, message credibility, and media credibility all three can be examined in future research. The impact of perceived trust in brand-related content posted by influencers, as well as user engagement in following social media influencers, on influencer loyalty and purchase intention could also be examined. Future research could also analyze trust in brand-related content and different types of brand-related content shared by social media influencers and their influence on purchase intention to better understand the type of content with the most positive effect on consumer purchase intention.

REFERENCES

Alam, A., Usman Arshad, M. and Adnan Shabbir, S. (2012), "Brand credibility, customer loyalty and the role of religious orientation", *Asia Pacific Journal of Marketing and Logistics*, Vol. 24 No. 4, pp. 583-598.

Ananda, A.F. and Wandebori, H. (2016), "The impact of drugstore makeup product reviews by beauty vlogger on YouTube towards purchase intention by undergraduate students in Indonesia", in Indartono, S. (Ed.). *International Conference on Ethics of Business, Economics, and Social Science,* Indonesia, Faculty of Economics, Yogyakarta State University, Vol. 3 No. 1, pp. 264-272.

Batra, R., Myers, J. and Aaker, D. (1996), *Advertising Management,* Prentice Hall International, New Jersey.

Bilgihan, A. (2016), "Gen Y customer loyalty in online shopping: An integrated model of trust, user experience and branding", *Computers in Human Behavior*, Vol. 61, pp. 103–113.

Bloom, P.N. and Reve T. (1990), "Transmitting signals to consumers for competitive advantage". *Business Horizons*, Vol. 33 No. 4, pp. 58-66.

Bogoevska-Gavrilova, I. and Ciunova-Shuleska, A. (2022), "SOURCE CREDIBILITY THEORY APPLIED TO INFLUENCER MARKETING", *Economic Development*, Vol. 24 No. 3, pp. 71-86.

Bower, A. and Landreth, S. (2001), "Is beauty best? Highly versus normally attractive models in advertising", *Journal of Advertising*, Vol. 30 No. 1, pp. 1-12.

Castillo, J.D. and Fernández, S.R. (2019), "The role of digital influencers in brand recommendation: Examining their impact on engagement, expected value and purchase intention", *International Journal of Information Management*, Vol. 49, pp. 366–376.

Chang, H.H. (2017), "Gender differences in leisure involvement and flow experience in professional extreme sport activities", *World Leisure Journal*, Vol. 59 No. 2, pp. 124–139.

Chen, J. and Shen, X.L. (2015), "Consumers' decisions in social commerce context: An empirical investigation", *Decision Support Systems*, Vol. 79, pp. 55–64.

Cheung, C.M.K., Lee, M.K.O. and Rabjohn, N. (2008), "The impact of electronic word-of-mouth: The adoption of online opinions in online customer communities", *Internet Research*, Vol. 18 No. 3, pp. 229– 247.

Dion, K., Berscheid, E. and Walster, E. (1972), "What is beautiful is good", *Journal of Personality and Social Psychology,* Vol. 24 No. 3, p. 285.

Djafarova, E. and Rushworth, C. (2017), "Exploring the credibility of online celebrities' Instagram profiles in influencing the purchase decisions of young female users", *Computers in Human Behavior*, Vol. 68, pp. 1–7.

Drigotas, S.M. and Rusbult, C.E. (1992), "Should I stay or should I go? A dependence model of breakups", *Journal of Personality and Social Psychology*, Vol. 62 No. 1, pp. 62-87.

Erdem, T. and Swait, J. (1998), "Brand equity as a signaling phenomenon." *Journal of Consumer Psychology*, Vol. 7, pp. 131-157.

Eysenbach, G. (2008), "Credibility of health information and digital media: new perspectives and implications for youth", in Metzger, M.J. and Flanagin, A.J. (Ed.s). *The John D. and Catherine T. MacArthur Foundation Series on Digital Media and Learning*, Cambridge, The MIT Press, pp. 123-154.

Giffin, K. (1967), "The contribution of studies of source credibility to a theory of interpersonal trust in the communication process", *Psychological Bulletin*, Vol. 68 No. 2, pp. 104–119.

Gilly, M.C., Graham, J.L., Wolfinbarger, M.F. and Yale, L.J. (1998), "A dyadic study of interpersonal information search", *Journal of the Academy of Marketing Science,* Vol. 26 No. 2, pp. 83–100.

Gunnarsson, L., Folkestad, A. and Postnikova, A. (2018), "Maybe Influencers Are Not Worth The Hype: An explanatory study on influencers' characteristics with perceived quality and brand loyalty", *Bachelor's Thesis*, Linnaeus University, Växjö, Sweden.

Hair, J.F., Black, W.C., Balin, B.J. and Anderson, R.E. (2010), *Multivariate data analysis*, Maxwell Macmillan International Editions, New York, NY.

Hajli, N., Sims, J., Zadeh, A.H. and Richard, M.O. (2017), "A social commerce investigation of the role of trust in a social networking site on purchase intentions", *Journal of Business Research*, Vol. 71, pp. 133–141.

Hazan, C. and Shaver, P.R. (1994), "Attachment as an organizational framework for research on close relationships", *Psychological Inquiry*, Vol.5 No. 1, pp.1-22.

Herbig, P. and Milewicz, J. (1996), "To be or not to be… credible that is: a model of reputation and credibility among competing firms", *Corporate Communications: An International Journal*, Vol. 1 No. 2, pp. 19–29.

Hovland, C.I. and Weiss, W. (1951), "The Influence of Source Credibility on Communication Effectiveness", *Public Opinion Quarterly*, Vol. 15 No. 4, pp. 635–650.

Hovland, C.I., Irving K.J. and Harold H.K. (1953), *Communication and Persuasion,* Yale University Press, New Haven, NY.

Jain, S. and Posavac, S. (2001), "Pre-purchase attribute verifiability, source credibility and persuasion", *Journal of Consumer Psychology*, Vol. 11 No. 3, pp. 169-180.

Jin, X.L., Cheung, C.M.K., Lee, M.K.O. and Chen, H.P. (2009), "How to keep members using the information in a computer-supported social network", *Computers in Human Behavior*, Vol. 25 No. 5, pp. 1172–1181.

Jun, S. and Yi, J (2020), "What makes followers loyal? The role of influencer interactivity in building influencer brand equity", *Journal of Product & Brand Management*, Vol. 29 No. 6, pp. 803-814.

Kim, D.Y. and Kim, H.Y. (2021), "Trust me, trust me not: a nuanced view of influencer marketing on social media", *Journal of Business Research*, 134, pp. 223-232.

Kim, D.Y. and Kim, H.-Y. (2023), "Social media influencers as human brands: an interactive marketing perspective", *Journal of Research in Interactive Marketing*, Vol. 17 No. 1, pp. 94-109.

La Ferle, C. and Choi, S.M. (2005), "The importance of perceived endorser credibility in South Korean advertising", *Journal of current issues & research in advertising*, Vol. 27 No. 2, pp. 67-81.

Lazarsfeld, P.F. and Merton, R.K. (1954), "Friendship as a social process: A substantive and methodological analysis", *Freedom and control in modern society*, Vol. 18 No. 1, pp. 18-66.

Leung, F.F., Gu, F.F., Li, Y., Zhang, J.Z. and Palmatier, R.W. (2022a), "Influencer marketing effectiveness", *Journal of Marketing*, Vol. 86 No. 6, pp. 93-115.

Leung, F.F., Zhang, J.Z., Gu, F.F., Li, Y. and Palmatier, R.W. (2022b), "Does Influencer marketing really pay off", *Harvard Business Review,* available at: https://hbr.org/2022/11/does-influencer-marketing-really-pay-off (accessed 25 September 2023).

Li, R. and Suh, A. (2015), "Factors influencing information credibility on social media platforms: evidence from Facebook pages", *Procedia computer science*, Vol. 72, pp. 314-328.

Lou, C. and Yuan, S. (2019), "Influencer marketing: how message value and credibility affect consumer trust of branded content on social media", *Journal of Interactive Advertising,* Vol. 19 No. 1, pp. 58-73.

McGuire, W.J. (1968), "The Nature of Attitudes and Attitude Change" In G. Lindzey, and E. Aronson (Eds.), *Handbook of Social Psychology,* Addison-Wesley, pp. 233–346.

McGuire, W.J. (1985), "Attitudes and Attitude Change", *Handbook of Social Psychology*, Vol. 2, pp. 233–346.

McKnight, D.H. and Kacmar, C.J. (2007), "Factors and effects of information credibility", in Gini M. and Kauffman R.J. (Ed.s)*, Proceedings of the 9th International Conference on Electronic Commerce,* New York, Association for Computing Machinery, pp. 423-432.

Metzger, M.J., Flanagin, A.J., Eyal, K., Lemus, D.R. and McCann, R.M. (2003), "Credibility for the 21st century: integrating perspectives on source, message, and media credibility in the contemporary media environment", *Communication Yearbook*, Vol. 27, pp. 293-336.

Mills, J. and Aronson, E. (1965), "Opinion change as a function of the communicator's attractiveness and desire to influence", *Journal of Personality and Social Psychology,* Vol. 1 No. 2, pp. 173–177.

Moorman, C., Deshpande, R. and Zaltman, G. (1993), "Factors affecting trust in market research relationships", *The Journal of Marketing,* Vol. 57, pp. 81-101.

Morimoto, M. and La Ferle, C. (2008), "Examining the influence of culture on perceived source credibility of Asian Americans and the mediating role of similarity", *Journal of Current Issues and Research in Advertising*, Vol. 30 No. 1, pp. 49-60.

Munnukka, J., Uusitalo O. and Toivonen H. (2016), "Credibility of a peer endorser and advertising effectiveness", *Journal of Consumer Marketing*, Vol. 33 No. 3, pp. 182-192.

Nafees, L., Cook, C.M. and Stoddard, J.E. (2020), "The impact of the social media influencer power on consumer attitudes toward the brand: the mediating/moderating role of social media influencer source credibility". *Atlantic Marketing Journal*, Vol. 9 No. 1, p. 3.

Ohanian, R. (1990), "Construction and validation of a scale to measure celebrity endorsers' perceived expertise, trustworthiness, and attractiveness", *Journal of Advertising,* Vol. 19 No. 3, pp. 39–52.

Petty, R.E. and Schumann, D. (1983), "Central and peripheral routes to advertising effectiveness: the moderating role of involvement", *Journal of Consumer Research*, Vol. 10 No. 2, pp. 135-146.

Pornpitakpan, C. (2004), "The persuasiveness of source credibility: a critical review of five decades' evidence", *Journal of Applied Social Psychology*, Vol. 34 No. 2, pp. 243-281.

Rather, R.A., Hollebeek, L.D., Vo-Thanh, T., Ramkissoon, H., Leppiman, A. and Smith, D. (2022), "Shaping customer brand loyalty during the pandemic: The role of brand credibility, value congruence, experience, identification, and engagement", *Journal of Consumer Behaviour*, Vol. 21 No. 5, pp.1175-1189.

Rebelo, M. F. (2017), "How influencers` credibility on Instagram is perceived by consumers and its impact on purchase intention", MSc Thesis, Universidade Católica Portuguesa.

Saima and Khan, M.A. (2020), "Effect of social media influencer marketing on consumers' purchase intention and the mediating role of credibility", *Journal of Promotion Management*, Vol. 27 No. 4, pp. 503-523.

Serman, Z.E. and Sims, J. (2022), "Source credibility theory: SME hospitality sector blog posting during the Covid-19 pandemic", *Information Systems Frontiers*, pp.1-18.

Shimp, T. A. (2000), *Advertising promotion. Supplemental aspects of integrated marketing communications* (5th ed.), Harcourt College Publishers.

Smith, R.E. and Vogt, C.A. (1995), "The effects of integrating advertising and negative word-of-mouth communications on message processing and response", *Journal of Consumer Psychology*, Vol. 4 No. 2, pp. 133-151.

Sokolova, K. and Kefi, H. (2020), "Instagram and YouTube bloggers promote it, why should I buy? How credibility and parasocial interaction influence purchase intentions", *Journal of Retailing and Consumer Services*, Vol. 53, p. 101742.

Spry, A., Pappu, R. and Cornwell, B. (2011), "Celebrity endorsement, brand credibility and brand equity", *European Journal of Marketing*, Vol. 45 No. 6, pp. 882-909.

Statista, (2023a), "Influencer marketing market size worldwide from 2016 to 2023", available at: https://www.statista.com/statistics/1092819/global-influencer-market-size/ (accessed 1 May 2023).

Statista, (2023b), "Share of marketing budgets spent on influencer marketing worldwide as of February 2023", available at: https://www.statista.com/statistics/268641/share-of-marketing-budgets-spent-on-digital-worldwide// (accessed 1 May 2023).

Statista, (2023c), "Global Instagram influencer market size from 2021 to 2025", available at: https://www.statista.com/statistics/748630/global-instagram-influencer-market-value/ (accessed 22 May 2023).

Sternthal, B. and Samuel, C.C. (1982), "*Consumer behavior: An information process perspective*", Prentice-Hall, Englewood Cliffs.

Sussman, S.W. and Siegal, W.S. (2003), "Informational Influence in Organizations: An Integrated Approach to Knowledge Adoption", *Information Systems Research*, Vol. 14 No. 1, pp. 47–65.

Van der Waldt, D., Van Loggerenberg, M., Wehmeyer, L. (2009), "Celebrity Endorsements versus Created Spokespersons in Advertising: A Survey among Students", SAJEMS, Vol. 12 No. 1, pp. 110-114.

Wang, S.W., Kao, G.H.Y. and Ngamsiriudom, W. (2017), "Consumers' attitude of endorser credibility, brand and intention with respect to celebrity endorsement of the airline sector", *Journal of Air Transport Management*, Vol. 60, pp. 10–17.

Weismueller, J., Harrigan, P., Wang, S. and Soutar, G.N. (2020), "Influencer endorsements: how advertising disclosure and source credibility affect consumer purchase intention on social media", *Australasian Marketing Journal (AMJ)*, Vol. 28 No. 4, pp. 1-11.

Xiao, M., Wang, R. and Chan-Olmsted, S. (2018), "Factors affecting YouTube influencer marketing credibility: a heuristic-systematic model", *Journal of media business studies*, Vol. 15 No. 3, pp. 188-213.

Yoon, K., Kim, C.H., and Kim, M.S. (1998), "A cross-cultural comparison of the effects of source credibility on attitudes and behavioral intentions", *Mass Communication and Society*, Vol. 1 No. 3-4, pp. 153-173.

SOCIAL EXCHANGE IN COMMUNITY-BASED PEER-2-PEER RIDESHARING: A QUALITATIVE APPROACH

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ABSTRACT
The sharing economy is a business model that has revolutionized the way individuals travel, work, and engage with each other (Akhmedova et al., 2021). The rise of digital technologies has led to changes in how sharing is performed, making it simpler and more efficient (Teodorović and Orco, 2008). The present study focuses on ridesharing facilitated by Facebook rather than specialized commercial peer-to-peer (P2P) platforms. This form of ridesharing is a type of community-based sharing economy with a high level of contribution to a more sustainable economy but still has not received the deserved scientific attention (de Rivera et al., 2017; Wai Lai and Ying Ho, 2022). Facebook groups have emerged as viable platforms for peer-to-peer ridesharing (Santa and Ciunova-Shuleska, 2019), where drivers and passengers are using informal Facebook groups to pre-arrange and self-organize the riding while sharing the costs with no intention for financial gain (Eskelinen and Venäläinen, 2021). However, it is not only the economic exchange transaction that matters in this form of sharing but also the social benefit, which has its role in the subjective cost-benefit analysis and comparison of alternatives that individuals do when making decisions (Kim et al., 2015). The Social Exchange Theory can be used to comprehend how the interactions between people lead to the development of relationships, which people may choose to maintain or end depending on the advantages (costs and rewards) associated with the relationship (Boateng et al., 2019). This theory resonates with the specifics of the sharing economy concept which is also embedded in interpersonal exchanges (Kim et al., 2015; Yan et al., 2016).

Through the Social Exchange Theory (SET) lens, the present study focuses on identifying the main benefits of using Facebook ridesharing and the main costs (risk/uncertainties) of its use. Based on this theory, we expect that users' actual ride-sharing participation is driven by economic and social benefits (Hamari et al., 2016; Boateng et al., 2019). On the other hand, the cost of participating in ridesharing is the perceived risk and uncertainties in the arrangement and performing processes (Kim et al., 2015). By researching users' behavior and underlying motivations, a deeper understanding of the sharing economy concept will be provided, and the strategies to encourage users' interest. Furthermore, this study seeks to fill the research gap on the drivers of users' sharing behavior that has arisen in addition to the rising research focus on the sharing economy (Davlembayeva et al., 2020).

Although previous research studies have focused on ridesharing via dedicated ridesharing platforms (Kooti et al., 2017; Wallsten, 2015), our study focuses on ridesharing via social media i.e., Facebook. Moreover, although previous research studies focused on analyzing

users' motivations to use ridesharing platforms (Amirkiaee and Evangelopoulos, 2018; Furuhata et al., 2017; Zhu, So, and Hudson, 2017) along with perceived risks (Wang, Wang, and Wang, 2019; Chean et al., 2022), it is still unclear what benefits, value and risks users perceive in sharing time and space with strangers using social media self-organizing ridesharing groups such as Facebook. This is even more important given that Facebook ridesharing groups do not have an online rating system that allows customers to rate drivers after the ride and to rely on drivers' ratings before making the decision to share a ride (Aw, Basha, Ng, and Sambasivan, 2019; Anderson, 2016). So, this study will be the first study to analyze the motivations and risks of using ridesharing via social media self-organized ridesharing groups providing valuable insights into the perceptions and behavior of the participants in ridesharing groups on Facebook.

The present research is based on a qualitative study applying focus groups as a data collection method. Focus groups are deemed suitable for this research as they provide exploration and generation of in-depth insights, opinions, and experiences of participants on the researched topic (Nyumba et al., 2018). The interactive nature of focus groups also facilitates group dynamics and the sharing of diverse perspectives. A convenience sample of 21 users of Facebook ridesharing groups was used, divided into three focus group sessions. The focus group sessions were conducted online and each lasted approximately 100 minutes, ranging from 88 to 112 minutes. The identified Facebook groups are dedicated to inter-city ridesharing in North Macedonia where more than ten public Facebook groups successfully assist in the organization of ridesharing in North Macedonia (Santa and Ciunova-Shuleska, 2019). The discussions were led by experienced moderators following a semi-structured list of questions/discussion topics, guiding the conversation and eliciting participants' thoughts, opinions, and experiences related to the research topic. The video recordings from each session were transcribed verbatim to maintain accuracy. Transcripts, along with any field notes taken during the sessions, were then subjected to a systematic coding process. The obtained qualitative data will be analyzed by applying a reflexive thematic analysis approach to provide deeper insights into the researched topics through interpretation (Braun and Clarke, 2021). The six-step process for reflexive thematic analyses is applied: 1) familiarity with the data, 2) generating initial codes, 3) constructing themes, 4) revising themes, 5) defining themes, and 6) reporting (Braun and Clarke, 2019).

Based on the initial exploration of the data, we strive to identify the crucial functional and economic benefits of using community-based P2P ridesharing (e.g., convenience, lower price, etc.) as well as some social benefits (e.g., enjoyment, social belonging, social interactions). On the other side of the cost-benefit matrix, we expect users to report some concerns and potential costs, such as uncertainty regarding the arranged price, safety, reliability, emotional labor, etc. By identifying the economic and social aspects of the ridesharing exchange, this study will provide insights into the underlying reasons for users' contribution to this form of sharing economy, thus obtaining a deeper understanding of the usage patterns.

Keywords: Facebook, ridesharing, sharing economy, social exchange theory

JEL Classification: M31, O33

REFERENCES

Akhmedova, A., Vila-Brunet, N., and Mas-Machuca, M. (2021), "Building trust in sharing economy platforms: Trust antecedents and their configurations", *Internet Research*, Vol. 31 No. 4, pp. 1463-1490.

Amirkiaee, S.Y. and Evangelopoulos, N. (2018), "Why do people rideshare? An experimental study", *Transportation Research Part F: Traffic Psychology and Behaviour*, Vol. *55*, pp. 9-24.

Anderson, D.N. (2016), "Wheels in the head: Ridesharing as monitored performance", *Surveillance & Society*, Vol. 14 No. 2, pp. 240-258.

Aw, E.C.X., Basha, N.K., Ng, S.I. and Sambasivan, M. (2019), "To grab or not to grab? The role of trust and perceived value in on-demand ridesharing services", *Asia Pacific Journal of Marketing and Logistics*. Vol. 31 No. 5, pp. 1442-1465.

Boateng, H., Kosiba, J. P. B., & Okoe, A. F. (2019), "Determinants of consumers' participation in the sharing economy: A social exchange perspective within an emerging economy context", *International Journal of Contemporary Hospitality Management*, Vol. 31 No. 2, pp. 718-733.

Braun, V. and Clarke, V. (2019), "Reflecting on reflexive thematic analysis. Qualitative Research in Sport", *Exercise and Health*, Vol. 11 No. 4, p. 589-597.

Braun, V. and Clarke, V. (2021), "Can I use TA? Should I use TA? Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches", *Counselling and Psychotherapy Research*, Vol. 21 No. 1, pp. 37-47.

Cheah, I., Shimul, A.S., Liang, J. and Phau, I. (2022), "Consumer attitude and intention toward ridesharing", *Journal of Strategic Marketing*, Vol. 30 No. 2, pp. 115-136.

Davlembayeva, D., Papagiannidis, S., and Alamanos, E. (2020), "Sharing economy: Studying the social and psychological factors and the outcomes of social exchange", *Technological Forecasting and Social Change*, Vol. 158, pp. 120-143.

de Rivera, J., Gordo, A. and Cassidy, P. (2017), "The collaborative economy in the era of digital capitalism", *Redes Com-Revista de Estudios Para el Desarrollo Social de la Comunicacion*, Vol. 15, pp. 20-31.

Eskelinen, T. and Venäläinen, J. (2021), "Economic moralities in self-organised alternative economies: the Finnish cases of ridesharing and timebanking", *International Journal of Sociology and Social Policy*, Vol. 41 No. 5/6, pp. 657-672.

Furuhata, M., Dessouky, M., Ordóñez, F., Brunet, M.E., Wang, X. and Koenig, S. (2013), "Ridesharing: The state-of-the-art and future directions", *Transportation Research Part B: Methodological*, Vol. 57, pp. 28-46.

Hamari, J., Sjöklint, M., and Ukkonen, A. (2016), "The sharing economy: Why people participate in collaborative consumption", *Journal of the Association for Information Science and Technology*, Vol. 67 No. 9, pp. 2047-2059.

Kim, J., Yoon, Y., and Zo, H. (2015), "Why people participate in the sharing economy: A social exchange perspective", *PACIS 2015 Proceedings*, 76.

Lai, M.K.W. and Ho, A.P.Y. (2022), "Sharing towards cohesive community: the role of social capital in sharing economy", *Social Transformations in Chinese Societies*, Vol. 18 No. 2, pp.105-121.

Nyumba, O.T., Wilson, K., Derrick, C.J. and Mukherjee, N. (2018), "The use of focus group discussion methodology: Insights from two decades of application in conservation", *Methods in Ecology and Evolution*, Vol. 9 No. 1, pp. 20-32.

Santa, M. and Ciunova Shuleska, A. (2019), "Is Facebook a ride-sharing platform? Exploration through affordance theory", In: *Humanizing Technology for a Sustainable Society Conference Proceedings*, University of Maribor Press, Maribor, 2019.

Teodorović, D. and Dell'Orco, M. (2008), "Mitigating traffic congestion: solving the ride-matching problem by bee colony optimization", *Transportation Planning and Technology*, Vol. 31 No. 2, pp.135-152.

Wang, Y., Gu, J., Wang, S. and Wang, J. (2019), "Understanding consumers' willingness to use ride-sharing services: The roles of perceived value and perceived risk", *Transportation Research Part C: Emerging Technologies*, Vol. 105, pp. 504-519.

Yan, Z., Wang, T., Chen, Y., and Zhang, H. (2016), "Knowledge sharing in online health communities: A social exchange theory perspective", *Information & Management*, Vol. 53 No. 5, pp. 643-653.

Zhu, G., So, K.K.F. and Hudson, S. (2017), "Inside the sharing economy: Understanding consumer motivations behind the adoption of mobile applications", *International Journal of Contemporary Hospitality Management*, Vol. 29 No. 9, pp. 2218-2239.

ESG ADOPTION IN THE BANKING SECTOR OF THE WESTERN BALKAN COUNTRIES

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ABSTRACT

Environmental, Social and Governance criteria (ESG) have been raising attention from all the stakeholders – governments, supervisors, businesses, financial institutions, investors etc. ESG has become mainstream in business strategy. Today, ECG criteria are an important and even obligatory part of the corporate strategy and sustainable development of a business. Those criteria are being used to evaluate business practice and performance. Studies have shown that applying ESG criteria properly could create higher value for the business. Western Balkan countries need sustainable financing and investments. In that regard, the banking sector in this region starts introducing ESG criteria in their metrics when approving financing for the companies. Sustainable financing is dedicated now to those companies that apply ESG framework in their business strategies. This paper aims to describe the current level of ESG adoption in the banking sector of the Western Balkan countries using SWOT analysis. Analysis has shown that the banking sector in Western Balkan countries has a good starting point to use strengths and opportunities for stronger development of ESG criteria for themselves and to support business in ESG reporting. In that regard, this paper contributes to the Western Balkans banks to remind them to further use and enhance their strengths and opportunities, but, on the other hand, to pay special attention and to focus more on those ESG criteria that are currently weak and represent threats for the ESG implementation in the Western Balkan's banking sector.

Keywords: banks, ESG criteria, ESG investing, Western Balkan (WB) countries, SWOT analysis

JEL classification: G21, Q01, R11

1. INTRODUCTION

In the last decade there has been inevitable business talk about ESG criteria (very often are called ESG factors or even standards as well). It has become mainstream in business strategy. ESG stands for Environmental, Social and Governance criteria. Those are a set of criteria related to the influence that organizations have on environment, employees' rights, health, and risk factors of injury to employees at work, as well as factors of stability and effectiveness of the corporate governance system. Non-traditional risk factors can have a key impact on the long-term sustainability of a corporation. Many financial institutions and managers take these criteria into account when making investment decisions.
ECG criteria today represent an important and even obligatory part of the overall corporate strategy and sustainable development of a business. Those criteria are being used to evaluate

business practice and performance in the aforementioned areas. ESG framework gives insight to stakeholders on the level of managing risks and opportunities that their organization has on environmental, social and governance criteria (Corporate Finance Institute, 2023). On capital markets, those criteria are becoming inevitable part of the analyses of a company's evaluation and performance on capital markets.

Having all this in mind, McKinsey&Company (2019) has stated that applying ESG criteria properly could create higher value for the entity. That results in fact that companies should put in ESG reporting everything that have performed in ESG field. Beforehand, this kind of reporting was used just from the part of those companies that have self-consciousness of practicing ESG criteria. Today, In European Union (EU), there are number of directives regarding sustainable finance and ESG criteria (SFDR-Sustainable Finance Disclosure Regulation; CSRD-Corporate Sustainability Reporting Directive; NFRD-Non-Financial Reporting directive). Some of those directives are already in force, and some of them will be used starting next year (2024).

Financial institutions also have strong regulatory demands regarding ESG criteria. "The number of financial institutions that integrate ESG in their decision-making processes is on the rise globally, and it is expected to increase in a post-Covid economy as studies have shown that companies with high ESG ratings held up better than their competitors during the crisis." (PwC Netherlands, 2023). According to World Economic Forum (2022) sustainable investing (traditional investments that are combined with ESG to achieve long-term returns and positive social impact; its importance has been growing in recent years in line with the growing importance of the concept of sustainability) will become the norm and companies that invest in clean, green businesses will continue to see better returns due to their ability to adapt to changing world.

A commitment to sustainable and socially responsible practices improves the reputation of financial institutions and attracts socially conscious clients and investors. Environmental, social and governance (ESG) risk represents a new risk area for banks. Stakeholders increasingly expect banks to demonstrate responsible practices for environmental protection, social impact, and corporate governance. Failure to address ESG issues, such as air pollution, human rights violations, or inadequate diversity of committees, can lead to a compromised reputation and loss of trust. Banks need to integrate ESG issues into their operations, develop sustainability strategies and report on their performance in the field of ESG (Gyamerah *et al.*, 2020).

This paper analyses the level of involvement of the banks in Balkan countries (Serbia, Montenegro, North Macedonia, Albania and Bosnia and Herzegovina) into the ESG framework. The aim is to describe the current level of ESG adoption in the banking sector of the Western Balkan countries using SWOT analysis. After the Introduction part, literature review is covered and then in the next section, research has been presented on given topic. According to the research results, some conclusions are pointed out as well as shortcomings of the given research. Finally, suggestions for future research have been disclosed, followed with the reference list.

2. LITERATURE REVIEW
2.1. ESG and ESG investing
In the global financial services industry, ESG criteria represent one of the most prominent topics nowadays. It is in focus for all stakeholders: businesses, capital markets, investors, financial institutions, and regulators. According to Syed & Ntim (2017) application of ESG criteria in investment decision making process will decrease inefficiencies and environment, social and governance criteria will enhance the overall management of entities from the view

of all stakeholders. In their study they have analyzed preferences of managers toward ESG criteria. They have pointed out some differences in that view between countries.

When we talk about business sustainability and responsible business practices, we came across two concepts - CSR (Corporate Social Responsibility) and ESG, often used in this context. These two concepts are similar but have different focuses and implications. Both these frameworks are being used by companies to evaluate sustainability, but the difference is that CSR may provide an internal framework for the company to communicate with employees, while ESG provides a measure of assessment for investors (O'Neill). Besides being a quantitative measure of sustainability, ESG, according to previous author, also improves the valuation of the business. Cornell and Damodaran (2020) in their study examined if the socially responsible behavior of a company leads eventually to concrete rise of value for the company itself, but also for the investors.

Study of Whelan *et al.*, (2020) who were analyzed more than 1,000 research papers exploring the relation between ESG and financial performance from 2015 till 2020, arguments to a growing agreement that good corporate management of ESG issues typically results in improved financial performance metrics such as ROE, ROA, or stock price.

Bearing in mind all this information, it is not hard to conclude the importance of including ESG criteria in the investment process. As mentioned before, ESG investing is an upgrade of the traditional investment process with the addition on environmental, social and governance performance of a company. "ESG analysis has become an increasingly important part of the investment process. For investment professionals, a key motivation in the practice of considering environmental, social, and governance (ESG) issues as part of their financial analysis is to gain a fuller understanding of the companies in which they invest." (CFA Institute, 2023).

Due to numerous supranational institutions' measures, sustainable finance approach is of great importance for achieving sustainable development goals (SDG). As a result, financial institutions have started heavily incorporating ESG in their investment process, encouraged by the need for the enhanced long-term financial values (OECD, https://www.oecd.org/finance/esg-investing.htm). But, on the other hand, investors should be aware of the findings from the study of Cornell (2020) that a lower cost of capital for the firms with high ESG score implies lower expected returns for them. Furthermore, the same author adduces that the importance of ESG framework "implies that the corporate objective of maximizing shareholder value, which lies at the core of much of finance theory, is outdated and needs to be replaced by a more comprehensive stakeholder model."

Very interesting research considering implementation of ESG criteria into the investment decision making process of conventional asset managers, has been conducted by Van Duuren *et al.*, (2016). One of the key findings of this survey is that assets mangers were using ESG data especially for red flagging and to manage risk. Authors Bai *et al.*, (2022) in their study investigated if a good ESG score could lead to lesser financial constraints. They revealed that not only did a good ESG score lead to diminished financial constraints but also could encourage institutional investors to increase their share in those companies, with further positive signal to the investment community.

The importance of ESG-oriented investing could be proved by looking into the size of ESG investments. According to Global Sustainable Investment Alliance - GSIA (2020) global sustainable investments reach 35,5 trillion US dollars. It has risen 15% since 2018, and it was 34% rise from 2016. (GSIA, 2018).

2.2. ESG criteria and banks

As awareness of ESG criteria and its effect on business performance are expanding, importance for this topic in financial institutions, especially banks, is huge. Achieving sustainable development, what should be of paramount importance for every responsible entity on Earth, requires large investments. In that sense sustainable finance and sustainable investments are very significant areas and its importance would grow further. In this context, financial services, with banks on the top, should have a prominent role in the process of providing adequate funds (Barjaktarovic Rakocevic *et al.*, 2022). Financial services firms or capital providers to industry and channels for investing individual wealth, are immensely involved directing the move from traditional business activities to those activities that incorporate ESG criteria (Thomson Reuters, 2021)

Authors Azmi *et al.*, (2021) have investigated how ESG criteria effects bank value. Their research among 251 banks from emerging markets revealed that environmentally friendly activities have the greatest effect on bank value, mainly through cost of equity, cash flow and net interest margin positively affect bank value. When considering banking promotion of ESG policies among their clients especially for lending activities, research of Houston and Shan (2022) found out that banks are keener to borrow to those clients that have similar ESG practices as the bank itself have. Also, this kind of practice further improves borrowers' ESG performance.

Interesting research on the impact ESG criteria, individually and jointly, have on bank stability, has been performed by the authors Chiaramonte *et al.*, (2021) within European banks. They have pointed out that the total ESG score decreases bank vulnerability during periods of financial stress. A similar study, with ESG score influencing specifically operation risk of the bank, has been performed in 35 countries. Results clearly suggest that the higher the ESG score, the lower bank operational risk is (Galletta *et al.*, 2023). Shakil *et al.*, (2021) have investigated the effects of ESG performance of banks on their financial performance, in emerging markets. The results showed a positive correlation of emerging market banks' environmental and social performance with their financial performance, but governance performance does not influence financial performance.

As mentioned before, EU legislation has NFRD, as an additional regulatory framework to comply with EU Taxonomy regarding ESG. EU banks, insurance companies and large companies with more than 500 employees will have to start obligatory ESG reporting beginning from next year (2024). What is important to mention is that banks will have to report on their climate change risks exposure, and what are they doing to soothe it. Furthermore, EU banks will also have to report on their level on financed greenhouse gas emissions and how they support the 2050 net-zero gas emissions (Furness, 2022).

ESG reporting has positive impact on bank performances, like shown in the research of Buallay (2019). This author analyzed the impact ESG has on ROA, ROE and Tobin Q. Study concluded that if measured individually, relationship between ESG disclosures differs: "the environmental disclosure found positively affect the ROA and TQ; the corporate social responsibility disclosure is negatively affecting the three models; the corporate governance disclosure found negatively affects the ROA, ROE and positively affects the Tobin's Q." This study was conducted within the European banking system.

Brogi and Lagasio (2018) have conducted research considering ESG reporting in companies as well as financial institutions. They concluded that that ESG activities in financial institutions, with the special focus on environmental activities, have higher positive impact on profitability than for the companies. Banks globally are paying a lot of attention to environmental issues, and Meles *et al.*, (2023) stated that environmental pillar outperforms all other dimensions in terms of risk reduction. Gai *et al.*, (2023) have created a theoretical model for a new scoring model for ESG disclosure in banks, and main results, from their pilot

testing, point out the necessity for banks to raise awareness "to social issues, especially concerning local communities".

3. RESEARCH
3.1. Descriptive analyses
ESG criteria have brought added value to business strategies, policies, and decision-making process, creating opportunities and challenges as well. As shown previously in the paper, from different studies, ESG criteria can bring economic performance enhancement, too, because of improvement of environmental, social relations and corporate governance framework within an organization. Before being incorporated in laws and directives, ESG criteria were important for those companies that were aware of incentives and expectations from their stakeholders, mainly business partners and investors.

For the banking sector ESG criteria are important twofold, for the banks themselves, to improve their environmental, social, and corporate governance performance, but also important for them as lenders, as financial institution that offers financial services to businesses and in that sense face ESG opportunities but also risks. To fulfill this ESG framework is a big challenge for banks. They have to collect and store important data sets on all ESG elements for themselves but also for the business partners they work for or with. In any case, every bank will have its own ESG framework because there are no two same solutions.

For all these reasons, as a research tool, we have decided to perform SWOT analyses, as situation analyses, to help identify strengths and weaknesses, opportunities and threats for ESG framework in banking sector of the Western Balkan countries. To use all the benefits from ESG implementation, we would like, with this analysis, to reveal current strengths and weaknesses, and future opportunities and threats for the banks in this area. After the analysis has been completed, the idea is to further enhance current strengths and eliminate current weaknesses but also to transform future opportunities into the strengths and be aware that threats could become future weaknesses.

In this section we start with the descriptive analysis of the Western Balkan countries: Serbia, Bosnia and Herzegovina, Montenegro, North Macedonia, and Albania. This part of analyses will support attempt to create SWOT analysis of ESG framework in the banking sector of Western Balkans countries. Analysis of ESG in banking sector has not been performed in this region so far, to the best of authors' knowledge. Data are segregated and encompass just part of the ESG criteria.

In table 1. are presented relevant data considering economies and banking sector of the Western Balkans countries: population, GDP per capita (PPP parity), number of banks and total bank assets.

Table 1: Relevant data for Western Balkan's countries

Country	Population[1] 2023	GDP (PPP) per capita[2] 2022 in US dollars	Number of banks[3]	Bank assets 2020[3]
Serbia	7,149,077	23.911	22	39,1 bln EUR
Montenegro	626,485	26.984	12	4,6 blb EUR
Bosnia and Hercegovina	3,210,847	20.377	15	13,2 bln EUR
North Mecedonia	2,085,679	20.162	14	9,5 bln EUR

| Albania | 2,832,439 | 18.552 | 12 | 12,5 bln EUR |

(Source:
[1] https://www.worldometers.info/world-population/population-by-country/, accessed August 2023
[2] https://www.worldometers.info/gdp/gdp-per-capita/, accessed August 2023
[3] https://thebanks.eu/compare-countries-by-banking-sector#ref_4, accessed August 2023)

Serbia has the biggest economy, according to total bank assets. In Serbia, question regarding ESG principles is not weather to apply them but how to integrate them into the bank's strategies. According to the official web page of biggest Serbian banks (considering total assets), they have created ESG strategies and perform activities in accordance with UNs The Sustainable Development Goals (SDGs). Also, those top tier banks are dedicated to green financing, meaning that companies that have higher ESG risks, have restrictions or total cease of long-term financing from the banks. Top banks in Serbia believe and act in direction to educate and support businesses in their effort to include ESG strategies in their business policies and strategies.

Banks individually rate the ESG score of the companies and include the ESG risks in their credit analyses. Bankers in Serbia believe that banks could push companies to sustainable development and ESG principles, because they have financing in their hands and could channel funds to those project that have prefix of being green. This is in accordance with EU Green Agenda for the Western Balkans[1] where EU is looking for decarbonization of Western Balkan countries. Serbia still does not have ESG scoring, but there is preparation of adopting first ESG regulations. Although ESG is still not mandatory in Serbia, there is a non-financial reporting requirement for all large legal entities with more than 500 employees, as well as for all large groups of legal entities with more than 500 employees. ESG's biggest flaw is that criteria are based on data provided by companies themselves, which are not always accurate and complete.

Bosnia and Hercegovina have the second largest banking sector within the Western Balkans. Banks in this country believe that "by investing in sustainable technologies, assets and operations, banks are funding solutions that reduce the impact on the planet for future generations. And in fact, it is not at all a question of whether banks should focus on ESG, but how much they are working in this direction to make the right decisions in this area with as much information as possible, as urgently as possible."[2] Largest banks in Bosnia and Herzegovina, similar to largest banks in Serbia, have prepare and adopt ESG strategies in their business strategies and decision making. There are banks in Bosnia and Hercegovina that, as a part of their banking group, are part of the Net Zero Banking Alliance (NZBA). That is a group of "leading global banks committed to financing ambitious climate action to transition the real economy to net-zero greenhouse gas emissions by 2050. NZBA's framework, guidance, and peer learning opportunities support members to design, set, and achieve credible science-based net zero targets for 2030 or sooner that deliver value for their investors, clients, and customers[3]. Bosnia and Hercegovina also are expecting to adopt its first regulation regarding directly ESG criteria. Also, there are two banks in Bosnia and Hercegovina that are part of NLB group that has received its first ESG rating in the Western Balkans region. This rating gives a score for the entity regarding its ESG performance in every sub element.

[1]https://neighbourhood-enlargement.ec.europa.eu/system/files/2020-10/green_agenda_for_the_western_balkans_en.pdf
[2] https://banke-biznis.com/esg-strategije-u-korporativnom-biznisu/
[3] https://www.unepfi.org/net-zero-banking/

Montenegro has the smallest population in this region, and accordingly the smallest bank sector considering bank assets, but on the other hand it has highest GDP per capita in the region. According to the population of Montenegro, there are too many banks currently operating in the country. Montenegro considers ESG framework as very important on their path to joining EU, and this country went the farthermost in EU approximation form all the Western Balkan countries. It is in Montenegro that the first Western Balkans ESG Summit took place in 2023. and was dedicated to sustainable development in this region.

"While in a better position than most other Western Balkans countries, Montenegro is more energy- and carbon-intensive than the average EU country, mainly because of its fossil-fuel use and aluminum industry. Reductions in capacity or the closure of facilities could hinder regional employment and economic development." (EBRD, 2022). This is the reason why banks in Montenegro pay strong attention to green financing and approving loans to those companies that have ESG criteria in their business strategies. Montenegro also has several banks that have adopted ESG framework in their business, for the banks themselves but also for the partners they do business with. The Central Bank of Montenegro became a member of the Network for Greening the Financial System (NGFS) (members are also Serbia, Albania an North Macedonia), the group of central banks and supervisory bodies whose goal is to support sustainable financial sector and to support transition to sustainable economy development (NGFS, 2017.)

North Macedonia has also raised interest in ESG information in the business. In 2022. Macedonian Stock Exchange (MSE) developed and launched, together with EBRD, ESG Reporting Guidelines for the listed companies. Those guidelines depict the strong dedication of financial institutions to help business sector include ESG framework in their strategies and business policies, for better performance and dedication to sustainable development. This guide will help listed companies to prepare for better reporting regarding ESG information (MSE&EBRD, 2022). Macedonian Stock Exchange is member of the Sustainable Stock Exchanges Initiative (SSE) (members are also Belgrade Stock Exchange and Banja Luka Stock Exchange), that proves their intention to promote sustainable investment and emphasize the importance of ESG framework.

Banks in Macedonia are on the strong path to promote ESG practices for themselves but also for the companies. The banking sector in Macedonia, in the future period, has intention to raise the loans to those companies with ESG strategies (Hadžispirkoska Stefanova, 2023). European banks, with their subsidiaries in North Macedonia will have to implement regulation in the domicile countries, and that will push forward the ESG practice in North Macedonia too, meaning that they will not finance companies that do not apply to ESG criteria. That is obvious because if they finance those companies with the higher risk, they will have to maintain higher levels of capital in that case and that will lower their profits and performance. Research in North Macedonia has showed that younger generation, that ae starting as banks clients as well as hold management positions in the companies are more aware of and support ESG topics (Hadžispirkoska Stefanova, 2023).

Albania has started already to promote sustainability as the nationally important framework for the government and business sector as well "through collective actions such as UN's Sustainable Development Goals Agenda persistently promoted by the international organizations present in the country, supported by the Government and embraced by large corporations"
(https://static1.squarespace.com/static/62630ecaf04bfe74d010e50b/t/62acef29ae630420cce58 fb0/1655500588292/ESG+in+Albania.pdf).

It is believed that banking sector in Albania should play crucial role in raising awareness for the ESG criteria and develop further ESG reporting. Starting from 2018. non-financial reporting is obligatory for companies with more than 500 employees. In non-financial

reporting, banks in Albania take leading role in preparing those reports. Largest banks in Albania, especially those that are subsidiaries of the foreign banks, have strong incentives to promote ESG with their clients for better performance of bank themselves and of the companies and improve their source of financing,

3.2. SWOT analysis

In this part of the paper SWOT analysis on ESG framework in the banking sector of Western Balkans countries is presented. Previous descriptive analysis on country's relation to ESG, regulations, as well as bank and company's adoption on ESG criteria were input for creating SWOT analysis. Besides previous analysis from secondary sources, web pages of the banks were also valuable insights for SWOT analysis.

Table 2 : SWOT analysis of ESG framework in banking sector of Western Balkan countries.

Strengths	Weaknesses
- strong will of the banking sector to implement ESG criteria; - every country has already begun progress towards ESG framework; - in banking sector of every country exist, at least initial, ESG framework; - banking sector in the Western Balkan region is aware that they must be initiators, facilitators, supporters and controllers of ESG implementation for the business sector.	- lack of ESG professionals and specialists; - no common metrics for ESG reporting; - lack of ESG metrics in current bank credit analyses; - no ESG scoring in countries; - no ESG scoring of banks operating in Western Balkan region (only one for now); - lack of ESG regulation in countries;
Opportunities	**Threats**
- building new value propositions; - developing new products and solutions for clients that add value; - maintaining competitive advantage; - driving sustainable growth; - younger generations understand and support ESG criteria; - foreign banks operating in Western Balkan region have expertise to deliver to the subsidiaries; - EU Green Agenda for the Western Balkans;	- constant flow of new regulations; - extensive compliance for the banks; - collection of ESG data; - ESG risks of companies; - creation of applicable metrics for companies and their scoring; - applicability of the metrics for the SMEs; - not even consideration between E, S and G criteria in the ESG framework; - when data are presented by companies themselves, they are not always accurate and precise;

(Source: Authors research)

This situation analysis, presented in the form of SWOT analysis, tried to depict the current situation regarding ESG level of adoption in the banking sector of the Western Balkan countries. This is just the first step for further analyses of this topic that has growing attention.

4. DISCUSSION AND CONCLUSION

Western Balkan countries are one of the most affected regions in Europe regarding climate issues. In 2020, those countries have signed Green Agenda for Wester Balkan, with the main goal to reach carbon-neutral status in these countries until 2050 and harmonization with the EU Green Deal. Western Balkan countries lag EU Member States in Central Europe and the Baltics, especially in the field of being green. Those countries are still more energy- and carbon-intensive than the EU average. This is primarily for the reason of fossil-fuel use and aluminum industry.

Achieving those goals could not be done without sustainable finance and investments. ECG criteria today represent an important and even obligatory part of the overall corporate strategy and sustainable development of a business. To be sustainable, business have to include those three letters in their business strategies – E - they have to care about environment, S – social responsibilities - care for people in the organization, and G – corporate governance = adequate management of the entity.

ESG is becoming mainstream in today's business. The banking sector has important role in achieve those ESG criteria. Banks could provide sustainable finance and investment for those businesses that implement ESG framework in their business. The value of sustainable finance and investments are even more significant for the Western Balkan countries.

EU regulations will include obligatory ESG reporting starting from 2024. In that sense, Western Balkan countries, being candidates to join the EU or having EU countries as main trading partners, will have to keep pace with the ESG regulations.

The goal of this paper was to depict the current degree of ESG acceptance in the banking sector of the Western Balkan countries. To portray aforementioned, SWOT analysis of ESG framework in the banking sector of Western Balkans countries have been presented. We have attempted to describe the strengths, weaknesses, opportunities, and threats of current and future ESG criteria in this region. We must conclude that the current position of the ESG topic in the banking sector is affirmative and promising. There are several strengths and opportunities banks should focus on, but also should pay strong attention to weaknesses and especially threats.

From this SWOT analysis, as perceived strengths of the WB banking sector could be highlighted: strong will of the banking sector to implement ESG criteria, and beside that, every country has already begun progress towards ESG framework with, at least initial, ESG framework in banking sector of every country. As main weaknesses were revealed: lack of ESG professionals and specialists, lack of common metrics for ESG reporting and lack of ESG metrics in current bank credit analyses. Main opportunities for the WB banking sector in ESG adoption include building new value propositions, developing new products and solutions for clients that add value, maintaining competitive advantage, driving sustainable growth. Also, the fact that younger generations understand and support ESG criteria gives opportunities for the bank since those generations are soon to be or already are bank' clients, business partners or employees. And finally, threats WB banks could face depict in the constant flow of new regulations, extensive compliance for the banks, extensive and diverse collection of ESG data; numerous ESG risks of companies, as bank clients or partners etc.

Results presented in the analysis could help WB banks to further enhance current strengths and eliminate current weaknesses but also to transform future opportunities into the strengths and be aware that threats could become future weaknesses in ESG implementation in the Western Balkan's banking sector.

This analysis has its limitation in using just secondary resources to reveal current situational analysis in ESG topic in Western Balkan banking industry. Future research is aimed at doing primary research and generating data from the Western Balkan banking sector.

REFERENCES

Corporate Finance Institute (2023), https://corporatefinanceinstitute.com/resources/esg/esg-environmental-social-governance/ (accessed 1. July 2023).

McKinsey&Company (2019), https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/five-ways-that-esg-creates-value (accessed 2. July 2023).

PwC Netherlands. https://www.pwc.nl/en/insights-and-publications/services-and-industries/financial-sector/six-key-challenges-for-financial-institutions-to-deal-with-ESG-risks.html (accessed 3. July 2023).

World Economic Forum (2022), https://www.weforum.org/agenda/2022/02/sustainable-investing-esg-finance-future-norm/ (accessed 3. July 2023).

Gyamerah, S., Amo, H. F., and Adomako, S. (2020), Corporate governance and the financial performance of commercial banks in Ghana. *Journal of Research in Emerging Markets*, *2*(4), 33–47. https://doi.org/10.30585/jrems.v2i4.541

Syed, A. M., and Ntim, C. G. (2017), Environment, social, and governance (ESG) criteria and preference of managers. Cogent Business & Management, 4:1, DOI: 10.1080/23311975.2017.1340820

O'Neill. What is the difference between CSR and ESG? Corporate Governance Institute. https://www.thecorporategovernanceinstitute.com/insights/lexicon/what-is-the-difference-between-csr-and-esg/ (accessed 4. July 2023).

Whelan, T., Atz, U., and Clark, C. (2020), ESG And Financial Performance: Uncovering the Relationship by Aggregating Evidence from 1,000 Plus Studies Published between 2015 – 2020. NYU Stern.

https://sri360.com/wp-content/uploads/2022/10/NYU-RAM_ESG-Paper_2021-2.pdf

Cornell, B., and Damodaran, A. (2020), Valuing ESG: Doing Good or Sounding Good? NYU Stern School of Business, Available at SSRN: https://ssrn.com/abstract=3557432 or http://dx.doi.org/10.2139/ssrn.3557432

CFA Institute. ESG Investing and Analysis. https://www.cfainstitute.org/en/research/esg-investing (accessed 5. July 2023).

OECD, https://www.oecd.org/finance/esg-investing.htm). (accessed 6. July 2023).

Cornell, B., (2020), ESG investing: Conceptual issues. The Journal of Wealth Management, 23(3), pp.61-69.

Van Duuren, E., Plantinga, A. and Scholtens, B., (2016), ESG integration and the investment management process: Fundamental investing reinvented. *Journal of Business Ethics*, *138*, pp. 525-533.

Bai, X., Han, J., Ma, Y. and Zhang, W., (2022), ESG performance, institutional investors' preference and financing constraints: Empirical evidence from China. Borsa Istanbul Review.

Global Sustainable Investment Alliance – GSIA (2020), Global Sustainable Investment Review 2020, pp 5. https://www.gsi-alliance.org/wp-content/uploads/2021/08/GSIR-20201.pdf

Global Sustainable Investment Alliance – GSIA (2018), Global Sustainable Investment Review 2018, pp 3. http://www.gsi-alliance.org/wp-content/uploads/2019/03/GSIR_Review2018.3.28.pdf

Barjaktarović Rakočević S., Rakić N., and Žarkić Joksimović N. (2022), Sustainable finance and investments in Western Balkans – where are we?, Conference proceedings of the 41st International Scientific Conference on the Development of Organizational Science „Society's Challanges for Organizational Opportunities". Portorož, Slovenia, pp. 109-123. ISBN 978-961-286-583-2 (pdf). DOI https://doi.org/10.18690/um.fov.3.2022.8

Thomson Reuters (2021), ESG: Fast-emerging challenges for financial institutions - A 2021 special report by Thomson Reuters Regulatory Intelligence. pp. 3. https://www.thomsonreuters.com/en-us/posts/wp-content/uploads/sites/20/2021/09/ESG-2021_A4_Final_web.pdf

Azmi, W., Hassan, M.K., Houston, R. and Karim, M.S., (2021), ESG activities and banking performance: International evidence from emerging economies. *Journal of International Financial Markets, Institutions and Money*, *70*, p.101277.

Houston, J.F. and Shan, H., (2022), Corporate ESG profiles and banking relationships. *The Review of Financial Studies*, *35*(7), pp.3373-3417.

Chiaramonte, L., Dreassi, A., Girardone, C. and Piserà, S., (2022), Do ESG strategies enhance bank stability during financial turmoil? Evidence from Europe. *The European Journal of Finance*, *28*(12), pp.1173-1211.

Galletta, S., Goodell, J.W., Mazzù, S. and Paltrinieri, A., (2023), Bank reputation and operational risk: The impact of ESG. *Finance Research Letters*, *51*, p.103494.

Shakil, M.H., Mahmood, N., Tasnia, M. and Munim, Z.H., (2019), Do environmental, social and governance performance affect the financial performance of banks? A cross-country study of emerging market banks. *Management of Environmental Quality: An International Journal*, *30*(6), pp.1331-1344.

Furness, V. (2022), "What worries banks about the EU's new ESG reporting proposals", available at https://capitalmonitor.ai/institution/banks/what-worries-banks-about-the-eus-new-esg-reporting-proposals/ (accessed 10. July 2023).

Buallay, A. (2019), Is sustainability reporting (ESG) associated with performance? Evidence from the European banking sector. Management of Environmental Quality: An International Journal, 30(1), pp. 98-115. https://doi.org/10.1108/MEQ-12-2017-0149

Brogi, M., and Lagasio, V. (2018), Environmental, social and governance and company profitability: Are financial intermediaries different? Corporate Social Responsibility and Environmental Management. 26 (3) (2019), pp. 576-587. https://doi.org/10.1002/csr.1704

Meles, A., Salerno, D., Sampagnaro, G., Verdoliva, V., and Zhang, J. (2023), The influence of green innovation on default risk: evidence from Europe. International Review of Economics & Finance. Vol. 84, pp. 692–710. https://doi.org/10.1016/j.iref.2022.11.036

Gai, L., Bellucci, M., & Ielasi, F. (2023), *Banks' ESG* disclosure: A new scoring model. Finance Research Letters. Vol. 57. https://doi.org/10.1016/j.frl.2023.104199

EBRD – European Bank for Reconstruction and Development, (2022), Montenegro country diagnostic: Private investment challenges and opportunities. https://www.ebrd.com/montenegro-country-diagnostic.pdf (accessed 10. August 2023.)

NGFS - Network for Greening the Financial System, (2017), https://www.ngfs.net/en (accessed 12. August 2023.)

MSE = Macedonian Stock Exchange & EBRD, (2022). ESG Reporting Guideline. https://sseinitiative.org/wp-content/uploads/2019/11/MSE-ESG-Reporting-Guide.pdf (accessed 14. August 2023.)

Nataša Hadžispirkoska Stefanova (2023), ESG what? Macedonian companies in a timid attempt, more back. https://mk.bloombergadria.com/biznis/kompanii/22020/esg-sto-makedonskite-kompanii-vo-sramezliv-obid-povekje-nazad/news (accessed 16. August 2023.)

FINANCIAL PERFORMANCE INDICATORS AND STOCK RETURNS: A DECADE-LONG ANALYSIS OF MBI10 FIRMS IN NORTH MACEDONIA

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ABSTRACT
This paper investigates the relationship between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia over a ten-year period from 2013 to 2022. A total of 100 observations from the Macedonian stock market index (MBI10) are analyzed, using audited financial statements as the primary data source. The financial performance indicators studied include Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS), and Dividend per Share (DPS). A multiple linear regression model is applied to examine the impact of these indicators on annual stock returns, with the model estimated through ordinary least squares (OLS) estimation. The research tests four hypotheses, aiming to establish significant positive relationships between ROA and Stock Return, as well as EPS and Stock Return. The results confirm the hypotheses related to ROA and EPS, with significant positive impacts on Stock Return. However, the relationships between ROE, DPS, and Stock Return lack statistical significance. The findings suggest that the financial performance indicators considered in this study only account for a limited proportion (4.9%) of the variations in Stock Return, indicating the influence of other essential factors not included in the model. To enhance the reliability of the findings, a robustness check was conducted by introducing two control variables: Macedonian GDP annual real growth rates, and DAX30 Index annual rate of return. The regression model, including these control variables, exhibited almost the same results as the model without them. Furthermore, the model with the control variables demonstrated a slightly higher Adjusted R Square value (0.058) compared to the model without them (0.049), implying a slightly improved explanatory power.This study highlights the complexities of the Macedonian stock market and emphasizes the importance of investigating additional factors that significantly contribute to stock price movements and returns in this specific market context.

Keywords: Stock return, ROA, ROE, EPS, DPS

JEL Classification: G12, M41.

1. INTRODUCTION

In recent years, there has been a growing interest in understanding the factors that influence stock returns and the relationship between financial performance indicators and stock market performance. The stock market plays a critical role in the economy, as it serves as a platform for companies to raise capital and for investors to allocate their resources. Investors often seek to maximize their returns by making informed investment decisions based on the financial performance of companies. At the same time, company managers aim to enhance their financial performance to attract investors and boost shareholder value. The aim of this paper is to explore

the relationship between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia. This study is motivated by the need to understand the dynamics of the Macedonian stock market and the influence of financial performance on stock prices. The MBI10 index represents a selected group of prominent companies listed on the Macedonian stock exchange, making it a relevant sample for studying stock market performance in the country. To achieve this objective, we will analyze a comprehensive dataset covering a period of ten years, from 2013 to 2022, and encompassing 100 observations from the MBI10 companies. The study will focus on four key financial performance indicators: Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS), and Dividend per Share (DPS). These indicators are widely used to assess a company's profitability, efficiency, and ability to generate returns for its shareholders. The study will investigate how these financial metrics are associated with annual stock returns in North Macedonia. The methodology employed in this study involves a quantitative analysis of financial data obtained from audited financial statements of the MBI10 companies. These financial statements provide reliable and comprehensive information about the financial performance of the companies over the specified ten-year period. Data on financial performance indicators (ROA, ROE, EPS, and DPS) and annual stock returns will be collected from the Macedonian stock exchange's official website (www.mse.mk) and other reliable financial databases. The study will employ a multiple linear regression model to examine the relationship between financial performance indicators and annual stock returns. The multiple linear regression model allows us to identify and quantify the impact of each independent variable (ROA, ROE, EPS, and DPS) on the dependent variable (annual stock return), while controlling for potential confounding factors. In order to enhance the reliability and validity of the findings, a robustness check will be conducted to assess the stability and consistency of the relationships between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia. For this purpose, two additional control variables will be introduced in the analysis: 1. Macedonian GDP annual real growth rates, and 2. DAX30 Index annual rate of return.The model will be estimated using the Statistical Package for the Social Sciences (SPSS) software. The results of the multiple linear regression analysis will be presented and discussed to assess the significance and direction of the relationships between financial performance indicators and annual stock returns. The findings will shed light on the influence of each independent variable on the dependent variable, providing valuable insights into the factors affecting stock prices in the context of the MBI10 companies in North Macedonia. The paper comprises five main sections: Introduction, Literature Review, Methodology, Results and Discussion, and Conclusion. Each section contributes to a comprehensive analysis of the relationship between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia.

2. LITERATURE REVIEW

Financial performance indicators play a crucial role in assessing a company's profitability, efficiency, and ability to generate returns for its shareholders. Investors, analysts, and stakeholders often rely on these performance metrics to evaluate the financial health and potential of a firm. Among these indicators, Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS), and Dividend per Share (DPS) are widely used in financial analysis due to their significance in decision-making processes. This literature review aims to explore and synthesize existing research on the relationship between these financial performance indicators

and average annual stock returns, shedding light on the influence of these metrics on shareholder wealth and stock market performance. Various financial indicators provide insights into a company's profitability and efficiency. The association between financial data and stock prices is elucidated by several theoretical frameworks, such as the Efficiency Market Hypothesis (EMH) and signaling theory. According to the EMH, stock prices encompass all currently available information, including financial indicators (Borges, 2010). In contrast, the signaling hypothesis posits that financial indicators can serve as signals of a company's financial stability and future potential, influencing investors' evaluations of the company's value and leading to fluctuations in stock prices (Hayes, 2022). The study by Indraswono (2021) assesses company performance using both traditional and modern techniques on the New York Stock Exchange, focusing on the Dow Jones index. The research analyzed two performance indicators, Economic Value Added (EVA) and traditional metrics (ROA, ROE, EPS, and DPS), using purposive sampling on 29 Dow Jones-listed companies from 2015 to 2018. The findings indicated that the traditional indicators had a significant and positive effect on Stock Return, while EVA had an insignificant and negative impact on Stock Return. Moreover, all indicators collectively demonstrated a significant and positive influence on Stock Return. Kopecká (2018) highlights that financial measures, particularly return on investment (ROI) and earnings, are valuable indicators providing meaningful information to shareholders and significantly influencing market value. However, the superiority of Economic Value Added (EVA) remains uncertain, and companies tend to prefer traditional financial measures over other financial tools. Musallam (2018) investigates the relationship between financial ratios and market stock returns in 26 Qatari listed firms from 2009 to 2015. The study finds that earnings per share, earnings yield ratio, and dividend yield ratio have a significant and positive relationship with market stock returns, while other ratios like market to book value ratio, return on assets, return on equity, price to earnings ratio, dividends earnings ratio, and net profit margin show insignificant relationships with market stock returns. Al-Lozi and Obeidat (2016) conducted a study on 65 manufacturing companies listed on the Amman Stock Exchange over a 10-year period (2001-2011) to investigate the relationship between financial indicators (profitability and leverage measures) and stock return. The results indicate that gross profit margin (GPM), return on assets (ROA), return on equity (ROE), and earnings per share (EPS) have a significant relationship with stock return, while net profit margin (NPM) and leverage measures (debt ratio, debt-to-equity ratio, and current ratio) do not show a significant relationship with stock return. Har and Ghafar (2015) conducted a study to examine the impact of ROA, ROE, and ROCE on stock returns for plantation companies listed on the Main Board of Bursa Malaysia, focusing on two distinct economic periods - prior to (2004-2006) and during (2007-2008) an economic recession. The research findings revealed that ROE had the highest explanatory power in explaining the variations in stock returns, while ROA and ROCE showed a positive and significant relationship with stock returns only during the economic period before the recession. Garba (2014) conducted a study to investigate the influence of dividend-per-share on common stock returns of manufacturing firms listed on the Nigerian Stock Exchange. The data from ten randomly selected companies were collected for the period 1991-2003, and multiple regressions and Pearson Moment Correlation were employed. The study found a highly significant positive relationship between dividend-per-share and common stock returns, indicating that dividend payments impact the stock returns of the sampled firms. Avdalović and Milenković (2017) conducted an empirical investigation to assess the association between different company performance indicators (ROA, ROE, EPS, etc.) and the stock price of firms listed on the Belgrade Stock Exchange during the period from 2010 to 2014.

The study confirmed a statistically significant correlation between company performance and stock price. Similarly, Parlakkaya and Kahraman (2017) employed earnings per share (EPS) and book value per share as independent variables and stock price as the dependent variable to examine how accounting information influences stock prices. The regression analysis revealed a direct link between stock price fluctuations and profitability ratios such as EPS and book value, suggesting that data from a company's balance sheet and income statements play a role in shaping stock prices. On the other hand, Tsipouridou and Spathis (2014) conducted a study in Greece, concluding that audit opinions are not associated with earnings management. In a related study, Choiriyah et al. (2020) found that both Return on Assets (ROA) and EPS significantly affect the stock prices of banking companies listed on the Indonesia Stock Exchange (IDX). As per the results of Claudia and Indrati's (2021) investigation, Return On Assets (ROA) does not appear to influence stock prices, while earnings per share (EPS) has a positive impact on stock prices. The evidence supporting the usefulness and relevance of accounting data in transition economies remains limited. Financial markets in European transitional economies, including North Macedonia, may exhibit reduced value relevance compared to Western economies due to several factors. Firstly, Jindrichovska (2001) suggests that these marketplaces may be less efficient. Secondly, despite the progress of financial markets, Eastern and Central European nations maintain bank-oriented financial systems, with a limited number of banks responsible for most of the company financing (Ali and Hwang, 2000). Lastly, the majority of nations in Eastern and Central Europe operate under a code-law legal system. According to Ball et al. (2000), the political nature of the standard-setting process in Eastern and Central Europe reduces the necessity for swift and conservative accounting income. Additionally, tax regulations contribute to the decreased value relevance of accounting data in these regions, where accounting earnings closely align with taxable income due to their use of the Continental accounting model. Another justification for the increased value relevance of accounting data in these countries is that financial statements serve as the primary and often sole source of information for investors in developing markets. As such, market prices are more likely to reflect accounting figures, particularly since investors have limited access to information beyond publicly available accounting data. Furthermore, the adoption of International Financial Reporting Standards (IFRS) by all listed businesses in Eastern and Central Europe has been instrumental in enhancing investor trust in accounting statistics and the overall utility of accounting information (Filip and Raffournier, 2010). Prior research in accounting and finance emphasizes the significance of investigating the impact of EPS and ROA on stock prices. EPS, representing the profit attributed to each existing share of common stock, serves as a crucial measure of a company's performance. Previous studies have consistently shown a strong positive relationship between EPS and stock prices (Dang et al., 2020; Agrawal and Bansal, 2021; Gharaibeh et al., 2022). Likewise, ROA, gauging the profit generated per unit of assets, acts as an essential indicator of a company's profitability and efficiency. Multiple studies (Baker and Powell, 2000; Alaagam, 2019; Ligocká and Stavárek, 2019) have highlighted the considerable positive impact of ROA on stock prices.

3. METHODOLOGY

This section outlines the methodology employed in the study that aims to explore the relationship between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia. The study covers a period of 10 years, from 2013 to 2022, and analyzes a total of 100 observations representing the 10 companies listed on the Macedonian stock market index

(MBI10). The primary source of data for this research is the audited financial statements of the MBI10 companies. These statements provide comprehensive and reliable information regarding the financial performance of the companies over the specified period. The financial statements were accessed through reliable sources, such as annual reports and financial databases, available on the Macedonian stock exchange's official website (www.mse.mk), ensuring the accuracy and consistency of the data. The dependent variable in this study is the annual stock return, which represents the percentage change in the stock price of a company over a specific year. The independent variables of interest are the financial performance indicators, including Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS), and DPS (Dividend per Share). These indicators are commonly used measures to assess a company's profitability, efficiency, and ability to generate returns for its shareholders. To ensure the robustness and validity of the multiple linear regression model used to explore the relationship between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia, additional control variables will be introduced: 1. Macedonian GDP annual real growth rate, and 2. DAX30 Index annual rate of return. These control variables will provide a comprehensive evaluation of the impact of the financial indicators on stock returns while considering the influence of external economic and market factors. Table 1 provides a description of the employed variables in the paper.

Table 1: Description of the Variables

Variables	Abbreviation	Measurement
Average Stock return	STOCK_RETURN	The difference between the stock prices at the end of the current year and the stock price at the end of the previous year.
Return on Assets	ROA	The Ratio between net profit after tax and average assets.
Return on Equity	ROA	The Ratio between net profit after tax and average equity.
Earnings per Share	EPS	The ratio between net earnings available to common shareholders and average outstanding common shares.
Dividend per Share	DPS	The total dividend payments divided by the number of shares outstanding.
GDP annual real growth rate	GDP	Macedonian GDP annual real growth rate,
DAX30 annual rate of return	DAX30	DAX30 Index annual rate of return (represents the performance of the 30 largest publicly traded companies in Germany)

(Source: Author's elaboration)

To examine the relationship between the financial performance indicators and annual share returns, a multiple linear regression model will be applied using the Statistical Package for the Social Sciences (SPSS) software. The multiple linear regression allows for the identification and quantification of the impact of each independent variable on the dependent variable while controlling for potential confounding factors. The multiple linear regression model will be constructed, with the annual share return serving as the dependent variable and the financial performance indicators (ROA, ROE, EPS, and Dividend per Share) as the independent variables.

The model will be estimated using ordinary least squares (OLS) estimation technique to determine the coefficients and significance levels of each independent variable. The model is formulated as follows:

$$Y = \beta0 + \beta1X1 + \beta2X2 + \beta3X3 + \beta4X4 + \mathcal{E}$$

Where: β0 represents the intercept term, the constant value; β1, β2, β3, and β4 are the regression coefficients that estimate the effect of each independent variable on the dependent variable Y = Stock Return; X1 = ROA; X2 = ROE; X3 = EPS; X4 = DPS and $\mathcal{E}$ = random error.

Based on prior literature and theoretical considerations (Clubb and Naffi, 2007; Haghiri and Haghiri, 2012; Ebrahimi and Chadegani, 2011; Al-Lozi and Obeidat, 2016), the following hypotheses will be tested:

Hypothesis 1 (H1): There is a significant positive relationship between ROA and Stock Return.
Hypothesis 2 (H2): There is a significant positive relationship between ROE and Stock Return.
Hypothesis 3 (H3): There is a significant positive relationship between EPS and Stock Return.
Hypothesis 4 (H4): There is a significant positive relationship between DPS and Stock Return.

These hypotheses suggest that higher values of ROA, ROE, EPS, and DPS will correspond to higher annual share returns for the MBI10 companies in North Macedonia. The hypotheses posit a positive relationship between these financial performance indicators and annual share returns, indicating that stronger financial performance and greater returns to shareholders are expected to be associated with higher share returns in the market.

Moreover, various diagnostic tests will be conducted to evaluate the assumptions of the model. These tests encompass linearity, normality, homoscedasticity, multicollinearity, and autocorrelation. In case any of these assumptions are violated, appropriate remedial actions will be taken, such as data transformations or the inclusion of interaction terms, to address the issues. The first assumption is related to the presence of a linear relationship between the dependent and independent variables. It is crucial for accurate estimation in multiple regression analysis. If the relationship is not linear, the results may underestimate the true relationship, leading to inaccurate estimations (Osborne and Waters, 2002). The second assumption focuses on the normal distribution of variables. When variables exhibit severe skewness, kurtosis, or contain significant outliers, it can distort correlations and significance tests, impacting the accuracy of the analysis (Osborne and Waters, 2002). Homoscedasticity is another important assumption. It indicates that the variance of errors remains constant across all levels of the independent variables. On the contrary, heteroscedasticity occurs when the variance of errors varies at different values of the independent variables (Osborne and Waters, 2002). While minor heteroscedasticity may not significantly affect significance tests, substantial heteroscedasticity can distort the results, increasing the risk of Type I errors (Berry and Feldman, 1985; Tabachnick and Fidell, 2001). Multicollinearity arises when two or more independent variables in the regression model are correlated. While a small degree of multicollinearity may occasionally pose issues, moderate to high levels can significantly impact the analysis and must be addressed (Daoud, 2017). The absence of autocorrelation is another essential aspect of a reliable model. Autocorrelation typically emerges in stock prices, where the current price is dependent on the preceding price. Autocorrelation occurs when the residuals are not independent from each other

(Getis, 2007). By thoroughly assessing these assumptions and addressing any violations, the research aims to ensure the robustness and reliability of the regression analysis and its findings. In this study, a value relevance approach is employed alongside multiple linear regression analysis to assess the impact of the independent variables (ROA, ROE, EPS and DPS) on the stock return of MBI10 companies. Value relevance refers to the extent to which financial information influences stock prices, determined by the strength of the correlation between the financial information and stock prices (Barth et al., 2001). A high correlation with market data signifies greater value relevance, indicating that accounting data aligns closely with market prices or returns (Filip and Raffournier, 2010). To evaluate the value relevance, calculating the coefficient of determination (R^2) for each independent variable in the regression model was a crucial step. This R^2 value indicates the proportion of variance in the dependent variable (Stock Return) that can be explained by the independent variable. According to Barth et al. (2001), a high R^2 value signifies a strong influence of the independent variable on the dependent variable, highlighting its value relevance.

4.   RESULTS AND DISCUSSION

Prior to presenting the regression model results, an analysis was conducted to examine the relationship between the stock returns of MBI10 and the independent variables (ROA, ROE, EPS, and DPS). The assumptions for multiple linear regression were tested to ensure their validity and appropriateness. The first assumption tested was the linearity assumption between the dependent variable (Stock return) and the independent variables (ROA, ROE, EPS, and DPS). Chart 1 illustrates the results of this analysis, showing the presence of linearity between the variables. Nearly all data points in Chart 1 align closely with the straight line, indicating a clear linear relationship between the variables.

Chart 1: Linearity
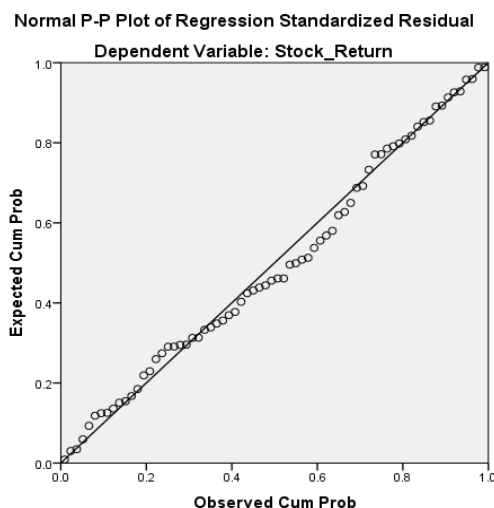
(Source: Author's elaboration)

Furthermore, a normality test was performed, i.e. testing the assumption of a normal distribution of the residuals of the dependent variable (the stock return). This assumption is checked with Kolmogorov-Smirnov and Shapiro-Wilk tests in SPSS, and the results are shown in Table 2.

Table 2: Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Stock_Return	.176	70	.000	.871	70	.000
Stock_Return (Sqrt)	.100	70	.079	.971	70	.109

(Source: Author's elaboration)

Upon analyzing Table 2, it becomes evident that the initial examination of the normality assumption for the dependent variable (Stock return) indicated a lack of normal distribution in the residuals. This was confirmed by both tests, where the p-values were below 0.05, signifying a statistically significant deviation from normality. To address this issue and meet the assumption, the dependent variable was transformed using the Square root (Sqrt) function in SPSS.

Following the transformation, it can be observed that the dependent variable now satisfies the requirement of normal distribution for further regression model testing. This is evident from the Kolmogorov-Smirnov (0.079) and Shapiro-Wilk (0.109) tests, both of which yield values greater than 0.05 as shown in Table 2. These results indicate that the transformed dependent variable (Stock return (Sqrt)) adheres to the assumption of normality, signifying that the deviation of its distribution from the normal distribution is not statistically significant.

The fulfillment of the normality assumption is also visually apparent in the graphical representation. Chart 2 displays the distribution of the dependent variable, demonstrating that its residuals exhibit a normal distribution pattern.

Chart 2: Distribution of Stock return (Sqrt)
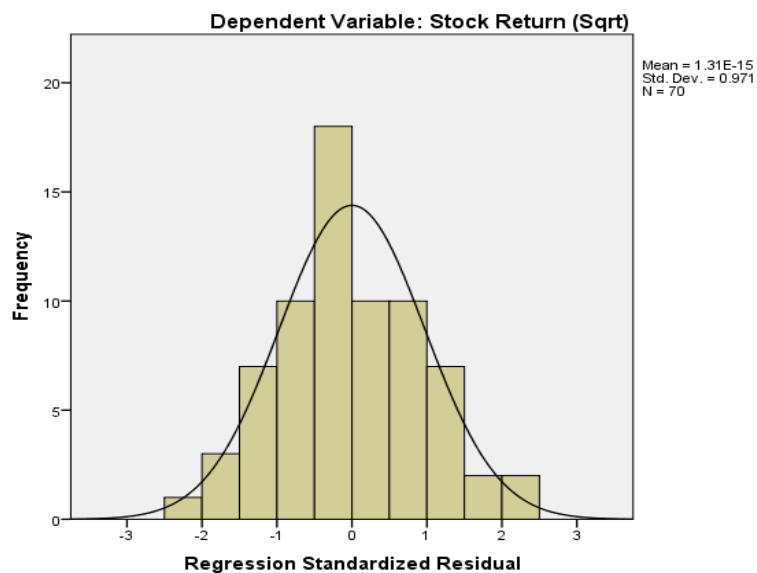
(Source: Author's elaboration)

Table 3 presents the results of the collinearity test, which helps determine whether there is multicollinearity among the independent variables. In order to satisfy the condition of absence of multicollinearity, the Variance Inflation Factor (VIF) should be below 10 (O'Brien, 2007). By

examining the collinearity statistics in the test, we can conclude that there is no multicollinearity, indicating that there is no significant correlation between the independent variables. This conclusion is supported by the VIF values, which are all less than 10.

Table 3: Collinearity Test

Model		Collinearity Statistics	
		Tolerance	**VIF**
1	EPS	.248	**4.036**
	DPS	.319	**3.133**
	ROA	.621	**1.610**
	ROE	.641	**1.560**

(Source: Author's elaboration)

The visual representation of Chart 3 supports the assumption of homoscedasticity. It is evident that the data points are evenly distributed around zero, indicating a relatively consistent variance of errors across all levels of the independent variables. Therefore, we can infer that heteroscedasticity is not present in the data.

Chart 3: Scatter Plot
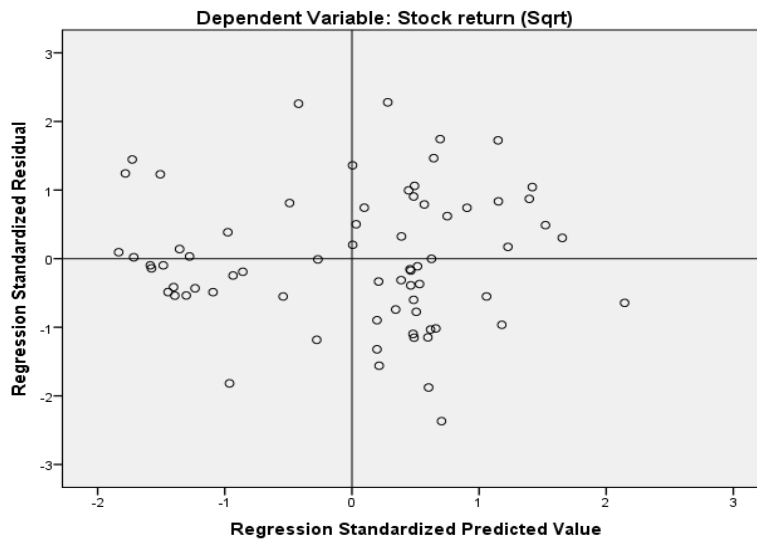
(Source: Author's elaboration)

To validate this finding, further examination was conducted by performing an analysis of variance (ANOVA) on the residuals. The outcomes of this test can be observed in Table 4, revealing that the p-value (Sig.) is 0.124, which exceeds the significance level of 0.05. Hence, based on these results, we can conclude that no heteroskedasticity is present.

Table 4: ANOVA of the residuals

Model		Sum of Squares	df	Mean Square	F	**Sig.**
1	Regression	.309	4	.077	1.881	**.124**
	Residual	2.669	65	.041		
	Total	2.978	69			

(Source: Author's elaboration)

Autocorrelation was examined as the final assumption using the Durbin-Watson test. The test yielded a value of 2.100, which is above the significance level of 0.05 (Table 5). Based on this result, it can be inferred that there is no evidence of autocorrelation present in the data.

Table 5: Durbin-Watson test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	**Durbin-Watson**
1	.322	.104	.049	.20265	**2.100**

(Source: Author's elaboration)

Once the necessary tests have confirmed that the assumptions for a valid and trustworthy regression model are satisfied, the next step involves executing the model to examine the potential influence of the independent variables on the dependent variable.

The results of the multiple linear regression model, are presented in the Table 6a.

Table 6a: Multiple Linear Regression Model – Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.463	.059		7.885	.000
	EPS	4.366	.000	.454	1.926	**.045**
	DPS	.000	.000	.281	1.353	.181
	ROA	2.212	.937	.352	2.360	**.021**
	ROE	.412	.526	.115	.782	.437

(Source: Author's elaboration)

Regarding H1, which posited a significant positive relationship between ROA and Stock Return, the regression analysis yielded a coefficient of 2.212 (Beta = 0.352, p = 0.021). The positive coefficient suggests that an increase in ROA is associated with a corresponding increase in Stock Return. Moreover, the p-value of 0.021 indicates that the relationship is statistically significant at the 5% level, supporting the acceptance of H1. This result builds on the study of Bintara and Tanjung (2019), who, investigating the Kompas 100 index listed on the Indonesia Stock Exchange (IDX), conclude that ROA has a positive effect on stock returns. Similarly, for H2, which proposed a significant positive relationship between ROE and Stock Return, the regression coefficient was found to be 0.412 (Beta = 0.115, p = 0.437). The positive coefficient suggests a positive association between ROE and Stock Return, but the p-value of 0.437

indicates that the relationship lacks statistical significance. Thus, H2 is not supported by the results. This result is contrary to the conclusions of most previous research, which concluded that ROE affects stock returns (Clubb and Naffi, 2007; Haghiri and Haghiri, 2012; Al-Lozi and Obeidat, 2016). In the case of H3, which assumed a significant positive relationship between EPS and Stock Return, the regression coefficient was 4.366 (Beta = 0.454, p = 0.045). The positive coefficient and the statistically significant p-value (0.045) indicate a strong and positive impact of EPS on Stock Return, supporting the acceptance of H3. This conclusion corresponds with the result in the study of Al-Lozi and Obeidat (2016) who, investigating 65 manufacturing companies listed in Amman Stock Exchange, conclude that EPS have a significant relationship with stock return. Lastly, H4 proposed a significant positive relationship between DPS and Stock Return. However, the regression coefficient for DPS was 0.000 (Beta = 0.281, p = 0.181), and the p-value of 0.181 suggests that the relationship is not statistically significant. Therefore, the results do not support H4. This result is contrary to the conclusions of most previous research, such as the study of Ebrahimi and Chadegani (2011), whose results show a relationship between DPS and stock returns. Shortly, the multiple linear regression analysis indicates that ROA and EPS have a statistically significant positive impact on Stock Return, supporting H1 and H3. On the other hand, the results do not provide sufficient evidence to support the significance of the relationships between ROE, DPS, and Stock Return (H2 and H4). These findings provide valuable insights into the influence of financial performance indicators on Stock Return, enabling a better understanding of the factors affecting stock prices in the context of the MBI10 companies in North Macedonia.

The results of the robustness check (Table 6b), where the regression model includes the two control variables, Macedonian GDP annual real growth rates and DAX30 Index annual rate of return, have provided valuable insights into the relationship between financial performance indicators and the stock return of MBI10 companies in North Macedonia. Interestingly, the findings from this extended model align closely with the initial regression model, which considered only the financial performance indicators (EPS and ROA) as independent variables.

Table 6b: Multiple Linear Regression Model – Coefficients (Including the control variables)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.451	.067		6.739	.000
	EPS	4.315	.000	.449	1.902	**.042**
	DPS	.000	.000	.281	1.358	.179
	ROA	2.259	.939	.359	2.405	**.019**
	ROE	.478	.526	.133	.909	.367
	GDP	.927	1.226	.090	.756	.453
	DAX30	.277	.184	.179	1.509	.136

(Source: Author's elaboration)

In both models, the multiple linear regression analysis revealed that only EPS and ROA had a statistically significant and positive impact on the stock return of MBI10 companies. This consistency in the results signifies the robustness and reliability of the relationships observed

between these financial performance indicators and stock returns, as they hold true even when accounting for external economic and market factors. Interestingly, the control variables, Macedonian GDP annual real growth rates, and DAX30 Index annual rate of return, did not exhibit statistically significant relationships with stock return in either regression model. This lack of significance suggests that, in the context of the MBI10 companies in North Macedonia, the stock returns are primarily influenced by internal financial performance indicators (EPS and ROA) rather than external economic and market conditions. The consistent results between the two regression models provide robust evidence that EPS and ROA are key determinants of stock return for the MBI10 companies, regardless of fluctuations in the country's GDP growth rates or changes in the DAX30 Index performance. This indicates that investors place significant emphasis on the financial performance and profitability of the individual companies when making investment decisions, outweighing the impact of broader economic and market factors.

Table 7a: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.322	.104	**.049**	.20265

(Source: Author's elaboration)

The strength of the influence of the independent variables on the dependent variable is determined using the coefficient of determination (Adjusted R Square), which ranges from 0 to 1, so the closer it is to 1, the stronger the relationship. Interpreting the Adjusted R Square rather than the R Square is preferable in this context because the Adjusted R Square considers the number of independent variables in the model, providing a more accurate representation of the proportion of variance in the dependent variable (Stock Return) that can be explained by the selected independent variables. In our analysis, the calculated Adjusted R Square value is 0.049 (as shown in Table 7a), indicating that the regression relationship is not particularly strong. To put it into perspective, the Adjusted R Square value of 0.049 implies that only 4.9% of the changes observed in the Stock Return can be attributed to the influence of the independent variables (ROA, ROE, EPS, and DPS) considered in the study. In contrast, the remaining 95.1% of the changes in the Stock Return are influenced by other factors that were not included in the model. Therefore, based on the obtained Adjusted R Square value, we can infer that the financial performance indicators (ROA, ROE, EPS, and DPS) examined in the research have a limited explanatory power when it comes to predicting the variations in Stock Return. These results suggest that there are likely other crucial factors beyond the scope of this study that play a more dominant role in determining the fluctuations in Stock Return among the MBI10 companies in North Macedonia. It is essential to acknowledge the limitations highlighted by the modest Adjusted R Square value and consider them when interpreting the research outcomes.

In the extended regression model, which includes the two control variables, the Adjusted R square is calculated to be 0.058 (Table 7b). This indicates that approximately 5.8% of the variance in the stock return of MBI10 companies can be explained by the combined influence of the financial performance indicators (EPS and ROA) and the control variables (Macedonian GDP annual real growth rates and DAX30 Index annual rate of return). The model's ability to explain a slightly higher proportion of the variance compared to the initial model without the control variables suggests that the addition of these external factors has a marginal impact on the overall explanatory power of the model. The financial performance indicators, specifically EPS

and ROA, continue to show statistically significant and positive impacts on the stock return of MBI10 companies, while the control variables do not contribute significantly to the model's explanatory power.

Table 7b: Model Summary (Including the control variables)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.374	.140	**.058**	.20169

(Source: Author's elaboration)

These findings underscore the importance of financial performance and profitability as key determinants of stock return in the Macedonian market and emphasize the need for investors and policymakers to focus on the internal financial health of companies when making investment decisions or formulating economic policies. Furthermore, the modest Adjusted R square values in both models highlight the complexity of stock market dynamics and the presence of various other factors that influence stock returns, warranting further exploration and research in this area. The results of this study offer valuable implications for investors and policymakers alike. For investors, the findings underscore the importance of analyzing a company's financial performance indicators, particularly EPS and ROA, to make informed investment decisions. Companies with strong earnings and efficient asset utilization are more likely to generate higher returns for investors, making them attractive investment opportunities. For policymakers, the results emphasize the significance of fostering an environment that promotes strong financial performance and profitability for companies operating in North Macedonia. Policies and regulations that support transparency, accountability, and financial sustainability are crucial for attracting investment and fostering economic growth. It is essential to acknowledge some limitations of this research. Despite the robustness of the results, the study focused on a specific set of financial performance indicators and control variables. There may be other relevant factors not considered in this analysis that could also influence stock returns. Additionally, the study is based on data from a particular period, and the results may vary in different market conditions or timeframes.

5. CONCLUSION

This paper sought to explore the relationship between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia over a ten-year period from 2013 to 2022. Through an empirical study utilizing multiple linear regression analysis, the impact of key financial indicators, including Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS), and Dividend per Share (DPS), on annual stock returns was investigated. Additionally, a robustness check was performed to assess the stability and consistency of the findings, while two control variables: Macedonian GDP annual real growth rates and DAX30 Index annual rate of return, were introduced to enhance the reliability of the results.The research aimed to provide valuable insights into the factors influencing stock prices in the Macedonian market and their implications for investors, analysts, and policymakers. The results of the multiple linear regression analysis revealed varying degrees of influence of the financial performance indicators on stock returns. Specifically, Return on Assets (ROA) and Earnings per Share (EPS) were found to have a statistically significant positive impact on annual

stock returns. This implies that companies with higher ROA and EPS values tend to generate higher stock returns, making them more attractive to investors. On the other hand, Return on Equity (ROE) and Dividend per Share (DPS) did not demonstrate a statistically significant relationship with annual stock returns, indicating that these financial indicators may not be strong predictors of stock price movements in the Macedonian market. To enhance the reliability and validity of the results, a robustness check was conducted by introducing two control variables: Macedonian GDP annual real growth rates and DAX30 Index annual rate of return. The inclusion of these control variables did not alter the main findings of the study, as the regression model with the control variables showed the same results as the model without them. This reaffirms the robustness and consistency of the relationships between ROA and EPS with stock returns. Moreover, the model with the control variables demonstrated a slightly higher Adjusted R Square value (0.058) compared to the model without them (0.049), indicating a slight improvement in the explanatory power. The control variables may have contributed to capturing some of the unexplained variance in the stock returns, leading to the increased Adjusted R Square value. The findings emphasize the importance of considering multiple financial performance indicators when assessing a company's potential to generate returns for shareholders. ROA reflects the efficiency of a company in generating profits from its assets, while EPS provides insights into the profitability allocated to each outstanding share. These two indicators can serve as valuable metrics for investors in assessing a company's overall performance and its ability to deliver attractive returns. Thus, investors and analysts in the Macedonian market should pay close attention to companies with robust ROA and EPS values as potential investment opportunities. However, the limited explanatory power of the financial performance indicators (as indicated by the modest Adjusted R Square value) suggests that there are other critical factors beyond the scope of this study that significantly influence stock returns in the Macedonian market. The complexity of stock market dynamics demands a comprehensive examination of various economic, political, and market-specific factors that could contribute to stock price movements. Therefore, future research should delve deeper into the exploration of additional factors that may play a more dominant role in determining stock returns in North Macedonia. The empirical study offers insights into the value relevance of accounting information in the Macedonian market. The positive relationship between financial performance indicators (ROA and EPS) and annual stock returns indicates that accounting data does indeed hold value relevance, influencing market prices and returns. This finding aligns with prior research and underlines the importance of financial statements as essential sources of information for investors in emerging markets like North Macedonia. In such markets, where other sources of information may be limited, financial statements play a crucial role in guiding investment decisions. Furthermore, the research contributes to the understanding of stock market efficiency and investment strategies in the Macedonian context. Investors seeking to maximize returns may consider focusing on companies with higher ROA and EPS values, as these companies have demonstrated a greater potential for delivering attractive stock returns. The research also highlights the potential benefits of diversification, as investors can spread their risk across multiple companies and industries to capture a wide range of opportunities in the market. From a policy perspective, the findings may be relevant for regulators and policymakers in North Macedonia who seek to promote transparency, efficiency, and investor confidence in the financial markets. Strengthening financial reporting standards, improving the accessibility of financial information, and fostering a robust investment environment are critical steps that can enhance market efficiency and attract more domestic and international investors. The integration

of rigorous methodology, robustness checks, and comprehensive analysis strengthens the reliability of the study's findings and establishes a foundation for further advancements in this field.

REFERENCES

Alaagam, A. (2019). The relationship between profitability and stock prices: Evidence from the Saudi Banking Sector. Research Journal of Finance and Accounting, 10(14).

Ali, A., and Hwang, L. S. (2000). Country-specific factors related to financial reporting and the value relevance of accounting data. Journal of Accounting Research, 38, 1−21.

Al-Lozi, N. M., and Obeidat, G. S. (2016). The relationship between the stock return and financial indicators (profitability, leverage): An empirical study on manufacturing companies listed in Amman Stock Exchange. Journal of Social Sciences (CoesandRj-Jss), 5(3), 408-424.

Avdalović, M. S. and Milenković, I. (2017) Impact of company performances on the stock price: An empirical analysis on select companies in Serbia, Ekonomika poljoprivrede, 64(2), 561-570, https://doi.org/10.5937/ekoPolj1702561M

Baker, H. K., and Powell, G. E. (2000). Determinants of corporate dividend policy: a survey of NYSE firms. Financial Practice and education, 10, 29-40.

Ball, R., Kothari, S. P., and Robin, A. (2000). The effect of international institutional factors on properties of accounting earnings. Journal of Accounting and Economics, 29, 1−51.

Barth, M. E., Beaver, W. H., and Landsman, W. R. (2001). The relevance of the value relevance literature for financial accounting standard setting: another view. Journal of accounting and economics, 31(1-3), 77-104.

Berry, W. D., and Feldman, S. (1985). Multiple Regression in Practice. Sage University Paper Series on Quantitative Applications in the Social Sciences, series no. 07-050. Newbury Park, CA: Sage.

Bintara, R., Tanjung P. R. S. (2019). Analysis of Fundamental Factors on Stock Return. International Journal of Academic Research in Accounting, Finance and Management Sciences, 9 (2), 49-64. http://dx.doi.org/10.6007/IJARAFMS/v9-i2/6029

Borges, M. R., 2010. Efficient market hypothesis in European stock markets. The European Journal of Finance, 16(7), 711-726. https://doi.org/10.1080/1351847X.2010.495477

Choiriyah, C., Fatimah, F., Agustina, S. and Ulfa, U., 2020. The Effect Of Return On Assets, Return On Equity, Net Profit Margin, Earning Per Share, And Operating Profit Margin On Stock Prices Of Banking Companies In Indonesia Stock Exchange. International Journal of Finance Research, 1(2), 103-123. https://doi.org/10.47747/ijfr.v1i2.280

Claudia, A., and Indrati, M. (2021). Analysis of Effect on Asset Return, Return on Equity, Earning Per Share, and Net Profit Margin on Stock price on Banking Company. Journal Research of Social, Science, Economics, and Management, 1(2), 64–78. https://doi.org/10.36418/jrssem.v1i2.10

Clubb, C., and Naffi, M. (2007). The usefulness of book-to-market and ROE expectations for explaining UK stock returns. Journal of Business Finance and Accounting, 34(1-2), 1-32. doi: 10.1111/j.1468-5957.2006.00662.x

Dang, H. N., Nguyen, T. T. C., and Tran, D. M. (2020). The impact of earnings quality on firm value: The case of Vietnam. The Journal of Asian Finance, Economics and Business, 7(3), 63-72.

Daoud I., J., 2017. Multicollinearity and Regression Analysis. Journal of Physics: Conference Series, p. 949.

Ebrahimi, M., and Aghaei Chadegani, A. (2011). The relationship between earning, dividend, stock price and stock return: evidence from Iranian companies. In International Conference on Humanities, Society and Culture, IPEDR, 20. IACSIT Press, Singapore

Filip, A., and Raffournier, B. (2010). The value relevance of earnings in a transition economy: The case of Romania. The International Journal of Accounting, 45(1), 77-103.

Garba, A. (2014). Impact of Dividend-Per-Share on Common Stock Returns: A Case Study of Some Selected Manufacturing Firms Listed on the Nigeria Stock Exchange. European Journal of Business and Management, 6(30).

Getis, A., 2007. Reflections on spatial autocorrelation. Regional Science an Urban Economics, 37(4), 491-496. https://doi.org/10.1016/j.regsciurbeco.2007.04.005

Gharaibeh, A. T., Saleh, M. H., Jawabreh, O., and Ali, B. J. (2022). An empirical study of the relationship between earnings per share, net income, and stock price. Appl. Math, 16(5), 673-679.

Haghiri, A., and Haghiri, S. (2012). The investigation of effective factors on stock return with emphasis on ROA and ROE ratios in Tehran stock exchange (TSE). Journal of Basic and Applied Scientific Research, 2(9), 9097-9103.

Hayes, A., 2022. Dividend Signaling: Definition, Theory, Research, and Examples. [Online] Available at: https://www.investopedia.com/terms/d/dividendsignaling.asp [Accessed 24 August 2023].

Indraswono, C. (2021). Traditional and Modern Analysis Performance Indicators: Evidence from New York Stock Exchange. KINERJA, 25(1), 64-78.

Jindrichovska, I. (2001). The relationship between accounting numbers and returns: Some empirical evidence from the emerging market of the Czech Republic. The European Accounting Review, 10, 107−131.

Kopecká, N. (2018). A literature review of financial performance measures and value relevance. In The Impact of Globalization on International Finance and Accounting: 18th Annual Conference on Finance and Accounting (ACFA), 385-393. Springer International Publishing.

Krishnan, J. and Krishnan, J., 2016. The Role of Economic Trade-Offs in the Audit Opinion Decision: An Empirical Analysis. Journal of Accounting, Auditing and Finance, 11(4), 565–586. https://doi.org/10.1177/0148558X9601100403

Ligocká, M., and Stavárek, D. (2019). The relationship between financial ratios and the stock prices of selected European food companies listed on stock exchanges. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 67(1), 299-307.

Musallam, S. R. (2018). Exploring the relationship between financial ratios and market stock returns. Eurasian Journal of Business and Economics, 11(21), 101-116.

O'Brien, R. M., (2007). A Caution Regarding Rules of Thumb for Variance Inflation Factors. Quality and Quantity, 41, 673–690.

Osborne, J. W. and Waters, E., 2002. Four assumptions of multiple regression that researchers should always test. Practical Assessment, Research, and Evaluation, 8(2). https://doi.org/10.7275/r222-hv23

Parlakkaya, R. and Kahraman, Ü. M. (2017). Muhasebe Bilgilerinin Hisse Fiyatlarını Açıklama Düzeyi Üzerine Bir Araştırma: Bist100 Uygulaması, Selçuk Üniversitesi İktisadi ve İdari Bilimler Fakültesi Sosyal Ekonomik Araştırmalar Dergisi, 17(33), 46-58

Tabachnick, B. G., Fidell, L. S. (2001). Using Multiple Statistics (4th ed.). Needham Heights, MA: Allyn and Bacon.

Tsipouridou, M. and Spathis, C., (2014). Audit opinion and earnings management: Evidence from Greece. Accounting Forum, 38(1), 38-54. https://doi.org/10.1016/j.accfor.2013.09.002

IS THE CLAIMS RATIO DYNAMIC PREDICTABLE? A STUDY OF THE MACEDONIAN NON-LIFE INSURANCE SECTOR

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ABSTRACT
Insurance, simplified to a risk management concept, offers protection against unexpected losses arising from adverse events. As a financial service of structural importance in modern economies, it requires specific attention due to its risk protection component. Consequently, insurance companies devote sufficient resources towards stable, resilient, and profitable operations. However, a scarce amount of research treats the topic of financial stability maintenance and claims management with even fewer studies dealing with its prediction. This study deals with claims ratio (CR) dynamics in the Macedonian non-life insurance sector and its prediction. Utilizing a data set of 138 monthly observations between January 2012 and June 2023, this paper models the CR indicator through multiple approaches i.e., naïve, ARIMA, ETS exponential smoothing, and random forest (RF) thus making suitability and accuracy comparisons. Results suggest that the SARIMA(4,0,2)(2,1,2,12) model is superior in predicting the claims ratio in both the training and test samples. Moreover, the random forest algorithm shows good performances in the test set but is only superior to the ETS(A,N,A) model.

Keywords: *Insurance, Predictive modeling, ARIMA, Exponential smoothing, Random forest.*

JEL classification: C22, G22.

1. INTRODUCTION

Insurance can be considered an ancient concept, with the earliest primitive iterations of insurance agreements predating the Common Era. Nonetheless, it was not until the late 14th century in Genoa, Italy, that autonomous insurance contracts first surfaced. Initially, the premise was relatively straightforward. In exchange for a nominal financial contribution, the insurer undertook the responsibility of mitigating the inherent risks to which the client was exposed. By amassing a substantial pool of premiums, signifying the cost associated with the respective insurance policy, the insurer could provide financial assistance to those encountering adverse events. However, the conceptual framework transcends this simplicity and extends beyond rudimentary business dealings. Through the application of intricate actuarial models predicated upon the probability of specific risk occurrences and the anticipated losses, insurance enterprises possess the capacity to sensibly establish premiums that are adequate to cover filed claims, sustain their insurance operations, and, notably, yield profitability. In a global context, emerging economies often encounter challenges when integrating the insurance sector into their financial systems. To illustrate, the Macedonian insurance market may still be characterized as emerging, with compulsory and government-regulated motor third-party liability (MTPL) insurance dominating the non-life insurance sector. Notably, 11 non-life insurance companies currently operate within the Macedonian

insurance market, each undergoing structural transformations over the past decade. Market strategies exhibit variability contingent upon corporate objectives and the maturation of distribution channels. Given the scarcity of global insurance literature devoted to the Western Balkan region, focusing particular attention on such growing markets assumes key significance.

This paper studies the problem of choosing an adequate approach toward claims ratio prediction in the Macedonian non-life insurance market. Companies must engage in strategic business planning, encompassing the formulation of anticipations regarding the forthcoming evolution of the market. Subsequently, the National Insurance Supervision Agency (ISA) must adopt a corresponding policy stance in response to these expectations. Through the utilization of predictive models, the study contributes to the global literature by observing the Macedonian case, which is a previously unexplored topic.

Secondary data is obtained from the national Insurance Supervision Agency (ISA) reports on the performance of the insurance undertakings by the 11 non-life insurance companies currently operating. Univariate time series data on gross written premiums (GWP) and gross liquidated claims (GLC) were obtained for the 2012Q1 to 2023Q2 period. Since the data at hand is initially supplied on a quarterly cumulative basis, while we are interested in a higher frequency i.e., monthly data, necessary transformations were conducted. Additionally, the study can be regarded as sectoral as we are not interested in studying individual company cases. Since the claims ratio (CR) is not readily available, we calculate it additionally. By employing several models for predicting the future dynamics of CR, we ought to find the best model and compare the accuracy performances of each, thus making a predictive power distinction. A naïve, ARIMA, and ETS exponential smoothing models are estimated, and their performance is observed. Finally, through time series embedding for the application of supervised learning, we run a random forest (RF) algorithm as a distinct solution for univariate forecasting concerning the previous. Accuracy measures are evaluated for the training and test period, with each of the models utilized for obtaining out-of-sample predictions. Results indicate that the seasonal ARIMA model outperforms the ETS state-space and random forest approach for a univariate set of data. In the test sample, the seasonal naïve model outperforms the exponential smoothing approach by 6.785 p.p. which rejects the previously set hypothesis. Overall, the random forest algorithm provides a novel and efficient approach to univariate forecasting but lacks predictive power based on the limited input and time series embedding.

The paper is structured in the following manner. After the introduction, Section 2 summarizes the global literature regarding insurance, risk management, and applications of predictive analytics in insurance. Next, we provide a detailed exploratory data analysis followed by a theoretical framework behind the models employed. In Section 4, we discuss and summarize the results and research limitations of our study. In the last section, we conclude the study adequately.

2. LITERATURE REVIEW

The claims ratio within the insurance industry constitutes a pivotal performance indicator aiding insurance enterprises in evaluating their fiscal well-being and the efficiency of their underwriting and claims administration procedures. It is a ratio that compares the total value of claims paid out by an insurance company to the total premiums collected from policyholders (Mahlow and Wagner, 2016) over a specific period, typically spanning a year. A heightened claims ratio signifies that the insurance firm is disbursing a substantial proportion of the premiums it accumulates in the form of claims, potentially affecting its profitability. Conversely, a diminished claims ratio implies that the firm is retaining a greater

proportion of the premiums as revenue. Insurance entities strive to maintain an equilibrium in their claims ratio. If the claims ratio is excessively elevated, it may signal that the company is either pricing its policies too conservatively or encountering a substantial influx of claims, which can engender financial instability. Conversely, a markedly low claims ratio may suggest that the company is inadequately fulfilling its obligations to policyholders or engaging in an overly assertive underwriting approach. According to Korir (2020), insurers should have a claim ratio between 60% and 90% to maintain financial soundness and profitability. However, one shoe does not fit all since the optimal level may be determined by a palette of micro and macro factors with claim ratios differing between various insurance classes. For example, property insurance companies may look for a lower ratio in order to generate profits and buffer possible natcat (natural catastrophe) events. Reinsurers on the other hand usually target a claims ratio near 100% as their primary function is to take on risks from primary insurance providers. Insurance companies employ claims ratios as a mechanism for risk appraisal and financial strategizing, and they may modify their pricing strategies, underwriting criteria, or claims handling procedures to attain a sustainable claims ratio that simultaneously facilitates profitability as one of its main micro-determinants in non-life insurance (Camino-Mogro and Bermúdez-Barrezueta, 2019). Empirically, the negative relationship between profitability and the claims ratio is studied by Ortyński (2016). The claims ratio, alongside other factors explored by Tsvetkova et al. (2021), accounts for approximately 45.1% of the total variability in the performance of insurance companies in Russia. However, some authors such as Tarsono et al. (2019) do not find a significant relationship between financial performance and claims ratio in the case of life insurance companies. Subsequently, if the claims ratio is one of the determinants of overall insurance performance, then the question of its predictability arises.

Since the claims ratio (CR) itself has been rarely studied, we observe research advances for its counterparts – the gross written premiums and claims. Traditional time series forecasting of premiums and claims is often found in the literature, with the ARIMA models being the frontrunner. Kumar et al. (2020) found that an ARIMA(1,0,1) acceptably predicts motor insurance claim data. A similar approach to ours is done by Olszowy (2013), which advocated that gross written premiums in the Polish insurance market follow a seasonal pattern and thus can be modeled by a SARIMA(0,1,2)(1,0,0,4) model. Contrary to classic time series methods, Goundar et al. (2020) study the predictability of medical claims through artificial neural networks (ANN), confirming their effectiveness in forecasting. Contrary to our approach, Quan and Valdez (2018) find that multivariate tree models marginally outperform univariate tree models for insurance claims. On the other hand, Fauzan and Murfi (2018) conclude that the XGBoost algorithm gives better accuracy compared to other supervised learning methods i.e., AdaBoost, Stochastic GB, Random Forest, and Neural Networks. For additional and expanded usage of machine learning in predicting insurance claims we suggest the work of Poufinas et al. (2023).

We extend the existing body of research by adopting a distinct approach. Our investigation centers on a multimodal framework, wherein we assess the precision metrics associated with each of the suggested methodologies. Additionally, the limited body of literature about the prediction of claims ratios has established a novel space for research, wherein predictive techniques can be leveraged to monitor the operational performance of insurance firms over an extended temporal horizon.

3. RESEARCH APPROACH

The study can be considered quantitative, employing predictive models for time series which are purely econometric or machine learning through supervised learning. A qualitative

assessment of the problem at hand is also given, supporting the empirical findings of the research. This paper focuses on two research aspects which we aim to solve i.e., unravel: a) finding the best possible univariate model of claims ratio (CR) based on model diagnostics and b) determining the financial health of the Macedonian non-life insurance sector and its future developments. Next, we set two interconnected hypotheses that we test: a) the ETS exponential smoothing models offer a more adequate approach when predicting the CR, and b) the employed random forest algorithm offers a powerful prediction but is a subordinated approach to classical time series methods. Both will be tested through a comparison of the accuracy measures of the training and test samples at hand. Model accuracy in the prediction of the claims ratio is evaluated based on time series splitting into two subsets. The first, also called a training set is used for model estimation and usually consists of the larger portion of the data. The test set is used to observe and evaluate model adequacy. Traditionally, the split is done on a 70:30 or 80:20 ratio. For our research, we split the disposable series such that 90% of data points are used for model estimation, while the remaining 10% for testing the models' accuracy. This is done largely due to the higher volatility observed in the premiums and claims in recent months since a smaller proportion for training would give predominantly inaccurate results.

3.1. Data analysis

For this research, we have utilized quarterly datasets for over a decade-long period, between 2012Q1 and 2023Q2. These data sources were procured from the insurance industry publications issued by the national regulatory body i.e., the Insurance Supervision Agency (ISA). Our analysis is particularly focused on the non-life insurance sector in the Republic of North Macedonia, which is comprised of eleven distinct insurance enterprises. The selection of this sector is underpinned by our specific interest in conducting a sectoral examination and the relative importance of non-life over life insurance in the country. Given the unavailability of publicly accessible monthly data, we have undertaken a transformation process to convert the quarterly data to monthly periodicity. This transformation was executed through the utilization of a quadratic transformation technique, which is an integral feature of the EViews software package. Consequently, this conversion has allowed us to establish a temporal framework spanning from January 2012 to June 2023. The rationale behind this conversion is twofold: firstly, it serves the purpose of enhancing the number of observations at our disposal, thereby bolstering the robustness of our modeling efforts; secondly, it facilitates a more nuanced comprehension of the main dynamics in the sectoral CR.

Since the claims ratio is not directly available, we calculate it based on the data at hand i.e., the gross written premiums (GWP) and the gross claims liquidated (GCL). The calculation of the claims ratio (CR) involves the division of the aggregate claim amounts settled during a specific fiscal year by the total premiums received during the same period. Thus, we can calculate it as

$$CR_t = \frac{GCL_t}{GWP_t} \tag{1}$$

where t denotes the observed period, with $t = 1, 2, 3, \dots T$. Figure 1 depicts the consolidated sectoral series of premiums and claims for the Macedonian non-life insurance market. Both series portray a rising trend, with evident seasonal components, which are emphasized for the GWPs. The COVID-19 pandemic notably created a structural break in the series for the 2020 period, after which the insurance activity experienced a sharp growth. It is worth mentioning that the last 12 or 18 months show a deterioration from the historical performance, especially

evident for the claims series. While such a dynamic may be an indicator of claims liquidation for large adverse events, that seems not to be the case. We believe that it is due to a balance sheet maneuver by specific entities, liquidating a larger buildup of multi-period claims.

Figure 1: Time series of gross written premiums (GWP) and gross liquidated claims (GLC), monthly sectoral data.
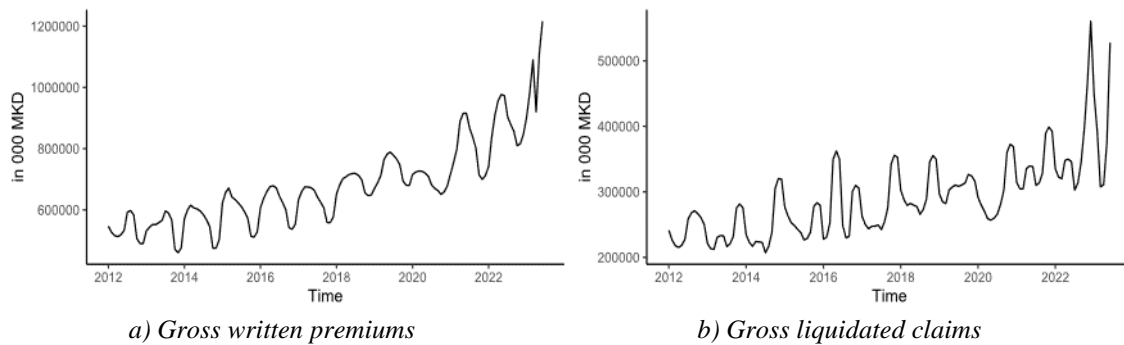
a) Gross written premiums   *b) Gross liquidated claims*
(Source: ISA reports on the performance of the insurance undertakings (2012-2023); Authors' depiction.)

The seasonal performance can be observed in Figure 2 which portrays the seasonal plots for each of the input variables. For the gross written premiums, it seems that they reach their peak during the second quarter of the year notably in June. On the contrary, claims usually peak during the last months of the year, mostly in December i.e., the fourth quarter. A certain degree of seasonality is thus also expected when calculating the claims ratio.

Figure 2: Seasonal plots of gross written premiums (GWP) and gross liquidated claims (GLC), monthly sectoral data.
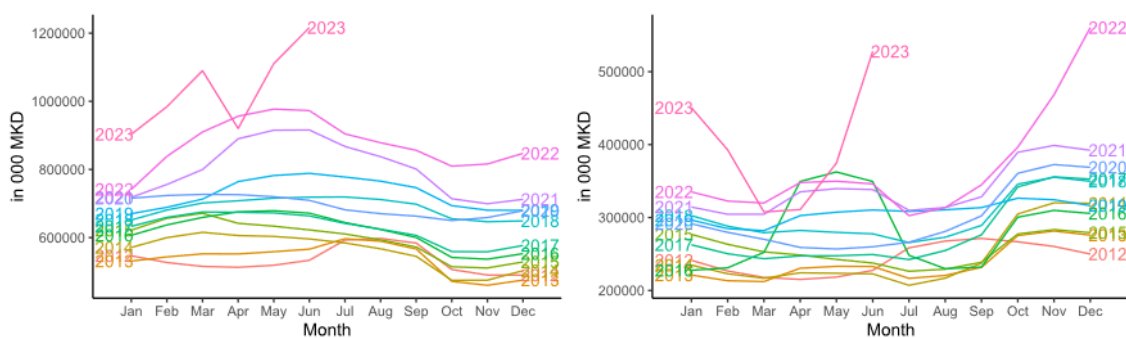
a) Gross written premiums   *b) Gross liquidated claims*
(Source: ISA reports on the performance of the insurance undertakings (2012-2023); Authors' depiction.)

The non-life insurance claims ratio can be observed in Figure 3 alongside their seasonality for each of the years under analysis. The shaded grey area portrays the 'assumed' level of the claims ratio to retain the financial stability of the insurance companies and it ranges between 35%-55%, based on median data of the European insurance markets which predominantly fall in this range (EIOPA, 2022). Predominantly, the claims ratio rarely breaches the lower bound of 35%. Even though such information may indicate lost profitability, the levels at which non-life insurance premiums are set in North Macedonia seem to be adequate in the coverage of the potential claims filed. Isolated cases of such dynamics may be observed only

in 2022 and 2023, while peaks above the upper bound of the 0.55 ratio are notable during 2013, 2014, 2017, 2018, 2020, 2021, and 2022.

Figure 3: Time series and seasonal plots of Macedonian non-life insurance claims ratio.
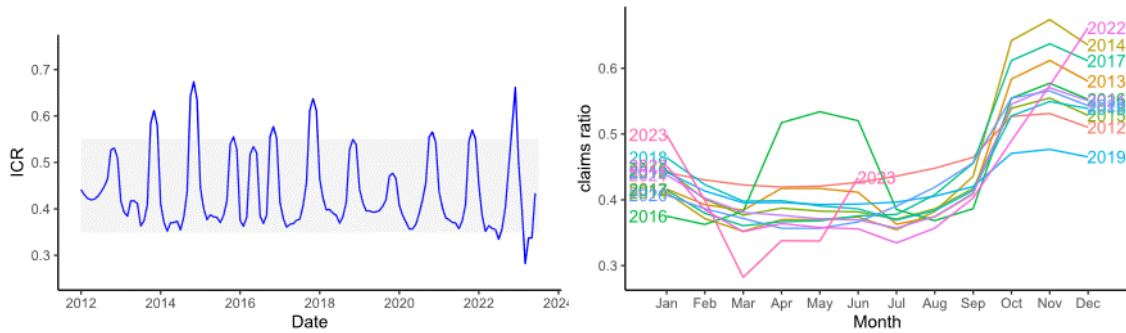
| *a) Claims ratio* | *b) Seasonal plot of the claims ratio.* |

(Source: Authors' calculations.)

According to the descriptive statistic, the claims ratio ranges between 0.6739 and 0.2823 with a mean value of 0.4367. Additionally, the median value of the CR is 0.4083, 25% of the data is found up to the level of 0.3766, and 75% of the data is up to 0.4752. Thus, half of the time analyzed, the claim ratio ranges between the first and the third quartile or in the highlighted grey area. The standard deviation of the data is 0.0824 while the coefficient of variation (CV) of 18.85% shows a relatively low variation present in the data. Based on the skewness and kurtosis values of the dispersion of the dataset (1.0381 and 3.143, respectively), we conclude that the CR series is positively skewed and with fatter tails compared to the normal distribution. After decomposing the CR series to check for its components, we found a strong seasonality present in the data peaking during Q4 each year as well as the absence of a clear trend, especially between 2014 and 2020.

Figure 4: STL decomposition of the non-life claims ratio.
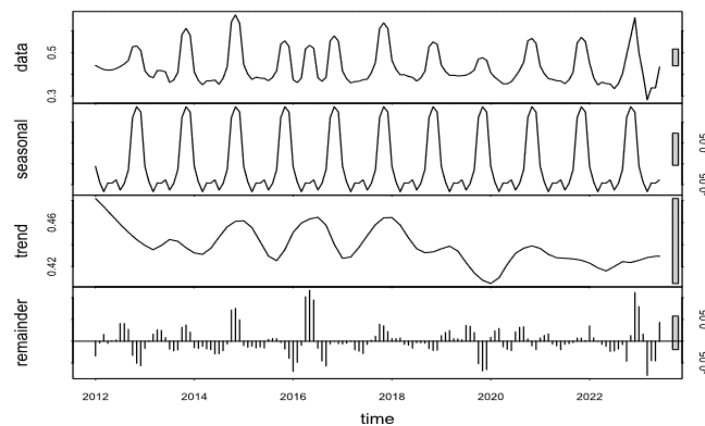
(Source: Authors' calculations.)

We split the claims ratio time series into two segments for our study. We employed a 90:10 split for the training and test sets, mostly due to the significant change in dynamics in the last 14 months for the gross written premiums and liquidated claims. Symbolically, the red line shows the test set upon which we check for model accuracy in the later stages.

Figure 5: Training and test split of non-life insurance claims ratio.
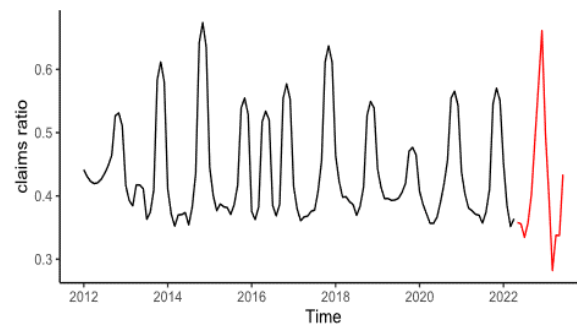
(Source: Authors' depiction.)

3.2. Methodology

Utilizing a variety of models in time series forecasting is essential due to the inherent complexity and variability present in real-world data. Employing multiple models allows for a more comprehensive exploration of the data's characteristics and patterns. Furthermore, model diversity helps in detecting anomalies, validating results, and accounting for uncertainties, which are crucial considerations in decision-making processes. Consequently, we aim to compare multiple approaches in forecasting the non-life insurance claims ratio (CR) in the Republic of North Macedonia in order to highlight the most suitable one.

Naïve models within the area of time series forecasting represent an elementary approach employed for predictive purposes, primarily reliant upon historical data. These models hypothesize that forthcoming values within a time series are either identical to or predominantly influenced by the most recently observed data points while disregarding underlying trends, patterns, or seasonality. Despite their lack of sophistication and susceptibility to underperform in scenarios involving intricate and dynamic time series data, naive models serve as helpful benchmarks for comparative assessments against more advanced forecasting methodologies. Even though they particularly find utility in instances where the data lacks a discernible pattern, we employ such an approach primarily to assess other models' performance in relation to the naïve approach. For instance, the seasonal naïve model, for example, can take the following form

$$\hat{Y}_{t+1} = Y_{t-k} \tag{2}$$

where k is the seasonal lag, which in the case of monthly data would be 12.

On the other hand, ARIMA (AutoRegressive Integrated Moving Average) models constitute a foundational and extensively utilized framework within the domain of time series analysis (Box and Jenkins, 1976). These models offer a robust methodology for capturing and modeling intricate temporal patterns embedded within time-dependent data. ARIMA models comprise three fundamental components: the autoregressive (AR) terms, which elucidate the temporal association between a data point and its historical values; the integrated (I) element, which states the number of differencing operations required to make the time series stationary; and moving average (MA) terms, which account for the impact of previous forecast errors on the current data point. Through thorough determination of the order of these components (typically represented as p, d, and q, respectively), ARIMA models can adeptly accommodate a diverse spectrum of time series data characteristics, encompassing trends, seasonality, and the presence of autocorrelation. Other extended models are also

popular, with the seasonal ARIMA and the ARIMAX being the most common. For example, a SARIMA(p,d,q)(P,D,Q,m) model, assuming it is stationary, can be expressed as

$$y_t = \mu + \sum_{i=1}^{p} \alpha_i y_{t-i} + \sum_{j=1}^{q} \beta_i \varepsilon_{t-j} + \sum_{i=1}^{P} A_i y_{t-mi} + \sum_{j=1}^{Q} B_i \varepsilon_{t-mj} + \varepsilon_t \qquad (3)$$

such that, A_i are the seasonal autoregressive parameters of order P and B_i are seasonal moving average parameters of order Q. With d and D we denote the differencing and seasonal differencing orders, while for indicating the seasonality we choose m. Additionally, for the ARIMAX form, we can include an additional exogenous regressor which should be significant in explaining the series dynamics.

The ETS (Error, Trend, Seasonality) exponential smoothing models represent a prominent category of methodologies extensively employed in the realm of time series analysis and forecasting. They present a versatile framework for the comprehensive modeling of diverse temporal patterns inherent in sequential data. ETS models encompass three fundamental constituents: error term (E), signifying the quantification of the residual variance or stochasticity within the time series, trend (T), which captures any systematic ascending or descending tendencies manifested over time, and seasonality (S), explaining the recurring patterns or cyclical components embedded within the data. Through manipulation of the smoothing parameters associated with these components, ETS models demonstrate proficiency in accommodating time series data characterized by varying combinations of error structures, trend dynamics, and seasonal influences (Holt, 2004). ETS models find particular utility in circumstances where data adherence to specific functional forms is not guaranteed or where the underlying temporal patterns evolve dynamically. Since there are a large number of plausible model combinations, hereby we present the multiplicative Holt-Winters form

Level equation: $$l_t = \alpha \left(\frac{y_t}{s_{t-L}} \right) + (1 - \alpha)(l_{t-1} + b_{t-1}) \qquad (4)$$

Trend equation: $$b_t = \gamma(l_t - l_{t-1}) + (1 - \gamma)b_{t-1} \qquad (5)$$

Seasonal equation: $$s_t = \delta \left(\frac{y_t}{l_t} \right) + (1 - \delta)s_{t-L} \qquad (6)$$

Forecast equation: $$\hat{y}_{t+h|t} = (l_t + hb_t)s_{t+h-L(k+1)} \qquad (7)$$

where the α, γ, and δ are the smoothing constants that require optimization, and L denotes the seasonal period. Unlike the ARIMA models, the exponential smoothing models are less rigorous in terms of achieving stationarity prior to model estimation. Moreover, they are less oriented towards posterior residual diagnostics and fit well on most of the data at hand.

The Random Forest (RF) algorithms, originally devised for classification and regression purposes, have been adapted for utilization in the domain of time series analysis. These supervised learning algorithms harness the principles of ensemble learning by constructing a multitude of decision trees and subsequently aggregating their predictive outputs. When applied to time series data, Random Forest models are modified to incorporate lagged observations and temporal features as input variables, thereby enabling the exploitation of temporal dependencies and underlying trends within the time series. While Random Forest algorithms may not possess the specialized focus on time series exhibited by dedicated

models like ARIMA or ETS, they offer a versatile and robust approach that we aim to put side to side with the aforementioned time series models.

4. RESULTS AND DISCUSSION

The seasonal naïve forecast replicates the previous season of values for the claims ratio as an intuitive way of portraying test period dynamics. It is interesting that even though this approach ranks among the simplest, still provides sufficient accuracy for our test period with a MAPE value of 8.552% (compared to 9.0629% during the training sample) which is regarded as a high accuracy. The MASE measure in the training period indicates that the model is exactly as good as just picking the last observation – which is logical to its nature, while for the test period, it is slightly better than that.

Upon estimation of the ARIMA model for the claims ratio, we imposed several restrictions on the *auto.arima()* function in R. To stabilize the variance, we use the $\lambda = 0$ parameter which is the same as taking the natural logarithm of the series. We also checked for the number of seasonal differences necessary in order to make the CR series stationary. The test indicated only one seasonal difference of lag 12 and no first-order differences necessary. The subsequent ACF and PACF plots resulted in ambiguous results, so we let the *auto.arima()* function chooses the optimal model based on minimizing the AICc. The maximum number of AR and MA terms was preset to 6, while the seasonal terms were set at a maximum of 2, with the maximum order of the model $(p + q + P + Q) = 16$. After estimating 882 different model combinations, the algorithm chose the $SARIMA(4,0,2)(2,1,2,12)$ model with drift as the one with the lowest AICc of -418.69. The mean absolute percentage error for the test period indicates a good model accuracy with a value of 1.8829%. By checking for residual autocorrelation through the Ljung-Box test, with a p-value of 0.7142 we could not reject the null hypothesis of no residual autocorrelation, which indicates a suitable prediction model. Even though the subsequent test model accuracy measures indicate improvement in predictability, we ought to emphasize that this model is unstable resulting in an infinite AICc. This is predominantly accounted for the especially short test period (14 months) to estimate a model with 13 parameters, thus yielding an irrelevant accuracy result.

Unlike the ARIMA model, the exponential smoothing does not require stationarity in the series prior to model estimation. However, we retain the logarithmic transformation in this model. Resembling the *auto.arima()* function, the *ets()* function under the forecast package also estimates a series of models and optimizes the smoothing parameters to reach the minimum information criteria. The model of choice is the additive $ETS(A, N, A)$ with no trend – as recalled earlier with the series decomposition. The optimized smoothing parameters $\alpha = 0.7975$ and $\gamma = 0.0395$ indicate a more responsive reaction to recent changes in the level of the series and slow adaptation to the seasonality changes, thus focusing more on historical seasonality dynamics. Subordinated to the SARIMA model, the ETS model has a slightly worse accuracy in the training period with MAPE of 4.7025%. If we check the model accuracy in the test period, due to the short time frame, the seasonal component is not estimated yielding just a simple exponential smoothing with additive errors or $ETS(A, N, N)$.

Finally, we observe how supervised learning deals with time series. The claims ratio as a vector of values needs to go through a procedure called time series embedding in order for the random forest algorithm to work. To feed the model with enough information upon building the regression trees, the features are the 12 lags of the original series. Then, they are embedded into a matrix structure suitable for applying our method. Consequently, we end up with a log-differenced series. By subsequently removing the blank values, we run the random forest algorithm on the training set and observe its behavior on the test sample. The

forecasting horizon h is set to the length of the test sample i.e., 14 observations. Even though the *auto.arima( )* and the *ets( )* functions revert the series to their original form, here we have to do it manually. We revert the process, i.e., we first reverse the differencing and then the natural log transform through an exponent function. The resulting model shows good forecasting accuracy with a MAPE of 10.629% for the test sample, making it a better approach than the exponential smoothing procedure.

Table 1: Model performances.

Training sample model	AICc	RMSE	MAPE	MASE
Seasonal Naïve	n.a.	0.054	9.063%	1
SARIMA(4,0,2)(2,1,2,12) with drift	-418.69	0.012	1.883%	0.204
ETS(A,N,A)	-33.43	0.031	4.703%	0.514
Random Forest Regression	n.a.	n.a.	n.a.	n.a.
Test sample model	**AICc**	**RMSE**	**MAPE**	**MASE**
Seasonal Naïve	n.a.	0.046	8.552%	0.877
SARIMA(4,0,2)(2,1,2,12) with drift	Inf.	0.009	0.718%	0.061
ETS	n.a.	0.085	15.848%	1.369
Random Forest Regression	n.a.	0.059	10.629%	n.a.

(Source: Authors' calculations.)

As can be observed, model accuracy increased for the testing period only for the seasonal naïve approach. By using the mean absolute percentage error as a relative measure of accuracy, fit for comparison between various models, we reject the hypothesis that the ETS exponential smoothing model provides better predictions. Moreover, it seems to be the worst-performing model for the testing period of May 2022 to June 2023 with a MAPE of 15.848% even though it's still regarded as a good prediction. On the other hand, the random forest algorithm can be applied to time series and offers a good prediction but is subordinated to the seasonal naïve and the SARIMA approach in the test period, confirming the initially set hypothesis. However, we can conclude that all models adequately predict the claims ratio which is expected to remain stable in the 35%-55% interval. The following Figure 6 shows how well each of the models predicts the test period dynamics alongside the confidence intervals (which are objectively omitted only for the random forest case). As can be observed, the SARIMA model offers smaller prediction intervals compared to the seasonal naïve and ETS models. Most of the data fits in the 80% intervals, especially for the naïve and exponential smoothing cases.

It is worth noting that there are some limitations to the research. At first, we only discuss univariate modeling while in reality, the case can be much more complex thus emphasizing the importance of exogenous predictors. The SARIMAX models are a possible fit but one should carefully choose the most significant exogenous variables. Second, the random forest regression employed is a novel approach to dealing with univariate data. The algorithm itself is built for multivariate data frames which by default provide a higher explanation for the cumulative variability. Finally, due to a lack of high-frequency data, we imposed a series of transformations to the original data so that we could work with stationary series. A small degree of important properties in the series were inevitably eliminated as a result.

Figure 6: Test period forecasts of claims ratio.
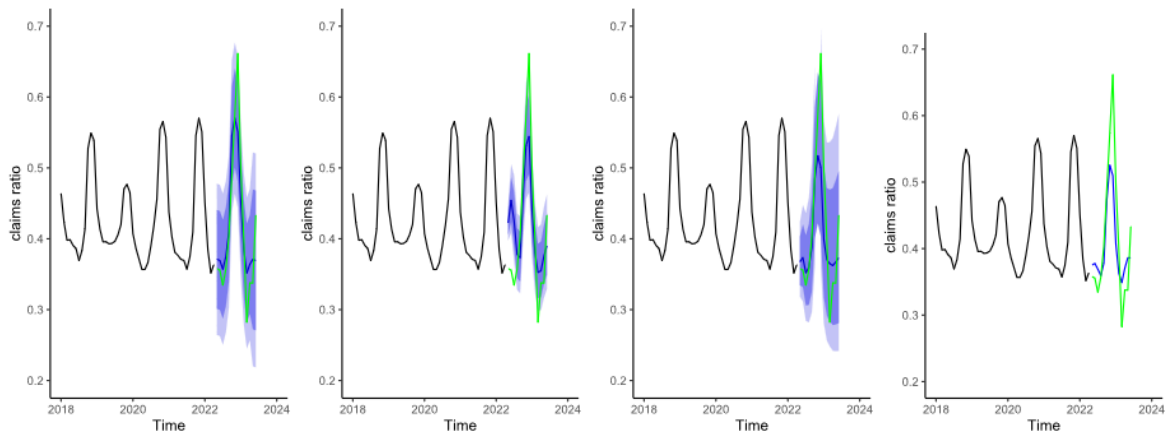
(Source: Authors' depiction.)

5. CONCLUSION

This research study addresses a pivotal concern about the prediction of claims ratios (CR) within the non-life insurance sector of Macedonia. The primary objective of this investigation was to make a substantive contribution to the extant scholarly literature by exploring a hitherto unexplored subject matter, specifically, the prediction of CR dynamics. Various predictive models were deployed, encompassing a simplistic naïve approach, ARIMA models, ETS exponential smoothing, and the random forest algorithm. These modeling choices were made to evaluate their appropriateness and precision in forecasting CR dynamics, thereby offering valuable insights to both insurance enterprises and regulatory bodies, with particular emphasis on the Insurance Supervision Agency (ISA) concerning the profitability and financial stability of the insurance sector. The research findings unveiled that the seasonal ARIMA model, specifically the SARIMA(4,0,2)(2,1,2,12) configuration, demonstrated superior predictive accuracy for CR, both within the training and test datasets. This model, characterized by its adeptness in capturing seasonal patterns and underlying trends, exhibited a mean absolute percentage error (MAPE) of 1.8829% during the test period, thereby underscoring its efficacy in CR prediction. Although the random forest algorithm exhibited promise, it was discerned to be comparatively less effective than the SARIMA model, albeit still outperforming the ETS model in the test dataset. Additionally, the seasonal naïve model, despite its inherent simplicity, demonstrated a commendable degree of accuracy in predicting CR during the test period, registering a MAPE of 8.552%, thus underscoring its potential as an uncomplicated yet potent forecasting tool. In summary, this research effort contributes significantly to the comprehension of CR dynamics within the Macedonian non-life insurance sector and underscores the paramount significance of judicious model selection for predictive purposes. The research findings offer valuable insights for stakeholders within the industry and regulatory authorities, thereby facilitating informed decision-making and enabling assessments of financial stability. Future research initiatives in this domain should contemplate the augmentation of the dataset and the exploration of advanced modeling methodologies to further enhance predictive precision. In the broader context, this study serves as a valuable point of reference for academicians, practitioners, and policymakers with a vested interest in the financial robustness and performance of insurance entities operating within an evolving market milieu. The outcomes suggest that the incorporation of predictive models could greatly augment the anticipations of profitability and financial stability for both the ISA and insurance companies.

REFERENCES

Box, G. E. P., and Jenkins, G. M. (1976), *Time Series Analysis: Forecasting and Control*, Second edition, Holden-Day.

Camino-Mogro, S. and Bermúdez-Barrezueta, N. (2019), "Determinants of profitability of life and non-life insurance companies: evidence from Ecuador", *International Journal of Emerging Markets*, 14(5), pp. 831-872. doi: 10.1108/IJOEM-07-2018-0371

EIOPA (2022), "European Insurance Overview 2022". Available at: https://register.eiopa.europa.eu/Publications/Insurance%20Statistics/European-Insurance-Overview-Report-EIOPA-2022.html (accessed 2 October 2023).

Fauzan, M.A. and Murfi, H. (2018), "The accuracy of XGBoost for insurance claim prediction", *International Journal of Advances in Soft Computing and its Applications*, 10(2), pp.159-171.

Goundar, S. Prakash, S., Sadal, P., and Bhardwaj, A. (2020), "Health Insurance Claim Prediction Using Artificial Neural Networks", *International Journal of System Dynamics Applications (IJSDA)*, 9(3), pp. 40-57. doi: 10.4018/IJSDA.2020070103.

Holt, C. C. (2004), "Forecasting seasonals and trends by exponentially weighted moving averages", *International Journal of Forecasting*, 20(1), 5–10. doi: 10.1016/j.ijforecast.2003.09.

Insurance Supervision Agency. *Reports on business performance of the insurance undertakings* (2012-2023). Available at: https://aso.mk/en/category/reports/isa-reports-en/insurance-companies-en/

Korir, E. K. (2020), "A Study on Medical Insurance Claim Ratio in Kenya", *International Journal of Innovative Science and Research Technology*, 5(10), pp. 146-152.

Kumar, V. S., Satpathi, D. K., Kumar, P. T. V. P., and Haragopal, V. V. (2020), "Forecasting motor insurance claim amount using ARIMA model", International conference on mathematical sciences and applications (ICMSA-2019). doi:10.1063/5.0014449.

Mahlow, N., and Wagner, J. (2016), "Process landscape and efficiency in non-life insurance claims management", *The Journal of Risk Finance*, 17(2), pp. 218–244. doi:10.1108/jrf-07-2015-0069

Olszowy, W. (2013), "Time Series Forecasting of the Development of the Insurance Industry in Poland", Bachelor Thesis, Humboldt Universität zu Berlin School of Business and Economics.

Ortyński, K. (2016), "Determinants of profitability of general insurance companies performance in Poland", *Central European Review of Economics & Finance*, 12(2), pp. 53-66.

Poufinas, T., Gogas, P., Papadimitriou, T., and Zaganidis, E. (2023), "Machine Learning in Forecasting Motor Insurance Claims", *Risks 2023*, 11(9), 164, doi: 10.3390/risks11090164.

Quan, Z. and Valdez, E. A. (2018), "Predictive analytics of insurance claims using multivariate decision trees", *Dependence Modeling*, 2018, 6, pp. 377-407. doi: doi.org/10.1515/demo-2018-0022

Tarsono, O., Ardheta, P. A., and Amriyani, R. (2019), "The Influence of Net Premium Growth, Claim Ratio and Risk-Based Capital on the Financial Performance of Life Insurance Companies", *Advances in Economics, Business and Management Research*, volume 127, pp. 65-68.

Tsvetkova, L., Bugaev, Y., Belousova, T., Zhukova, O. (2021), "Factors Affecting the Performance of Insurance Companies in Russian Federation", *Montenegrin Journal of Economics*, 17(1), pp. 209-218. doi: 10.14254/1800-5845/2021.17-1.16

INTEGRATION OF ESG ISSUES IN INVESTMENTS PRACTICES OF PENSION FUNDS

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ABSTRACT
Pension funds are major asset owners in financial markets and global investors with long-term investment horizons and the need for stable and predictable cash flows. On the other hand, these institutional investors are crucial for maintaining social security, so their performance and investment structure should take into account their responsibility for the environment and society in general. Therefore, they have an extraordinary potential and special responsibility to take measures against sustainability risks and to green the economy, but also to improve social and managerial aspects when adjusting their investment portfolios. Pension funds among institutional investors are expected to make an important contribution to the transition to a sustainable economy. The objective of this paper is to highlight the importance of integrating environmental, social and governance (ESG) aspects into the structure of pension funds' investment portfolios, taking into account related regulatory measures and anticipating transition risks. Investment strategies refer to exclusion procedures for ineligible investments, but also to sophisticated screening techniques and verification of compliance with specific sustainability criteria to contribute to the transition to a greener and more sustainable economy.

Keywords: ESG, Pension funds, Investments

JEL classification: G11, G23, Q5

1. INTRODUCTION

In recent decades, economic development has been largely determined by environmental and social responsibility. The process of sustainable development, in the sense of economic growth that does not endanger future generations, has significantly changed the main reasons for investment (Brundtland, 1987). The need for more responsible investments led to the creation of standards in the form of ESG criteria that promote sustainable businesses and investments. The concept of ESG stands for a set of criteria that include measures of environmental impact (eng. environment), social impact (eng. social), and structure and management methods (eng. governance) (Li and others 2021). ESG criteria as a continuation of socially responsible investment, with international and national policies, have made additional efforts to achieve sustainable development. The integration of green policies in business and investment has changed business strategies and consumer preferences. The integration of green policies has fostered additional growth of green investments, affecting

investor behavior in financial markets (Bialkowski and Starks, 2016). Measuring environmental awareness, social responsibility, and fairness in corporate governance and corporate rankings directs capital flows toward companies that prioritize morally responsible business (Taliento, Favino, and Netti, 2019). Although there are significant results demonstrating positive effects, investors have different viewpoints on corporate sustainability investments. The first group believes that sustainability investments do not have a significant impact on business operations and reduce profits, while the second group views investments in sustainable companies positively and considers such investments as a long-term investment. The third group is indifferent to investing in sustainability (Hartzmark and Sussman, 2019). However, according to Whelan et al. (2021), the majority of investors have a positive opinion about investing in sustainability, while very few investors have a negative view of investing in sustainable development.

Recent studies also show that institutional investors are increasingly considering ESG criteria for several reasons. First, the integration of ESG principles as part of fiduciary duty has gained international acceptance (UNEP FI, 2009). Second, stakeholder demand for their environmental and social impacts is increasing (Goy and Schwarzer, 2013). Third, conventional funds seek to restore trust in their damaged legitimacy and mitigate the impact of crises (Gangi and Trotta, 2015; Joliet and Titova, 2018). Moreover, ESG integration is a way to generate profits (Revelli, 2017). Consequently, the ESG niche may cross the boundary with conventional funds and expand into the mainstream of conventional management.

Institutional investors, including pension funds, typically invest their assets with the primary objective of maximising returns at an acceptable level of risk. Recently, sustainable criteria and the inclusion of sustainable investments in the portfolios of pension funds have become an inevitable part of their investment policy. They are at the top of the investment value chain, which puts them in a strong position to advance the integration of sustainability and achieve the Sustainable Development Goals set by the United Nations (García, Sánchez, 2022; Martí-Ballester, 2020). Sustainable investment helps combat climate change and promote sustainable development, but it also has the potential to create new jobs, drive innovation, and promote long-term economic growth.

The potential impact and accompanying responsibility of pension funds on the global economy is also clear from data on their size and accelerating growth. Pension funds are the largest institutional investors in the financial market, representing 37% of total assets or US$57 trillion in 2020 (Thinking Ahead Institute's, 2021). Global pension assets are growing faster than the global economy, up 15% in 2019 and 11% in 2020 (Nikulina 2023). Nonetheless, global assets under management (AuM) in sustainable investments grew at a rate of 19% per year between 2016 and 2021, well above the average growth rate of the asset management industry as a whole. By the end of 2021, global AuM in dedicated ESG strategies reached a record high of US$2.1 trillion (EFAMA 2022, p. 7). In recent years, ESG factors have been one of the investment priorities of pension funds in order to protect savings from climate risks and capitalize on the financial advantages of early adoption. Nevertheless, available data of pension funds investing in sustainable securities is no relevant data to analyze because of the short time horizons, unclear assumptions and non transparent processes. According to the above, the paper was made as a review paper. The aim of this paper is therefore to find out what are the main reasons for pension funds to integrate ESG issues and sustainable and green investments into their portfolios, and what are the main advantages and disadvantages of integrating ESG into investment practices. The contribution of the paper is to review the importance and influence of ESG criteria on pension funds so that investors in pension funds and asset managers can make rational decisions according to their preferences.

The paper is organized in the following order: After the introduction, the history of the ESG framework and its evolution over the past decade are explained. The third part focuses on green investment instruments and analyzes the tools that can be used in green investments. The fourth part reviews the advantages of integrating ESG in pension funds and possible disadvantages that can complicate the management process or influence investors. The last part concludes the paper and includes the main parts of the paper with recommendations for future research.

2. HISTORICAL ORIGINS AND EVOLUTION OF ESG FRAMEWORK

The sustainability standardization model existed even before the emergence of ESG. Socially responsible investing (SRI) emerged in the 1920s, and ESG can be seen as a continuation of this model. The goal of both models is to invest in sustainable companies, with ESG broadening the understanding of sustainability and bridging the partial disinterest of investors, as in the case of SRI (Billio et al., 2021). For the first time, the term "ESG" was used in the report "Who Cares Wins" in 2004, and the idea was to develop guidelines for creating a more resilient market and sustainable society by implementing ESG in companies and by directing investors to more sustainable business ventures (The Global Combat, 2004).

The majority of institutional investors are actively participating in the adaptation of responsible investing principles and are adjusting their investment policies towards a sustainable and greener economy (Hammond and O'Brien, 2021). In 2006, under the leadership of the United Nations (UN) Principles for Responsible Investment (PRI) were developed. A significant portion of the world's professionally managed investment institution signed the document. Voluntarily enrolled institutional investors began to incorporate six principles into their investment practices by requesting disclosure of ESG factors from invested companies and reporting on their own activities.

Table 1: Six key principles of responsible investment for institutional investors

Principle 1	We will incorporate ESG issues into investment analysis and decision-making processes.
Principle 2	We will be active owners and incorporate ESG issues into our ownership policies and practices.
Principle 3	We will seek appropriate disclosure on ESG issues by the entities in which we invest.
Principle 4	We will promote acceptance and implementation of the principles within the investment industry.
Principle 5	We will work together to enhance our effectiveness in implementing the principles.
Principle 6	We will each report on our activities and progress towards implementing the principles.

(Source: EFAMA 2022)

Figure 1 shows the assets managed according to the principles of responsible investment and the number of asset owners in the period from 2006 to 2021.

Figure 1: AUM and number of signatories of Principles for Responsible Investment
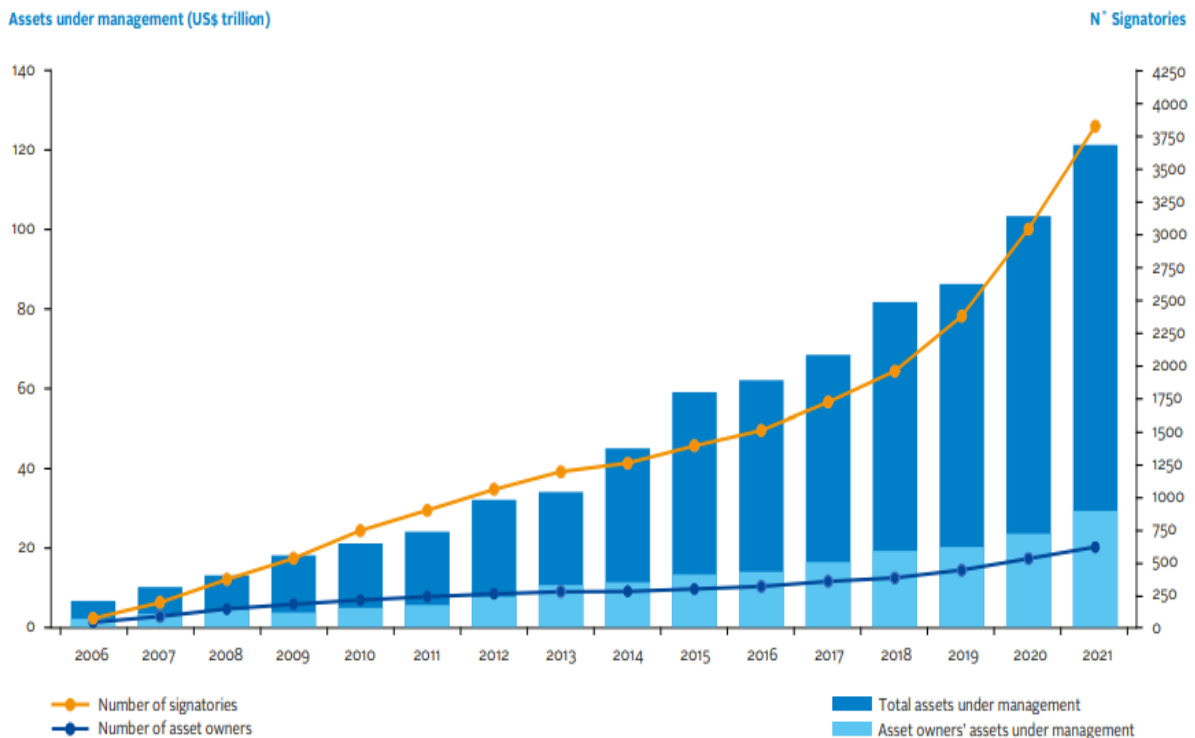
(Source: PRI, 2022)

At the end of 2022 the number of participating financial institutions was approximately 4900 with AUM over US$ 120 trillion (PRI, 2022). Since 2006 and the development of the PRI, there has been a steady growth of AUM and signatories, with a significant shift in 2015, 2020, and 2021. The reason for the first significant growth is the Paris Conference in 2015. The creation of the European Union Taxonomy in 2020, which governs the process of environmental change, facilitates green investment, and makes greenwashing more difficult, also had a major impact. The taxonomy is a comprehensive framework designed to encourage sustainable investment by both retail and institutional investors, including pension funds. The second timing is in 2021 after the outbreak of the Covid crisis.

With the creation of the EU taxonomy, a change in the price of capital or other expectations of other market participants was expected (Dumrose, Rink, and Eckert, 2022). To increase transparency for investors, non-financial sustainability monitoring reports are required. According to Regulation (EU) 2019/2088 (2019), the preparation of non-financial reports is mandatory for large companies, while medium and small companies can improve their reputation. In addition, ESG are central to the development of sustainable investment strategies, but regulation and reporting methods should reduce the possibility of greenwashing.

The growing interest of financial institutions in integrating ESG factors into their investment processes is further motivated by the greenwashing problem and other high-profile ESG failures, increasing public concern about ESG issues (International Actuarial Association 2020), and scientific evidence of positive effects on investment returns and/or volatility when ESG are integrated into investment processes with appropriate consideration of risk (Kim and Li, 2021; Minutolo, Kristjanpoller, and Stakeley, 2019).

3. VEHICLES OF GREEN INVESTING FOR PENSION FUNDS

Pension funds as conservative and long-term oriented investors are interested in different types of financing vehicle with lower risk and a steady, inflation adjusted income stream. These institutions are part of an upstream investment chain and represent the most influential player in financial markets. Moreover, pension funds are of particular importance in the social and political spheres of any country, and their establishment, operation, and investment structure are of special interest to the state, as they are linked to numerous stakeholders across different generations. The basic principles of pension fund operation relate to safety, risk diversification, liquidity, and long-term predictability of cash flows, and not primarily to maximizing the return on investments. Given these requirements, pension funds typically have a highly diversified investment structure and invest predominantly in long-term financial instruments, with an emphasis on top-rated securities, such as government bonds and "blue chip" equities. A smaller but growing portion of the portfolio is allocated to investments in private equity, real estate and infrastructure assets. The fiduciary duty of pension funds is to invest in the best long-term interest of their beneficiaries. Applying the principles of responsible investing to ESG issues could better align investors with the broader goals of society while having a positive impact on investment portfolio performance.

Pension funds' investment strategies must balance risk, return and costs. Recently, pension funds'investment policies increasingly incorporate sustainable finance and in general ESG investments.Green and sustainable investing is an emerging asset class of particular interest to pension funds, as it plays a special societal role in social cohesion and offers great potential to address global sustainability issues. Since the first issuance of green bonds in 2008[1], they have become an important asset class for pension funds. Issues such as climate risk have long-term implications for the long-term cash flows that affect these investors. Achieving sustainable, long-term returns while managing investment risk in a portfolio is therefore critical for pension investments (Owadally et. al., 2021). Some pension funds to incorporate non-financial objectives in their investment policy, such as specific carbon reduction targets, within the scope of the risk-return objectives set out by the prudent person principle (Pensions Europe, 2022, p. 23).

However, these investments do not only refer to allocating funds to projects or companies that focus on sustainable practices, green technologies, and natural resource conservation, but also to other investment products that apply ESG principles. Pension funds also invest in equities, real estate, sustainable bonds, social bonds, and other financial products with the goal of achieving measurable social and environmental impact in addition to financial return. The readiness to integrate ESG into different asset classes of pension funds was studied by Mercer UK (2020). It found that 88% of pension funds are considering these changes. Table 2 shows different forms of financing sustainable and green growth initiatives that pension funds might consider.

Table 2: An overview of vehicles for green investing of pension funds

Asset class	Type of vehicle	Description
Equity	Indices	Include only stocks of companies that have

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[1] The beginnings of the green market began in 2007 with the European Investment Bank's issuance of the Climate Awareness Bond (CAB), an equity index-linked bond listed on 27 markets in the EU. A year later, the World Bank issued its first green bond, designed in collaboration with Skandinaviska Enskilda Banken. With this issue, the World Bank responded to specific demand from Scandinavian pension funds seeking a fixed-income investment opportunity to support the transition to a lower-carbon and more climate-friendly world, taking into account their long-term investment horizon as pension funds.

		„good environmental practices"
	Green Mutual Funds	They pool money from multiple investors to invest in a diversified portfolio of green assets, such as renewable energy companies and sustainable infrastructure projects.
	Green Exchange-Traded Funds (ETFs)	financial instruments that track the performance of a specific index, sector, or theme, including green investment-focused indices.
Fixed-income	Green bonds	Debt securities issued by governments, corporations, or financial institutions to raise capital to solve environmental problems
Alternatives	Real estate	Real estate investments that are environmently acceptable
	Green private equity and venture capital	Investment firms that provide capital to start-ups and established businesses engaged in environmentally sustainable projects or technologies.
	Carbon Credits and Offsets	Financial instruments that represent the reduction or removal of one metric ton of carbon dioxide equivalent emissions, which can be purchased by individuals or organizations to offset their carbon footprint

(Source: Authors)

The first pension fund to issue green bonds was the Canada Pension Plan Investment Board (CPPIB) in 2018, issuing EUR 1.2 billion worth of 10-year bonds with a 3% coupon. This allows CPPIB to further invest in energy efficiency, renewable energy and sustainable water management.

4. PENSION FUNDS INVESTMENT STRATEGIES – ESG CRITERIA

An increasing number of pension funds are adopting a holistic approach to sustainability at the institutional, operational and portfolio levels. UNCTAD (2023) reports that pension funds are increasingly committed to integrating ESG criteria into all investment decisions, with long-termism as a guiding principle, and to considering ESG performance to manage risks and seize opportunities related to the transition to a more sustainable economy.

Pension funds' strategy for selecting ESG investments is based on discretion, using one or a combination of the following approaches (Mercer UK, 2022; Pension Europe, 2022; UNCTAD, 2023):

a. ESG integration: combining ESG factors in traditional investment analysis with the aim of determining the issuer's real value and identifying potential risks and opportunities.

b. Best-in-class or positive screening: strategically investing in sectors, companies, or projects that are leaders in the sustainability performance of their peer group (leaders in renewable energy, employee satisfaction, and product safety).

c. Exclusion or negative screening: exclusion from the portfolio of issuers whose activities are inconsistent with sustainable development (specific sectors, companies, and practices) or specific ESG criteria including moral values (e.g., tobacco or gambling),

standards and norms (e.g., human rights), ethical convictions (e.g., animal testing), or legal requirements (e.g., controversial armaments such as cluster bombs or land mines, excluded to comply with international conventions).

d. Norm based screening: involves screening potential investments against minimum standards of business practice based on international norms relating to climate protection, human rights, working conditions, and action plans against corruption.

e. Thematic investing: Selecting issuers based on specific themes that contribute to a positive environmental or social outcome (cleantech, infrastructure, energy-efficient real estate, or sustainable forestry).

f. Impact investing: targeting ESG-oriented sectors (sustainable energy, affordable healthcare, or inclusive connectivity) or capital market instruments (green bonds, social bonds, or ESG funds).

g. Governance or social dimension: working with companies to highlight the importance of ESG issues, improve ESG practices, transform sustainability outcomes, e.g. governance, human capital management, promoting diversity and inclusion in the company, and climate risks.

h. Active ownership: focusing on engagement and dialogue with portfolio companies to influence the strengthening of ESG strategy and action through ownership and activism for change.

Figure 2: Sustainability investment strategies of reposting funds, 2022 (%)
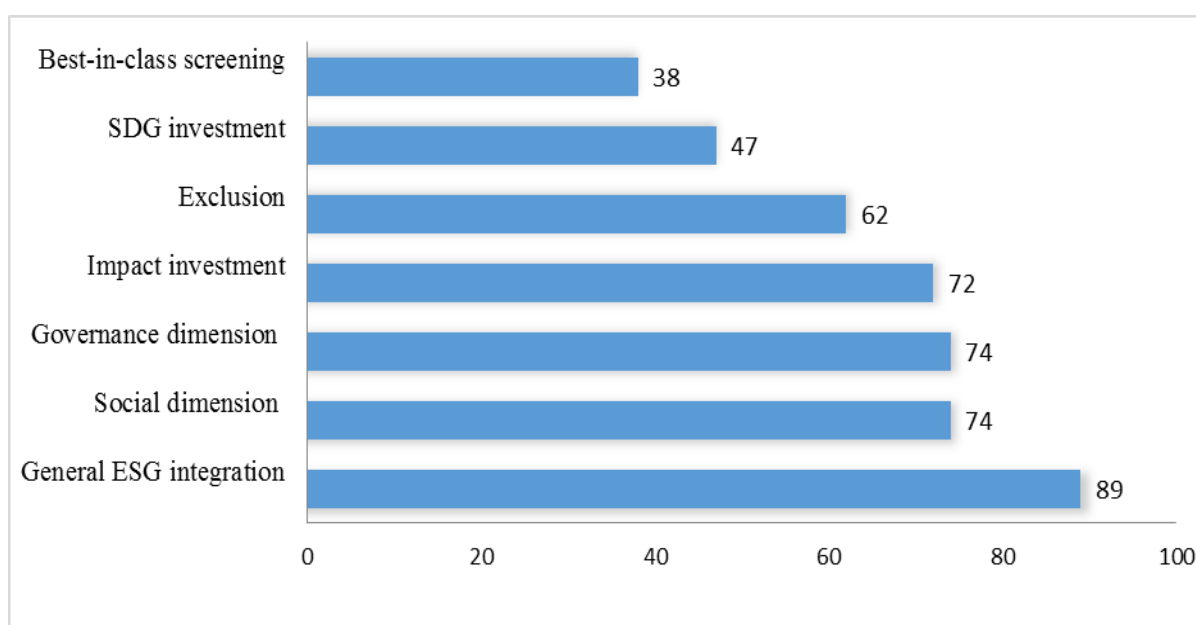
(Source: UNCTAD 2023)

Investment strategies range from relatively simple exclusionary strategies to more positive screening strategies to integrate an ESG and SDG perspective into their investment decisions. The vast majority (89%) of pension funds involved incorporate ESG factors into their strategies. The social and management dimension of investment is second in the choice of investment strategies. Typically, funds favour engagement with asset managers and investment recipients as a first means of improving ESG performance and divestment as a last resort if performance does not improve (UNCTAD, 2023). Nearly three-quarters of funds use an impact strategy, indicating a shift from responsible investing in earlier periods to

sustainability-focused investing that specifically targets sustainability-related issues or sectors.

5. LIMITATIONS AND PREREQUISITES FOR THE DEVELOPMENT OF SUSTAINABLE INVESTMENT STRATEGIES OF PENSION FUNDS

When creating a portfolio, pension fund managers should consider a number of risks related to issuers, but also those whose emergence depends on environmental conditions. The most important strategic risks for pension funds are generally market risk, inflation risk, and interest rate risk, to which climate risk has been added in recent years. Climate change is a systemic risk that poses a particular challenge for pension funds.

From an ESG perspective, different types and sources of ESG-related risks can be distinguished (Sautner and Starks, 2023; Della Croce, Kaminker, and Stewart, 2011, UNCTAD, 2023):

1. Reputational risks - refer to the threat or danger to a company's good name or reputation,

2. Human capital management risks - social risks related to working conditions, including slavery and child labour, health and safety issues, employee relations and diversity, employment and occupational discrimination, industrial action (strikes), etc.

3. Supply Chain Risk - risks associated with the securities of all issuers included in the portfolio,

4. Regulatory and political risk - potential interference of partisan politics in the management of pension investments, unstable regulatory environment or regulatory restrictions (asset class, due to liquidity and diversification requirements, solvency restrictions, etc.)

5. Governance risk - risks related to executive compensation, respect for the rule of law, bribery and corruption, political lobbying and donations, board diversity and structure, tax strategy, cybersecurity, accounting fraud, anti-money laundering (AML), and counter-terrorist financing (CFT).

6. Transition risks - relate to changes in climate change policy, regulations, technologies, investor sentiment, and prices due to the transition to a low-carbon economy. These are particularly relevant for investors in resource-intensive activities with high GHG emissions within their value chains,

7. Climate risks - environmental risks can be physical risks arising from the direct impact of natural disasters such as earthquakes or floods, climate change, greenhouse gas emissions, renewable energy, and resource depletion.

Pension funds should develop processes to identify, measure, and manage ESG-related downside risks, especially those related to climate change. When considering regulatory constraints or incentives for sustainable investments in pension fund portfolios, several studies (Sievänen et al., 2013; Zwan et. al., 2019) have identified regulation as an important influencing factor, with vast area of improvement in the disclosure and reporting of ESG practices. In addition, the use of performance indicators is lagging, which means that sustainability disclosure is not objective. In summary, greater harmonization of standards and regulations is needed to promote a broader approach to integrating sustainability and performance. The last decade has also seen an increase in the regulatory framework at the national and regional level, making it more difficult to monitor and compare pension fund

activities and risks. For example, sustainable finance regulations have increased by up to 40% in the last five years, with 300 national and regional regulations listed in the 35 most developed economies (UNCTAD, 2023). ESG risk disclosure is still limited and insufficient for most pension funds (except the largest) (International Actuarial Association 2020), but is increasing rapidly as legislation is implemented, particularly in Europe. The majority of pension funds now voluntarily produce detailed reports on the management of their investments and are continuously improving disclosure to make sustainability and risk management transparent to investors and regulators. In 2019, the International Organization of Pension Supervisors issued Supervisory guidelines on the integration of ESG into investment with aim to "disclose to members and stakeholders information about the pension fund's investment policies related to long-term sustainability, including ESG factors, stewardship, and non-financial factors" (IOPS, 2019).

6. CONCLUSION

Pension funds can be a powerful force in directing the global financial market towards sustainable and inclusive goals and development in the right direction. Recently they are becoming more active in redefining their portfolios with respect to environmental, social, and governance (ESG) factors and are engaging in more effective and assertive asset management. Their investment strategies are increasingly focused on sustainability-related risks, particularly with respect to climate-related, sustainable, and inclusive actions. Pension funds responsibility to achieve sustainability goals stems from their large assets, long-term investment horizon, and social role in the economy, especially from the perspective of the different types and sources of ESG-related risks (reputational, litigation, regulatory, climate, etc.). Therefore, they are one of the key players in climate change mitigation and adaptation. Pension funds are increasingly adopting internal strategies and policies to incorporate ESG considerations into their investment strategies and decisions, anticipating transition risks, and aiming for net-zero in their portfolios by 2050 at the latest. They have a great opportunity to incorporate ESG factors into their investment strategy to enhance or preserve the value of their investments or manage long-term risks by deploying capital in areas with a stronger ESG or sustainability focus and promoting good governance both within the pension system and in investments. In order to attract a larger number of investors and following the market trends, it is necessary to strengthen the process of collecting data and reporting related to ESG factors.

REFERENCES
Bialkowski, J. and Starks, L. T. (2016), "SRI funds: Investor demand, exogenous shocks and ESG profiles", San Francisco, CA, USA: 2016 *BlackRock Research Conference*, 6 Jan 2016.
Billio, M., Costola, M., Hristova, I., Latino, C. and Pelizzon, L. (2021), „Inside the ESG ratings:(Dis) agreement and performance. Corporate Social Responsibility and Environmental Management", 28(5), 1426-1445.
Brundtland, G. H. (1987), "Our Common Future World Commission On Environment and Development".

Della Croce, R., Kaminker C. and Stewart, F. (2011), "The Role of Pension Funds in Financing Green Growth Initiatives", *OECD Publishing*, Paris.

Dumrose, M., Rink, S. and Eckert, J. (2022), "Disaggregating confusion? The EU Taxonomy and its relation to ESG rating. Finance Research Letters", 48, 102928. *Finance Research Letters*, Volume 48, 2022, 102928, ISSN 1544-6123, https://doi.org/10.1016/j.frl.2022.102928.

EFAMA (2022), „Asset management in Europe: an overwie of the asset management industry", 14th edition Facts and figures, available at: https://www.efama.org/newsroom/news/efama-asset-management-report-2022 (accessed 1 July, 2023)

Gangi, F. and Trotta, C. (2015), "The ethical finance as a response to the financial crises: An empirical survey of European SRFs performance", Journal of Management and Governance, 19, 371-394. J Manag Gov (2015) 19:371–394 DOI 10.1007/s10997-013-9264-7

García, Sánchez, I. M., Aibar-Guzmán, C., Núñez, Torrado, M. and Aibar, Guzmán, B. (2022), "Are institutional investors "in love" with the sustainable development goals? Understanding the idyll in the case of governments and pension funds", Sustainable Development, 30(5), 1099-1116.

Global Compat Leaders Summit (2004), avalaible at: https://unglobalcompact.org/library/255 (accessed 25 June, 2023).

Goy, J. and Schwarzer, H. (2013), "Socially responsible investment, decent work and pension funds: Concepts and international experiences", ESS Paper 36, Global Campaign on Social Security and Coverage for All, International Labour Office, Social Security Department, Geneva.

Hammond, P. B. and O'Brien, A. (2021), "Pensions and ESG: An Institutional and Historical Perspective" Pension Funds and Sustainable Investment: Challenges and Opportunities", ed. Hammond, P. B., Maurer, R., Mitchell O. S., Wharton Pension Research Council Working Paper No. 2021-19, Oxford: Oxford University Press.

Hartzmark, S. M. and Sussman, A. B. (2019), "Do investors value sustainability? A natural experiment examining ranking and fund flows", The Journal of Finance, 74(6), 2789-2837.

Hoogendoorn, B., Van der Zwan, P. and Thurik, R. (2019), "Sustainable entrepreneurship: The role of perceived barriers and risk", Journal of business ethics, 157, 1133-1154.https://doi.org/10.1007/s10551-017-3646-8

International Actuarial Association 2020, "Pension Fund Environmental, Social and Governance Risk Disclosures: Developing Global Practice", Discussion Paper, Resource and Environment Working Group, December 2020.

IOPS (2019), "Supervisory guidelines on the integration of ESG factors in the investment and risk management of pension funds", Paris, 28 January 2019, available at: https://www.iopsweb.org/IOPS-Supervisory-guidelines-integration-ESG-factors.pdf (accessed 7 July, 2023).

Joliet, R. and Titova, Y. (2018), "Equity SRI funds vacillate between ethics and money: An analysis of the funds' stock holding decisions", Journal of Banking & Finance, 97, 70-86.

Kim, S. and Li, Z. (2021), "Understanding the Impact of ESG Practices in Corporate Finance", Sustainability, 13(7), pp.3746-3761. doi:10.3390/su13073746.

Li, T. T., Wang, K., Sueyoshi, T. and Wang, D. D. (2021), "ESG: Research progress and future prospects". Sustainability, 13(21), 11663

Martí-Ballester, C. P. (2020), "Examining the financial performance of pension funds focused on sectors related to sustainable development goals", International Journal of Sustainable Development & World Ecology, 27(2), 179-191.

Mercer UK (2020), "Investing in the Future – European Asset Allocation Insights 2020", Mercer UK. https://www.uk.mercer.com/content/dam/mercer/attachments/

Minutolo, M.C., Kristjanpoller, W.D. and Stakeley, J. (2019), "Exploring environmental, social, and governance disclosure effects on the SandP 500 financial performance", Business Strategy and the Environment. doi:10.1002/bse.2303.

Nikulina, L. (2021). Global Pensions and ESG: Is There a Better Way? Wharton Pension Research Council Working Paper, (2021-17). Oxford: Oxford University Press.

Owadally, I., Mwizere, J. R., Kalidas, N., Murugesu, K. and Kashif, M. (2021), "Long-term sustainable investment for retirement", Sustainability, 13(9), 5000. https://doi.org/10.3390/su13095000

Pension Europe (2022), "PensionsEurope Report 2022 – Trends and developments in funded pensions", available at: https://www.pensionseurope.eu/system/files/PensionsEurope%20report%202022%20-%20Trends%20and%20developments%20in%20funded%20pensions.pdf, (accessed 25 September, 2023).

PRI, UNEP FI and UN Global Compact (2005), "Principles for Responsible Investment: An Initiative of the UN Secretary-General Implemented by UNEP Finance Initiative and the UN Global Compact", accessed at: private/6010897a-WE%20EAAS%202020_FIN_KR.pdf (accessed 5 July, 2023).

PRI (2022) Annual report, https://www.unpri.org/annual-report-2022 (accessed 4 July, 2023)

Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32019R2088 (accessed 23 June, 2023)

Revelli, C. (2017), "Socially responsible investing (SRI): From mainstream to margin?" Research in International Business and Finance, 39, 711-717.

Sautner, Z. and Starks, L. T. (2023), "ESG and Downside Risks. Pension Funds and Sustainable Investment: Challenges and Opportunities", 137.

Sievänen, R., Rita, H. and Scholtens, B. (2013), "The drivers of responsible investment: The case of European pension funds", Journal of business ethics, 117, 137-151. DOI 10.1007/S10551-012-1514-0

Taliento, M., Favino,C. and Netti, A. (2019), "Impact of Environmental, Social, and Governance Information on Economic Performance: Evidence of a Corporate 'Sustainability Advantage' from Europe", Sustainability 11, no. 6: 1738. https://doi.org/10.3390/su11061738

Thinking Ahead Institute (2021), "Global Pension Assets Study 2021", Arlington, VA: Thinking Ahead Institute, Willis Towers Watson, available at: https://www.thinkingaheadinstitute.org/research-papers/global-pension-assets-study-2021/ (accessed 8 July, 2023)

UNCTAD (2023), "Sustainability integration by public pension and sovereign wealth funds", available at: https://unctad.org/publication/sustainability-integration-public-pension-and-sovereign-wealth-funds-2022 (accessed July 9, 2023)

Whelan, T., Atz, U., Van Holt, T. and Clark, C. (2021), "ESG and financial performance", Uncovering the Relationship by Aggregating Evidence from, 1, 2015-2020.)

INVESTIGATING THE INTERPLAY OF ECONOMY AND ENVIRONMENT IN THE WESTERN BALKANS AND NEIGHBORING COUNTRIES USING THE VECM APPROACH

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ABSTRACT
The relationship between economic development and carbon dioxide emissions in the Western Balkans and the neighboring countries has been a subject of significant interest and study. Economic development, which involves increased industrialization, urbanization, trade, household, and energy consumption, is often associated with higher carbon dioxide emissions due to the burning of fossil fuels. Researchers have investigated how various factors such as economic growth, population size, energy mix, and technological advancements influence carbon dioxide emissions in different regions of the world. The purpose of this paper is to investigate the relationship between the carbon dioxide emissions and a set of economic factors which include gross domestic product, trade, household consumption and energy use, using the panel vector error correction model. The analysis includes nine countries from the Western Balkans and the neighboring countries and annual data for the period 2000 – 2019. The research uses panel unit root tests, cointegration testing and estimation of vector error correction model.
The model has confirmed that shocks that emerge in gross domestic product, total trade and household consumption increase the carbon dioxide emission in the long-term. The effect from the private (household) consumption is with the highest intensity, compared to other factors. A shock in trade causes a decline in carbon dioxide emissions in the long-term.

Keywords: Carbon dioxide emissions, economic development, consumption, VECM

JEL classification: Q540, O1, E210, C32

1. INTRODUCTION

The relationship between economic development and carbon dioxide emissions is pivotal in the context of climate change. Balancing economic growth with emissions reduction is a significant challenge, but it is essential for a sustainable and prosperous future. This is extremely important when comes to rising economies like the ones from the Western Balkans and neighboring countries. These nations have experienced various economic and political transitions in the past several decades, which have had implications on their environmental policies and carbon emissions. Exploring the key determinants of carbon dioxide emissions in the appointed region is a topic that has not been sufficiently explored, in authors' opinion, thus making this research a valuable contribution and a chance to fill a research gap regarding the intertwined long-term effects onto CO2 emissions in this part of the world.

The analysis uses panel vector error correction model for estimation of the long-term equilibrium relationship and short-term dynamics of the variables, considering their interdependencies. Included variables that represent the complexity of the economic growth for each country are gross domestic product per capita, total trade, household final consumption per capita, and energy use. Understandably, CO_2 emissions are included in the model. The panel dataset consists of observations for nine countries - North Macedonia, Serbia, Bulgaria, Greece, Montenegro, Albania, Bosnia and Herzegovina, Croatia, and Slovenia – annual data for period 2000 to 2019. Identifying the key determinants of carbon emissions could help in raising awareness about how these countries can achieve sustainable development in face of frequent economic, political, and social crises (Mitic et al., 2022).

Additional motivation for exploration of the dynamics between CO_2 emissions and economic growth can be summed up in the following details:

Environmental impact - substantial economic growth causes environmental impact with high CO_2 emissions that contribute to greenhouse effect, that leads to global warming, climate change, rising sea levels, extreme weather events and disruptions to ecosystems. These all create substantial economic and social costs;

Economic opportunities - reducing carbon emissions poses challenges and presents economic opportunities. The shift towards clean energy technology can create green jobs and new markets. Investing in green energy can stimulate economic growth and innovation;

Sustainable development goals - the United Nations Sustainable Development Goals (UNDP, 2023) recognize the interconnection between economic development and environmental sustainability. Goal 13, "Climate Action" points out the need to take immediate action to combat climate change and its impacts, while promoting sustainable economic growth and poverty reduction (Goal 1);

Global cooperation - addressing the relationship between economic development and CO_2 emissions requires global cooperation. International agreements like the Paris Agreement aim to limit global warming by transition to a low-carbon economy.

This study adds to the existing scientific literature, which is a noteworthy contribution to the subject. It focuses on identifying significant economic factors impacting CO_2 emissions in the Western Balkans and surrounding regions, a topic that requires more attention in future research. According to World Bank Lead Economist Richard Record (World, 2023) the current energy crisis has highlighted the need to accelerate the green transition across Europe, including the Western Balkans. The starting point would be acceleration towards carbon pricing and implementation of environmental fiscal measures that incentivize households and companies to shift toward lower carbon intensity. The first step towards green transition, according to the authors of this research, is to identify the key factors that determine the intensity of carbon emissions.

2. LITERATURE REVIEW

The relationship between carbon dioxide (CO_2) emissions and economic growth has been a subject of extensive research in the field of environmental economics and sustainable development. Numerous studies have attempted to explore the complex dynamics between these two critical factors, particularly in the context of different regions and countries. In this literature review, we discuss some of the key findings and contributions of previous research related to the link between CO_2 emissions and economic growth.

Goodness & Prosper (2017) conducted an analysis of 31 developing countries to examine the effect of economic development on carbon dioxide emissions. The results indicate that economic development has a negative effect on emissions when development is weak but a positive effect when development is substantial. According to their research, energy

consumption and population growth have the most significant impact on the growth of CO2 emissions.

Cedeborg & Snobohm (2016), based on a regression analysis of 69 industrialized countries and 45 poor countries, showed that there is a relationship between GDP per capita and emissions per capita. The correlation is positive, indicating that an increase in GDP per capita leads to higher CO2 emissions per capita.

Rambeli, et al. (2018) investigated the relationship between GDP, electricity production, net trade, electricity consumption and oil price on CO2 emissions in Malaysia using the Ordinary Least Square (OLS) method. The results suggest that GDP, electricity production, net trade and energy consumption affect CO2 emission positively, whereas the oil price affects emissions negatively.

In an analysis of 93 countries, Stolyarova (2013) demonstrated a cointegrated relationship between economic development and CO2 emissions in the short term but not in the long term. She also showed that the rate of growth of carbon dioxide emissions per capita increases proportionally with the rate of growth of GDP per capita.

Sharma (2011) showed that trade openness, GDP per capita, and energy consumption have positive effects on CO2 emissions. Urbanization has a negative effect on emissions in all countries regardless of their income levels. On a global level, GDP per capita and energy consumption are statistically significant determinants of carbon dioxide emissions, while urbanization, trade openness, and electricity consumption have a negative effect on emissions.

Among those researching the statistical relationship between economic development and CO2 emissions in the region, (Kokotovic, et al., 2015) conducted an analysis using a Vector Autoregressive (VAR) model on multiple variables for several European Union (EU) member countries, including Croatia, Bulgaria, Slovenia, and Greece. They confirmed the existence of a statistically significant relationship between energy consumption and CO2 emissions in the EU countries that became members after 2004, which includes Croatia, Bulgaria, and Slovenia.

Ahmad, et al. (2017) developed a model to test the Environmental Kuznets Curve theory in Croatia. According to the theory, as the economy develops over time, environmental pollution increases. However, when the economy reaches a certain level of wealth (income) per capita, pollution decreases. The study showed that the theory is valid in the long term, i.e., economic development leads to rising CO2 emissions up to a certain level, after which they start to decrease with prolonged economic growth.

Mitic, et al. (2020) assessed the causal relationship between CO2 emissions and the contributions of industrial production, services, and gross fixed capital in the total GDP of the Balkan countries. They discovered a strong link between the variables and concluded that all the factors have a long-term relationship with CO2 emissions. In a similar study involving countries from the Western Balkans, (Pejovic, et al., 2021) explored the relationship between economic development, energy consumption, and CO2 emissions using panel VAR analysis. The results reveal that most of the variations in CO2 emissions are determined by variations in GDP, but they conclude that growing GDP reduces CO2 emissions in the long term.

Mitic, et al. (2023) examined the relationship between CO2 emissions and GDP per capita in five Western Balkan countries using a VECM. The study provides evidence of a long-term cointegration between CO2 emissions and GDP per capita and revealed a short-run bidirectional causal relationship between CO2 emissions and GDP per capita. In the long run, no statistically significant causality from GDP per capita to CO2 emissions was found, but there was a statistically significant causal relationship from CO2 emissions to GDP per capita.

While most of the cited literature examines the effects that economic growth and development has on carbon emissions, very few authors (Mitic, et al., 2020, 2023) focus their attention on the Balkan countries in the recent period. In particular, the specified set of countries included in this analysis for the appointed period of observation and the selection of variables has not been a part of similar comprehensive study. The authors of this study consider this research as one that can fill the current research gap. The importance of this analysis can be seen by its findings and contribution to the policy makers by identifying the key determinants of CO2 pollution as a first step toward its slow eradication. Further step is creating an opportunity for development of green economies, especially in periods of energy crisis, which have severe effect onto the economies in the Wester Balkan and the neighboring countries. Reducing the level of carbon emissions and making economies less dependent on global energy sources should be one of the main topics of the policy makers agenda. Insights from this research may contribute as an incentive for further consideration.

3. DATA, METHODOLOGY AND EMPIRICAL RESULTS

This paper uses the panel vector error correction model to test the hypothesis regarding the long-term effects of the carbon dioxide emissions on economic growth. To represent the economic growth of one economy, several variables were used, such as:

- gross domestic product per capita (data in constant 2015 dollars, logarithmically transformed) - $ln(GDP)$;
- total trade as a sum of imports and exports of goods and services (data in constant 2015 dollars, logarithmically transformed) - $ln(TRADE)$;
- household final consumption per capita (private consumption per capita, logarithmically transformed) - $ln(CONSUMPTION)$;
- energy use (kg of oil equivalent per capita (primary energy), logarithmically transformed) - $ln(ENERGY)$;

CO2 emissions are expressed in metric tons per capita, thus the model is constituted of five variables - CO_2

The countries that are included in the panel model are: North Macedonia, Serbia, Bulgaria, Greece, Montenegro, Albania, Bosnia and Herzegovina, Croatia, and Slovenia. The observed period starts in 2000 and ends in 2019, so the model has a total of 180 observations. All the data is generated from the World Bank Database World Development Indicators. Their graphical presentation is in Figure 1.

CO2 emissions have different trends for each country. The most significant reduction is noticeable in Greece (from 8.74 in 2000 to 5.60 metric tons per capita in 2019 and Slovenia (from 7.31 in 2000 to 6.51 metric tons per capita). From the opposite side, Bosnia and Herzegovina and Montenegro have increased their emissions, producing as twice as much metric tons per capita in 2019 compared to 2000.

Regarding the GDP growth, most of the countries mark steady growth in the observed period. Greece, Slovenia, and Croatia have suffered certain instability in the period of the global economic crisis in 2008.

Total trade points increasing trends in all observed countries. Greece is the leading country, by the amount of total trade through the years, while Montenegro is the country with lowest amount of total trade. This is expected regarding the size of the countries and their economies.

Household final consumption per capita is the highest in Greece, followed by Slovenia, and Croatia (13,177 dollars, 12,879 dollars and 8,185 dollars per capita in 2019, respectively). Albania has the lowest consumption per capita (3,466 dollars per capita in 2018). Trends tend to show an increase in the households' final consumption in the observed period.

Energy used is the last of the explanatory variables that might influence CO2 emissions. All the countries have steady trends, though there is a significant difference between the countries. Slovenia is a country with the highest energy usage (3,175 kg of oil per capita in 2015), while Albania has only 808 kg of oil per capita in 2015.

Variables, presented as time series, are tested for their stationarity by using unit root tests. This process is needed to avoid potential spurious relationships and to determine whether vector autoregressive model or vector error correction model is more appropriate for modeling of the determinants of the CO2 emissions. The results from the panel unit root tests are presented in Table 1.

Figure 1: Presentation of variables used in the model
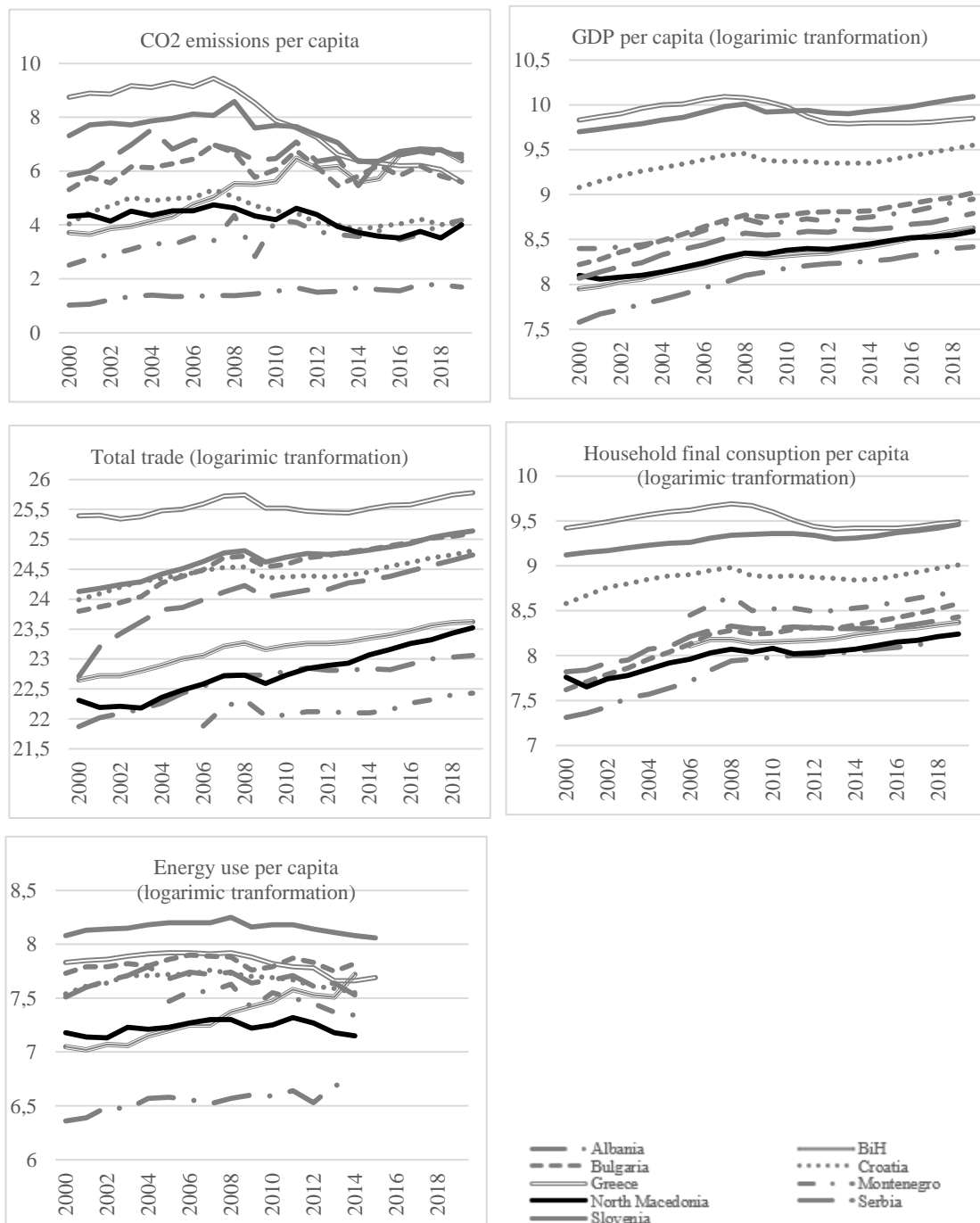
Source: World Bank (2023), graphical presentation by authors

Since all the variables present trends in their dynamics, the stationarity tests are performed for individual intercept and trend. Also, since data are missing for some time periods and variables, unbalanced panel requires to use test that assume individual unit root process. In Table 1 results from ADF and Philip Perron tests are presented.

Table 1: Results of the panel unit root tests (p-values)

Variable	ADF test		PP test	
	$I(0)$	$I(1)$	$I(0)$	$I(1)$
$ln(GDP)$	0.7463	0.8916	0.9492	0.0183**
$ln(TRADE)$	0.6943	0.0003***	0.1303	0.0000***
$ln(CONSUMPTION)$	0.3631	0.0030***	0.9708	0.0000***
$ln(ENERGY)$	0.6799	0.0000***	0.0005***	0.0000***
CO_2	0.1011	0.0001***	0.0027***	0.0000***

Significant at 0.05; * Significant at 0.01
(Source: Authors' calculations)

To bring the conclusion about the stationarity of the data, results from both tests are considered. Variables are not stationary in their original form, and they need to be differentiated to become stationary. Lag selection determines the number of time lags for the used model. Both LR test statistic and Final prediction error suggest five time lags (detailed results from the Lag Order Selection Criteria are available upon request). Another essential information for estimation is the number of cointegrating relationships. The Unrestricted Cointegration Rank Test indicates one cointegration equation at 0.05 level. Thus, with all variables integrated of order one and one cointegrating relationship confirmed, vector error correction model $VECM$ is more suited for estimation.

The $VECM$ with $p = 5$ time lags, five endogenous variables and one cointegrating relationship is presented in the equation:

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{5} \Gamma_i \Delta y_{t-1} + \varepsilon_t$$

And the cointegrating relationship:

$$\Pi y_{t-1} = \alpha + \sum_{i=1}^{5} \beta_i y_{it} + u_t$$

Where:
- y_t is a 5×1 vector of endogenous variables at time t;
- Δy_t is the first difference of the vector y_t at time t;
- Π is a 5×5 matrix of cointegrating relationships, showing the long-term equilibrium relationship among the variables;
- Γ_i us a 5×5 matrices of coefficients for each of the p lags;
- ε_t is a 5×1 vector of white noise error terms at time t, assumed to be normally distributed with zero mean and constant variance;
- α is a 5×1 vector of constants in the cointegrating relationship;
- β_i is a 5×1 vector of coefficients on the i-th variable in the cointegrating relationship;
- u_t is the cointegration error term, which is assumed to be stationary.

The $VECM$ helps analyze the long-term relationship among the variables and the short-term dynamics in their adjustments toward the long-term equilibrium, as captured by the

cointegrating relationship. The error correction term u_t reflects the speed at which deviations from the long-term equilibrium are corrected.

The estimated VEC model reproduced the impulse response functions presented in Figure 2. Impulse responses trace out the responsiveness of the dependent variable in the VEC model to shocks to each of the variables (Brooks, 2014). The analysis focuses on responses that the CO2 emissions have when certain shocks are present in the independent variables for the following 12 periods.

Most prominent response is the one that is caused by the household consumption. Innovations to unexpected rise in consumption have positive impact on the CO2 emissions. The effect does not die, on the opposite, it continues to grow further on.

Figure 2: Impulse response functions
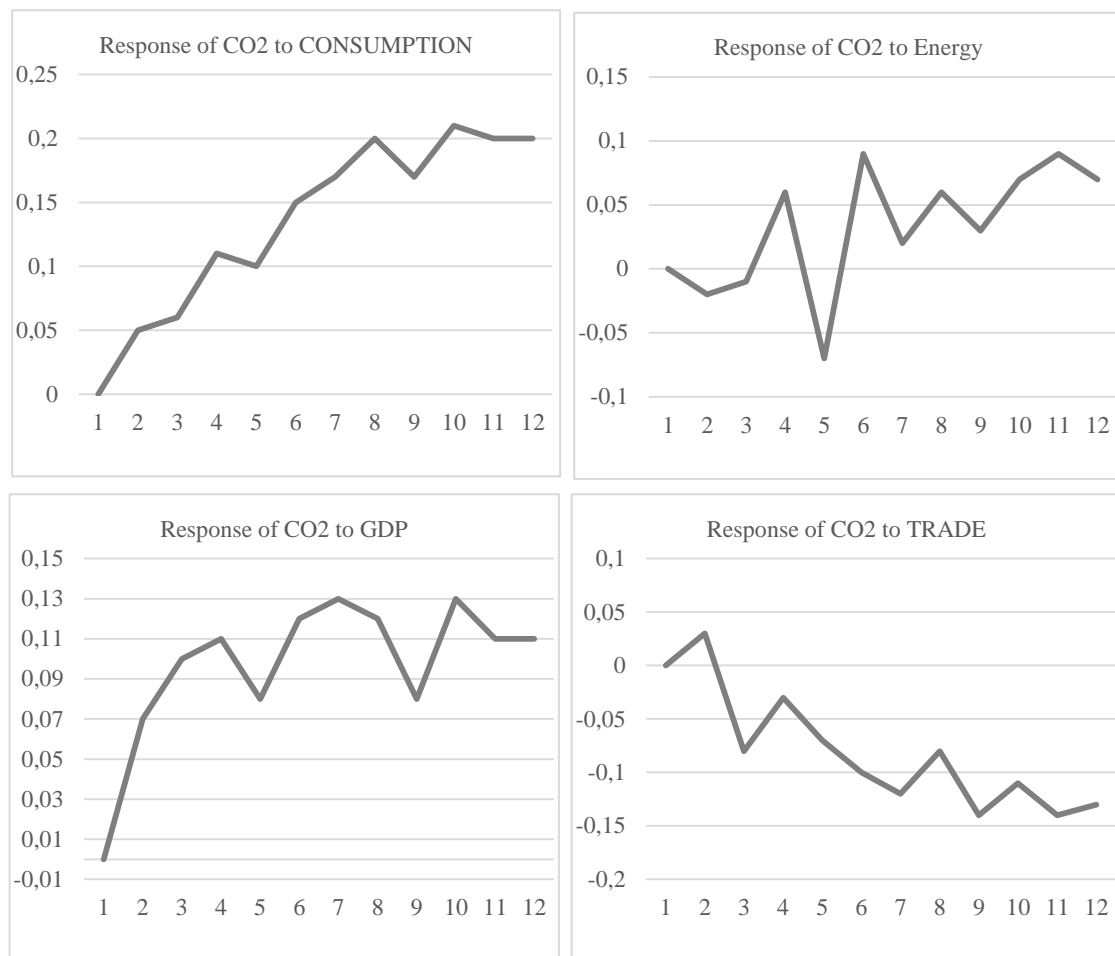
(Source: Calculations and graphical presentation by authors)

A shock of one standard deviation in energy use causes positive effect onto CO2 emissions. The intensity of this reaction is smaller than the one caused by the consumption. In the first three years the effect is near to zero, and a more significant increase comes after the fifth period.

GDP causes steady and positive response to CO2 emissions. A shock of one standard deviation in GDP always increases the emissions of carbonite dioxide, and this increase is persistent through the twelve periods horizon.

The last effect is one caused by total trade. Increasing shock in trade has negative impact on the CO2 emissions, starting from the third period and with increased intensity, this negative trend continues until the end.

The results from the impulse response functions confirm that the economic factors are important determinants of carbon dioxide emissions in the Western Balkans and the neighboring countries.

4. DISCUSSION

The results from the estimated model manage to confirm that household consumption, energy use, GDP per capita and trade have statistically significant and long-term effect on carbon emissions. Private household consumption seems to have the leading impact on CO_2 emissions, since according to the impulse response function, this effect starts from the second year and continues to grow throughout the forecast period. The effect is in accordance with expectations and similar results can be found in research by Druckman & Jackson (2015) and Lai, et al. (2020). Particularly Druckman & Jackson (2015) state that households are accountable for almost three-quarters of the global carbon emissions and understanding the drivers of these emissions is important for making progress towards low carbon future. Lai, et al., 2020 consider that it is important to discuss the effects that household consumption have on carbon emissions in order to achive the goal of energy conservation and emission reduction. Their results confirm that most household carbon emissions come from direct energy, food, medical and daily necessities consumpition.

In addition to the previous findings, it is important to mention that consumerism contributes to increased personal consumption causing greater use of energy and materials, leading to increased waste from purchased products (Orecchia & Zoppoli, 2007). Personal consumption has a considerable influence on economic growth, which is why governments try to stimulate consumption to foster economic development. Yet, this comes with a significant negative impact on the environment and increases carbon dioxide emissions.

The presented model confirms a long-run relationship between energy consumption and carbon emissions. Impulse response function shows that innovations to unexpected rise in energy use causes increase in CO_2 emissions, particularly after the fifth year. In the first three years there are no significant increases in carbon emissions. The increase in CO_2 emissions caused by energy increase is the expected determinant and few other studies have confirmed this finding. Abbassi et al. (2021) performed panel cointegration model and confirmed long-run relationship between energy consumption and CO_2 emissions, indicating that high energy consumption represents a barrier for improvement of the environmental quality in the long run in eight Asian countries. Energy consumption as one of the key causes for increased carbon emissions was confirmed by Sharma (2011), Akadiri et al. (2019) and Salari et al. (2021).

Economic growth is expected to contribute to increased CO_2 emissions. Rise in industrial production, construction of new buildings and infrastructure require higher energy demand across sectors, and in the analyzed set of countries most industries rely heavily on fossil fuels. The impulse response function reports fluctuating and constantly growing long-term effect on carbon emissions caused by an increase in GDP per capita. Growth rate of domestic product per capita and the growth rate of CO_2 emissions corresponds to conclusions from Pejovic, et al., (2021), Wang et al. (2019), while Salari, et al. (2021) had findings that showed an inverted-U shape relationship between CO_2 emissions and GDP, providing evidence to validate ne Evnironmental Kuznets Curve.

According to the impulse response function, the impact of a positive shock in total trade value leads to a reduction in carbon dioxide emissions in the long term. Akin (2014) obtained a similar result in an analysis of the relationship between energy use, economic development, and trade openness as variables influencing carbon dioxide emissions. He concluded that trade openness can reduce carbon dioxide emissions in the long run, although a positive

change in trade openness leads to an increase in carbon dioxide emissions in the short term. The results are not surprising since increase in trade can reduce CO2 emission through several mechanisms such as: global supply chain efficiency, where country specialize in production of goods and services for which they have comparative advantages, or the scenario of carbon leakage mitigation where emission intensive industries relocate to countries with less strict environmental regulations. Of course, this only keeps the emission on the same level or higher, globally. Other mechanisms include technological transfer, access to clean energy sources, or import of cleaner goods. A study from Wang et al. (2023) finds that the impact of trade on carbon emissions is heterogeneous, where trade openness leads to increase in carbon emissions, while trade diversification leads to reduction in carbon emissions. This study used data from OECD and G20 countries. It can be concluded that when comes to countries from the Western Balkan and the surrounding countries increase in trade can contribute to reduced CO2 emissions, mostly due to the imported goods instead of producing the same goods at emission intensive industries.

4. CONCLUSION

Economic growth has been one of the most important goals set by the policy makers in the Western Balkan and neighboring countries. After decades of turbulence and political instability, achieving and sustaining this goal is not an easy task. The governments of these economies were ready to compromise between the economic growth and development, which brings employment and social stability on one hand, and on the other hand there is the significant rate of pollution, an unwanted and yet present side effect of increased economic activity. After decades of compromises now is probably a good starting point for those same policy makers to reconsider their policies and to start developing viable alternatives for reduction of CO2 emissions and development of new green economies.

The first step towards reduction of CO2 emissions is identifying the key economic determinants that have impact on these emissions. The findings of this study confirm that household consumption, energy use, gross domestic product and trade have statistically significant impacts on carbon emissions. It would be important for policymakers to know that increase in household consumption, energy use and gross domestic product also causes increase in CO2 emissions, while increase in trade causes reduction in carbon emissions. These findings are particularly important for the selected countries since they seem to be not sufficiently researched in the previous literature.

This study brings its theoretical and practical contributions. Its theoretical contribution comes by enriching the literature regarding the main determinants of carbon emissions in a group of countries that was underrepresented in previously performed research. This initial analysis can act as a catalysator for further and more complex research regarding the dynamics of CO2 and economic growth. Practical contributions of this study come from its main findings, and they can serve as potential guidelines for creation of environmental and economic policies that will carry the message for reduced emissions and their benefits. Since the energy usage was one of the determinants of CO2 emissions, governments should consider a transition to renewable energy by promotion of solar, wind, hydro, or geothermal power, they can incentivize investments in renewable energy infrastructure and research and development, and ultimately, they can implement polices to phase out or reduce the use of fossil fuels. Regarding the household consumption there are few measures than can be considered such as energy efficiency standards for buildings, appliances and vehicles, carbon pricing mechanism like carbon taxes for reduction of carbon emissions, sustainable transportation where investments in public transportation, cycling infrastructure and pedestrian friendly urban planning can take effect. A lot can be done with education and awareness where the public should be educated about the climate change and the importance

of reducing greenhouse gas emissions and to encourage sustainable behaviors and choices in both households and businesses.

When overall economy is considered, there is much that can be done for reduction of carbon emissions: promotion of circular economy by reducing waste and encouraging recycling and reuse and supporting sustainable production and consumption practices, sustainable agriculture with reduced emissions and reduced food waste, reforestation, and afforestation with implementation of sustainable forestry management practices. Engagement in international climate agreements and partnerships could help in coordination of effort for CO_2 reduction and it could contribute to promotion of technology transfer and financial assistance to help developing countries transition to cleaner energy sources. When comes to trade, encouraging trade agreements could alleviate the overall carbon emissions in certain national economies.

Overall, this research contributes to the understanding of the linkages between economic growth and environmental sustainability in the Western Balkans and neighboring regions. It highlights the urgent need for policy interventions that promote sustainable development pathways, ensuring economic prosperity while safeguarding the environment for future generations.

Future research could expand on this study by incorporating additional variables and refining the analysis to capture a more comprehensive understanding of the drivers of CO_2 emissions.

In conclusion, the results of this study underscore the importance of integrating environmental considerations into economic policymaking. Achieving sustainable economic growth in the Western Balkans and neighboring regions necessitates a transformative approach that balances prosperity with environmental preservation. Promoting renewable energy, improving energy efficiency, and adopting low-carbon technologies are key strategies to mitigate the impact of rising energy demand on the environment and combat climate change. Policymakers should prioritize investments in clean technologies, energy efficiency, and sustainable infrastructure. Moreover, public awareness campaigns and education initiatives can foster a culture of responsible consumption and environmental stewardship.

REFERENCES

Abbassi, M., Parveen, S., Khan, S. & Kamal, M., 2020. Urbanization and energy consumption effects on carbon dioxide emissions: evidence from Asian-8 countries using panel data analysis. *Environmental Science and Pollution Research,* Volume 27, p. 18029–18043.

Ahmad, N. et al., 2017. Modelling the CO_2 emissions and economic growth in Croatia: Is there any environmental Kuznets curve?. *Energy,* Volume 123, pp. 164-172.

Akadiri, S. S., Alola, A. A., Olasehinde-Williams, G. & Etokakpan, M. U., 2020. he role of electricity consumption, globalization and economic growth in carbon dioxide emissions and its implications for environmental sustainability targets. *Science of The Total Environment,* Volume 708.

Akin, C., 2014. The impact of foreign trade, energy consumption and income on CO_2 emissions. *International journal of energy economics and policy,* 4(3), pp. 465-475.

Brooks, C., 2014. *Introductory Econometrics for Finance.* New York: Cambridge University Press.

Cedeborg, J. & Snobohm, S., 2016. *Is there a relationship between economic growth and carbon dioxide emissions,* Stockholm: Sodertorns University.

Druckman, A. & Jackson, T., 2015. Understanding households as drivers of carbon emissions. In: R. Clift & A. Druckman, eds. *Taking Stock of Industrial Ecology.* s.l.:Springer Cham, pp. 181-203.

Goodness, C. & Prosper, E., 2017. Effect of economic growth on CO2 emission in develeping countries: Evidence from a dynamic panel threshold model. *Cogent Economics & Finance,* 5(1).

Kokotovic, F., Kurecic, P. & Cingula, D., 2015. The greenhouse gas emission in the EU: VAR analysis of the relevant variables. *International Journal of Management Science and Business Administration,* Том 2, pp. 37-46.

Lai, S., Wang, X. & Li, Y., 2020. *Carbon footprint of household consumption of different income groups - evidence from micro-data of Chinese Housholds.* Jeju Island, International conference of energy, environment and bioengineering (ICCEB 2020).

Mitic, P., Fedajev, A. & Kojic, M., 2023. Exploring the economy-environment interatctions in the Western Balkans. *Economic Analysis,* 56(1), pp. 43-56.

Mitic, P., Kostic, A., Petrovic, E. & Cvetanovic, S., 2020. The relationship between CO2 emissions, industry, services and gross fixed capital formation in the Balkan countries. *Economics of Engineering Decisions,* 31(4).

Orecchia, C. & Zoppoli, P., 2007. Consumerism and environment: does consumption behavior affect environmental quality?. *CEIS Working Paper,* Volume 261.

Pejovic, B., Karadzic, V., Dragasevic, Z. & Backovic, T., 2021. Economic growth, energy consumption and CO2 emissions in the countries of the European Union and the Western Balkans. *Energy Reports,* Volume 7, pp. 2775-2783.

Rambeli, N. et al., 2018. The impact of selected macroeconomic variables on carbon dioxise (CO2) emissions in Malaysia. *International Journal of Engineering & Technology,* 7(4.15), pp. 204-208.

Salari, M., Javid, R. J. & Noghanibehambari, H., 2021. The nexus between CO2 emissions, energy consumption, and economic growth in the U.S.. *Economic Analysis and Policy,* Volume 69, pp. 182-194.

Sharma, S., 2011. Determinants of carbon dioxide emissions: empirical evidence from 69 countries. *Applied Energy,* 88(1), pp. 376-382.

Stolyarova, E., 2013. *Carbon dioxide emissions, economic growth and energy mix: empirical evidence from 93 countries.* Prague, EcoMod 2013 conference.

UNDP, 2023. *Sustainable Development Goals.* [Online] Available at: https://undp.org/sustainable-development-goals [Accessed 26th October 2023].

Wang, C., Hsueh, H., Li, F. & Wu, C., 2019. Bootstrap ARDL on health expenditure, CO2 emissions, and GDP growth relationship for 18 OECD countries. *Frontiers in public health,* Volume 7, p. 324.

Wang, Q., Zhang, F. & Li, R., 2023. Free trade and carbon emissions revisited: The asymmetric impacts of trade diversification and trade openness. *Sustainable Development.*

World Bank., 2023. *Western Balkans Show Resilience Despite Slowing Growth and Continued Price Rises.* [Online] Available at: https://www.worldbank.org/en/news/press-release/2023/04/25/western-balkans-show-resilience-despite-slowing-growth-and-continued-price-rises [Accessed 3 November 2023].

World Bank., 2023. *World Development Indicators 2023.* [Online] Available at: https://databank.worldbank.org/source/world-development-indicators

CULTIVATING PERSPECTIVES: THE AGRICULTURE SECTOR IN NORTH MACEDONIA, THE 'OPEN BALKAN' INITIATIVE, AND THE DUAL SHOCKS OF COVID-19 AND THE UKRAINIAN CRISIS

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ABSTRACT
This paper investigates the intertwined effects of two contemporaneous global crises, the Covid-19 pandemic and the Russia-Ukraine military conflict, on agriculture sector companies operating in North Macedonia. Additionally, it explores the potential advantages arising from regional economic cooperation within the Western Balkans. The study pursues a comprehensive analysis to discern the multifaceted challenges confronted by these companies while evaluating the role of regional collaboration in mitigating the repercussions of such crises. The research explores the measures adopted by North Macedonian government to mitigate the adverse effects of these crises. Moreover, it examines the role of regional economic cooperation among Western Balkan countries in enhancing the agricultural sector's resilience and recovery. Findings reveal the pivotal role of regional cooperation in creating a supportive framework for agricultural sector in North Macedonia and neighboring countries. The study encompasses various aspects, including general perspectives of companies, import-export dynamics, regional economy, and production conditions during post-COVID-19 and the Russia-Ukraine military conflict crises. Furthermore, the research outlines the agricultural development policy priorities for North Macedonia. The findings shed light on the effects of the "Open Balkan" initiative and provide valuable insights for policymakers and stakeholders in the agricultural sector. Our findings are poised to inform policy formulation, guide strategic decisions within the business landscape, and drive international collaboration initiatives geared toward enhancing agricultural resilience and fostering sustainable development in the region.

Keywords: agriculture sector, Open Balkan, covid19, Ukrainian crisis

JEL classification: C83, D20, L10,

1. INTRODUCTION

The subject of analysis in this paper is the attitudes and perceptions of companies from the agricultural sector in the Republic of North Macedonia in relation to the Open Balkan initiative and the impact of the Covid pandemic and the Ukrainian crisis on their operations. Agriculture has a great importance for the economic development of the country, hence the justification of its analysis within the framework of the creation of a common regional agricultural market. Agriculture represents the third largest sector in the economy of N. Macedonia. Following the

service sector and industry in N. Macedonia, the participation of agriculture in GDP and total employment is at a significant level. Hence, the importance of the agricultural sector for the Macedonian economy can be seen in the fact that in 2021, about 50% of the total area is agricultural land.[1]

Regional economic cooperation is key to promoting sustainable growth and development in the countries of the Western Balkan. In recent years, there has been an increased focus on promoting regional economic cooperation in the agricultural sector, particularly through initiatives such as the Open Balkan initiative. Overall, regional economic cooperation in the agricultural sector in the Western Balkans has the potential to promote sustainable growth and development, and initiatives such as Open Balkan are important steps in this direction. Open Balkan is a regional initiative created by North Macedonia, Serbia, and Albania, committed to securing conditions for practicing the four European freedoms for as many as possible citizens and companies in the Balkans. When speaking of free movement of people, goods, capital and services, Open Balkan reinforces the regional cooperation and connectivity[2]. This initiative is an opportunity to strengthen regional economic cooperation and promote the freedom of movement of people, goods/goods, capital and services. The main goal of the Open Balkan is to overcome the social, economic and trade barriers that hinder economic growth in the region by implementing the four freedoms on which European integration is based, freedom of movement of goods, workers, capital and services. One of the benefits of this initiative is the establishment of a regional market between member countries of the initiative.

COVID-19 health crisis caused a shock and threat to the stability of the global economy and labor markets, affecting not only supply (production of goods and services) but also demand (consumption and investment). A large number of companies, regardless of size, faced serious challenges, with the real threat of a significant drop in revenues, insolvency, and job losses in certain sectors. At the same time, for the current war between Russia and Ukraine, as early as March 2022, both world and domestic analysts were decisive that the global economy will experience a major crisis, inflation will rise, and a recession will be possible as a result of the war. Economists predicted that the Macedonian agriculture, food industry, wine industry, pharmacy, metal industry and companies related to the supply of energy will suffer great damage after the Russian invasion of Ukraine and from the economic sanctions that have begun to be implemented. One-third of Macedonian agricultural products end up on the Russian market. The figures for Macedonia's foreign trade with Russia and Ukraine are small. In 2021, Russia participated with 0.7% in the total export of North Macedonia. That percentage for Ukraine is even lower - with 0.2%. On the other hand, Russia participates with 1.7% and Ukraine with 1.5% in the Macedonian import.[3] This analysis aims to perceive the progress of North Macedonia in terms of integration processes within the Western Balkans through the prism of companies in the country that are only export or export/import oriented in one or more countries of the region. The analysis aims to examine the recognition of the characteristics of the Open Balkan initiative, perception, and localization of the main advantages and disadvantages according to the opinion of the respondents. It further aims to reveal the effects that the COVID-19 pandemic and the military conflict between Russia and Ukraine have had on companies and to see if the Government's measures aimed at helping agricultural and food production and processing

[1] Hristovska Mijovic, B., Spasova Mijovic, T., Trpkova-Nestorovska, M., Tashevska, B., Trenovski, B. & Kozeski, K., (2022). Tobacco Farming and the Effects of Tobacco Subsidies in North Macedonia, Analytica, Skopje, North Macedonia
[2] https://vlada.mk/Otvoren-Balkan
[3] State Statistical Office of RNM

were/are sufficient and beneficial during the COVID-19 pandemic and the military conflict with Russia and Ukraine.

2. LITERATURE REVIEW

The regional economic cooperation of the countries of the Western Balkans is an important topic of research, especially in terms of its impact on the agricultural sector. In this literature review, the existing literature on the regional economic cooperation of the countries of the Western Balkans and the impact on the agricultural sector is listed. A study by Broz et al. (2020) when analyzing the potential benefits of regional economic cooperation between the countries of the Western Balkans showed that closer economic integration can lead to increased trade, investment and economic growth. In all the countries of the Western Balkans, there is an intensification of trade in agricultural and food products and a partial change in the regional and commodity structures of trade. The results of the study by Matkovski, Zekić et al. (2022) showed that all Western Balkan countries, except Albania, have comparative advantages in the export of agricultural and food products, and Serbia has the highest level of comparative advantages in this sector. Moreover, this paper suggests that all countries should strive to secure the best possible positions for their agri-food products during pre-accession negotiations for EU membership and take the necessary steps towards increasing the level of competitiveness in the EU common market. The overview regional report analyses the progress of six Western Balkan economies (Albania, Bosnia and Herzegovina, Kosovo*, Montenegro, North Macedonia, Serbia) regarding the 20 principles of the European Pillar of Social Rights (EPSR). The 2022 review of the performance of Western Balkan (WB) economies regarding the EPRS has been conducted by the Employment and Social Affairs Platform 2 (ESAP 2) programme implemented by the RCC and funded by the European Union. It was produced by WINS Global Consult (Germany) and experts from Western Balkans on behalf of the RCC. Furthermore, the World Bank report (2020) highlights the potential benefits of regional economic cooperation in the post-Covid pandemic period. The report indicates that closer economic integration between the countries of the Western Balkans can help mitigate the negative impacts of the pandemic on the agricultural sector, especially in terms of facilitating trade and investment. In general, the available literature and analyzes suggest that regional economic cooperation between the countries of the Western Balkans can play an important role in promoting the development of the agricultural sector. Closer economic integration can facilitate trade, investment and cooperation, which can promote sustainable agricultural practices and increase access to finance and technology. However, challenges such as political tensions and economic differences between member states need to be addressed for regional integration to be successful. In the context of the impact of the Covid-19 pandemic on companies operating in the agricultural sector, such as in the countries of the Western Balkans, a study by Vuković and Popović (2020) analyzed this impact and showed that the pandemic led to disruptions in supply chains, reduction of demand for agricultural products and challenges in accessing labor and inputs such as fertilizers and seeds. Similarly, a report by the Food and Agriculture Organization (FAO 2020) highlighted the impact of the pandemic on the global food system. The report indicates that the pandemic has led to disruptions in trade and logistics, as well as reduced access to finance and technology, which has affected the ability of companies in the agricultural sector to operate and invest. In terms of government responses to the crisis, a World Bank (2020) report suggests that governments could provide support to companies in the agricultural sector, such as through financial assistance and policy measures to improve access to inputs and markets. The report also highlights the importance of promoting digital technology and innovation in the agricultural sector to help companies adapt to changing

market conditions and improve efficiency. Overall, the available literature and analysis suggest that the Covid-19 pandemic has had significant impacts on companies operating in the agricultural sector, both in the Western Balkans and worldwide. The challenges posed by the pandemic have highlighted the importance of resilience and adaptability in the agricultural sector and the need for policy measures to support companies and promote sustainable agricultural practices.

3.   METHODOLOGY

For the research, a quantitative research methodology was used. It is primarily aimed at agricultural and food companies for production and processing in North Macedonia that are export and/or export-import oriented with the region's countries. The research in the companies was carried out in most cases with a company manager, and in the remaining cases with the owner, director, and/or manager, which indicates that the profile of the respondents are decision makers and are well acquainted with the situation in the company itself. The data collection technique consisted of conducting a telephone survey (CATI) using a computer, through a platform that is specialized for this type of research. Using the software program SPSS (IBM SPSS Statistics Program) the data were processed with the method of descriptive statistics. For the needs of the research, a questionnaire was created - a research instrument of 56 open and closed questions. Sample size and design: The sample consists of 100 companies that are export and/or export-import oriented with the countries of the region, and each is represented by a relevant decision maker (e.g. manager, director, owner, etc.) A stratified simple random sample was created for this research, according to the national classification of activities. Note: This sample design approach does not allow full generalization of the data at the level of all companies in the country, but only at the level of the industries represented in the survey. The average length of the interview is 16 minutes, and the data were collected in October and November 2022.

4. INTERPRETATION OF THE RESULTS AND DISCUSSION OF FINDINGS

The questionnaire consisted of five parts. The first part of the questionnaire, in addition to determining the characteristics of the companies that ensure the representativeness of companies operating in the field of agricultural, food, and processing industry in the country, aims to examine the opinion and perception of the Open Balkan initiative. Furthermore, the second part of the questionnaire measures the level of imports and exports of agricultural, dairy, meat products, and processed products in the countries of the region, the use and satisfaction of subsidies as well as possible barriers and obstacles related to regional cooperation. The third part examines issues related to the regional economy and trade in agricultural and food products and processed products within the framework of the Open Balkan initiative. The fourth and fifth parts of the quantitative analysis deal with the specific problems of companies such as the consequences of the COVID-19 pandemic and the military conflict Russia-Ukraine.

An open Balkan should contribute to free trade, saving time at border crossings and less documentation to show. For the majority (36.0% would completely open new opportunities, 52.0% would mainly open new opportunities) of the companies, this initiative would mean a lot, precisely because of the new opportunities to improve the operation and the opening of opportunities for even better growth of the company. A small part of the companies answered that the Open Balkan would not open new opportunities at all. Analyzed by activity, we note that in the food industry, there is greater optimism (43%) that the initiative would completely open up new opportunities for improving operation, than in companies from the wholesale and retail trade

sectors; repair of motor vehicles (20%). Further considering the companies by size, it is evident that medium-sized companies that have from 50 to 249 employees and large companies with over 250 employees, to a greater extent (58%) believe that the initiative would completely open up new opportunities, unlike micro and small companies who have up to 50 employees (23%). About three-quarters of the surveyed companies or 73.0% answered that there are no obstacles to economic cooperation with the countries of the region. Almost a quarter believe that there are obstacles, and 5% do not know the answer to this question. As for what constitutes an obstacle to economic cooperation, customs and administrative obstacles regarding the delivery of products are pointed out in the first place, and excessive documentation analyses and tests, which take a lot of time, are in the second place. The long waiting at the borders for exporting products is the third place. Most of the surveyed companies believe that the opportunities for trade exchange through the Open Balkan are similar to those of the EU. That is, 17.0% of companies consider that the opportunities are identical, and 40.0% that they are mostly similar. Every third company answered that the opportunities are mainly different from those of the EU, and 8.0% that they are completely different. A small percentage (4.0%) did not have an answer to this question.

4.1. Import-export of agricultural, dairy, meat products and processing
The second part of the questionnaire was created to measure the level of import and export of Macedonian companies with the countries of the region. In fact, through this section, we will find out which crops during production and/or processing prevail among the surveyed companies and with which countries of the region cooperate the most. Furthermore, the research will show whether the surveyed companies receive subsidies and to what extent they are satisfied with them. Finally, this section should reveal whether the COVID-19 pandemic and the military conflict between Russia and Ukraine have affected the companies' profits.
It is evident from the results that most parts of the companies are focused on the domestic (98%) and regional markets (95%). 56% of companies are targeting the European market. The other countries that 6% of the companies are targeting are America, Africa, Asia, Canada, and Argentina. These results are not surprising considering that in 2021, Macedonian food producers sold products worth 389.5 million EUR abroad, which is an increase of 7.23% or 26 million EUR more compared to the export realized in the previous year 2020. If we analyze the export of food from the aspect of the markets when it is exported, then Macedonian food products in 2021 were best sold in the countries of the region and EU member countries. Likewise, according to the data of the State Statistical Office, the total value of exports of goods from the Republic of North Macedonia, in the period January - September 2022, amounts to 379,441,735 thousand MKD and records an increase of 20.1% concerning the same period of the previous year. The value of imported goods, in the period January - September 2022, amounts to 554,574,596 thousand MKD, which is 29.1% more compared to the same period of the previous year. Concerning the size of the companies, the results show that medium-sized companies that earn up to 50 million EUR and large companies that earn more than 50 million EUR are to a greater degree (76%) oriented towards the European market, in contrast to micro and small companies that earn up to 10 million EUR (35%).
To the question: Do you have cooperation with any of the countries in the region (Serbia, Albania, Montenegro, etc.)? a high 86% of the surveyed company representatives answered that they have regional cooperation, and only 14% stated negatively. Analysis of cross-sectional data by company size indicates that medium-sized companies with 51-249 employees and large

companies with 250+ employees have more cooperation with countries in the region (97%) than micro and small companies with up to 50 employees (79%).

The companies that have regional cooperation answered that it is mostly in the domain of: placement of agricultural products (98.8%), then promotion of agricultural products (62.8%), and supply of raw materials and materials (41.9%). On the other hand, companies that do not have cooperation with the countries of the region, indicate that the main reason is that they did not need cooperation (50.0%), then 35.7% said that they are not familiar with the benefits of cooperation. About one-third are not familiar with the ways and channels of communication and the same number had difficulties and barriers to cooperation.

Analysis of the data shows what percentage of the companies' operations are directed to Serbia, Albania, and Montenegro. Thus, four out of ten companies do business with up to 50% of Serbia, a quarter does up to 25%, and about 16% of the companies answered that they do up to 10% with this country. Analyzing company size (number of employees), we notice that medium and large companies cooperate with Serbia at a higher percentage than micro and small companies. That is, half of the surveyed medium and large companies cooperate with Serbia up to 50%, compared to micro and small companies of which 34% answered that they do business with Serbia up to 50%.

The results show that 32% of the companies do business with Albania up to 10%. A quarter of the companies answered that they do not work with this country at all, while 21% said that they cooperate up to 25%. By activity, the results show that 37% of companies from the wholesale and retail trade sector do not cooperate with Albania at all, in contrast to processing industries (21%). Also, micro and small companies with up to 50 workers answered in a larger percentage that they do not cooperate with Albania at all (37%), in contrast to medium and large companies (8%). Montenegro is a country with which almost four out of ten companies do not cooperate at all. Every third company cooperates with up to 10%, and about a quarter of companies indicated that they cooperate with up to 25% of Montenegro. By activity, four out of ten companies from the processing industry answered that they do not cooperate with Montenegro at all, in contrast to companies from the wholesale and retail trade sector (30%). Analyzing by company size (number of employees) we notice that almost half of the micro and small companies or 48% said that they do not cooperate with Montenegro at all, concerning medium and large companies of which 18% answered that they do not cooperate with this country. Hence, it could be concluded that the companies represented in the sample mostly cooperate with Serbia. In second place is Albania, while the country with the lowest percentage of business is Montenegro.

On the question: "In your total income from the activity, what proportion is the income from trade in your agricultural/dairy/meat products and processing?" most of the companies (75.0%) answered that their only income is from crops, products and/or processing they work with. For a quarter of companies, the income from trade is up to 80%. A small percentage (1%) answered that the proportion of income from trade is up to 60%. The cross data shows that for the majority (79%) of companies from the processing activity, their only income is from agricultural, dairy, meat products, and processing, in contrast to the wholesale and retail trade sector (67%). Furthermore, according to the number of employees, for a high 86% of micro and small companies that have up to 50 employees, their only income is from crops, products, and/or processing they work with, unlike medium and large companies (58%). For 37% of the surveyed medium and large companies, the income from trade is up to 80%, and for micro and small 13%.

A large majority of the surveyed companies do not receive subsidies from the state. Namely, for trade and purchase, a quarter of companies receive subsidies, and 74% do not receive them. For processing facilities, almost every third company receives subsidies, while 73% do not receive

them. Eight out of ten companies declared that they do not receive subsidies from the state for their agricultural production, and only 12% answered positively to this question. One-third of the companies that receive some kind of subsidies for trade and purchase, processing facility, and agricultural production are satisfied with the form and amount of the subsidies. On the other hand, 10% expressed dissatisfaction.

In the following two questions, we consider how much impact the COVID-19 pandemic and the war between Russia and Ukraine have had on the revenues of the companies. For half of the companies, the revenues remained unchanged. As a result of the COVID-19 pandemic, for 17.0% of the companies surveyed, revenues decreased by up to 20%, and for an additional 12.0%, revenues decreased by up to 50%.

By activity, for 60% of companies from the wholesale and retail trade sector, the revenues remained unchanged, compared to companies from the processing industry (46%). The decline in revenues varies by company size. For the majority (61%) of medium-sized companies with 50-249 employees and large companies with over 250 employees, the revenues remained unchanged. Then, nearly four out of ten micro and small companies with up to 50 employees also did not experience a drop in revenues. Medium and large companies show greater resilience (none of them operated with a realized loss), in contrast to micro and small companies (15%). Furthermore, as a result of the conflict between Russia and Ukraine, for one-third of the companies surveyed, the revenues remained unchanged. Decreased revenues up to 50% are the case for 21.0% of the companies, and for 14.0% the revenues decreased up to 20%.

Analyzed by activity, for 40% of companies from the wholesale and retail trade sector, the revenues remained unchanged, compared to companies from the processing industry (33%). According to company size (number of employees), almost four out of ten medium and large companies do not experience a decrease in revenues as a result of the Russia-Ukraine conflict, compared to micro and small companies (31%).

Eight out of ten surveyed companies or 79% said that they have not faced and currently are not facing obstacles and barriers in regional cooperation related to the activity they operate with. About 21% stated specific problems and obstacles. The three biggest barriers stated by the surveyed companies are double documentation, analyzes and tests, detailed laboratory analyses of the products, and long waits at the borders for the export of the products.

By activity, three out of ten companies from the processing industry faced obstacles and barriers in regional cooperation, unlike the companies operating in wholesale and retail trade (17%). Also, the results show that companies with an annual turnover of up to 50 and over 50 million EUR (medium and large) had a higher percentage of problems with regional cooperation (27%), compared to companies with a turnover of up to 10 million EUR, i.e. micro and small (14%).

The opinion of more than half of the surveyed companies is that the conditions for the export of goods are continuously getting easier compared to 10 years ago. Every third company believes that export processes are stagnant, and 7% said that they are moving downwards.

4.2. Regional economy and trade in agricultural, dairy, and meat products within the framework of the "Open Balkan" initiative

The goal of the Open Balkan initiative is the creation of an economy, without customs, without border waiting, and with one hundred percent free trade. Open Balkan means a new chapter in regional cooperation, which will "make us better and make Europe better". The initiative is not limited to the three countries and any other country from the surrounding area is welcome and can join if they wish. In the third part, the main emphasis was to examine the opinion of the

companies on improving the placement, competitiveness, and new opportunities for North Macedonia for a common market with the Open Balkan initiative. All surveyed companies had to express their level of agreement with each statement. Most of the companies believe that the *"Open Balkan" initiative would open up new opportunities for North Macedonia for a common market* (18% completely agree, 52% mainly agree), 20% have a neutral attitude, while 10% of the companies do not agree with this statement (9% mainly disagree, 1% disagree). Almost three-quarters of the surveyed companies agree with the following statements: *the "Open Balkan" initiative would improve the placement of Macedonian products and processing in the countries of the region* (26% completely agree, 47% mainly agree), and with *the "Open Balkan" initiative" would open up new opportunities for North Macedonia for a common market of agricultural, dairy and meat products and processing* (25% completely agree, 50% do not agree at all). The results show that the companies agree that the Open Balkan initiative would open up new opportunities for North Macedonia and a common market. It would also improve the placement and competitiveness of production and processing activities of agricultural, dairy, and meat products.

There is a high level of optimism among companies that the Open Balkan initiative could overcome the current barriers to distribution and trade in agricultural, dairy, meat products, and processing within the countries of the region. Namely, more than half of the companies (53.6%) believe that the initiative would overcome barriers, while a quarter of the surveyed companies have the opposite opinion, i.e., they do not agree with this statement.

On the question: To what extent do you agree that the negative consequences in agricultural/dairy/meat production and processing caused as a result of COVID-19 and the Russia-Ukraine conflict would be overcome if these countries acted in an integrated manner, as is the basic idea of the "Open Balkan" initiative?, 62% of the surveyed companies answered that the Open Balkan initiative would successfully overcome the consequences, while 18.4% answered that they would not. 19.4% of representatives of the surveyed companies have a neutral opinion regarding this issue.

The last question from this topic refers to the possibility of advancing the operation of companies with the Open Balkan initiative in certain domains. So, the results of the research show that with the initiative Open Balkan, in the first place, it would be possible to work on improving the placement of agricultural products (80%). In second place as a possible domain for promotion, they ranked the promotion of agricultural products (61%), followed by a joint performance on a third market with 47%.

4.3. Condition of agricultural, dairy, and meat production in the Republic of North Macedonia in the POST-COVID-19 period

The Covid crisis started in the country in mid-March 2020. Agriculture and food production during this period was severely affected by market restrictions, restriction of movement, financial debts, lack of seasonal workers, and so on. Losses and decline in revenues slowed down production activities due to limited working hours and movement, closure of the usual sales channels, uncertain placement, and problems with the purchase, which are just some of the consequences caused by the COVID-19 pandemic in the Macedonian agricultural and food production. Food production is still a very important element of our existence, and thus agriculture is a determinant of society and its development. By increasing productivity itself, agriculture as a basic economic branch that connects society with nature enables the stable and sustainable development of any economy. Many analyses show a drastic drop in the prices of

certain products, which further worsens the economic situation. Farmers and scientists agree in stating that the Covid crisis has brought weaknesses to the surface and deepened the problems lasting over the last decades. It also raised the question of whether, as a country dependent on imports, we will have enough food. So, in the following section, we consider the impact and consequences of the COVID-19 pandemic on agriculture, food, and processing industries. We also consider the measures that were taken by the surveyed companies for easier managing of the pandemic, as well as the use of economic measures by the state and the level of satisfaction with them. At the beginning of this set, company representatives were first asked if they have experienced the consequences of the COVID-19 crisis in terms of the demand for products and processing. Most of the companies (56%) did not notice a decrease in demand. About 19% of companies surveyed reported that the pandemic decreased the demand by up to 50%. For an additional 18% of companies, the demand decreased to 25%. A decrease in demand differs according to the size of the company (number of employees). Larger companies show greater resilience, i.e. 68% of medium and large companies did not experience a decrease in demand during the COVID-19 pandemic at all, in contrast to micro and small companies (48%). By activity, the results show that the processing industries in a greater percentage experienced a decrease in demand, in contrast to companies operating in wholesale and retail trade.

The research shows that due to restrictive measures taken as a result of the COVID-19 pandemic, companies mostly faced a decrease in the placement of products and processing. This is a problem faced by 38% of the companies, and the same number said that they did not face any of the listed problems. Furthermore, 33% experienced a significant increase in operating costs. 24% of companies were affected by a significant decrease in income.

The main problems faced by the Macedonian processing industries are a decrease in the placement of products and processing and a significant decrease in operating costs (41%). A decrease in the placement of products is also highlighted as the first-ranked problem in the wholesale and retail trade sector (26%). Furthermore, 16% of the trade sector said they had a problem in supplying raw materials, artificial fertilizers necessary for optimal agricultural production, and decreased income. According to company size, micro and small companies with up to 50 employees mostly faced increased operating costs (47%) and a decrease in the placement of products and processing they deal with (45%) compared to medium and large companies.

To mitigate the consequences of the pandemic and maintain the workforce, more than half of the surveyed companies have taken measures to adjust their business operations. Every third company or 35% introduced remote working. About 11% of the companies reduced salaries, and 10% had financial indebtedness. Other measures taken by 33% of companies are: wearing protective equipment and masks, working in groups, wearing protective suits and masks, and wearing protective equipment and masks, less workload. 42% of the companies did not take any of the listed measures to deal with the COVID-19 pandemic. The analysis by activity shows that the wholesale and retail trade sector most often practiced the measure of remote working (50%), in contrast to the food industries (29%). Two major factors influenced this: the curfew prohibited the enterprises from working in the afternoon (therefore, they had to organize the work in one shift[4]), and the reduced volume of work/sales due to lower consumption and demand for certain products. But, of course, the possibility of working from home is still related to the nature of the workplace and the ability of companies to adapt to this type of work.

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[4] Some production facilities were able to work during the curfew with special permits, although they also had problems with the transportation of workers.

Most parts of the companies (83%) did not use the economic measures from the state to deal with the crisis of COVID-19. About 17.0% of the companies gave a positive answer. Of the companies that used economic measures from the state, 64.7% said that it was a payment of MKD 14,500 per employee for April and May 2020, while 52.9% of the companies used favorable loans or subsidized loans from the Development Bank of North Macedonia (DBNM), and one quarter used the obligatory use of annual leave until May 2020 at the latest. As a follow-up to the previous question, the companies were asked how they evaluate the usefulness of the measures from the state for managing the crisis of the COVID-19 pandemic. Almost six out of ten companies responded positively to this question (11.8% completely helped, 52.9% mainly helped), and one-third of the surveyed companies answered negatively (23.5% mainly helped, and 5.9% did not help at all). About 5.9% do not know the answer to this question.

To the question: "As a result of the COVID-19 pandemic and the restrictive measures taken, to what extent did the trade of agricultural/dairy/meat products and processing of your company decrease?" for 28.0% of the companies, the trade decreased up to 10%. For 27.0% of the surveyed companies, there was no decrease in trade, and for 18% it decreased up to 50%. As a result of the COVID-19 pandemic and the restrictive measures taken, for one-third of the surveyed companies, the trade of agricultural, dairy, and meat products and processing with the countries of the region decreased by up to 10%. For a quarter of the companies, there was no decrease in trade, while for 16.0% it decreased up to 20%.

4.4. The condition of agricultural, dairy, and meat production in the Republic of North Macedonia during the Russia-Ukraine conflict

The state military conflict between Russia and Ukraine generally has a major impact on agricultural and food export. The increase in the price of electricity, oil, and raw materials for production and the closing of markets significantly affected the agricultural sector. The Russian aggression against Ukraine, which causes a price shock in the markets, not only worsens the situation given the growth of prices, but also the lack of basic agricultural products such as wheat, sunflower, and corn, which we produce, but we also import. The transport business, which must move to survive, also suffers great damage. The increased fuel prices, the increased cost of transportation, but also the increased competition of empty trucks waiting for products to be transported are part of the consequences that transporters deal with in conditions of military conflict.

In the last set of this research, we examine the changes that occurred in agricultural, dairy, and meat production and processing during the crisis of the Russia-Ukraine military conflict. The analysis shows that 45.0% of the surveyed companies did not experience a decrease in product demand at all as a result of the Russia-Ukraine military conflict. About 22% of companies reported that demand decreased by up to 50%, and by almost the same percentage demand decreased by up to 25%.

A large majority (58%) of medium and large companies that have from 50 to 249 and over 250 employees did not experience a decrease in the demand for products and processing at all, in contrast to micro and small companies that have up to 50 employees (37%). By activity, the demand did not decrease at all among 53% of companies from the wholesale and retail trade sector, in contrast to the processing industry (41%).

One of the biggest consequences of the restrictive measures taken due to the Russia-Ukraine conflict is a significant increase in operating costs for 81.0% of the surveyed companies. This

problem is obvious because the conflict between Russia and Ukraine first led to the increase in the price of electricity, increased fuel prices, and increased cost of transportation, which further worsened the conditions in agricultural and food production. In the second place, one-third of the companies faced problems in the procurement of raw materials, and artificial fertilizers necessary for optimal agricultural production, and for one-quarter, the restrictive measures caused a decrease in the placement of products and processing.

A significant increase in operating costs is the main problem faced by 93% of companies in the wholesale and retail trade sectors. This problem is also highly ranked among processing industries (73%). Furthermore, in second place, trade and processing industries were faced with problems in the supply of raw materials, and artificial fertilizers necessary for optimal agricultural production (33%). In processing industries, the problem of decreasing the placement of products and processing (30%) stands out, compared to the wholesale and retail trade sector, where this problem is manifested in a smaller percentage (13%).

More than half of the companies have taken various actions related to their personnel in response to the crisis of the Russia-Ukraine conflict. It is evident that a significant number (44%) of companies reported financial indebtedness. About 11.0% of companies said they cut wages, and 6.0% said they simply laid off employees and canceled bonuses and rewards. On the other hand, almost half of the surveyed companies stated that they did not undertake any of the listed measures to deal with the crisis conflict between Russia and Ukraine.

Regarding economic measures from the state to help deal with the crisis of the war between Russia and Ukraine, the analysis of the results shows that 99% of the surveyed companies did not use economic measures from the state. Only one company that answered positively to this question used subsidies that mainly helped it deal with the crisis from the Russia-Ukraine conflict.

Furthermore, 28.0% of the surveyed companies did not face a decrease in trade in agricultural, dairy, and meat products and processing. On the other hand, 27.0% reported that trade in products and processing decreased up to 10%. For an additional 15%, trade decreased up to 20%, and 14% of companies faced a decrease of up to 50%. Analyzed by activity, for 47% of companies from the wholesale and retail trade sector, the Russia-Ukraine conflict did not contribute to a decrease in trade, in contrast to the processing industry (20%). For 27% of the processing industry, trade decreased by up to 10% and 19% faced a decrease of up to 50%.

Furthermore, for three out of ten surveyed companies, there was no decrease in trade of products and processing with the countries of the region. For 28.0% of companies, regional trade in agricultural, dairy, and meat products and processing decreased by up to 10%, while 14.0% reported a decrease in trade by up to 20%. By activity, the analysis shows that for half of the companies from the wholesale and retail trade sector, there was no decrease in trade with the countries of the region. For a third of companies from the processing industry, regional trade decreased by up to 10%, and 21% did not face a decrease.

More than half of the surveyed companies stated that the Open Balkan initiative will not improve the placement and exchange of agricultural, dairy, and meat products and processing, while 46.0% gave a positive answer to this question. Analyzed by activity, we note that there is more optimism in the food industry (51%) that the Open Balkan initiative will improve the placement and exchange of products and processing, than in companies from the area of wholesale and retail trade; and motor vehicle repair (33%).

To the question: Do you consider that if the "Open Balkan" initiative had been established earlier, the consequences caused by COVID-19 and the Russia-Ukraine conflict for

agricultural/dairy meat production and processing and their placement would have been reduced?, the majority of surveyed companies believe that the earlier establishment of the Open Balkan initiative would not have reduced the consequences caused by COVID-19 and the Russia-Ukraine conflict. About a quarter of the companies answered positively, and 16.0% do not know the answer to this question.

The companies that answered positively to this question believe that if the Open Balkan initiative had been established earlier, the consequences would have been reduced because the companies would have: better placement and transportation of the products; regional cooperation, and the surpluses would be placed in the countries of the Open Balkan; faster transfer of goods to other countries and vice versa; market price competitiveness; faster placement of products and greater volume of operation.

At the end of the survey, the companies were asked an open-ended question that allowed them to express themselves freely about this topic. For a more precise interpretation, the answers are grouped by category and intensity of repetition. To the last question: If you could create the future agricultural development policy of the Republic of North Macedonia, which questions would you put as a priority?, most of the surveyed companies indicated that the development of agricultural policy in North Macedonia, is necessary to emphasize the increase of subsidies for domestic production, but also its timely payment.

5. CONCLUSIONS

The research findings indicate a generally positive perception of the "Open Balkan" initiative among companies, emphasizing its potential to enhance regional cooperation and streamline trade processes. Key benefits acknowledged include smoother documentation processes, expedited flow of goods, increased cooperation, and simplified import-export operations. The majority of companies focus on domestic and regional markets, with a notable percentage targeting the European market. Additionally, most companies rely heavily on their own agricultural production for income.

The impact of the COVID-19 pandemic and the Russia-Ukraine conflict varied for the surveyed companies. However, a significant portion reported stable profits or limited decrease in profits. The crisis situations highlighted challenges related to reduced product demand, increased operating costs, and supply chain disruptions, necessitating various coping mechanisms.

Looking ahead, the surveyed companies advocated for enhanced agricultural policies in North Macedonia, emphasizing the need for increased subsidies, timely payment, and regulation of product purchases. Investments in high-quality seeds, modern machinery, and infrastructure were deemed essential to elevate agricultural production and competitiveness while promoting environmental sustainability and food safety.

In conclusion, fostering sustainable agriculture, optimizing production, and supporting the agricultural sector's modernization are fundamental steps toward achieving competitiveness, improved livelihoods for farmers, and the overall development of rural areas. Addressing challenges effectively and implementing informed policies will be pivotal in ensuring a prosperous future for the agricultural sector in North Macedonia.

That is why it is necessary to aim for the creation of conditions for sustainable agriculture and its modernization in primary and secondary production to achieve an increase in production and raise the quality of Macedonian agricultural products, environmental protection, and food safety, i.e. to create competitiveness and added value to agricultural products, while at the same time to ensure the satisfying of country's needs from domestic production. By achieving the

competitiveness of agricultural products, dignified life for farmers and the development of rural areas will be necessarily ensured.

REFERENCES

Broz, T., Buturac, G. i Parezanin, M. (2020). Digital transformation and economic cooperation: The case of Western Balkan countries. Zbornik radova Ekonomskog fakulteta u Rijeci, 38 (2), 697-722. https://doi.org/10.18045/zbefri.2020.2.697

Customs Administration of Republic of North Macedonia, https://customs.gov.mk/otvoren-balkan.nspx

Emil Erjavec, Tina Volk, Miroslav Rednak, Pavel Ciaian & Marius Lazdinis (2021) Agricultural policies and European Union accession processes in the Western Balkans: aspirations versus reality, Eurasian Geography and Economics, 62:1, 46-75, DOI: 10.1080/15387216.2020.1756886

FAO (2022), FAO Food Price Index,

Goran Nikolic (2020) Does it make sense to deepen the economic cooperation of the western Balkan economies?, Economic Research, 33:1, 3453-3475, DOI: 10.1080/1331677X.2020.1774791

Government of Republic of North Macedonia, https://vlada.mk/node/27282

Hristovska Mijovic, B., Spasova Mijovic, T., Trpkova-Nestorovska, M., Tashevska, B., Trenovski, B. & Kozeski, K., (2022). Tobacco Farming and the Effects of Tobacco Subsidies in North Macedonia, Analytica, Skopje, North Macedonia

https://bit.ly/3Eks8Hk

https://www.fao.org/worldfoodsituation/foodpricesindex/en/

J.S. Gaastra, A. de Vareilles & M. Vander Linden (2022) Bones and Seeds: An Integrated Approach to Understanding the Spread of Farming across the Western Balkans, Environmental Archaeology, 27:1, 44-60, DOI: 10.1080/14614103.2019.1578016

Matkovski B, Zekic S, Dokic D, Jurjevic Z, Dzuric I. Export Competitiveness of Agri-Food Sector during the EU Integration Process: Evidence from the Western Balkans. Foods. 2022; 11(1):10. https://doi.org/10.3390/foods11010010

NovaTV, https://novatv.mk/otvoren-balkan-edna-ekonomija-bez-tsarini-100-protsenti-slobodna-trgovija/

Open Balkan Initiative, available at: https://customs.gov.mk/otvoren-balkan.nspx

Open Balkan, available at: https://vlada.mk/Otvoren-Balkan

Recreational Opportunities through Agritourism Increases Relationships within Urban and Rural Communities in Western Balkan Societies, Ermir Shahini, Eugen Skuraj, Fatbardh Sallaku and Shpend Shahini

REGIONAL COOPERATION IN THE WESTERN BALKANS Policy Report January 2021 Regional Economic Area, the "Mini-Schengen" and the Common Regional Market

SOME FEATURES OF DEVELOPMENT IN THE AGRICULTURAL POLICY WESTERN BALKAN CANDIDATES FOR MARKET ACCESS IN THE EU, Zoran Simonovic, Slavomir Miletic, Vesna Popovic

State Statistical Office of RNM

Top 20 largest export markets for Macedonian food in 2021 https://bit.ly/3NULXtj

Trade exchange with foreign countries, January - September 2022 https://www.stat.gov.mk/PrikaziSoopstenie.aspx?rbrtxt=78

Uvalic, M. (2019). Economic Integration of the Western Balkans into the European Union: The Role of EU Policies. In: Dzankic, J., Keil, S., Kmezic, M. (eds) The Europeanization of the Western Balkans. New Perspectives on South-East Europe. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-91412-1_10

World Bank. 2015. Next Generation Albania. Systematic Country Diagnostic.

World Bank. 2017. Faster Growth, More Jobs. Western Balkans Regular Economic Report no. 11, Spring 2017

NAVIGATING CRISIS AND COOPERATION: NORTH MACEDONIAN TOURISM COMPANIES' VIEWS ON THE 'OPEN BALKAN' INITIATIVE AMIDST THE CHALLENGES OF COVID-19 AND THE UKRAINIAN CRISIS

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ABSTRAKT
This paper investigates the dual challenges posed by the Covid-19 crisis and the Ukrainian crisis and their profound impact on the tourism sector in North Macedonia. As these crises disrupted global travel patterns and tourism dynamics, North Macedonia's tourism industry faced challenges. Through an in-depth analysis of empirical data, this paper sheds light on the resilience and adaptability of tourism companies in North Macedonia during these crises. The research explores the measures adopted by North Macedonian government to mitigate the adverse effects of these crises. Moreover, it examines the role of regional economic cooperation among Western Balkan countries in enhancing the tourism sector's resilience and recovery. Findings reveal the pivotal role of regional cooperation in creating a supportive framework for tourism companies in North Macedonia and neighboring countries. Leveraging their shared cultural, historical, and geographical ties, these nations have demonstrated the potential to foster sustainable tourism growth and strengthen economic ties. This paper contributes to the understanding of crisis management in the tourism sector, offering valuable insights for policymakers, businesses, and academics interested in the Western Balkans region's economic development and tourism resilience strategies. The research underscores the importance of collaboration in overcoming crises and capitalizing on shared opportunities, ultimately paving the way for a more robust and resilient tourism industry in North Macedonia and the broader Western Balkans region.

Keywords: tourism sector, Open Balkan, covid19, Ukrainian crisis

JEL classification: C83, D20, L10

1. INTRODUCTION

The subject of analysis of this paper is the analysis of the attitudes and perceptions of companies from the tourism sector in North Macedonia in relation to the Open Balkans initiative and analyze the impact of the Covid -19 crisis and the Ukrainian crisis on their operation.

1.1. Structure and dynamics of the tourism sector

Tourism in North Macedonia has realized continuous growth over the years. Thus, in 1995, 18.5 million EUR of income from tourism were achieved (0,4 percent of GDP) and only 126 EUR of income per tourist. After 2.5 decades, the contribution of tourism to the economic

development of North Macedonia increases significantly to 392 million EUR of income and 517 EUR of income per tourist.

The dynamics of tourism activity depends on the size of the country and the intensity of tourism development. As a small country, North Macedonia has a modest volume of tourist flows, but prosperous to contribute to the economic growth and development of the country. The tourism statistics of North Macedonia are expressed through the number of tourist arrivals (total tourists, domestic tourists and foreign tourists) and overnight stays (total overnight stays, overnight stays by domestic tourists and overnight stays by foreign tourists) (table 1).

Table 1: Tourism statistics for North Macedonia, between 2011 and 2022

Year	Total No. of tourists	Domestic tourists	Foreign tourists	Total overnight stays	Domestic overnight stays	Foreign overnight stays
2011	647.568	320.097	327.471	2.173.034	1.417.868	755.166
2012	663.633	312.274	351.359	2.151.692	1.339.946	811.746
2013	701.794	302.114	399.680	2.157.175	1.275.800	881.375
2014	735.650	310.336	425.314	2.195.883	1.273.370	922.513
2015	816.067	330.537	485.530	2.394.205	1.357.822	1.036.383
2016	856.843	346.359	510.484	2.461.160	1.407.143	1.054.017
2017	998.841	368.247	630.594	2.775.152	1.480.460	1.294.692
2018	1.126.935	419.590	707.345	3.176.808	1.685.273	1.491.535
2019	1.184.963	427.370	757.593	3.262.398	1.684.627	1.577.771
2020	467.514	349.308	118.206	1.697.535	1.444.605	252.930
2021	702.463	408.500	293.963	2.313.543	1.643.083	670.460
2022*	677.843	328.653	349.190	2.228.138	1.456.145	771.993

Note. * 2022 data is incomplete and refers only to the period from January to August.
(Source: MakStat database of the State Statistical Office of the Republic of North Macedonia) (http://makstat.stat.gov.mk).

The analysis period is from 2011 to 2019 due to several points. Namely, since 2011, the Government has successfully introduced measures to subsidize tour operators and agencies working with incoming tourism. At the same time, many low-budget airlines opened, so North Macedonia became an easily accessible tourist destination. Thus, within a decade, international tourism began to develop, so in 2019, the number of nights spent by foreign tourists almost equaled the number of nights spent by domestic tourists. In the best tourist year, 2019, 1,184,963 tourists were registered in North Macedonia, of which 63 percent are foreign tourists, and 36 percent are domestic tourists. In the same year, a total of 3,262,398 nights were spent, of which 48 percent were from foreign tourists, and 52 percent were from domestic tourists (table 1). The average length of stay of all total registered tourists in the period 2011-2019 is 2.7 days, while domestic tourists stayed on average 3.7 days, and foreign tourists 1.9 days. This indicates a space for creating a new tourism product that would keep tourists staying longer.

Table 2 shows the total revenues from tourism and the percentage share in GDP. With the exception of the pandemic year 2020, the average is 295 million EUR of income, i.e. the average annual rate of participation of total revenues from tourism in GDP is 2.7 percent. There are expectations for their increase to more than 450 million EUR.

The favorable positive trend of tourism development, which can be seen from the data in tables 1 and 2, was interrupted by the COVID-19 pandemic, which left great negative consequences at the world and European level, and in North Macedonia. And while in 2021 a

large drop of almost 70 percent in tourism was observed in Europe, in North Macedonia that drop is significantly smaller (-30 percent in the total number of overnight stays, and -40 percent in the total number of tourists). In 2021, a total of 2.3 million nights were registered (1.6 million from domestic tourists and 0.7 million foreign tourists, including tourists from the region from Serbia, Kosovo and Albania). At the same time, the number of foreign tourists increased by 139 percent, making North Macedonia one of the top five countries in the world in terms of the number of tourists. The positive trend can be felt because in the first eight months of 2022, an average of 60-70 percent of the total tourist flows were realized compared to 2019 (table 2). Thus, tourism is seen as an activity that can quickly stimulate economic growth in the post-pandemic period, if the surrounding conditions remain stable.

Table 2: Tourism incomes and participation in GDP

Year	Total incomes from tourism (in millions of EUR)	% of GDP
2011	236	2,3
2012	231	2,4
2013	264	2,5
2014	291	2,6
2015	262	2,7
2016	276	2,7
2017	323	2,9
2018	378	3,1
2019	392	3,2
2020	247	2,1
Average between 2011 and 2019	295	2,7

(Source: https://www.worlddata.info/europe/northmacedonia/tourism.php)

1.2. Tourism and the impact of the Covid-19 crisis

The Covid-19 pandemic has had a major impact on the tourism industry globally. This led to a significant drop in tourist arrivals, resulting in huge revenue losses for companies in the tourism sector. According to the World Tourism Organization (UNWTO, 2022), global international tourist arrivals decreased by 73% in 2020 compared to the previous year. The drop in tourist arrivals has also led to the loss of jobs in the tourism sector. Many hotels, resorts and other tourism-related businesses have had to close or reduce their operations, leading to layoffs and layoffs.

The countries of the Western Balkans were not spared from the negative effects of the Covid-19 crisis. Western Balkans, a region heavily reliant on tourism as a key economic sector. However, the negative effects of the pandemic have seriously affected the tourism industry, leading to huge revenue losses and job cuts. Western Balkan countries have implemented various measures to mitigate the impact of the pandemic on the tourism sector, such as financial support for affected businesses and promotion of domestic tourism.

1.3. Government measures in the tourism sector in North Macedonia

North Macedonia government has adopted economic measures to deal with the crisis from the Covid-19 pandemic, which focus on the citizens, their jobs, social security, solidarity, creating an environment for easier overcoming of the economic consequences of the corona virus. Most of the measures taken by the Government refer to the overall economy, but there are also those that are directly intended for the tourism sector:

• Formation of the Tourism Fund
• Postponing the validity of tourist vouchers
• Continuation of the validity of licenses for catering and tourism activities
• Continuation of the importance of the categorization of accommodation, food and beverage facilities
• Tourist vouchers for domestic tourism
• Subsidizing 50% of contributions for employees in companies from the tourism, transport and hospitality sectors
• Support with salaries for tour guides
• Return of tourist tax for 2019 to support the tourism sector, as one of the most affected by the crisis
• Grants for travel agencies from 3,000 to 7,000 EUR
• Loans with 0% interest for companies from the tourism, craft, catering, transport, event organization industry, private health facilities and the like, through the Development Bank of North Macedonia
• Financial support for categorized travel agencies from 2,000 to 5,000 EUR
• Financial support for tourist guides of MKD 30,750
• Free 50,000 PCR tests for foreign tourists who stayed in the country and
• Financial support for hotels operating outside tourist centers.

1.4. The "Open Balkan" initiative

The countries of the Western Balkan have recognized the importance of regional economic cooperation in the tourism sector, especially in light of the challenges brought by the Covid-19 pandemic. One initiative that has attracted considerable attention in recent years is the Open Balkan initiative, which aims to promote economic integration and cooperation among countries in the region. "Open Balkan" is a regional initiative created by North Macedonia, Serbia and Albania, which is dedicated to providing conditions for the exercise of the four European freedoms for as many citizens and companies as possible in the Balkans. "Open Balkan" is an amplifier of regional cooperation and connectivity when it is about the free movement of people, capital, goods and services. Currently, the three countries (North Macedonia, Albania and Serbia) lead and develop the initiative, which has an open door policy, especially for other countries from the Western Balkans, such as Montenegro, Bosnia and Herzegovina and Kosovo, but also for other countries in the region members of the EU. The main goal of the "Open Balkans" is to overcome the social, economic and trade barriers that hinder economic growth in the region by implementing the four freedoms on which European integration is based, freedom of movement of goods, workers, capital and services. One of the benefits of this initiative is the establishment of a regional market between the member countries of the initiative. Within the framework of the "Open Balkan", agreements have been signed establishing joint border crossings and enabling a shorter time for stay at the borders. In addition, progress has been made in improving the business climate in the entire region by signing agreements on the mutual recognition of Authorized Economic Operator (AEO) approvals. Green corridors have been established, which ensures that products and services reach the markets in the region faster.
The tourism sector is a key focus of the "Open Balkans" initiative.

2. LITERATURE REVIEW
2.1. Tourism and regional economic cooperation
Tourism is important for national economies and the personal income of citizens (Blazejczyk, 2007). Usually the papers of researchers and international institutions focus on realized

income and expenditure from foreign tourism. However, external tourism is only one part of the whole picture (Ljubotina and Raspor, 2022). Of course, domestic tourism is also important.

Regional economic cooperation among the countries of the Western Balkans is a sensitive and complex topic for both researchers and policy makers because of its potential to increase economic growth and stability in the region. One of the sectors that is significantly influenced by this cooperation is the tourism sector, which has the potential to become a significant contributor to the economic development of the region. In this literature review, the existing literature on the regional economic cooperation of the Western Balkan countries and the impact on the tourism sector is listed.

The Western Balkan region includes Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia and Serbia. These countries have historically been divided by ethnic, linguistic and religious differences, which have contributed to political instability and economic underdevelopment. However, in recent years, these countries have been making efforts to strengthen their regional cooperation through various initiatives, such as the Regional Cooperation Council (RCC) and the Southeast European Cooperation Initiative (SECI) and the latest Open Balkans initiative.

One of the main reasons for the promotion of regional economic cooperation in the Western Balkans is to increase the attractiveness of the region for foreign investors and tourists. Tourism is one of the fastest growing global sectors, which is experiencing strong growth with the emergence of new destinations. Destinations from the Western Balkan are gaining popularity (UNWTO, 2018a; WTTC, 2019). The majority of destinations from the Western Balkan reported growth in arrivals of 10% or more, and some destinations doubled: Albania (+14.1%), Bosnia and Herzegovina (+18.7%), Kosovo* (+2%), Montenegro Gora (+12.9%), North Macedonia (+23.5%) and Serbia (+16.8%). This led to a total of over 12 million visits to the WB6 region in 2018 (Kennell et al RCC 2021).

Several studies have shown that regional cooperation can lead to improved trade, investment and tourism flows. For example, a study by Porfidoa, 2020 notes that the establishment of common tourism policies between neighboring countries is crucial. Joint tourism strategies and actions could support the momentum for regional cooperation (OECD, 2018). At the same time, more scholars and institutions agree that the creation of joint regional initiatives is of crucial importance and importance (Hammer and Siegrist, 2008; Denga, et al, 2019).

In addition, regional economic cooperation can help improve the competitiveness of the tourism sector in the Western Balkans. For example, joint marketing efforts and the development of regional tourism services can help create economies of scale and reduce transaction costs. According to a study by the Balkan Policy Research Group (2021), regional cooperation can lead to the creation of more attractive tourism products and services, which can help increase the overall competitiveness of the region.

However, there are also certain challenges related to regional economic cooperation in the tourism sector. One of the main challenges is the lack of institutional capacity and coordination among the countries of the Western Balkan. Several studies have highlighted the need for stronger institutional frameworks and coordination mechanisms to improve regional economic cooperation (OECD, 2021, WB6CIF, 2021). Furthermore, there are concerns about the potential negative impacts of tourism development on the environment and local communities. Several studies have highlighted the need for sustainable tourism development policies that take into account the social, economic and environmental impacts of tourism (Golja, 2021; Baloch et al., 2022, Ibănescu, 2018).

In conclusion, regional economic cooperation between the countries of the Western Balkan has the potential to bring significant benefits to the tourism sector. However, these benefits can only be realized if there is strong institutional capacity and coordination between

countries and if policies for sustainable tourism development are implemented. Further research is needed to explore the potential of regional economic cooperation in the Western Balkan and its impact on the tourism sector.

2.2. Tourism and the impact of the Covid-19 crisis

The coronavirus pandemic has not only caused a health crisis, but also a global economic crisis. The widespread impact forced the economy to change to a new normal. The 2021 Tourism Investment Report (UNWTO & fDi Intelligence, 2021) points out that the Covid-19 crisis has hit the global tourism industry hard. According to this report, the number of foreign tourists in 2020 decreased by 73% compared to the previous year, causing a loss of export earnings of 1.3 trillion dollars. This negative trend affected all countries. Namely, to clarify things in terms of the negative consequences for tourism, before the pandemic, travel and tourism (including their direct, indirect and induced impacts) created 1 in 4 of all new jobs created worldwide, 10.6% of all jobs (334 million) and 10.4% of world GDP ($9.2 trillion). Meanwhile, international visitor spending was $1.7 trillion in 2019 (6.8% of total exports, 27.4% of world services exports). Thus, in 2020 the losses amount to 62 million jobs, a decrease of 18.5%, leaving only 272 million jobs worldwide in the sector, compared to 334 million in 2019. Spending on domestic visitors has dropped by 45% and on international visitors by an unprecedented 69.4% (WTTC, 2020).

Therefore, the short-term impact of the pandemic is the loss of millions of jobs, the closure of enterprises and the reduction of entrepreneurial activity. In the medium and long term, the consequences are a deep economic recession, affecting tourism and hospitality (Porfido, 2020). Although rich countries can mitigate the negative economic impacts, many tourist destinations in less rich countries have suffered more. This is highlighted by the less likely that poorer countries pay attention to the domestic tourism market to compensate for the lower level of international tourism (Porfido, 2021; Chang et al., 2020; Fletcher et al., 2020). Contemporary scientific debates emphasize that focusing exclusively on the rapid recovery of the industry is contrary to efforts to reform the tourism sector in order to make it sustainable. The rethinking of tourism towards sustainability is related to natural conservation, the reassessment of the socio-cultural environment and the benefits of active participation in the economy and the local community (Tuan & Rajagopal, 2019). In addition, the participation of all relevant stakeholders and strong political leadership are key to the sustainable development of tourism (WTO, 2005).

3. METHODOLOGY

The purpose of this paper is to perceive the opinion and perceptions of tourism companies from North Macedonia in relation to the regional cooperation initiative "Open Balkan" and the impact of the Covid-19 crisis and the Ukrainian crisis on their operation. The survey was conducted with companies that are fully/mainly familiar with the "Open Balkan" regional cooperation initiative. The interviews were conducted by telephone. The survey of the companies was carried out in most cases with a company manager or company owner, which indicates that the profile of the respondents are people who make decisions and are well acquainted with the situation in the company itself. The results of the analysis are shown in percentage (%). On the graphs where "multiple answers are possible" is marked, the percentage is more than 100.

The data collection technique consisted of conducting a telephone survey (CATI) with the help of a computer, online through the SurveyMonkey platform, which is specialized for this type of research. With the help of software program SPSS (IBM SPSS Statistics Program) the data were processed with the method of descriptive statistics.

For the needs of the research, a questionnaire was created - a research instrument of 45 closed questions.

Size and design of the sample: The sample consists of 50 companies that are familiar with the "Open Balkan" initiative and relevant decision makers (manager, director, company owner, etc.) responded. For the purposes of this research, a stratified simple random sample was created according to the national classification of activities.

The average length of the interview is 17 minutes, and the data was collected in the month of October 2022.

4. INTERPRETATION OF RESULTS

The questionnaire consisted of three parts. The first part of the questionnaire, in addition to the characteristics of the company and activities, aims to examine the opinion and awareness of the "Open Balkan" initiative. Also, this first part covers questions about new opportunities and obstacles. Furthermore, thematic issues in the field of tourism follow, with which countries they cooperate as part of their business operations. The second part of the questionnaire consists of questions related to the regional economy and tourism, opportunities for a common tourist market, destinations, obstacles to cooperation and consequences of the Covid-19 crisis and the military conflict Russia-Ukraine and in which domains this initiative can improve the situation in tourism. The third part examines the issues related to the state of tourism in North Macedonia in the post-Covid-19 period and during the crisis of the Russia-Ukraine military conflict and how to attract more tourists and promote the tourism development of the country.

To the question *"To what extent do you think that this initiative Open Balkan would open up new opportunities for improving the operation of your company/the company you work for?",* 70 percent of the companies answered this initiative would be of great importance, precisely because of the new opportunities for improving the operation and the opening of opportunities for even better growth of the company (70%). A small part of the companies (20%) answered that this initiative would not at all/mainly would not open up new opportunities. While 10% respondents cannot estimate.

For most of the companies (78%), their representatives declared that there are no obstacles for economic cooperation between the countries of the region, while only 16% declared that there are obstacles. A small percentage (6%) do not know if there are obstacles. In terms of the obstacles that the respondents pointed out are: the slow flow of vehicles, the long staying at the border and complicated customs barriers.

More than half of the companies (64%) consider that the opportunities for trade through the "Open Balkan" are identical/similar to those of the EU. A quarter (24%) of companies consider that the opportunities are mainly/completely different from those in the EU.

Tourism, as one of the fastest growing economic sectors, has great opportunities for attracting a larger number of tourists, providing new markets throughout the domestic market, but also outside it. It represents the main driver and basic pillar of the socio-economic progress of developed countries, but also of developing countries. This set of questions aims to measure the cooperation of North Macedonia with other markets, i.e., whether there is an increase or decrease in the revenues of the companies as a result of the Covid-19 pandemic and the impact of the military conflict between Russia and Ukraine.

Companies were asked which market their activity is aimed at. They stated out the domestic market in first place (94%), then on second place they singled out the regional market (72%) and on third place the European market (64%). This means that the companies are mostly oriented towards the domestic market. However, cooperation with other economies (regional and European) is also at a high level.

According to the survey results*: "Do you have cooperation with any of the countries in the region (Serbia, Albania, Montenegro, etc.)?",* more than half of the companies answered that they have cooperation with the countries of the region (62%). The emphasis of the domain of cooperation is on tourist arrangements and travel. From the total sample of surveyed companies, 38% answered that they do not have cooperation.

Great importance for companies' growth and development is the Income as the main source of financing for any company. The majority (78%) of the companies answered that only 50% of the total income was generated from foreign tourists. A small percentage (8%) of the surveyed companies answered that 80% of the total income is generated from foreign tourists, while a very small percentage (4%) answered that 60% of their income comes from foreign tourists.

As a result of the Covid-19 pandemic, the operation of the companies results in a significant loss of profit, i.e. more than half of the companies (60%) answered that they were operating at a loss, while 34% answered that their revenues decreased up to 50%. A very small percentage (4%) stated that revenues have decreased by up to 20%.

To the question: *Have you experienced a significant decrease in revenues as a result of the Russia-Ukraine conflict?,* the results show that the revenues of 42% of the companies decreased up to 10%, in 26% of the companies the revenues decreased up to 20%, and in only 18% the revenues remained unchanged. In the case of 12% of the surveyed representatives of the companies, the revenues decreased by up to 50%.

4.1. Regional economy and tourism within the Open Balkan initiative
On the question: "*To what extent do you agree that the initiative "Open Balkan" would open up new opportunities for North Macedonia for a common tourist market?",* the majority of the companies that were surveyed completely/mainly agree that new opportunities would be opened up for NM for a common tourist market with the countries of the region (70%). Almost two out of ten respondents disagree with that (18%). The percentage of representatives who declared neutral and that have no opinion on this issue is small (6%).

To the question*: "To what extent do you agree that North Macedonia would be a more attractive tourist destination if offered as part of a regional tourist market within the framework of the "Open Balkan" initiative?"* more than half of the companies (66%) agree that it would be a more attractive tourist destination. For a quarter (24%) of the respondents, it would not be a more attractive destination.

When analyzing the results of the survey, it can be concluded that for most of the companies this initiative would contribute to the state in terms of competitiveness. More than half of the companies (60%) completely/mainly agree with this perception, while 26% of them mainly/completely disagree that the initiative would contribute to the competitiveness of the international tourism market, if offered as part of the "Open Balkan".

In addition, 72% of the respondents believe that "Open Balkan" initiative can improve the condition in tourism with **financial support and investment** (72%). 62% of the companies believe that "Open Balkan" initiative can improve the condition in tourism through promotion of tourist destinations and joint performance on third markets or through cooperation with companies from the region.

4.2 Condition in tourism in the post-covid-19 period and during the crisis of the russia-ukraine military conflict

The Covid-19 pandemic has caused changes in every segment of people's lives, both socially and economically. According to a study that was conducted during the Covid-19 crisis by the Macedonian Chamber of Commerce, it shows that until August-September 2020 there was a massive drop in tourist arrangements, as well as their cancellation.

Also, the expected number of tourists dropped, which is a normal phenomenon, since it was the peak period of the corona virus. The key moment of the Covid-19 crisis, which has affected the whole world and which has brought serious consequences for the population and the economy, is precisely the global uncertainty. When it comes to the post-Covid-19 period, as a result, the tourism and hospitality have emerged as one of the most affected sectors. This is not the case only in our country, but also in a wider area. Consequences are inevitable when it comes to the state of companies in terms of demand and revenues. The crisis itself hit a large number of companies forcing them to lay off employees or put a lock on the door. The implemented measures against the crisis also contributed to the deterioration of the operation of certain companies that were most affected by it.[1]

To the question ***"To what extent were the consequences of the COVID-19 crisis experienced in your company in terms of demand?"***, 40% of the companies answered that the demand decreased up to 100%, while 32% of the surveyed companies answered that the demand decreased up to 75%. Then, 24% answered that demand has decreased by up to 50%.

When analyzing the survey results, it can be concluded that the majority of companies, as a result of the restrictive measures for the Covid-19 pandemic, faced problems such as a significant **decrease in revenues** (in 84% of cases), a **decrease in demand** (in 76 % of cases) and a **significant increase in operating costs** (in 72% of cases). Also, a high percentage (54%) answered that they faced **liquidity problems**. After, only 16% answered that they faced an outflow of labor force.

With the emergence of the Covid-19 crisis, many activities and measures were implemented to prevent it, so companies were forced to implement certain measures in favor of the company. The three most common measures implemented by the companies were the **partial closure of the company** (in 36% of cases), then **financial indebtedness** (in 34% of cases) and layoffs from work (in 32% of cases). While the three least implemented measures by the companies are remote working (12%), with the same percentage answered that they implemented the measure of canceling the payment of bonuses and premiums, and 10% answered that they did not implement any measures.

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[1] The impact of Covid-19 on the economy in the region: E-commerce on the rise, drop of tourism and hospitality
shorturl.at/myDT6

In order to mitigate the negative effects of the Covid-19 pandemic, the Government started activities to support tourism through economic measures. Thus, the majority of companies answered that they used economic measures given by the state (74%), while only 26% answered that they did not use measures.

When asked *"As a result of the COVID-19 crisis, the number of tourists/guests/visitors/business partners from Albania, Serbia, Montenegro, Bosnia that you serve",* the representatives of the companies declared that the number decreased (88%), while only 4% answered that it remained unchanged, and 8% answered that they do not know/cannot estimate.

4.3 The Russia-Ukraine military conflict

As for the crisis from the Russia-Ukraine military conflict, it left negative economic consequences, i.e., it caused obstacles in the trade exchange with Ukraine, which is actually a direct target of the military attacks. The beginning of the military conflict caused a serious disruption of a significant part of the economic relations between Russia and the rest of the world. All this caused a significant impact on the world economy.

The representatives of the companies expressed their opinion regarding the consequences of the war, what measures they implement, use of economic measures by the state, their usefulness. Also, as a result of the pandemic and the military conflict, we asked in general to what extent the number of tourists has changed. Furthermore, what can be changed with the "Open Balkan" initiative, will there be an improvement in tourism, how can a greater number of tourists be attracted, and what are their suggestions in the coming period for the promotion of tourism development in RN Macedonia. Also, part of this set of the questionnaire will give us an insight into the activities in particular, what has changed and what could be changed with this initiative.

To the question *"To what extent were the consequences of the Russia-Ukraine conflict experienced in your company in terms of demand?"* for most of the companies (78%), the demand decreased up to 25%. For 14% of the respondents, no negative consequences were experienced at all.

To the next question *"What problems did you face due to the restrictive measures taken as a result of the Russia-Ukraine conflict?"* half of the respondents (50%) faced a decrease in demand. Furthermore, 34% said they faced a significant increase in operating costs due to the restrictive measures taken as a result of the Russia-Ukraine conflict. On third place with 18% of the companies had a significant decrease in revenues.

To the question *"As a result of the Russia-Ukraine conflict, in general the number of tourists/guests/visitors/business partners that you serve:"* more than half of the companies said that the number of tourists/guests/visitors/business partners decreased in general due to the conflict. In contrast, the number of tourists remained unchanged for 36%.

Regarding the number of tourists from Albania, Serbia, Montenegro and Bosnia served by the companies, for more than half (62%) the number decreased as a result of the military conflict. For three out of ten of the companies, the number of tourists **remained unchanged**.

To the question *"Do you consider that the "Open Balkan" initiative will improve the tourism?"* more than half of the companies consider that tourism will improve with the

initiative. For 20% of company representatives, the placement will remain unchanged. While 16% of them agree that there will be no improvement in the tourism.

In addition, 60% of the companies anwered that the state aid (such as subsidies, promotions, etc.) can attract a larger number of tourists from Albania, Serbia and Montenegro. 18% of respondents, stated that tourists can be attracted with direct business contacts. For 10% of the companies, this can be done with signed formal agreements for regional cooperation.

To the question: ***"Which activity do you consider should be continued in the next period for the promotion of tourism development in North Macedonia?"*** almost half of the respondents (44%) believe that they need financial support for **incoming tourism** (travel agencies receiving support for promotion of the tourism). A **quarter of respondents** agree on an **intensive campaign to encourage domestic tourism**. For 18% of the companies, **increased promotion of tourism in the countries of the region** as an activity, would advance the tourism development.

On the last question of the survey, the majority (82%) of the respondents stated the **improvement of the tourist infrastructure** as the first priority. For more than half, the **second priority issue** is the **creation of a comparative and competitive advantage**. On third place with 48% is the **re-positioning of the tourist product.**

5. CONCLUSIONS
In the era of globalization, tourism has begun to play a vital role in the development of economies. Nowadays, tourism makes a significant contribution to a nation's economy. Tourism in itself is an economic process that in one way trades with the natural and cultural heritage of a certain area. The modern development of tourism shows specificities that are in the direction of expanding the tourist demand. The trends for the expansion of demand are moving towards increasing the quantity of activities and services in tourist offers, but also improving the quality of the services provided.

At the very end of the research, the respondents were asked questions related to ways to attract tourists from neighboring countries, promotion of tourism and what would be priority issues for its development. Mainly, the respondents consider that the state aid, such as **subsidies, promotions**, are the main drivers for attracting tourists from neighboring countries. The initiative itself showed, as never before, that all expectations were exceeded in terms of cooperation, mutual aid and support between the countries. Tourism is the first practical scale for strengthening cooperation as a particularly prospective economic branch that opens up job opportunities.

The promotion of tourism is of great importance for every country. In general, the respondents believe that the **funding of the incoming travel agencies**, which are successfully placed on the market and support the progress of tourism, should continue.

Improving the tourist infrastructure, creating a comparative and competitive advantage and repositioning the tourist product are part of the activities that need to be done for sustainable development in Macedonia. Only with their implementation, tourism development policy would be improved. To support domestic tourism, a package of measures

were implemented by the Government, which contributed to positive results for the citizens. These were the **vouchers for tourism** and the "**Home is home**" campaign**. [2]**

Tourism can greatly enrich and promote friendship between different countries in the world. Thus, it develops not only the economic condition of a country by earning foreign exchange for it, but also plays a vital role in its social, cultural and regional development and in promoting goodwill and friendship among the nations of the world.

By expanding the initiative, it would contribute to greater promotion of the beauties of the Balkans as a tourist destination, as well as economic stability and a more developed Balkans.

By increasing the tourism potential in the region, better protection and sustainable use of the natural and cultural heritage would be possible. [3]

REFERENCES

"Open Balkan" opens opportunities for joint promotion of the attractive tourist attractions of the countries of the region, available at: https://vlada.mk/node/29107

APPTRSM, Strategic Plan for 2023. https://tourismmacedonia.gov.mk/wp-content/uploads/2022/09/Stratesko-planiranje-na-APPT-za-2023.pdf

Beyond sightseeing: How can tourism affect public/global health in modern society?, 2022, Wen. J, Kozak. M, and Jiang. Y

Climate Change and Tourism—Assessment and Coping Strategies. Maastricht-Warsaw-Freiburg, 2007, Amelung, B., Blazejczyk, K. and Matzarakis, A.

Denga, T., Hu, Y. and Ma, M., 2019. Regional policy and tourism: A quasi-natural experiment. Annals of Tourism Research, 74, pp. 1-16.

DILEMMA AND OPEN ISSUES FOR THE FUTURE OF AN OPEN BALKAN, available at: https://respublica.edu.mk/blog/politika/dilemi-i-otvoreni-prashanja-za-idninata-na-otvoren-balkan/

Economic Integration of the Western Balkans into the European Union: The Role of EU Policies, 2018, Milica Uvalić

Final report on performance audit, 2022, available at: https://tourismmacedonia.gov.mk/wp-content/uploads/2022/06/Izvestaj-Drzaven-Zavod-za-Revizija-2018-2021.pdf

Hammer, T. and Siegrist, D., 2008. Protected Areas in the Alps: the Success Factors of Nature-Based Tourism and the Challenge for Regional Policy. GAIA - Ecological Perspectives for Science and Society, 17(1), pp. 152-160.

Impact of tourism development upon environmental sustainability: a suggested framework for sustainable ecotourism. 2022. Qadar Bakhsh Baloch, Syed Naseeb Shah, Nadeem Iqbal, corresponding authors: Muhammad Sheera, Muhammad Asadullah, Sourath Mahar, and Asia Umar Khan

MaxStat database. https://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/?rxid=46ee0f64-2992-4b45-a2d9-cb4e5f7ec5ef

OECD, 2018. Competitiveness in South East Europe: A Policy Outlook 2018, Paris: OECD Publishing

Open Balkan Initiative, available at: https://customs.gov.mk/otvoren-balkan.nspx

Open Balkan, available at: https://vlada.mk/Otvoren-Balkan

Open Balkans" opens opportunities for joint promotion of the attractive tourist attractions of the countries of the region, available at: https://vlada.mk/node/29107

Recovery of Slovenian Tourism After Covid-19 and Ukraine Crisis, 2022, Predrag Ljubotina and Andrej Raspor

---

[2] shorturl.at/lqzD1

[3] https://vlada.mk/node/29107

REGIONAL COOPERATION IN THE WESTERN BALKANS, Policy Report January 2021,

Regional Economic Area, the "Mini-Schengen" and the Common Regional Market

Study on obstacles and opportunities for doing business in the region Study no.1 Prospects for Traveling and Tourism Sector in the Western Balkans in 2020 (impact of the coronavirus pandemic)

STUDY ON THE EFFECTS ON THE PRIVATE SECTOR - TOURISM AND HOSPITALITY affected by the health - economic crisis caused by the COVID-19 pandemic, with recommendations for dealing with the economic effects

THE BEHAVIOR AND RESPONSE OF REGIONAL DESTINATION MANAGEMENT ORGANIZATIONS IN THE TWO RECOVERY PHASES OF TOURISM DESTINATION AMID COVID-19 PANDEMIC. THE CASE OF CROATIA, 2021, Tea Golja

THE COVID-19 CRISIS IN THE WESTERN BALKANS Economic impact, policy responses, and short-term sustainable solutions TACKLING CORONAVIRUS (COVID-19) CONTRIBUTING TO A GLOBAL EFFORT

The impact of Covid-19 on the economy in the region: E-commerce on the rise, tourism and hospitality down, available at: shorturl.at/myDT6

The Impact of Tourism on Sustainable Development of Rural Areas: Evidence from Romania, 2018, by Bogdan-Constantin Ibănescu, Oana Mihaela Stoleriu, Alina Munteanu and Corneliu Iațu

The Western Balkans Regional Economic Area: From Economic Cooperation to Economic Integration, 2018, Peter Sanfey & Jakov Milatović

To recovery and beyond. THE FUTURE OF TRAVEL & TOURISM IN THE WAKE OF COVID-19, WTTC 2020

Tourism Development in the Western Balkans: Towards a Common Policy, 2020, Enrico Porfidoa published in Annual Review of Territorial Governance in the Western Balkans, II, 2020, 24-45

Tourism in North Macedonia, available at: ttps://www.worlddata.info/europe/northmacedonia/tourism.php

UNWTO (2018a). UNWTO Tourism Highlights, 2018 Edition. United Nations World Tourism Organization, Madrid.

UNWTO Database. http://unwto.org

WESTERN BALKANS TOURISM POLICY ASSESSMENT AND RECOMMENDATIONS, Regional Cooperation council, 2021, Dr James Kennell, Dr Samantha Chaperon, Dr Tina Segota and Professor Alastair Morrison

What Does Incoming Tourism Actually Mean? Available at: https://www.cancograncanaria.com/en/incoming-tourism-gran-canaria/

WTTC (2019). Global Economic Impact & Trends 2019. Accessed from: https://www.wttc.org/economic-impact/country-analysis/ (25 May 2019).

THE EFFECTS OF INVOLUNTARY WORKING FROM HOME ON WORK-LIFE BALANCE, WORK-LIFE CONFLICT, AND EMPLOYEES' BURNOUT

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ABSTRACT
Before the COVID-19 pandemic, working from home (WFH) was supposed to be an HR practice to help employees attain a higher work-life balance. WFH has also been shown in previous research to reduce work-life conflicts. We suggest that these benefits of WFH are specific to voluntary WFH, and cannot be generalized to involuntary WFH, when it is not a choice, but a requirement. Unfortunately, research on involuntary WFH is extremely scarce. Using a time-lagged design, we collected data in three waves during the COVID-19 pandemic to test the effects of WFH on work life balance (WLB), work life conflict (WLC) and burnout. Results show that working from home directly and indirectly affects work-life balance, work-life conflict and burnout. The results also show that emotional exhaustion is the burnout dimension, which is most strongly influenced. Finally, results show that effects of WFH on burnout are mediated through WLB and WLC. These results significantly contribute to the research on working from home and burnout and present important directions for future research. In addition, the results help policy makers and managers in designing better WFH schemes and to develop conditions in which harmful effects of WFH are minimized.

Keywords: Working from home, work-life balance, work-life conflict, burnout.

1. INTRODUCTION

Work from home (WFH) involves managing one's time and other resources more efficiently while operating from home. It is one of the most flexible work arrangements that positively impact employees and organizations through outcomes, such as wellbeing, work-life balance, job satisfaction, organizational commitment and performance (Bosua, Kurnia, Gloet, & Moza, 2017; Gajendran, Harrison, & Delaney-Klinger, 2015; Raghuram & Wiesenfeld, 2004). Inspired by the positive results, several organizations have made it a permanent feature of their policies.

Most research focused on the positive effects of WFH is based on the premise that it is a voluntary decision and a choice that organizations offer to their employees. However, little is known about what effects involuntary WFH would have on employees' personal and organizational outcomes. Whether involuntary WFH brings the same positive outcomes associated with voluntary WFH or are the effects of involuntary WFH harmful is a question that has yet to be answered. Recent events such as the COVID-19 pandemic have resulted in many more people working from home, a trend which is ongoing even after the pandemic. Thus, it is essential and urgent to investigate the effects of involuntary WFH on employees so that managers and organizations may plan accordingly. We, therefore, propose and examine the possible outcomes of involuntary WFH in this study.

In this study, we attempt to explore the proposed adverse outcomes of WFH in conditions where employees do not have a choice. More specifically, we suggest that WFH will disturb the WLB and enhance WLC, leading to burnout. Conceived as a set of negative psychological experiences (Leiter, Bakker & Maslach, 2014), burnout includes emotional exhaustion, cynicism, and reduced professional efficacy. Emotional exhaustion refers to the draining of emotional resources and is gauged by the presence of fatigue and stress reactions. Cynicism indicates an indifferent attitude towards work in general and is related to frustration, disillusion, and mistrust towards the organization and people (Maslach, Schaufeli, & Leiter, 2001). Reduced professional efficacy is a behavior that decreases employee's feeling of competence and sense of achievement in their work. It is associated with a lack of personal accomplishment, subsequently reducing motivation (Maslach, 2003).

Using the Job Demand Control (JDC) framework (Karasek, 1979), we explain the positive effects of voluntary WFH on personal and organizational outcomes by highlighting that WFH offers flexibility to employees, which helps them manage their job demands efficiently. In contrast, involuntary WFH may be deficient in the flexibility or control element, lacking the advantages otherwise associated with WFH. Applying the JDC framework, we hypothesize that involuntary WFH may exert high job demands but offer low control, ultimately resulting in employee burnout. The job demands associated with involuntary WFH may include longer working hours and blurred work-home boundaries.

2. THEORY AND HYPOTHESES

The JDC framework (Karasek, 1979) is a theoretical model that attempts to provide insight into the effects of psychosocial work characteristics on employee motivation and well-being. This model can be utilized to investigate work-related stress and psychological fatigue in employees. JDC is based on the idea that employees experience job demands but have limited job resources. The job demands include workload, time pressure, and environmental conditions of the job, which elicit physical or mental depletion in employees. Resources or job control refers to the extent to which employees can manage the pace of work, deciding when and how to perform different tasks, along with a say in policy decisions.

Relationship between Working from Home and Burnout

The involuntary WFH is fundamentally distinct from the flexible telecommuting arrangement. Under this work plan, employees have little, or no volition related to WFH. Their access to physical infrastructure, tools, and resources in the workplace is also restricted (Chong, Huang, & Chang, 2020). Thus, involuntary WFH can be demanding and taxing as it might lack adequate control over resources, otherwise required for efficient performance (Sardeshmukh, Sharma, &

Golden, 2012). Additionally, employees may experience more strain while working from home (Giberson & Miklos, 2013) as they must spend extra time and energy in coordinating tasks, contacting colleagues for information, and fulfilling responsibilities without access to office technology or equipment (Rousseau, Tomprou, & Simosi, 2016). They may miss out on resources that otherwise facilitate spontaneous employee interactions, such as socio-emotional support, information, or the visibility that comes from simply being in the office.

For employees engaged in working from home involuntarily, the job becomes more demanding as it might require increased use of technological resources. Lacking adequate control over their resources to manage the increased demands, employees experience burnout (Bakker & Demerouti, 2007). The anxiety associated with psychological stressors causes mental strain and exhaustion (Huang, Du, Chen, Yang, & Huang, 2011). The related excessive demands make them feel frustrated and indifferent towards work activities. Resultantly, employees show indifference to avoid job stressors (Ter Hoeven, van Zoonen, & Fonner, 2016). Therefore, we hypothesize that involuntary WFH triggers the three dimensions of burnout.

Hypothesis 1: Involuntary WFH has positive effects on emotional exhaustion and cynicism but negative effects on professional efficacy.

Relationship between Working from Home and Work Life Balance
Working from home gives rise to increased job demands. Individuals must divert additional resources towards their work domain to cope with these demands. As work and family life are two key domains, the supplemental resources needed to cope with job demands in the corporate arena come at the cost of reduced resources in the family sphere. Moreover, lack of control or coping mechanisms negatively affects the balance between work and life (Grönlund, 2007). In other words, when individuals have excessive job demands with limited resources, it reduces WLB or "the extent to which an individual is equally engaged in – and equally satisfied with – his or her work and family role" (Greenhaus, et al., 2003; p. 513). With the invasive effect of technology, the boundaries between work and home get blurred with employees working odd hours at the cost of their privacy. Therefore, we hypothesize the following:

Hypothesis 2: Involuntary WFH has negative effects on WLB.

Relationship between Working from Home and Work-Life Conflict
Work-life conflict occurs when involvement in one domain, for example, work or personal life, interferes with participation in the other domain (Grönlund, 2007). Involuntary WFH limits employees' flexibility to plan and organize the competing demands effectively. Therefore, employees must be simultaneously present in their work domain (though virtually) and non-work area (physically), which might give rise to concurrent demands. They must either choose between the demands arising from work or non-work domains. Given the fuzzy work-life boundaries and compromised resources, involuntary WFH blurs the line between work and family lives, giving rise to unmet demands and conflicts in work as well as non-work life arenas. We therefore suggest the following hypothesis:

Hypothesis 3: Involuntary WFH has positive effects on WLC.

Relationship between Work-Life Balance and Burnout
WLB is defined as an individual's engagement and satisfaction in his/her work and family roles. When the balance between the work and family domain is not achieved, it could be a potential source of stress for employees (Grönlund, 2007). The role conflicts and physical and emotional demands associated with deteriorated WLB, cause further resource depletion and eventually

influence burnout (Lizano & Barak, 2012). When employees cannot perform work and family roles effectively, they suffer from emotional exhaustion, cynicism, and lack of a sense of professional efficacy at work. Hence, we may hypothesize that:

Hypothesis 4: WLB has negative effects on emotional exhaustion, cynicism but positive effects on professional efficacy.

Relationship between Work-Life Conflict and Burnout

When employees experience increased demands but lack adequate coping resources, they perceive conflict between their work and life domains. It results in energy depletion as the employees cannot fully recover or conserve energies (Reichl, Leiter, & Spinath, 2014). Therefore, the inter-role conflict between work life and personal life spheres might elicit stress in employees. They might feel overwhelmed, experiencing an increased level of emotional exhaustion, cynicism, and diminished professional efficacy. Thus, we hypothesize that:

Hypothesis 5: WLC has positive effects on emotional exhaustion and cynicism, but negative effects on professional efficacy.

The Complete Chain: Working from Home, Work-Life Balance & Conflict, and Burnout

Involuntary WFH is associated with non-traditional work hours, blurred responsibilities and boundaries, simultaneous and conflicting demands from different life domains, and job intensification (Golden, 2012; Kelliher & Anderson, 2010). Because of the invasiveness of technology, employees are expected to be constantly connected and responsive. Hence, there is an ongoing challenge of balancing work and family roles. In situations where the appropriate resources are unavailable, involuntary work from home results in loss of WLB and increased WLC, subsequently leading to burnout in employees (Perry, Rubino, & Hunter, 2018). These arguments suggest that the effects of involuntary WFH on burnout are transmitted through WLB and WLC. Therefore, we hypothesize that:

Hypothesis 6: WLB mediates the effects of involuntary WFH on emotional exhaustion, cynicism, and professional efficacy.

Hypothesis 7: WLC mediates the effects of involuntary WFH on emotional exhaustion, cynicism, and professional efficacy.

The figure below shows the conceptual model.

Figure 1. The Model
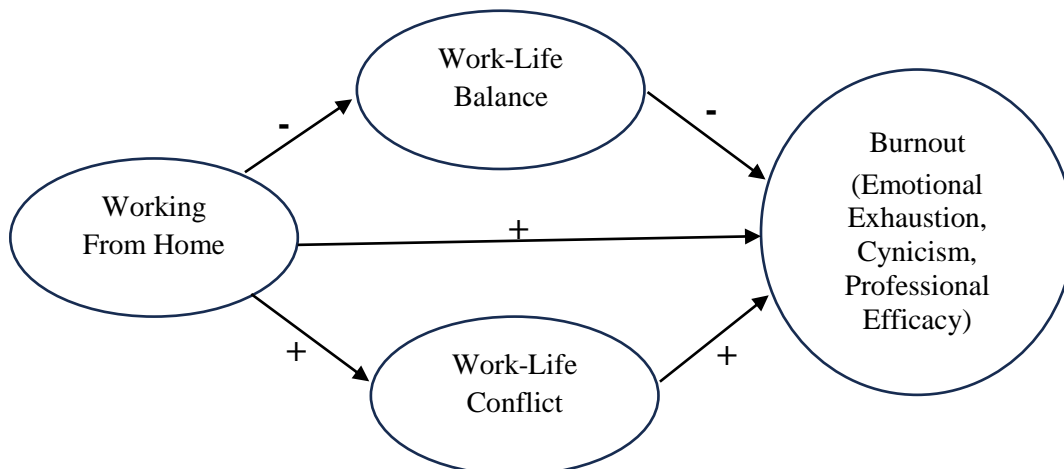
3. METHOD
Sample and data collection procedure
We collected data during the COVID-19 pandemic (Jan 2021 till March 2021) in Pakistan, when involuntary WFH became a norm. We sourced employees for participation in our study via email. Employees were contacted through professional contacts at organizations. Due to pandemic restrictions and lockdowns in Pakistan, only online collection of data was possible. Therefore, we used Google forms via email as the identifier to collect data.

To avoid common method bias concerns and mitigate causality issues we deployed a time-lagged multi-wave design. Data were collected in three waves, where each wave of data collection was temporally separated by three weeks. WFH was measured at time 1, WLB and WLC at Time 2, and the dependent variable, burnout at Time 3. The demographic information was also collected at Time 1. A total of 800 emails were sent at Time 1, out which 690 responses were received. At Time 2, 690 emails were sent to the respondents of the first wave, and 475 responses were received back. Then at Time 3, the third part of the questionnaire was sent to the 475 respondents of the second wave, and 285 responses were collected. Thus, the overall response rate was 35.6%. After removing questionnaires with missing data or unmatched identity (mentioning a different email address when filling in T3 data), 254 usable responses with data across all three waves were left. The final sample included 254 responses, which comprised 76.0% males, 74.4% married participants, and 35.4% employees working entirely from home.

To test the hypotheses, we conducted hierarchical multiple regression, using the software SPSS. To test the direct effects hypotheses, the controlled variables were entered first followed by the independent variables. Regression coefficients, p values, and R square values indicated the significance of direct effects. To test the mediation hypotheses, two separate regressions were performed. First, we conducted hierarchical linear regression to analyze the effects of the control variables (step 1), independent variables (step 2a), and mediators variables (step 3a) on the dependent variable. Second, we tested the effects of control variables (step 1), and mediator variables (step 2b) on dependent variable. Difference between regression coefficient of independent variable between step 2a and step 3a, along with the significance of regression coefficient of mediator variable in step 2b showed the presence of mediation effects.

Measures
The responses for WLB and WLC were gathered through items with five options likert scale ranging from 'strongly disagree' to 'strongly agree'. Burnout was measured through rating options and WFH was gauged through number of hours. For all the measures, pre-established scales were adopted except for 'working from home'.

WFH was measured as the difference in hours of WFH before and during COVID. This was to adjust for the jobs for which WFH was a significant portion even before COVID-19. Thus, the IV was a continuous variable, measured in the additional number of WFH hours.

WLB was measured through 8-item scale developed by Wu, Rusyidi, Claiborne, & McCarthy (2013). WLC was measured through 5-item scale developed by Netemeyer, Boles and McMurrian (1996).

Burnout was measured using the three dimensions of burnout in Maslach Burnout Inventory – General Survey (Schutte, Toppinen, Kalimo, & Schaufeli, 2000).

Gender and marital status were used as control variables, as both may have implications for WLB, WLC, and burnout. Moreover, we also controlled for the preference of an employee to work from home, as this might also alter the effects of WFH.

4. RESULTS

To establish the discriminant validity of WLB, WLC, and burnout, we conducted three confirmatory factor analyses (independent variable, WFH was operationalized as a continuous variable). First, we loaded all items on a single factor, however data did not fit this model well ($\chi 2$/d.f. = 6.102, CFI = .527, GFI = .498, AGFI = .421, TLI = .490, RMSEA = .142). Second, we created three factors, one each for WLB, WLC, and burnout. Fit indices for this model were better than the first model but not at satisfactory level ($\chi 2$/d.f. = 3.610, CFI = .760, GFI = .674, AGFI = .621, TLI = .739, RMSEA = .102). Finally, we tested a five-factor model, with one factor each for WLB, WLC, and three dimensions of burnout. CFA results showed this to be the best model among the three models, with reasonable fit indices ($\chi 2$/d.f. = 1.505, CFI = .955, GFI = .875, AGFI = .851, TLI = .950, RMSEA = .045). These analyses suggested that respondents were able to differentiate between study constructs, and common method bias did not impose any significant threat to the results of this study.

The descriptive statistics (mean and standard deviation) and bivariate correlations of the variables are depicted in Table 1.

Table 1: Means, standard Deviations and Bivariate Correlations of variables

	Measure	M	SD	1	2	3	4	5	6	7	8
1	Gender	.76	.43	-							
2	Marital Status	1.91	1.65	-.19**	-						
3	Work from home preference	3.37	1.28	-.33**	.07	-					
4	Work from Home	21.47	19.64	-.09	.07	.44**	-				
5	Work-life Balance	3.56	.67	.08	-.14*	.14*	-.09	-			
6	Work-life Conflict	3.00	.86	-.10	.08	-.04	.10	-.57**	-		
7	Emotional Exhaustion	2.29	1.53	-.12	.26**	-.003	.11	-.56**	.48**	-	
8	Cynicism	1.92	1.25	-.04	.23**	.01	-.03	-.38**	.30**	.66**	-
9	Professional Eff.	4.84	1.01	-.04	-.05	.05	.16*	.22**	-.04	-.19**	-.17**

Note. N=254; *p< .05 (2-tailed), **p< .01 (2-tailed); WHP= Work Home Preference, WFH= Work from Home, WLB= Work Life Balance, WLC= Work Life Conflict.
(Source: Authors calculations)

To test the hypotheses, we conducted hierarchical multiple regression. First, we conducted hierarchical linear regression to analyze the effects of the independent variable (WFH) on the two mediators (WLB and WLC). The control variables were added in the first step, and then in the second step WFH was added to assess its influence on WLB and WLC. Table 2 depicts that WFH has significant negative effects on WLB (β = -.19, p = .000) and significant positive effects on WLC (β = .14, p = .044). Hence, data supported hypotheses 2 and 3.

Table 2: Regression analysis for WLB and WLC

Step	Predictors	WLB		WLC	
		Model 1	Model 2	Model 1	Model 2
1	Gender	.12^{x}	.13^{x}	-.09	-.10
	Mar_Status	-.13*	-.12^{x}	.07	.07
	WHP	.18**	.27***	-.08	-.14
2	WFH		-.19**		.14*
	F	4.366**	5.20***	1.35	2.05^{x}
	R^2	.051	.079	.016	.016
	ΔR^2	.051	.028	.032	.016

N=254; Regression coefficients are standardized ones. $^{x}p < .1$; $*p < .05$; $**p < .01$; $***p < .001$. WHP=Work Home Preference, WFH = Work from Home, WLB = Work Life Balance.
(Source: Authors calculations)

Table 3 shows the results of hierarchical linear regression to assess the effects of WFH, WLB and WLC on the three dimensions of burnout. Table 3 shows that WFH has significant positive effects on emotional exhaustion (β = .14, p = .046). However, the effects of WFH on cynicism were insignificant (β = -.05, p=.461). Counter to hypothesis 1, the effects of WFH on professional efficacy were positive (β = .17, p=.02). Hence, data partially supported the first hypothesis. Results show that WLB has significant negative effects on emotional exhaustion (β = -.43, p=.000) and cynicism (β = -.31, p = .000) but significant positive effects on professional efficacy (β = .31, p = .000). Hence, hypotheses 3 was supported. WLC has significant positive effects on emotional exhaustion (β = .21, p=.001). However, the effects of WLC on cynicism (β = .13, p =.079) and professional efficacy (β = .09, p=.222) were non-significant. Therefore, hypothesis 4 was only supported for emotional exhaustion.

Table 3: Regression analysis for emotional exhaustion, cynicism, professional efficacy

Step	Predictor	Emotional Exhaustion			Cynicism			Professional efficacy		
		M 1	M 2	M 3	M 1	M 2	M 3	M 1	M 2	M 3
1	Gender	-.05	-.06	.02	.014	.02	.07	-.02	-.03	-.06
	Mar_Stat	.25***	.24***	.18***	.24***	.24***	.19***	-.05	-.06	-.03
	WHP	-.05	-.11^{x}	.04	.001	.02	.13^{x}	.05	-.04	-.10
2	WFH		-14*	.03		-.05	-.13*		.17**	.22**
3	WLB			-.42***			-.31***			.31***
	WLC			.21***			.13^{x}			.09
	F	6.08***	5.61***	25.51***	4.74***	3.69***	10.32***	.42	1.83^{x}	4.16***
	R^2	.069	.084	.387	.055	.057	.204	.005	.029	.094
	ΔR^2	.069***	.015*	.303***	.055**	.002	.184***	.005	.024^{x}	.064***

N=254; Regression coefficients are standardized ones; $^{x}p<.1$, $*p<.05$, $**p<.01$, $***p<.001$
(Source: Authors calculations)

To test the proposed mediation hypothesis, model 4 of PROCESS v3.5 by Hayes (Hayes, 2017) was used. It was observed that there was a significant positive indirect effect of WFH on emotional exhaustion through WLB (b = .008; BCaCI =.002 - .014]. Similarly, there was a significant positive indirect effect of WFH on cynicism (b =.005; BCaCI =.001 - .009] and a significant negative indirect effect on professional efficacy (b= -.002; BCaCI = -.005 - -.001]. These results supported Hypothesis 6. Table 4 shows these results.

Moreover, with respect to mediation through WLC, it was observed that there was a significant positive indirect effect of WFH on emotional exhaustion through WLC (b = .005; BCaCI =.0001 - .010]. However, the indirect effect of WFH on cynicism through WLC (b =.003; BCaCI =.000 - .006) and on professional efficacy (b= -.001; BCaCI =-.0022 - .0004) came out to be insignificant. Thus, hypothesis 7 was partly supported. Table 5 shows these results.

Table 4: Total, Direct, and Indirect effects of WFH on Three Dimensions of Burnout.
Role of WLB as a mediator.

Bootstrap results for Total, Direct, and Indirect Effect on Emotional Exhaustion				
	Effect	*SE*	*LLCI*	*ULCI*
Total Effect	.011	.005	.0002	.021
Direct Effect	.003	.005	-.006	.012
Indirect Effect	.008	.003	.002	.014
Bootstrap results for Total, Direct, and Indirect Effect on Cynicism				
	Effect	*SE*	*LLCI*	*ULCI*
Total Effect	-.003	.005	-.012	.005
Direct Effect	-.008	.004	-.016	.000
Indirect Effect	.005	.002	.001	.009
Bootstrap results for Total, Direct, and Indirect Effect on Professional Efficacy				
	Effect	*SE*	*LLCI*	*ULCI*
Total Effect	.009	.004	.002	.016
Direct Effect	.011	.004	.004	.018
Indirect Effect	-.002	.001	-.005	-.001

(Source: Authors calculations)

Table 5: Total, Direct, and Indirect effects of WFH on Three Dimensions of Burnout.
Role of WLC as a mediator.

Bootstrap results for Total, Direct, and Indirect Effect on Emotional Exhaustion				
	Effect	*SE*	*LLCI*	*ULCI*
Total Effect	.011	.005	.0002	.021
Direct Effect	.006	.005	-.004	.015
Indirect Effect	.005	.003	.0001	.010
Bootstrap results for Total, Direct, and Indirect Effect on Cynicism				
	Effect	*SE*	*LLCI*	*ULCI*

	Effect	SE	LLCI	ULCI
Total Effect	-.003	.005	-.012	.005
Direct Effect	-.006	.004	-.015	.004
Indirect Effect	.003	.002	.000	.006

Bootstrap results for Total, Direct, and Indirect Effect on Professional Efficacy

	Effect	SE	LLCI	ULCI
Total Effect	.009	.004	.002	.016
Direct Effect	.010	.003	.002	.017
Indirect Effect	-.001	.001	-.002	.000

N = 254; ^{x}*p<.1, *p<.05, **p<.01, ***p<.001*
Control variables = gender, marital status; WHP=Work Home Preference; WFH = Work from Home; WLC = Work Life Conflict. Bootstrap Sample size = 5000. LL = Lower Limit, CI = Confidence Interval (95%), UL = Upper Limit

(Source: Authors calculations)

5. DISCUSSION

In the current study, we suggested that unlike the positive effects of voluntary WFH, the effects of involuntary WFH on employees would be negative. Using the Job Demand Control (JDC) framework (Karasek, 1979), we hypothesized that involuntary WFH would decrease work-life balance but increase work-life conflict. We further hypothesized that reduced WLB and increased WLC would trigger burnout in employees. Data collected in three time-lagged waves from 254 employees working full-time or part-time from homes during the COVID-19 crisis largely supported these hypotheses.

Results show that employees working from home for more hours experienced significantly lower WLB and higher WLC. Results also show that WLB has significant effects on all three dimensions of burnout. In contrast, the effects of WLC were significant only for emotional exhaustion but not for cynicism and professional efficacy. Results also confirmed that WLB and WLC mediate the effects of WFH on burnout. Indirect effects of WFH through WLB were significant for all three dimensions of burnout. However, the indirect effects of WFH through WLC were significant, only for emotional exhaustion but not for cynicism and professional efficacy. These findings have several important implications, both for practice and research.

Practical Implication
The results of this study inform managers and policymakers to design more effective and beneficial policies during and after the COVID-19 pandemic. First, managers should be cognizant of the additional demands that WFH imposes on employees. Mastering the online platforms, managing work, and home chores simultaneously, and reduced organizational resources could be the potential reasons for these demands. Second, not everyone is likely to suffer equally from WFH. Results show that married employees experienced a significantly higher level of WFH on emotional exhaustion and cynicism. Similarly, the employees who prefer to work from home (high WHP) reported a significantly higher level of WLB. One of the most critical steps that organizations should take is to identify the employees and jobs at greater risk of being negatively affected by WFH. Third, the results show that the effects of WFH on burnout are mediated through WLB and WLC. Previous research has highlighted policies and initiatives such as flexible timings, family-friendly policies, etc., to help employees maintain a

healthy WLB and avoid WLC. Thus, one way to mitigate the adverse effects of WFH on burnout could be to use these initiatives and ensure that employees are maintaining a good WLB.

Theoretical implications, future research directions, and study limitations
The present study offers at least three significant theoretical contributions. First, the results show that the effects of human resource management policies and practices are contextual and depend on how employees perceive them. Thus, WFH can have adverse effects on employees' wellbeing if this practice triggers the perceptions of increased demands and reduced control. Second, the results contribute significantly to the burnout literature by identifying involuntary WFH as a precursor of burnout. The results also uncover the distinct direct effects of WFH on the three dimensions of burnout. These highlight that WFH has adverse and significant effects on emotional exhaustion. Effects of WFH on cynicism were insignificant, whereas effects of WFH on professional efficacy were positive and significant. It is possible that continued WFH may gradually affect the other dimensions of burnout. However, it is also possible that WFH has adverse effects exclusively on emotional exhaustion and not on cynicism and professional efficacy. Future research may shed light on these relationships by studying the effects of continued WFH over a long time. Counter to our expectations, the direct effects of WFH on professional efficacy were significant and positive. In contrast, the indirect effects of WFH on professional efficacy through WLB and WLC were significant and negative. It is possible that mastering online working platforms triggers positive perceptions about professional effectiveness. Whether the effects of continued WFH on professional efficacy will remain positive is another question that future research can investigate.

Finally, the current study contributes to the literature on WLB and WLC significantly. In addition to the identification of WFH as the driver of WLB and WLC, the results highlight WLB and WLC as the underlying mechanisms, which translate the harmful effects of WFH on burnout. These results trigger several interesting questions for future research. What are other mechanisms through which WFH affects employees' wellbeing? Whether the effects of WLB on the three dimensions of burnout are more sudden than the effects of WLC on burnout dimensions? Is there a temporal sequence in which WLB and WLC affect burnout? Would the effects of continued WLC will be significant on emotional exhaustion only, or if WLC will also affect cynicism and professional efficacy in the long run?

Like any other research, this one is not without some limitations. First, all the data for this study is from one source, collected through self-reported questionnaires. To reduce the common method issues, we employed a three-wave time-lagged method to collect data, using varied scales for different constructs. These measures and the CFA results suggested that common method bias did not affect the current results significantly. Second, although the literature suggests the causal direction to be from the stimulus affecting the demand-control balance (WFH in this case) towards employee wellbeing, we cannot establish causality through this research. Third, the respondents were from various jobs, organizations, and industries. Although such selection increased the generalizability of our results, there is a possibility that the effects of WFH vary depending upon the nature of jobs, organizations, and industries. Finally, there could be mediating mechanisms other than WLB and WLC, and it remains an area for future researchers to identify such mechanisms.

Despite these limitations, the results of this study significantly add to the literature on WFH, WLB, WLC, and burnout. This is one of the earliest studies to explore the harmful effects of involuntary WFH and identify the channels through which these effects are transmitted. The

practical implications can help managers deal with the adverse effects of WFH during and after the COVID crisis. The findings also help policy makers to design WFH schemes after carefully weighing the potential advantages with the unavoidable disadvantages. Further, the theoretical implications add to the existing literature and open several new avenues of future research.

REFERENCES

Bakker, A. B., & Demerouti, E. 2007. The job demands-resources model: State of the art. *Journal of Managerial Psychology*.

Bosua, R., Gloet, M., Kurnia, S., Mendoza, A., & Yong, J., 2012. Telework, productivity and wellbeing. *Institute for a Broadband-Enabled Society*.

Chong, S., Huang, Y., & Chang, C.-H. D., 2020. Supporting interdependent telework employees: A moderated-mediation model linking daily COVID-19 task setbacks to next-day work withdrawal. *Journal of applied psychology*.

Gajendran, R. S., & Harrison, D. A., 2007. The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. *Journal of applied psychology, 92*(6), 1524.

Giberson, T., & Miklos, S., 2013. Weighing in on telecommuting. *TIP: The Industrial-Organizational Psychologist, 51*(2), 163-166.

Golden, T. D., 2012. Altering the effects of work and family conflict on exhaustion: Telework during traditional and nontraditional work hours. *Journal of business and psychology, 27*(3), 255-269.

Greenhaus, J. H., Collins, K. M., & Shaw, J. D., 2003. The relation between work–family balance and quality of life. *Journal of Vocational Behavior, 63*(3), 510-531.

Grönlund, A., 2007. More control, less conflict? Job demand–control, gender and work–family conflict. *Gender, Work & Organization, 14*(5), 476-497.

Hayes, A. F., 2017. *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*: Guilford publications.

Huang, Y. H., Du, P. l., Chen, C. H., Yang, C. A., & Huang, I. C., 2011. Mediating effects of emotional exhaustion on the relationship between job demand–control model and mental health. *Stress and Health, 27*(2), e94-e109.

Karasek Jr, R. A., 1979. Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative science quarterly*, 285-308.

Kelliher, C., & Anderson, D., 2010. Doing more with less? Flexible working practices and the intensification of work. *Human relations, 63*(1), 83-106.

Leiter, M. P., Bakker, A. B., & Maslach, C., 2014. *Burnout at work: A psychological perspective*: Psychology Press.

Lizano, E. L., & Barak, M. E. M., 2012. Workplace demands and resources as antecedents of job burnout among public child welfare workers: A longitudinal study. *Children and Youth Services Review, 34*(9), 1769-1776.

Maslach, C., 2003. *Burnout: The cost of caring*: Ishk.

Maslach, C., Schaufeli, W. B., & Leiter, M. P., 2001. Job burnout. *Annual review of psychology, 52*(1), 397-422.

Netemeyer, R. G., Boles, J. S., & McMurrian, R., 1996. Development and validation of work–family conflict and family–work conflict scales. *Journal of applied psychology, 81*(4).

Perry, S. J., Rubino, C., & Hunter, E. M., 2018. Stress in remote work: two studies testing the Demand-Control-Person model. *European Journal of Work and Organizational Psychology, 27*(5), 577-593.

Raghuram, S., & Wiesenfeld, B., 2004. Work-nonwork conflict and job stress among virtual workers. *Human Resource Management: Published in Cooperation with the School of Business Administration, The University of Michigan and in alliance with the Society of Human Resources Management, 43*(2-3), 259-277.

Reichl, C., Leiter, M. P., & Spinath, F. M., 2014. Work–nonwork conflict and burnout: A meta-analysis. *Human relations, 67*(8), 979-1005.

Rousseau, D. M., Tomprou, M., & Simosi, M., 2016. Negotiating flexible and fair idiosyncratic deals (i-deals). *Organizational dynamics, 45*(3), 185-196.

Sardeshmukh, S. R., Sharma, D., & Golden, T. D., 2012. Impact of telework on exhaustion and job engagement: A job demands and job resources model. *New technology, work and employment, 27*(3), 193-207.

Schutte, N., Toppinen, S., Kalimo, R. and Schaufeli, W., 2000. The factorial validity of the Maslach Burnout Inventory-General Survey (MBI-GS) across occupational groups and nations. Journal of Occupational and Organizational psychology, 73(1), pp.53-66.

Ter Hoeven, C. L., van Zoonen, W., & Fonner, K. L., 2016. The practical paradox of technology: The influence of communication technology use on employee burnout and engagement. *Communication monographs, 83*(2), 239-263.

Wu, L., Rusyidi, B., Claiborne, N. and McCarthy, M.L., 2013. Relationships between work–life balance and job-related factors among child welfare workers. Children and Youth Services Review, 35(9), pp.1447-1454.

Research-in-progress

WHAT IS NEXT IN ENTREPRENEURIAL EDUCATION: BIBLIOMETRIC ANALYSIS ON BUILDING COMPETENCIES FOR THE ENTREPRENEURIAL WORLD

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ABSTRACT

In this study, we aim to present the first bibliometric analysis of entrepreneurial education research focusing on entrepreneurial competencies for the timeline 1998–2022, using the PRISMA protocol for conducting systematic literature reviews. We analyze 104 publications (articles, proceedings papers, and book chapters) in the citation topic Meso, Management search in Web of Science. In descriptive analytics, we present our findings on the distribution of articles by year, an artificial intelligence-driven visual (a "decomposition tree") for the citation distribution based on publisher and source title, and the top five most cited publications and top cited authors. However, the main focus of this study is identifying the research hotspots in the whole analyzed period and the last five years (2018–2022) by mining the abstracts with the use of the VOSiewer software. We present network visualization maps for the two specified periods with detailed explanations for each cluster keyword. The initial results suggest an implicative overall clustering around three main fields: personal traits and entrepreneurial intentions; practical skills and experiences; academy and society. Still, results for the last five years are presenting specializations in four segments: courses training and mindset; experience capacity and intention; knowledge, skills, and values; regional integration, policy, and technology. Based on our practical implications suggested, higher education management is offered options for taking further action for curriculum development, as well as relevant future research directions that can assist researchers in designing their research in this crucially important research field for each region worldwide.

Key words: bibliometric analysis, entrepreneurial education, entrepreneurial competences, entrepreneurial skills, descriptive analytics, AI visualization, text mining

1. INTRODUCTION

The reasons behind the affirmative role of entrepreneurship have been greatly engaging academia, business, and education, always seeking formulas for encouraging the development of new entrepreneurial potential. Research and education across the world have been attempting to answer the question of why some people choose to establish a new venture while others choose not to. Entrepreneurship has been a field of growing interest so education and especially universities have made it their priority to engage in building solid bases for the development of new types of curricula oriented strongly towards entrepreneurial competencies and entrepreneurial education. Entrepreneurship research emerged in the 1980s as a potentially promising field of study, and by the end of the 1990s, the area of research had gathered momentum. (Bygrave, Hofer, 1991) Entrepreneurship has become a priority for universities as it promotes the generation of successful entrepreneurs and increases brand, status, and revenues (Cantu-Ortiz et al., 2017). The first course in Entrepreneurship was delivered in 1947 at Harvard Business School and ever since entrepreneurship education (EE) curricula in higher education has grown globally extensively.

Entrepreneurial education has the goal of developing some level of entrepreneurial competencies. (Lackéus ,Middleton, 2015).Entrepreneurial competencies are defined as knowledge, skills, and attitudes that affect the willingness and ability to perform the entrepreneurial job of new value creation. (Sánchez,2011). Education has been discussed in line with the competencies, and intention mindset it is even suggested that an entrepreneurial mindset could be taught or learned (Marting et al.2013). The initial perceptions identified very early that competencies are preconditions for supporting business success (Bird, 1995). Entrepreneurial competency can also be associated with several sub-competences, including adventure, communication, creativity, decision-making, initiative-taking, innovation, interpersonal, leadership, proposal-making, motivation, problem-solving, risk propensity, self-control, and strategic thinking. (Pittaway, Cope 2007).

On many occasions, entrepreneurial activities in the country are determined by the level of knowledge related to entrepreneurship (Decker et al. 2014). So, it is often suggested that specific entrepreneurial competencies could be in relationship with the overall business development, and this is in line with the discussion about the founder's characteristics. Hence, the traits of entrepreneurs their characters on how they build their entrepreneurial potential, entrepreneurial intentions, the entrepreneurial event, self -efficacy are only a few of all the terms used to find the right ingredients for "creating entrepreneurs".

Initially one of the papers motivating our work is offering systematic review of empirical evidence using the teaching model framework. This manuscript has focused on papers published in the period between 2004-2016 focusing on the influence of entrepreneurship education (EE) in higher education on a range of entrepreneurial outcomes (Nabi et al. 2017) Hence the work of Nabi et al,2017 suggest three areas of concern. The dominant focus on short-term,so subjective impact measures such as entrepreneurial attitudes and intentions rather than longer-term ones like venture creation behavior and business performance, so future research to address this gap. (Nabi et al. 2017;Pittaway, Cope, 2007) The second conclusion is referring to EE programs having both positive and negative implications, attitudes and behaviors , hence there are contradictory findings, stating the third gap focused on the few reviews focusing on EE in higher education. (Nabi et al. 2017); Previously Pittaway and Cope covering mainly papers before the year 2006 aimed at preparing a systematic literature review concerning entrepreneurship education and the impact student propensity and intentionality (Pittaway, Cope,2007). We have

not been able to find a bibliometric analytical approach in concerning the topic of Entrepreneurial education. Hence the methodological novelty enables us to attain new findings considering an extensive amount of literature at once. The main aim of our research is at synthesizing the fast-growing body of empirical research and reviews in the field of entrepreneurial education coped strongly to entrepreneurial skills and competences. The purpose of this paper is to explore different themes within entrepreneurship education, entrepreneurial competencies, and skills via the use of bibliometric analysis and suggest causality based on this research. Hence based on all this we have proposed the following research questions;

RQ1: What are the bibliometric trends in EE research?

RQ1: What are the main clusters and topics in EE research agenda?

RQ1: What are the independent variables greatly cited considering EE?

These three questions offer a new and broad picture of the research area, indicative relationship which could be further pursued related to Entrepreneurial education, at the same time implicating potential gaps for further research Following the PRISMA protocol the initially suggested 347 papers turned into 104 papers as part of the final analysis. The initial results from the data mining suggest an overall clustering around three main fields: personal traits and entrepreneurial intentions; practical skills and experiences; academy and society. Still, results for the last five years are presenting specializations in four segments: courses training and mindset; experience capacity and intention; knowledge, skills, and values; regional integration, policy, and technology. Based on our practical implications suggested, higher education management can is offered options for taking further action for curriculum development, as well as relevant future research directions that can assist researchers in designing their research in this crucially important research field for each region worldwide.

2. METHODOLOGY AND DATA

We follow the four PRISMA protocol phases (identification, screening, eligibility, and inclusion) for systematic literature review according to Moher et al. (2009). In the *identification phase* in the Web of Science database, we searched the terms "entrepreneurial education," "entrepreneurial competence," and "entrepreneurial skills" in the topic and found 347 results in the period from the first study to the end of 2022. Then we selected three types of publications: articles, proceeding papers, and book chapters. The citation topic meso is 6.3, i.e., management, and our sample consists of 195 publications in the three above-mentioned types. In the *screening phase*, we excluded 19 articles that are in languages other than English, while duplicates were not found. To avoid the problem of results repetition, we excluded other systematic literature reviews that were 4 during the *eligibility phase*. In the final *phase of inclusion*, we conducted content analysis on the remaining 172 publications, ensuring that only abstracts related to the searched terms will be included in the bibliometric analysis. By carefully reading the 172 abstracts, we have found 68 inadequate for our analysis, for example, the ones that just mentioned the searched terms while the research was on another topic. Based on the PRISMA protocol phases our final consists of a sample of 104 publications (Figure 1).

Figure 1: PRISMA protocol for systematic literature review
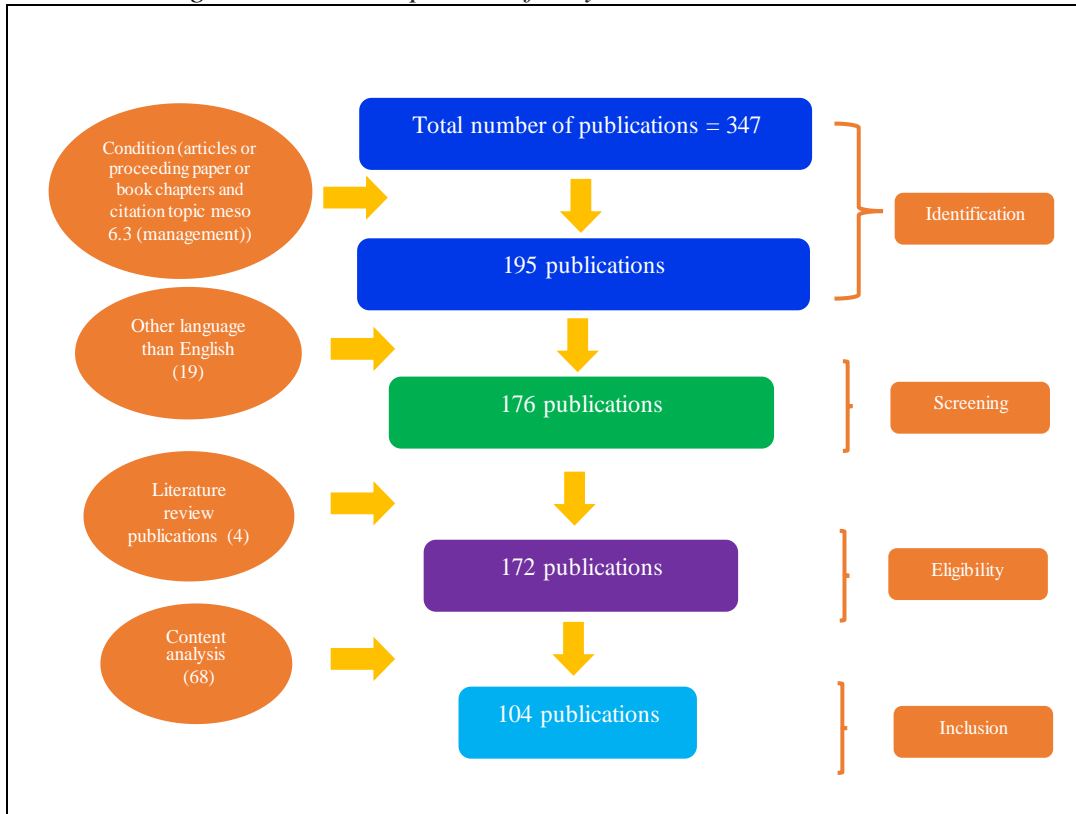
Source: Own research

We have created visuals in Excel to present the distribution of publications by publication type, the distribution of articles by year, the top source title, the five most cited publications, and the top cited authors in this area. Furthermore, we use an artificial intelligence-driven visual in Power BI, the decomposition tree, to present the distribution of citations by the publisher and source title.

To answer the set objectives in this paper regarding the research hotspots in the whole analyzed period and the last five years, we have mined the abstracts by using the VOSviewer version 1.6.18, which is leading in conducting scientific bibliometric analysis, and we have created two network visualization maps.

In creating those maps, we have ignored structured abstract labels and copyright statements. The counting method is binary. The minimum number of occurrences of a keyword for the whole observed period is set to 5, while for the last 2 years, it is set to 2 because new keywords may occur in the last 2 years and they may not show up as much as in the whole period. A relevance score is calculated for each extracted keyword, and 60% most relevant keywords are chosen by default. Then we verified each keyword and excluded those that are not relevant for the analysis (for example insight, researcher, basis, definition, etc.) .)[1] The network visualization map for the whole analyzed period is created with 81 keywords grouped in 4 clusters, while for the last 5 years, the map consists of 140 keywords grouped in 8 clusters.

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[1] The excluded terms will be given in an appendix to the paper.

3. RESULTS

Descriptive Analytics Results

The whole sample has included a total of 105 papers of which 67 are journal articles, 34 conference papers, and 3 book chapters. In our analysis, 56.7% of the publications were published in the last five years (2018-2022)(Figure -2) which confirms the relevance of the sample and the potential to discuss emerging topics.

Figure 2: Publications by Year
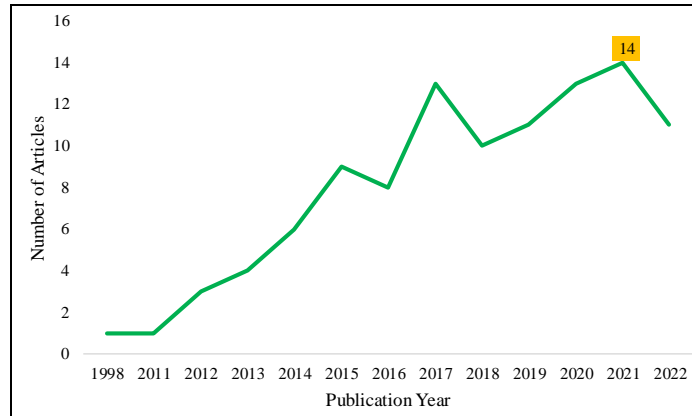
Source: Own research

Top publisher and source title based on citation have been the Journal of Business Venturing which has been mostly cited as well as Elsevier Science BV (Figure 3) As presented in Figure 4 the five most cited paper are presented , whereas top three are Chen et al.,1998, do Paço, et al.2011, Solesvik,2013

Figure 3: Top five journals based on the number of published article
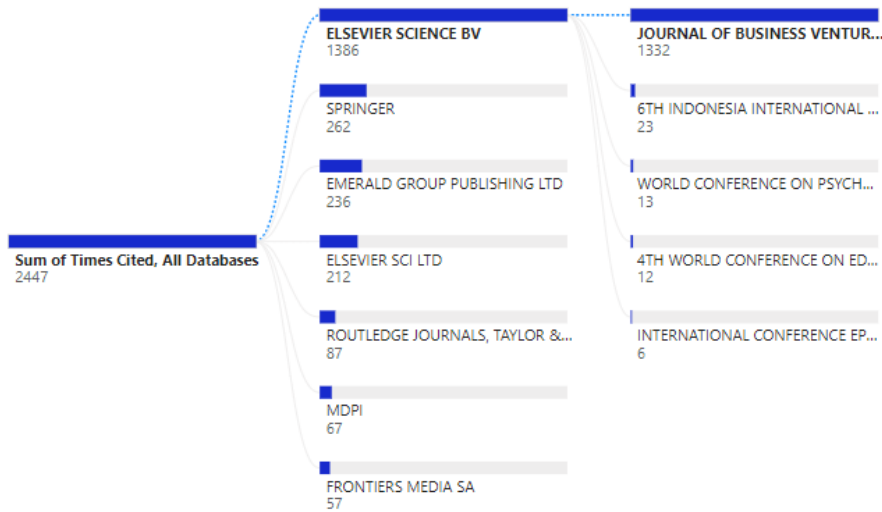
Source: Own research

Figure 4: Top 5 most cited articles

Authors	Citations
Total Citation (all authors)	2447
Chen, CC; Greene, PG; Crick, A	1332
do Paco, AMF; Ferreira, JM; Raposo, M; Rodrigues, RG; Dinis, A	130
Solesvik, MZ	107
Donnellon, A; Ollila, S; Williams, MK	99
Edwards-Schachter, M; Garcia-Granero, A; Sanchez-Barrioluengo,	97

Source: Own research

Text mining results for the identification of research hotspots

We have prepared a visualization map by using the bibliographic data which over the entire period implies three overall hotspots. The first is personal traits and entrepreneurial intentions, considering the individual personal trait aspects of the entrepreneur, the intention to start/own a business, and gender differences. The second one is more related to skills which entail the experiences/ practices, case studies, goals, demand for entrepreneurial skills, and policy for better education. The third is evolving around academy and society which is focusing the educational system itself namely schools, research, and society.

Figure 5: Research hotspots over the entire time period examined

PERSONAL TRAITS AND ENTR. INTENTION
Personal traits/attitudes
Intention/own business

PRACTICAL SKILL AND EXPERIENCE:
Practice/experience
Case studies/tools
Goal/success
Demand for entrep. skills
Policy for better education

ACADEMY AND SOCIETY:
Schools/management
Conferences/research
Society/ entrep. culture

Source: Own research

In figure 6 the main research hotspot for the 5 years has been presented which has been suffering some fine-tuning or restructuring. Hence here the focus is on four areas. The first is courses, training, and mindset. The second area engages in experience capacity and intention. The third evolving around regional integration, policy, and technology. The last fourth area focuses on knowledge, skills, and values. This phase implicates a specialization and development of new perspectives related to entrepreneurial education

Figure 6: Research Hotspots in the Last 5 Years (2018–2022)

Source: Own research

4. CONCLUSIONS

This study provides a bibliometric analysis of articles published in English by searching for the terms entrepreneurial education, entrepreneurial competencies, and entrepreneurial skills in the Web of Science database. The analyzed period is 2018–2022 and using the PRISMA protocol there have been made some selections from the initial gatherings and finding, This research effort has been a bibliometric study which despite the descriptive analysis, keyword co-occurrence uses also maps based on text mining, which utilizes a machine learning algorithm for logistic regression to analyze what influences the citations in this area to increase which will be added in the extended version of this paper. The clustering enables a visual presentation of the possible discussion and at the same time suggests a reframing of the field of entrepreneurial education. It has been clear that entrepreneurial education is actively pursuing new initiatives when it comes to research and hence our commitment is to draw out new potential research fields in the segment. Based on our findings, especially for the last five years, we provide practical

implications for entrepreneurial education and research directions for interested researchers in this challenging field.

REFERENCES

Bird, B. (1995). Towards a theory of entrepreneurial competency, Advances in Entrepreneurship, Firm Emergence and Growth, 2, 51-72.

Bygrave, W.D. and Hofer, C.W. (1991), "Theorizing about entrepreneurship", Entrepreneurship Theory and Practice, Vol. 16 No. 2, pp. 13-22.

Cantu-Ortiz, F.J., Galeano, N., Mora-Castro, P. and Fangmeyer Junior, J. (2017), "Spreading academic entrepreneurship: made in Mexico", Business Horizons, Vol. 60 No. 4, pp. 541-550

Chen, C.C., Greene, P.G. and Crick, A., 1998. Does entrepreneurial self-efficacy distinguish entrepreneurs from managers?. *Journal of business venturing*, *13*(4), pp.295-316.

Decker, R., J. Haltiwanger, R. Jarmin, and J. Miranda. 2014. "The Role of Entrepreneurship in US job Creation and Economic Dynamism." The Journal of Economic Perspectives 28 (3): 3–24.

do Paço, A.M.F., Ferreira, J.M., Raposo, M., Rodrigues, R.G. and Dinis, A., 2011. Behaviours and entrepreneurial intention: Empirical findings about secondary students. *Journal of International Entrepreneurship*, *9*, pp.20-38.

Kuratko, D. F. 2005. The emergence of entrepreneurship education: Development, trends, and challenges. Entrepreneurship Theory and Practic

Lackéus, M. and Williams Middleton, K., 2015. Venture creation programs: bridging entrepreneurship education and technology transfer. *Education+ training*, *57*(1), pp.48-73.

Martin, B. C., J. J. McNally, and M. J. Kay. 2013. "Examining the Formation of Human Capital in Entrepreneurship: a Meta-Analysis of Entrepreneurship Education Outcomes." Journal of Business Venturing 28 (2): 211–224.

Nabi, G., Liñán, F., Fayolle, A., Krueger, N. and Walmsley, A., 2017. The impact of entrepreneurship education in higher education: A systematic review and research agenda. *Academy of management learning & education*, *16*(2), pp.277-299.

Obschonka, M., Schmitt-Rodermund, E., Silbereisen, R.K., Gosling, S.D. and Potter, J. (2013), "The regional distribution and correlates of an entrepreneurship-prone personality profile in the United States, Germany, and the United Kingdom: a socioecological perspective", Journal of Personality and Social Psychology, Vol. 105 No. 1, pp. 104-122

Ortiz-Cantu, F.J., Galeano, N., Mora-Castro, P. and Fangmeyer Junior, J. (2017), "Spreading academic entrepreneurship: made in Mexico", Business Horizons, Vol. 60 No. 4, pp. 541-550.

Pittaway, L., & Cope, J. 2007. Entrepreneurship education a systematic review of the evidence. International Small Business Journal, 25(5): 479–510.

Sánchez, J. C. 2011. "University training for entrepreneurial competencies: Its impact on intention of venture creation", International Entrepreneurship and Management Journal, 7, 239-254.

Solesvik, M.Z., 2013. Entrepreneurial motivations and intentions: investigating the role of education major. *Education+ Training*, *55*(3), pp.253-271.

THE LEADERSHIP DILEMMA: INVESTIGATING THE RELATIONSHIP BETWEEN LEADERSHIP STYLE AND EMPLOYEE PERFORMANCE

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ABSTRACT
Background: *Several research studies have been devoted to the relationship between leadership and employee performance. They provided significant results that leadership styles have a positive correlation with employee performance.*
Aim: *The purpose of this paper is to examine how strong is correlation between leadership styles and employee performance in the private sector in Kosovo. This relationship between those variables has been little investigated by researchers in Kosovo, and from the research that we analyzed none of them take a laissez-faire style for research. We will consider three leadership styles: laissez-faire, transactional, and transformational leadership, along with employee performance, to provide the relationship between them. We will also discuss review papers that measured the correlation between these variables.*
Methods: *A study was conducted to determine if there is a significant linear relationship between leadership style and employee performance. The research utilized Pearson's Correlation and collected data through questionnaires distributed to employees and managers in various private-sector industries in Kosovo. A random sampling technique was used to collect 235 samples from the manufacturing, service, construction, and wholesale industries. The questionnaire was analyzed using Statistical Package for Social Sciences (SPSS) version 27. Yousef's (2000) scale was used to measure employee performance, while the Multifactor Leadership Questionnaire (Bass and Avolio 1995) was used to measure laissez-faire and transactional leadership, and transformational leadership was measured using a 7-item scale from Carless, Wearing, and Mann (2002).*
Results: *According to the findings of the research, it has been confirmed that leadership styles have a low but positive correlation with employee performance. There is no statistically significant correlation between laissez-faire leadership and employee performance. Transactional leadership and transformational leadership have a low but positive correlation with employee performance.*
Also, the results show that most of the employees consider that personal performance is higher than their peers in the same kind of work around 5.88%.

Keywords: *Leadership styles, laissez-faire, transactional, transformational, employee performance.*

1. INTRODUCTION

Leadership is considered the most investigated organizational variable that has a potential impact on employee performance (Cummings and Schwab, 1973; Veliu et al., 2017). Furthermore, a key factor for organizational success is employees. Their performance has been a long-standing interest of researchers because employee performance is an important indicator of leadership effectiveness (Shang, 2023). Leaders strongly believe that employees are an essential resource for the organization, and only by continuously improving their capabilities and quality can they drive sustainable development (Dong, 2023).

A custom that we encounter in many enterprises is that leaders point the finger at the employees themselves and blame them for poor performance. But in fact, it should also be analyzed whether the leadership style used by the leaders can affect the increase or decrease in the performance of the employees. Through this paper, it is attempted to find if there is a correlation between leadership styles and employee performance. By analyzing this correlation, we can be informed which leadership style has a positive correlation, which means that the more leaders use that style in the organization, it will affect the increase in employee performance. Meanwhile, if any style has a negative correlation with employee performance, then it means that the more that style is used by the leaders, the more the performance of the employees will decrease. If a correlation doesn't exist between those variables then means that is no relationship between those variables. Also, through this paper, it is attempted to analyze how employees evaluate their performance and that of their colleagues in comparison to their own.

The research tries to help companies in Kosovo to be informed if there is a correlation between these variables and if have which style has a positive correlation which is recommended to be used by leaders and which has a negative correlation. The link between leadership styles and employee performance is a topic that has been treated very little by researchers in Kosovo, so it is assumed that it will be a small contribution for researchers and businesses in Kosovo.

2. LEADERSHIP

Napoleon Bonaparte known as the Former Emperor of the French said, "A leader is a dealer in hope" (Malik and Azmat, 2019). Leadership is one of the most widely researched and discussed topics in all areas of organizational sciences because nothing gets accomplished without it (Yammarino, 2013). The question that is often asked is what could be more important to the long-term success of an organization than its ability to cultivate leaders. In an era in which the demand for high-quality leadership exceeds the supply, exemplary organizations are those that grow leaders at all levels of the organization by developing their leadership pipelines (Spreitzer, 2006).

Luedi (2022) considers that leadership is a dedicated position. Leadership is about oneself. Leadership is about people. Leadership is about processes. Leadership is about enterprises. Leadership is about individuals. Leadership is about societies. Leadership is about serving. Leadership is about conflict. Leadership is about followership. Leadership is about change (Luedi, 2022). Research on leadership began with a search for heritable attributes that differentiated leaders from non-leaders. A style represents a distinctive or characteristic behavior, a particular method of acting (Vasilescu, 2019). Comments about leaders and leadership are first seen in the books of Confucius (Amalects), Lao-Tzu (Tao Te Ching), and Sun Tzu (The Art of War), dating to the sixth century BC (Bickes and Yilmaz, 2020). The genesis of the debate on leadership theory in modern times began with the work of Stogdill (1948) who is also considered as the first leadership theory. This theoretical work came to be known as the trait theory of leadership (Bhattacharyya and Jha, 2018). One of the first studies of leadership behavior was conducted by Kurt Lewin and his

colleagues at the University of Iowa. In their studies, researchers explored three leadership styles or behaviors: autocratic, democratic, and laissez-faire (Robbins and DeCenzo, 2012).

2.1. Laissez-faire Leadership

Laissez-faire is a French expression. Leaders who practice Laissez-faire have a trusting and dependent attitude toward their workforce. They do not micromanage, become overly engaged, or provide excessive direction or instruction but they encourage their staff to utilize their initiative, resources, and expertise to further their objectives (Em, 2023). Defined as avoidance and abdication of one's responsibilities (Hinkin & Schriesheim, 2008b; Skogstad, Hetland, et al., 2014; Robert and Vandenberghe, 2021), laissez-faire has been consistently found to be the least satisfying and least effective management style (Bass & Bass, 2008; Robert and Vandenberghe, 2021). Some researchers might view laissez-faire leaders as displaying leadership skills that attract and avoid conflict management styles (Gray and Williams, 2012).

2.2. Transactional Leadership

James MacGregor Burns (1978) first introduced the concept of "transactional leadership" in his book Leaders, positing that the leader-employee relationship is based on an exchange of power and benefits (Dong, 2023). Transactional leadership was described as that in which leader-follower associations were grounded upon a series of agreements between followers and leaders (House & Shamir, 1993; Khan et al., 2016). The transactional leader can be defined as follows: "Typically, transactional leaders set explicit, work-related goals and the rewards that can be expected as a result of performing successfully… the implication is that "this is not done proactively and in close cooperation with each team member" (Rowold, 2011, Jangsiriwattana, 2019).

2.3. Transformational Leadership

Transformational leadership style is the most suitable one to be applied in the companies of the 21st century (Andreani and Petrik, 2016). Of all the studies that treated transformational leadership, the most representative is considered the study by Bass. Bass (1985) argued that transformational leaders have a very strong sense of intrinsic value and conceptual system, and they stimulate their subordinates' higher-level needs such as responsibility and honor by making them aware of the importance of the tasks they undertake so that they can put more effort into the team or organizational interests and ultimately achieve performance that exceeds expectations (Shang, 2023). This leadership sets the standard level of human interaction between the leader and follower (Banerji & Krishnan, 2000; Gray and Williams, 2012).

2.4. Leadership and employee performance

People manage other resources that factor into the company's existence in carrying out their respective roles. Companies have an obligation to monitor the performance of their employees, employees are assets and their performance contributes to company goals. Organizations that fail to maintain or manage employee performance may not comply with employee performance variances which can hinder the organization's progress in achieving its goals. Companies demand maximum performance from their employees in carrying out their work (Susanto et al., 2023).

Leaders need to know the various weaknesses and strengths of members to achieve targets for improving employee performance (Susanto et al., 2023).

Employee performance is the result of work produced by employees or real behavior that is displayed according to their role in the organization. Performance or performance of employees is a

very important thing in an organization's efforts to achieve its goals so that various activities must be carried out by the organization to improve it. (Hariandjaja, 2002; Bayo, 2023).

2.5. Hypothesis
H1. Leadership styles have a positive correlation with employee performance.
H1a. Laissez-faire leadership has a positive correlation with employee performance.
H1.b. Transactional leadership has a positive correlation with employee performance.
H1c. Transformational leadership has a positive correlation with employee performance.

3. METHODOLOGY
3.1 Sampling size
According to Lund (2023), the typical sample size has grown over the past 20 years from an average of 153 in the first five years of the new millennium, to 225 in the years 2015-2019 (+72).
This study utilized a random sampling method and a total of 500 potential respondents were distributed questionnaire, from which 235 useable responses were returned.

3.2. Data collection
Data was collected using two ways. In most of the organizations, the questionnaire was completed online with a Google Form (175), with the link being provided to the participants. In the beginning, the research author contacted managers in every organization that was part of the study (mainly entrepreneurs). The link was then shared by them with employees and managers of organizations. For 60 employees who had difficulty completing the questionnaire and asked for additional clarification, the questionnaires were filled in person, and administered by a person with authority in the organization who had previously been instructed by the author of the research.
Questionnaire data were automatically generated in an Excel sheet which was then imported into the SPSS (SPSS Statistics 27) database.

3.3. Questionnaire
The questionnaire is divided into three sections. The first section consists of 19 questions related to leadership styles. The second section has 4 questions related to the performance of employees. The last section consists of eight questions related to demographic details such as gender, age, work experience, education, etc. Dillman (1978) recommended placing the demographics questions be the least interesting and socially important items, at the end, rather than at the (more conventional) beginning of the survey instrument (Dillman, 1978; Green, et al., 2000). Section 1 and Section 2 were measured by using a 5-point Likert-type scale, ranging from strongly disagree (1) to strongly agree (5).

4. MEASUREMENT OF VARIABLES
4.1. Instrument for employee performance
The most suitable method to collect primary data is to distribute a questionnaire (McLeod, 2008; Khudhair et al., 2022). Employee performance was measured with the Yousef (2000) scale adapted from Aslam, S., Khan, M, B., Ullah, N. (2018) and measured the quality of performance, productivity, and evaluation of the performance of the respondents and their peers.

For this study, the items were rated on a 5-point Linkert scale, with options from 1-strongly disagree to 5- strongly agree. The Cronbach's alpha of the scale was 0.848.

4.2. Instrument for Leadership styles

The Laissez-Faire Leadership style was measured using a scale from the Multifactor Leadership Questionnaire (Bass and Avolio 1995). Four items were rated on a 5-point Linkert scale, with options from 1-strongly disagree to 5- strongly agree. The Cronbach's alpha of the scale was 0.864.
 Transactional Leadership Style was measured using a scale from the Multifactor Leadership Questionnaire (Bass and Avolio 1995). Eight items were rated on a 5-point Linkert scale, with options from 1-strongly disagree to 5- strongly agree. The Cronbach's alpha of the scale for transactional leadership was 0.812.
Transformational Leadership was measured using a scale from Carless, Wearing, and Mann (2002) with 7 items. Also, for this scale were using the Linkert scale. The Cronbach's alpha of the scale was 0.926.
The questionnaire for leadership styles was in rater form which means that others perceive the leader's leadership behaviors.

4.3. Respondent's profile

Participants for this study were 235 employees and managers from the private sector. Regarding gender, 146 (62.1%) were males and 81 (34.5%) were females and 8 (3.4%) of them prefer not to answer. The mean value of the age of participants is 35 years old. The youngest is 19 years old and the oldest is 64 years old. Out of the total participants, 159 (67.7%) were married, 60 (25.5%) were single, 14 (6.0%) respondents preferred not to answer and 2 of them (0.9%) were divorced. Regarding the education of 202 participants, 89 (37.9%) of participants with Bachelor, 86 (36.6%) participants with master's, 23 (9.8%) with higher education, 23 (9.8%) with middle school education, and 14 (6.0%) of participants with PhD or PhD student.
The minimum number of years of service in organizations is 1, while the maximum is 35. Participants were asked an open question about their length of service in the current organization and the results show that 1 year was the minimum of service in the current organization and the maximum was 35 years. Moreover, 137(58.3%) of the participants are in managerial positions and 98 (41.7%) are in non-managerial positions. Of 137 participants in managerial positions, 23 (9.8%) are in the top level of management, 81 (34.5) are in the middle level of management and 33 (14.0%) are part of the lower level of management. The majority of the participants are assumed to be in the service sector 72 (30.6%), 52 (22.1%) of them work in the manufacturing sector and retail sector, 31 (13.2) in the construction and 24 (10.2%) of participants in wholesale.

4.4. Validity and Reliability

For the interpretation of Cronbach's alpha, it's used the rule of thumb from George and Mallery (2003). According to George and Mallery (2003), a reliability level of $\alpha >0.9$ is considered excellent, 0.8-0.89 is good, 0.7-0.79 is acceptable, 0.6-0.69 is questionable, 0.5-0.59 is poor, and <0.5 is unacceptable. Cronbach's α coefficient for each variable of the model and its average was higher than 0.7, which confirms the reliability of the model. Cronbach's α for each variable is employee performance, Laissez-Faire Leadership style 0.864, Transactional Leadership 0.812, and Transformational Leadership 0.926.

4.5. Descriptive statistics

Table 1 below presents results from descriptive statistics for leadership styles. The mean value for the laissez-faire leadership style is 2.4064 (between low and medium) and the standard deviation is 1.15528. The mean value for transactional leadership style is 3.7473 (high) and the standard deviation is .72579. The mean value for transformational leadership style is 3.9891 (high) and the standard deviation is .87788. The leadership style questionnaire was in rater form which means that others perceive the leader's leadership behaviors. Of the responses from the participants, the most depicted leadership style from leaders in organizations is transformational leadership. The less-depicted leadership style is laissez faire which means that managers do not display a level of refusal to assume the responsibilities that are part of their position.

Table 1: Descriptive statistics of three leadership styles
Descriptive Statistics

	N	Mean	Std. Deviation
LFL	235	2,4064	1,15528
TAL	235	3,7473	,72579
TFL	235	3,9891	,87788
Valid N (listwise)	235		

From 1.00 to less than 2.33 = low, from 2.33 to 3.66 medium, and from 3.67 to 5.00 = high, (Al-Daibat, 2017).
(Source: Authors' calculation)

Table 2 presents results from descriptive statistics for Employee performance. The mean value for productivity is 4.1840 (high) and the standard deviation is 0.61317.

Table 2: Descriptive statistics for employee performance

	N	Mean	Std. Deviation
Productivity	235	4,1840	,61317
Valid N (listwise)	235		

From 1.00 to less than 2.33 = low, from 2.33 to 3.66 medium, and from 3.67 to 5.00 = high, (Al-Daibat, 2017).
(Source: Authors' calculation)

In the table 3 below are presented the results from employee performance. In the question of how the respondents evaluate their quality and productivity at work from a scale of 1-5, the mean is 4.3 (high). Also, the results show that most of the employees consider that personal performance is higher than their peers in the same kind of work around 5.88%.

Table 3: Descriptive Statistics- Employees' performance

	N	Mean	Std. Deviation
How do you rate the quality of your performance?	235	4,31	,759
How do you rate your productivity on the job?	235	4,37	,724
How do you evaluate the performance of your peers at their jobs compared with yourself doing the same kind of work?	235	3,91	,827
How do you evaluate the performance of yourself at your job compared with your peers doing the same kind of work?	235	4,14	,814
Valid N (listwise)	235		

(Source: Authors' calculation)

5. RESULTS

5.1. Multicollinearity

Table 4 presents the multicollinearity and variance inflation factor (VIF) between leadership styles and dependent variables (employee performance). According to Belsley (1991) cited by Shrestha (2020), the value of variance inflation factor =1 means that the independent variables are not correlated to each other. If the value of variance inflation factor (VIF) is 1< VIF < 5, it specifies that the variables are moderately correlated to each other. Also, if VIF ≥ 5 to 10, there will be multicollinearity among the predictors in the regression model, and variance inflation factor (VIF) > 10 indicates the regression coefficients are feebly estimated with the presence of multicollinearity (Belsley 1991; Shrestha, 2020), so in this study correlation between Leadership styles (laissez-faire, transactional, transformational) with performance as a depended variable is between 1 and 5 which indicated a moderate correlation between those variables. So, none of the VIF values in this example are greater than 5 which indicates that multicollinearity will not be a problem in the regression model.

The correlation between Laissez-faire, with employee performance as the dependent variable, is between 1 and 5 which indicates a moderate correlation between those variables. So, none of the VIF values in this example are greater than 5 which indicates that multicollinearity will not be a problem in the regression model.

The correlation between transactional leadership with employee performance as a dependent variable is between 1 and 5 which indicates a moderate correlation between those variables. None of the VIF values in this example is greater than 5 which indicates that multicollinearity will not be a problem in the regression model.

The correlation between transformational leadership with employee performance as a dependent variable is between 1 and 5 which indicates a moderate correlation between those variables. None of the VIF values in this example is greater than 5 which indicates that multicollinearity will not be a problem in the regression model.

Table 4: Collinearity

		Tolerance	VIF
1	LFL	,847	1,180
	TAL	,512	1,954
	TFL	,470	2,128

a. Dependent Variable: Productivity
(Source: Authors' calculation)

According to Asuero et al. (2016), the rule of thumb scale to evaluate the strength of the correlation is 0.90 to 1.00 very high correlation, 0.70- 0.89 high correlation, 0.50-0.69 moderate correlation, 0.30-0.49 low correlation and 0.00-0.29 little if any correlation. Based on this rule its interpreted the results from the table below (Table 5).

Table 5: Correlation between leadership styles and employee performance

		Employee Performace	Laissez-faire leadership	Transactional leadership	Transformatio nal leadership	LS
Employee Performace	Pearson Correlation	1	-,127	,317**	,415**	,341**
	Sig. (2-tailed)		,052	<,001	<,001	<,001
	N	235	235	235	235	235
Laissez-faire leadership	Pearson Correlation	-,127	1	,008	-,286**	,261**
	Sig. (2-tailed)	,052		,905	<,001	<,001
	N	235	235	235	235	235
Transactional leadership	Pearson Correlation	,317**	,008	1	,667**	,891**
	Sig. (2-tailed)	<,001	,905		<,001	<,001
	N	235	235	235	235	235
Transformational leadership	Pearson Correlation	,415**	-,286**	,667**	1	,779**
	Sig. (2-tailed)	<,001	<,001	<,001		<,001
	N	235	235	235	235	235
LS	Pearson Correlation	,341**	,261**	,891**	,779**	1
	Sig. (2-tailed)	<,001	<,001	<,001	<,001	
	N	235	235	235	235	235

**. Correlation is significant at the 0.01 level (2-tailed).

(Source: Authors' calculation)

The Pearson correlation coefficient between Leadership styles and employee performance is .341. Since this number is between 0.30 to 0.49, it indicates a low positive linear correlation between the two variables. The two-tailed p-value is <.001, which is less than the accepted value of 0.05, indicating a statistically significant association between the variables.
The Pearson correlation coefficient between laissez-faire leadership and employee performance is -.127. Since this number is between -0.0 to -0.29, it indicates a low but negative linear correlation

between the two variables. The two-tailed p-value is .052. Since this value is not less than 0.05 the two variables don't have a statistically significant association.

The Pearson correlation coefficient between transactional leadership and employee performance is .317. Since this number 30 to 0.49 indicates a low positive linear correlation between the two variables. The two-tailed p-value <.001, less than the accepted value of 0.05, indicates a statistically significant association between the variables.

The Pearson correlation coefficient between transformational leadership and employee performance is .415. Since this number is between 0.30 to 0.49, it indicates a low positive linear correlation between the two variables. The two-tailed p-value <.001. Since this value is less than 0.05 indicates a statistically significant association between the variables.

6. DISCUSSION AND CONCLUSIONS

The results from descriptive statistics reveal that transformational leadership is the most depicted leadership style depicted from leaders. The less-depicted leadership style is Laissez-faire which means that managers do not display a level of refusal to assume the responsibilities that are part of their position. Furthermore, the results from descriptive statistics present results from employee performance and show that the mean value for productivity is 4.1840 (high). The respondents evaluated their quality and productivity at work as high. Also, the results show that most of the employees consider that personal performance is higher than their peers in the same kind of work around 5.88%.

This paper aimed to investigate how strong is relationship between leadership styles and employee performance. The results from the study found a low positive correlation between leadership styles and employee performance which is consistent with previous research from Veliu (2017) who found that exist positive relationships between leadership and performance (Veliu et al., 2017), but does not support the recent studies that state that leadership style is no significant relationship to employee performance (Abdelwahed et al., 2022; Desti Febrian, 2023).

According to the results, laissez-faire leadership does not have a statistically significant association with employee performance which is consistent with a study from Shafie with colleagues (2013) who found that between laissez-faire and employee performance exists a significant negative relationship (Shafie et al., 2013). The more managers use a laissez-faire style in their leadership, the more employees' performance is reduced (Shafie et al., 2013)

Transactional leadership indicates a low positive linear correlation with employee performance which is consistent with research from Oladipo Kolapo Sakiru (et al., 2013; Anbazhagan and Kotur, 2014) who found a significant positive relationship between employee performance and transactional leadership but do not support research from authors Hoxha & Heimerer (2019) cited from (Buil, I., Martínez, E., & Matute, 2019; Desti Febrian et al. 2023) that conclude that transactional leadership style has no significant relationship with employee performance.

Transformational correlation indicates a low positive linear correlation with employee performance which is consistent with previous research conducted by Top, Abdullah Faraj (2020; Shang, 2023) and Shafie et al., (2013) who found that transformational leadership has a significant relationship with employee performance but does not support the findings from Oladipo Kolapo Sakiru et al., 2013; Anbazhagan and Kotur, 2014) who conclude that does not exist significant linear relationship between worker performance and transformational leadership

REFERENCES

Anbazhagan, S., & Kotur, B. R. (2014). Worker productivity, leadership style relationship. *IOSR Journal of Business and Management*, *16*(8), 62-70.

Andreani, F. and Petrik, A. (2016) Employee Performance as The Impact of Transformational Leadership and Job Satisfaction In Pt Anugerah Baru Denpasar. *Jurnal Manajemen Dan Kewirausahaan*, 18 (1), 25–32. DOI: 10.9744/jmk.18.1.25–32

Bayu, S. (2023). Effect of Mutations, Leadership Style and Employee Competence on Employee Performance. *Dinasti International Journal of Education Management And Social Science*, *4*(5), 834-841.

Bhattacharyya, S, S. & Jha, S. (2018). Strategic Leadership Models and Theories: Indian Perspectives. United Kindom: Emerald Publishing Limited.

Bickes, D, M. and Yilmaz, C. (2020) Leadership Theories. A Handbook of Leadership Styles. Edited by Ozgur Demirtas, O. and Karaca, M. UK- Cambridge Scholars Publishing.

Desti Febrian, W., Muliyati, Lily, Rajab, M. & Thamrin AR, M. (2023). Transactional Leadership: Employee Performance and Organizational Performance (Literature Review). *East Asian Journal of Multidisciplinary Research*, *2*(3), 1129–1142. https://doi.org/10.55927/eajmr.v2i3.3410

Dong, B. (2023). A Systematic Review of the Transactional Leadership Literature and Future Outlook. *Academic Journal of Management and Social Sciences*, *2*(3), 21-25.

Em, S. (2023). A review of different ideas concerning the characteristics of a good leader and shaping new ideas of an effective 21st-century leader. *Journal of General Education and Humanities*, *2*(1), 13-34.

Gray, E. C., & Williams, J. A. (2012). Retail managers: Laissez-faire leadership Is synonymous with unsuccessful conflict management styles. *Open Journal of Leadership*, *1*(3), 13-16. DOI: 10.4236/ojl.2012.13003

Jangsiriwattana, T. (2019). The relationship between transformational and transactional leadership: Employee perceptions of organizational performance and work engagement. *Journal of the International Academy for Case Studies*, *25*(3), 1-10.

Khan, Z, A., Nawaz, A. & Khan, I. (2016). Leadership Theories and Styles: A Literature Review*". Journal of Resources Development and Management,16(1), 1-7. Link:* Microsoft Word - JRDM-Vol.16 2016 (core.ac.UK)

Lo, M. C., Ramayah, T., & Min, H. W. (2009). Leadership styles and organizational commitment: a test on Malaysia manufacturing industry. *African Journal of Marketing Management*, *1*(6), 133-139.

Luedi, M. M. (2022). Leadership in 2022: A perspective. *Best Practice & Research Clinical Anaesthesiology*, *36*(2), 229-235.

Malik, M. A., & Azmat, S. (2019). Leader and leadership: Historical development of the terms and critical review of literature. *Annals of the University of Craiova for Journalism, Communication and Management*, *5*(1), 16-32.

Robbins, S. P. and DeCenzo, D. (2012). *Fundamentals of Management,* Tirana: UET Press.

Shafie, B., Baghersalimi, S., & Barghi, V. (2013). The relationship between leadership style and employee performance: A case study of real estate registration organization of Tehran Province. *Singaporean Journal of Business, Economics and Management Studies*, *51*(1119), 1-9.

Shang, J. (2023) Transformational Leadership Influences Employee Performance: A Review and Directions for Future Research. *Highlights in Business, Economics and Management, 10, 291-312.*

Spreitzer, G. M. (2006). Leading to grow and growing to lead: Leadership development lessons from positive organizational studies. *Organizational Dynamics*, *35*(4), 305-315.

Susanto, P. C., Syailendra, S., & Suryawan, R. F. (2023). Determination of Motivation and Performance: Analysis of Job Satisfaction, Employee Engagement and Leadership. *International Journal of Business and Applied Economics*, *2*(2), 59-68.

Vasilescu, M. (2019). Leadership styles and theories in effective management activity. *Annals of the „Constantin Brâncuşi,* University of Târgu Jiu", *Economy Series*, (4), 47-52. Link: 06_Vasilescu.pdf (utgjiu.ro)

Veliu, L., Manxhari, M., Demiri, V., & Jahaj, L. (2017). The Influence of Leadership Styles on Employee's Performance. *Management (16487974)*, *31*(2).

HIDDEN COSTS, VISIBLE CHALLENGES: DIAGNOSING THE DYSFUNCTIONS THAT LEAD TO HIDDEN COSTS IN HYBRID WORK MODELS OF ICT COMPANIES

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ABSTRACT
Hybrid work has emerged as a significant paradigm shift, particularly emphasized by the pandemic-induced lockdowns, and is now considered the 'third way' of future work arrangements, allowing individuals to vary their work location, schedule, or both (Gratton, 2021). Some benefits associated with this work arrangement are flexibility, increased productivity (Oppong Peprah, 2023), reduced attrition, and improved job satisfaction (Bloom et al., 2022). On the other hand, challenges like substantial investments in technology, IT support, and training, the need for redesigning organizational control, organizational identity, and organizational learning can arise (Petani and Mengis, 2023). It has been recognized that hybrid work also has hidden costs, which are indirect costs not readily apparent in standard financial accounting (Deco et al., 2023). They often result from poor management practices that significantly impact an organization's performance and profitability (Savall and Zardet, 2010). Hidden costs frequently occur when new technologies are introduced in the organization. This research aims to explore the hidden costs of hybrid work.

Theoretical background
Savall and Zardet (2010) define hidden costs as the consequence of constant interactions between the workers' behaviors and the organizations' structures, created through dysfunctions, as a by-product of the said interactions. As such, these hidden costs take the form of excess salary and time, over-consumption, missed creation of potential, risks, and missed production (non-production) (Savall and Zardet, 2010).

As mentioned above, organizational dysfunctions cause the emergence and increase of hidden costs (Savall and Zardet, 2010). The analysis of organizational dysfunctions is of interest now because they result from the lack of good structural conditions and the behavior of workers, which has changed tremendously with the widespread adoption of hybrid work models. Dysfunctions can be assessed through their indicators, which include absenteeism, turnover, variations in direct productivity, work accidents, and product quality defects (Savall and Zardet, 2010). Past research has shown that there can be shifts in absenteeism and turnover, as well as variations in worker productivity and output quality in the hybrid work model (Oppong Peprah, 2023), making calls for additional research.

Dysfunctions and hidden costs are subjects of interest in the Hidden Cost Theory, derived from the concept of hidden costs proposed by Henri Savall. The theory is based on innovative, heterodox management thinking, or the socio-economic approach to management, which considers the notion of dysfunction and costs that aren't recognized by traditional management tools, i.e., hidden costs (Savall and Zardet, 2010). The central relationships of the theory are illustrated in Figure 1. While abundant socio-economic research examines dysfunctions and hidden costs in different contexts, there remains a gap in the literature

regarding their occurrence in hybrid work environments. Moreover, through this research, we aim to assess the common practices of hybrid work in ICT companies and identify the primary dysfunctions that lead to the emergence of hidden costs. We propose the following research questions:

RQ1: What is the current form of hybrid work practices in Macedonian ICT companies?

RQ2: What are the primary organizational dysfunctions that lead to the appearance of hidden costs?

Figure 1: Central postulate of the hidden cost theory
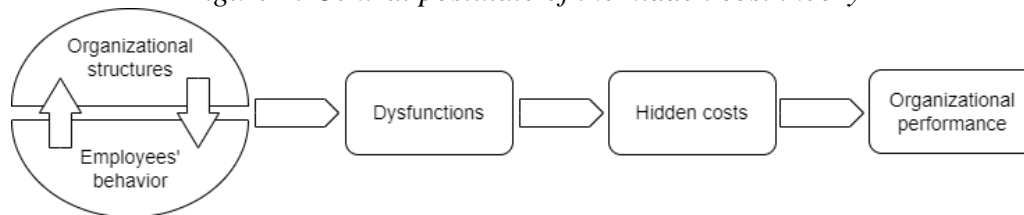
(Source: Adapted from Savall and Zardet (2010).)

Methodology, data collection, and analysis

Programmers in the ICT industry as a general population for this research can provide valuable insights into their hybrid work before, during, and after the pandemic, shedding light on the organizational dysfunctions that affect the level of hidden costs. We will use a qualitative research method and a semi-structured interview for data collection. For data analysis, we will use a grounded theory approach (Corbin and Strauss, 2008). The planned procedure is outlined in Figure 2. The scope of the research will include semi-structured with 20 programmers in the ICT industry or until we reach data saturation. To ensure additional representativeness, a call for interviewees will be published in popular Facebook groups for programmers; the interested random individuals will fill out a consent form and state their profession. Moreover, we will invite members of our networks of contacts to participate in the research. The timeframe for conducting the interviews is six months.

Figure 2: Proposed data analysis process based on grounded theory
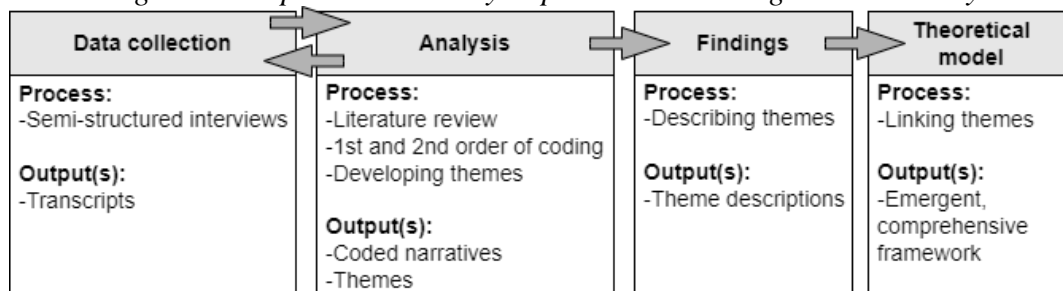
(Source: Adapted from Corbin and Strauss (2008).)

As mentioned, we will use purposive sampling for data collection. An open call for informants was posted on a Facebook group dedicated to Macedonian software developers and programmers on March 22, 2023. We have conducted two interviews with programmers working in different ICT companies. Table 1 summarizes the demographic information.

Table 1: Summary of data sources

#	Title	Gender	Age	Education	Employment status
1.	Computer programmer	Female	25	University student	Full-time employed

2.	Computer programmer	Male	23	University student	Full-time employed

Preliminary findings

The conducted interviews yielded several preliminary findings so far: 1) beforehand planning and premature task assignment save organizations from excess (over) salary, missed creation of potential, and excess time (overtime) (*Informant #1)*; 2) companies tend to provide the necessary equipment that employees can take home and don't cover other costs when employees work remotely *(Informant #2)*; 3) dysfunctions in hybrid work mostly occur due to breaks in communication because, most often, someone is missing from the team (*Informant #1)*; 4) hybrid work tends to be unregulated with a lack of company laws and procedures, and it is considered part of the informal company culture (*Informant #2)*; 5) the biggest long-term concern is for the IT workforce to permanently transition from hybrid to remote work and for hybrid work to disappear. (*Informant #1)*; 6) defects in product quality, as indicators of dysfunctions, are solved faster when the team is in the office due to swifter communication and collaboration (*Informant #2)*.

This extended abstract is the first step in our research endeavor and will serve as the basis for developing a full paper. As a result, this research will contribute to a better understanding of the critical dysfunctions in hybrid work settings that result in increased hidden costs, and how employers and employees can work together to mitigate their negative effects – leading to helping organizations adopt hybrid work practices that minimize hidden costs.

REFERENCES

Bloom, N., Han, R., and Liang, J. (2022), "How Hybrid Working From Home Works Out", working paper, Working Paper Series, National Bureau of Economic Research. https://doi.org/10.3386/w30292.

Corbin, J.M., and Strauss, A.L. (2008), *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*, 3rd ed. Sage, Newbury Park, California, USA.

Deco, P., dos Santos Napoleão, J.P., Tamo, K., and Simbo, A.R.N. (2023), "Contributions of Socio-Economic Theory in Hidden Costs Accounting in Companies and Organizations", *Journal of Service Science and Management*, Vol. 16, pp. 59-78. https://doi.org/10.4236/jssm.2023.161005.

Gratton, L. (2021), "How to Do Hybrid Right: When Designing Flexible Work Arrangements, Focus on Individual Human Concerns, Not Just Institutional Ones", *Harvard Business Review,* Vol. 99, No. 3, available at: https://hbr.org/2021/05/how-to-do-hybrid-right (accessed 9 September 2023).

Oppong Peprah, E. (2023), "Hybrid workplace: current status, positives, negatives, challenges, and team learning", *The Learning Organization*. https://doi.org/10.1108/TLO-11-2022-0150.

Petani, F.J., and Mengis, J. (2023), "Technology and the hybrid workplace: the affective living of IT-enabled space", *The International Journal of Human Resource Management*, Vol. 34, No. 8, pp. 1530-1553. https://doi.org/10.1080/09585192.2021.1998186.

Savall, H., and Zardet, V. (2010), *Maîtriser les Coûts et les Perfomances Cachés*. 5th ed. Economica, Paris, France.

REMOTE WORK REVOLUTION IN STRATEGIC HUMAN RESOURCE MANAGEMENT: IDENTIFYING AND EXPLORING MEMBER NEEDS OF A GEOGRAPHYCALLY-DISPERSED WORKFORCE

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ABSTRACT
Remote workspaces are an integral part of the future landscape of work. As more employees and gig workers are interested in working from a location other than the organizations' offices, it is vital for human resource management to recognize why a potential member of the organization would prefer a particular location over others and how to manage team members who prefer working remotely. Understanding member needs goes a long way towards achieving this. Yet, the number of published studies that try to understand the basic needs of remote workers is low; studies exploring the business context of North Macedonia and the Western Balkan countries in general are even scarcer. In this research paper, our objective is to discover and investigate remote member's needs in the digital workplace, structured through the lens of the self-determination theory. The research was conducted in North Macedonia, and we collected data through semi-structured interviews with remote employees who work in North Macedonia as a qualitative research approach. 24 member needs for the remote workplace were defined and categorized. The research makes an effort to contribute to the existing literature on remote work by addressing the significance and identification of member needs of remote workers, which can help human resource professionals humanize the digital workplace.

Keywords: Remote work, Member need, Self-determination theory

1. INTRODUCTION
In the contemporary landscape of work, the concept of remote workspaces has emerged as a transformative force, reshaping the dynamics of employment across industries and geographies. The rise of remote work has been catalyzed by advances in technology, changing employee preferences, and the evolving nature of work itself (Diab-Bahman and Al-Enzi, 2020). When the coronavirus pandemic started spreading in 2020, many industries adopted remote or hybrid work practices in what seemed like a global experiment characterized by the emergence of good practices, massive returns to the office in some instances, and sweeping debates between executives and employees in others (Yang et al., 2022). Further, on one hand, remote workers have expectations of increased freedom, flexibility, and autonomy in how they arrange their work patterns, while on the other employers handle the process of keeping the status quo and at the same time managing the onset of new working arrangements (de Vaujany et al., 2021).

Yet, as more employees and gig workers express a growing interest in working from locations other than traditional office spaces, organizations are faced with the imperative to adapt and harness the potential of remote work. This paradigm shift calls for a fundamental reevaluation of how human resource management (HRM) approaches the recruitment, management, and retention of talent in the digital age (Jeske, 2021). In the pursuit of a more comprehensive understanding of remote work, it becomes crucial for human resource (HR) professionals to discern why individuals gravitate towards specific remote work locations and how to effectively manage team members who opt for remote work arrangements (Davies, 2021). Central to this endeavor is the recognition that understanding the needs and motivations of remote workers is paramount.

However, despite the increasing prevalence of remote work arrangements, there remains a significant gap in the existing literature when it comes to exploring and interpreting the fundamental needs of remote workers. This gap is particularly pronounced when considering the context of businesses operating in the Republic of North Macedonia and even the broader Western Balkan region. The country has long been hailed as one of the best places for digital nomads, luring international remote workers with an affordable standard of living, captivating culture and beauty, and low limitations for residence permits (Sánchez-Vergara et al., 2023).

Our approach to the endeavor of uncovering remote workers' needs is grounded in the self-determination theory (SDT), a psychological framework that delves into the intrinsic motivations and needs that drive human behavior (Deci and Ryan, 2014). Even though SDT has been applied in different research areas, we have identified scarcity in studies on using SDT in a remote work context. By applying this theoretical lens, we aim to unravel the intricate web of motivations and necessities that shape the remote work experience. Using the theory's approach, we look at member needs as descriptions of jobs that consider intrinsic psychological nutriments, which in turn positively impact mental growth, integrity, and satisfaction (Deci et al., 2017). Moreover, basic needs can refer to psychological motivation theory, which recognizes three fundamental needs – autonomy, competence, and relatedness (Deci and Ryan, 2014). Also, this theory about needs claims that the prevailing culture and social environment significantly impact one's performance and satisfaction as much as the physical setting (Sjöblom et al., 2016). That is why insights into how the workplace environment thwarts or supports the process of satisfying needs start gaining ground and relevance for HR professionals and managers to maintain and boost the well-being and engagement of their remote workers (Ozimek, 2020).

Based on this, this study's main objective is to identify and explore the needs of remote members of modern organizations and afterward structure them through the lens of the self-determination theory. The research will attempt to contribute to the broader literature on remote work by shedding light on the fundamental needs of remote workers, thus providing a valuable resource for HR professionals seeking to improve working conditions and employee morale in this category of the workforce as much as the ones working in the office. As the landscape of work continues to evolve, understanding and catering to these needs will not only enhance organizational performance but also foster a more inclusive and productive remote work culture, ultimately shaping the future of work in the new age.

2. THEORETICAL BACKGROUND
2.1 The remote work revolution in strategic human resource management
The notion of remote work began to rise in the 1970s. These were the times when the practice of distance working from the organization's office using methods of technological communication as a replacement for physical traveling was called simply working from home

(Daneshfar et al., 2023). The enthusiasm for teleworking or remote work reached new heights in the 1980s when employees, managers, and experts hailed it as the next revolution in the working environment (Yang et al., 2022).

Before the pandemic, remote work was a privilege and an opportunity for certain socio-economic groups and a handful of individuals in an organization. To illustrate, the right to choose where you want to work more often was limited to employees who had high education, better-paid jobs on average, higher grade occupations, and were male (Xiong et al., 2023). Faced with the double impact of rapid digitalization and the lockdowns imposed by the pandemic, HR professionals deal with the challenge of managing a workforce who works in the office, remotely or hybrid, which is why we are calling it the new remote work revolution in SHRM.

Existing literature defines remote work as a type of flexible, work-from-anywhere approach, involving telecommuting and distance work, which heavily relies on the utilization of information and communication technologies (ICTs) (Petani and Mengis, 2023). The term falls under the broader umbrella category of flexible working arrangements, whereas remote work, itself, encompasses different variations of working-from-home, co-working, home-based telework, mobile telework, working from remote offices, nomadic work, and similar (Diab-Bahman and Al-Enzi, 2020). There are instances when the management controls the workplace, which is distanced from the primary offices, known as a satellite office (Diab-Bahman and Al-Enzi, 2020). Telecenters and telecottages are other attempts at accommodating remote workers – the primary differentiation being that the former type of workplace is characteristically paid for by the managers, whereas the expenses for the latter are paid for by clients (Diab-Bahman and Al-Enzi, 2020).

The underlying theme across all these working arrangements is that there are noteworthy spillovers and collisions between the personal life and professional one of the workers – whether they are full-time employed, part-time, or freelancers (Petani and Mengis, 2023). Another common denominator is the use of information systems and digital technology in a broad sense as enabling or mediating tools and infrastructure (Petani and Mengis, 2023).

Table 1: Why do people remote work?

	Barrero et al. (2021)	*Ferreira et al. (2021)*	*Ozimek (2020)*	*Thompson (2019)*	*Raghuram et al. (2001)*
Greater flexibility and autonomy		x	x		x
Increased productivity	x	x	x		x
Fewer distractions		x	x	x	
Less non-essential meetings	x		x	x	
Less (commuting) costs	x	x	x	x	x
Work-life balance		x		x	x
Increased job satisfaction	x	x		x	

(Source: Authors' analysis)

This results in a variety of benefits for both employers and remote workers (presented in Table 1). Studies have found that remote work can stimulate time-planning skills and autonomy in the organization, reduce workers' turnover as they take fewer sick days and have more options about the preferred location, and save costs considering that organizations can cut back on infrastructure, utility costs, office size, and similar (Diab-Bahman and Al-Enzi, 2020). At the same time, remote workers can enjoy more family time and flexibility, and save on travel expenses (Yang et al., 2022). On the other hand, remote work can easily translate into professional isolation and have a negative impact on manager-employee and worker-worker relationships due to the nature of communications, lack of feedback, and lack of opportunities for out-of-office socialization (Yang et al., 2022).

2.2 Member needs, preferences, and motives through the lens of the self-determination theory

SDT has been primarily used in the field of organizational psychology for encouraging well-being and productivity in an organizational context and has found a wide application in HRM research, too (Deci et al., 2017). As a motivational theory, it perceives needs as psychological nutrients, which are vital for the individuals' integrity, wellness, and mental growth (Deci and Ryan, 2014). In other words, the essence of the theory is the individual needs and when people feel their basic psychological needs are met, they behave with feelings of willingness, drive, and enthusiasm, and become more self-inspired.

For the purpose of this study, we employ the SDT lens to uncover, inspect, and combine the pressing user needs or the needs of people who work remotely. The theory considers three types of needs, which are autonomy, relatedness, and competence: 1) the need for *autonomy*, which is different from independence in this context, refers to the state of acting from interest and viewing the behavior as self-expression; 2) *relatedness* focuses on the willingness for connection with others, notions like one belongs in a community, cares for someone and is being cared for; 3) *competence* – the sense of reflection in the relations with the surroundings, expression of one's capacity, and experience of opportunities (Deci and Ryan, 2014). When these three needs are fulfilled, organizations can reap the benefits of higher intrinsic motivation, mental growth, and overall wellness; if they aren't satisfied, this can result in higher levels of psychological distress, lower performance, and irritation (Deci et al., 2017).

Figure 1: Needs, preferences, and motives through the lens of SDT
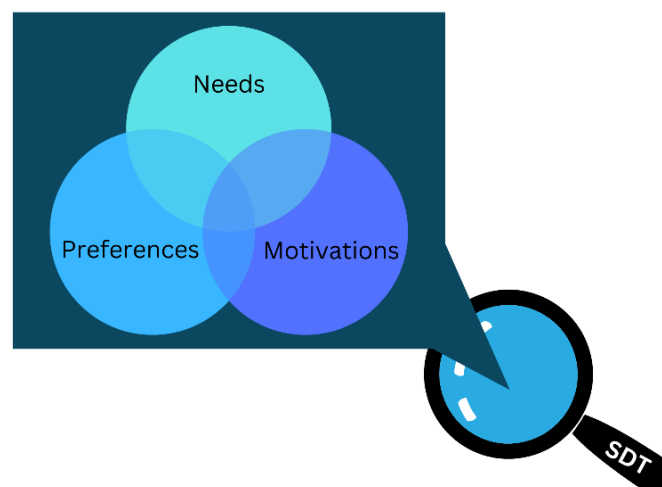
(Source: Adapted from Deci et al. (2017))

SDT differentiates the concept of needs from other broader concepts like desires, motives, and endeavors (Deci and Ryan, 2014). For instance, the desire to be a part of an online community as a remote worker (Davies, 2021) can be considered a motive and a need, however, it isn't a preference. Although these three concepts overlap, one still can't put an equal sign between them (Figure 1). This is why we follow the definition of a member need which describes it as a characteristic of a job that refers to intrinsic psychological nutriments, which are vital for the individual's psychological well-being (Deci and Ryan, 2014). Further, for this study, we view motivation as the quality of the experience that empowers certain behaviors, while the preferences represent a significant liking of one option over others (Weinstein and Ryan, 2010).

3. RESEARCH METHODOLOGY

We chose North Macedonia as the research context as it is one of the new favorite destinations for digital nomads due to the affordable cost of living, picturesque locations, interesting culture, and reliable technological infrastructure; data confirms this, placing the country in the second place when it comes to fastest growing digital nomad centers in the previous five years (Sánchez-Vergara et al., 2023). This makes it captivating for national and international remote workers alike. There is still no option to obtain a digital nomad visa from the country, yet the temporary residence permit is easily obtained and renewed (Sánchez-Vergara et al., 2023).

Regarding the method, we employ a qualitative method of semi-structured interviews to understand the member needs of remote workers, which is encouraged by Bettencourt and Ulwick (2008) for studies that aim to identify user or member needs in a particular environment. Moreover, we held 11 in-depth, semi-structured interviews with remote workers, gig workers, freelancers, and digital nomads who are working in North Macedonia. To cover a diverse group of respondents with different characteristics like gender, age, occupation, employment time, size of organization, and similar (Table 2), we adopted a purposive sampling approach, which is encouraged by Adeoye-Olatunde and Olenik (2021) when researching a diverse, specific socio-economic group.

The interviews were separated into two parts – the first one comprised of two design-thinking-inspired activities and the second part consisted of a semi-structured interview. During the first part, respondents were asked to narrate a day of conducting remote work, shedding light on their productivity during the day, the location where they worked, how long they stayed in a certain space and other aspects. Then, they were asked to provide three keywords from their remote work that they associated with something that made the remote work easier and one keyword about something that made them feel frustrated. The second part of the interview was performed per an interview guideline, which was iteratively modified to cover emerging topics and needs.

What's more, the interview questions were grounded in the self-determination theory to gain an in-depth understanding of the remote workers' psychological needs. Questions from previous research (Deci and Ryan, 2014; Rådman et al., 2023) were the inspiration for some questions, which were custom-tailored for the remote work environment. They covered themes like productivity, motives, sense of belonging, fostering relationships with others, opportunities, and challenges.

Table 2: Characteristics of respondents from member interviews

#	Age	Gender	Occupation	Job tenure	Size of organization
RA	25-34	Male	Insurance Salesperson	0.5 years	Medium
RB	55-64	Male	Entrepreneur	2 years	Small

RC	45-54	Male	Data Engineer	1.5 years	Large
RD	45-54	Female	Management Consultant	5 years	Small
RE	35-44	Male	Entrepreneur	1.5 years	Small
RF	25-34	Female	Software Developer	3.5 years	Medium
RG	25-34	Female	Salesperson	1 year	Large
RH	25-44	Male	Software Developer	4.5 years	Large
RI	25-34	Male	Social Media Manager	1.5 years	Large
RJ	25-34	Male	Salesperson	3.5 years	Medium
RK	25-34	Female	Graphic Designer	3 years	Small

(Source: Authors' analysis)

The interview statements were coded and clustered into similar main themes. The primary method for clustering the data into themes was affinity mapping, which draws its roots from the Kawakita-Jiro (KJ) approach (Iba et al., 2017). This type of mapping enlists several visually based steps that include analysis, categorization, and assignment of codes. Afterwards, we perceived the data through the lens of SDT. This means that we expressed the member needs per the affordance theory, which is used in spatial, product, and relation design and takes the form of 'to be able to…' statements (Rådman et al., 2023). Once the themes were put together into finalized versions of needs, these needs were put together based on the previously elaborated three basic psychological needs of the self-determination theory, which included relatedness, autonomy, and competence. We found that some needs are more strongly related to each other, so we established six all-encompassing categories to structure the SDT-grouped remote workers' member needs.

4. RESULTS AND FINDINGS

We found a total of 24 distinct member needs which are seen in remote workers, viewed through the prism of SDT's classification. They are grouped into six major categories (Table 3) and all needs are discussed in more detail in the following paragraphs.

Table 3: Needs of remote workers

Category	SDT classification	Need
Health and well-being	Autonomy	To have good physical and mental health.
		To be in control of the personal work-life balance.
Productivity	Competence	To be able to maintain focus on the core work activity.
		To feel more productive from a chosen location and/or at a chosen time.
	Autonomy	To be in control of choosing an adequate work area.
		To interact with other without causing disturbances.
		To be able to control the cost structure.
		To be able to manage and safeguard confidential organizational information.
Social needs	Autonomy	To be able to be transparent and honest in the work.
		To be in control of interactions with others.
	Relatedness	To feel valued, noticed, and welcome at a workplace.
		To feel energized at the workplace.
		To feel meaningfulness from a certain job.
		To feel belongingness in a community.
Confidence	Autonomy	To be able to undergo a safe and just performance

		management and evaluation procedure.
in technology and infrastructure	Competence	To be able to solve issues without traditional requirements related to collocation.
		To be able to work without technical disturbances or any other interruptions.
Networking	Autonomy	To know who else is a member of the organization.
	Relatedness	To have your chosen workplace be presentable to guests, clients, and other members.
	Competence	To be able to meet people that can lead to new opportunities.
		To be able to expand the personal network with contacts from relevant stakeholders.
Knowledge sharing	Competence	To be able to receive feedback, directions, or input from colleagues.
		To upgrade skills and knowledge from colleagues and events.
		To be able to share expertise.

(Source: Authors' analysis)

4.1 Health and well-being

As one of the basic human needs, remote workers recognize the ability to be mentally and physically healthy in their remote workplace. Three respondents highlighted team initiatives of running or going to the gym together with fellow members of organizations. Additionally, remote work is often related to the discourse among HR professionals about stress management, maintaining a healthy work-life balance, employee burnout, and similar. This theme came most frequently in relation to the COVID-19 pandemic.

> *I felt worried about the virus and my family. I learned to cherish my organization more for allowing me to choose to work from home even in times when the management preferred us to be in the office.* (RF)

4.2 Productivity

Productivity was one of the larger themes surrounding remote workers' needs. It involved the ability to choose a certain preferred location for remote work, maintain focus on the core work activities, work without external interruptions, make better decisions about personal costs, and safeguard sensitive work-related information.

To be able to maintain focus on the core work activity was often mentioned in relation to the fact that outside spaces often provide various services that the remote worker doesn't have to do on their own but can rather outsource like drinking coffee when working in a café or not caring for reception or Internet at a co-working space. The need to feel more productive from a chosen location and/or at a chosen time describes how the space infuses the notion of productivity in the members of the remote workspace.

> *In a single hour of working in the café next to my house, I deliver more than in my office. I get motivated by the chill and quiet atmosphere. In my office, I used to do all the practical and reception-related things, too. Now that is very simplified.* (RJ)

The needs that one requires to be productive are tied to one's feeling of autonomy. Predominantly, this means that remote workers may prefer this type of work because they can choose the work area they like and develop relationships with other members if they like and when they like without interrupting the work of others. To be able to manage and safely keep

sensitive information was seen as a challenge for many respondents as they often keep this kind of information on their personal computers or use co-working spaces where members from many organizations work in the same space. One of the primary reasons why remote members of an organization like their working arrangement is their increased sense of control of their budget and cost structure because they can cut commuting.

> *My organization didn't necessarily provide us with training about safekeeping information or how to effectively work remotely. We kind of had to figure it out on our own… Still, I like that I get paid the same and my expenses have plummeted.* (RA)

4.3 Social needs

When it comes to autonomy in maintaining social needs, members highlighted the need to be able to be transparent and honest in their work. Since their managers can't track their progress and whereabouts minute by minute, several interviewees mentioned that they need to feel free to be honest with their supervisors about where they work and if they work at a certain time. Even though they work from a distant location, remote members of organizations like the need to be in control of interactions with others so they can participate in group events and team-building sessions at their own pace and convenience. By nurturing their social needs, remote workers can curb the negative feelings of being left out, the fear of missing out on important events, and similar.

> *I live in a small town where I know almost everyone. So, when I enter the café, I feel as if half of my time is wasted on saying hi to everyone and small talk. In these situations, all I want is to open my laptop and finish the tasks.* (RE)

Furthermore, some remote members of organizations mentioned the need to feel valued, noticed, and welcome at a workplace and to be energized by it. Although they aren't in the office, these feelings of belonging and meaningfulness from a job are as important to them.

> *Being a member of the digital nomad community was the main reason why I became one. I visit faraway places, travel, meet new people, and finish my work at the same time.* (RH)

4.4 Confidence in technology and infrastructure

Remote work and work-from-home practices were challenging to members of organizations who weren't confident in their technological skills and capacities. This is why a respondent felt they weren't justifiably evaluated during the regular performance management evaluations.

> *I am slow when working from a distance because everything had to be done online during the peak of the pandemic. Half of the time I had to ask my children for help. Of course, my supervisor wasn't satisfied.* (RC)

This type of working arrangement depends mostly on technology and sufficient ICT infrastructure between remote workers of the organization themselves and the organization itself. Related to competence, a few of the remote members of organizations pointed out the need to be able to solve issues without traditional requirements related to collocation and to be able to work without technical disturbances or any other interruptions. They suggested that managers should lay down the necessary infrastructure, and make sure remote workers can successfully complete the work before allowing remote work arrangements in the first place.

> *The first few weeks after my team started working remotely were chaotic. We didn't have the credentials to enter the information system, some members shared computers with their children, and we couldn't regularly get hold of a team member who had a horrible reception in his grandmother's village.* (RI)

4.5 Networking

We found that the need to network with other stakeholders in the community is beneficial and preferable to remote members of organizations, too. A lot of business collaborations and partnerships depend on expanding the personal and professional network through attending business events, and conferences, and connecting on professional social media profiles. Subsequently, networking activities can be done under different conditions and capacities in the context of remote work.

> *The first thing that I proposed everyone to do when I started my remote business was that we all had to know each other well even though we were working from different locations of the world. This meant our true selves, our strengths, weaknesses, skills, and aspirations so that I know who I can rely on and for which activity.* (RB)

Moreover, the nature of the work requires some members of remote organizations to host and welcome clients or business partners. This was especially the case with employees who use the services of co-working spaces. As a result, the need to have the chosen workplace be presentable was stressed.

> *Leaving a good impression is imperative for our business. We strive to have our future suppliers or business partners think they can take their business to new lengths if they work with us and to see us as serious people when they check out the great location we work from.* (RG)

Most of the remote members of organizations agreed that networking doesn't look a lot different than working in the office. They see the main difference in the profession itself and the opportunities that are offered by certain locations.

> *I have no trouble meeting new people from the industry. I go to conferences and go to industry events as much as I did when I was working full-time in my office. However, some of my colleagues who moved abroad complained they couldn't as the industry there wasn't that developed, and they were constrained to online networking.* (RD)

4.6 Knowledge sharing

The need for knowledge exchange, which often relates to one's curiosity and taps into the intrinsic willingness to give and receive help, revolves around sharing as well as receiving knowledge for personal or business-oriented purposes. Through their working arrangements, remote workers strive to receive feedback, directions, or input from colleagues, upgrade skills and knowledge from colleagues and events, and share expertise. During an interview, a respondent was asked about what boosted their motivation:

> *My mindset is centered around the mantra that if you want to know something, there is always a way to learn it. I am motivated by the fact that there is always something that I have yet to understand. And the best thing is that you can always ask someone.* (RK)

5. DISCUSSION

As remote work slowly starts becoming ubiquitous in contemporary workspaces, organizations' SHRM is tasked with managing a diverse, geographically dispersed workforce. In this research, we brought to light 24 needs of remote members of organizations who are working in the territory of the Republic of North Macedonia. The identification of these needs represents a basis for improving current HR practices and developing solutions. Past studies on member needs in contemporary workplaces have explored the member needs of coworking spaces (Rådman et al., 2023), the needs of managers based on an experimental manager training program (Jungert et al., 2022), career satisfaction needs of hotel frontline employees (Lee, 2016), and similar. Yet their findings aren't entirely applicable to remote

workers as a newly widespread category of members of the organization, who oftentimes aren't even full-time employed. Furthermore, the identified needs and six major categories refer to published literature on SDT, member needs, and remote work.

To illustrate, the needs from the categories of health and well-being (Raghuram et al., 2001), productivity (Ferreira et al., 2021), social needs (Barrero et al., 2021), and confidence in technology and infrastructure (Ferreira et al., 2021) can be connected to some of the highest occurring reasons for opting for remote work, which are already present in the current public and academic discourse. The identified remote member needs combine the preferences and motives for becoming a remote worker with intrinsic psychological needs which characterize a member's mental growth, integrity, and satisfaction when said needs are satisfied.

As with most research endeavors, this one doesn't come free of its own set of limitations. At the same time, these limitations act as avenues for new research in this direction. For one, studies can employ additional methodologies like observations of how remote members of organizations spend their days or analyzing internal documentation like employee satisfaction surveys, emails, and similar. Additionally, more interviews can be conducted with remote members of organizations and other research can factor in different research contexts and regions to test the comparability of the findings. Finally, future research can explore tensions within and between individual remote members' needs.

4. CONCLUSION

Remote work has proven to be the right strategy for organizations that tend to boost internal flexibility and workforce mobility, while at the same time reducing costs and allowing full-time employees, gig workers, freelancers, and digital nomads to save on travel costs and enjoy a more balanced work-life experience (Ferreira et al., 2021). Before an organization adopts remote work practices, they may make sure that their members have access to suitable technology (Jeske, 2021) and other facilitating conditions to make sure they feel safe, productive, and socially connected.

The objective of this study was to identify and explore the needs of remote members of modern organizations and afterward structure these needs through the lens of the self-determination theory. 24 members' needs for the remote workplace were defined and grouped into six overarching categories. It was found that members of remote workplaces mostly look for and value the needs for maintaining their health and well-being, a remote workplace that enables them to be productive, social needs, the need for confidence in technology and infrastructure, networking needs, and needs for knowledge sharing. The research tries to make a contribution to the literature on remote work by highlighting the importance of member needs of remote workers, which can help employees of HR departments improve retention, satisfaction, and engagement among this specific segment of the workforce.

This study's implications are mostly aimed at managers and employees in HR departments in organizations that enable remote work as a standard working arrangement. These stakeholders are often called upon to tackle the challenges of remote work practices, including team communication, control over the technology (the workforce may use personally owned technology), team cohesion, and similar. By considering the identified needs of remote members of the organizations, HR managers can understand their remote members better, what drives them, what motivates them, and which aspirations they nurture. When HR acts as a bridge between the top management and this specific category of employees, organizations can potentially benefit from lower turnover rates and at the same time higher retention rates, and increased job satisfaction and workers' engagement. Making sure the identified needs are satisfied or exceeded, in the long run, can open new avenues that result in sustainable organizational growth and higher returns on human capital investment.

REFERENCES

Adeoye-Olatunde, O.A., and Olenik, N.L. (2021), "Research and scholarly methods: Semi-structured interviews", *Journal of the American College of Clinical Pharmacy*, Vol. 4, No. 10, pp. 1358-1367.

Barrero, J.M., Bloom, N., and Davis, S.J. (2021), *Why working from home will stick* (No. w28731). National Bureau of Economic Research.

Bettencourt, L., and Ulwick, A. (2008)., "Giving customers a fair hearing", *MIT Sloan Management Review*, Vol. 49, No. 3, pp. 62-68.

Daneshfar, Z., Asokan-Ajitha, A., Sharma, P., and Malik, A. (2023), "Work-from-home (WFH) during COVID-19 pandemic–A netnographic investigation using Twitter data", *Information Technology & People*, Vol. 36, No. 5, pp. 2161-2186.

Davies, A. (2021), "COVID-19 and ICT-supported remote working: Opportunities for rural economies", *World*, Vol. 2, No. 1, pp. 139-152.

de Vaujany, F.-X., Leclercq-Vandelannoitte, A., Munro, I., Nama, Y., and Holt, R. (2021), "Control and Surveillance in Work Practice: Cultivating Paradox in 'New' Modes of Organizing", *Organization Studies,* Vol. 42, No. 5, pp. 675-695.

Deci, E., and Ryan, R. (2014), "The importance of universal psychological needs for understanding motivation in the workplace", in Gagné, M. (Ed.), *The Oxford handbook of work engagement, motivation, and self-determination theory*. Oxford Library of Psychology, pp. 13-32.

Deci, E., Olafsen, A., and Ryan, R. (2017), "Self-Determination Theory in Work Organizations: The State of a Science", *Annual Review of Organizational Psychology and Organizational Behavior,* Vol. 4, pp. 19-43.

Diab-Bahman, R., and Al-Enzi, A. (2020), "The impact of COVID-19 pandemic on conventional work settings", *International Journal of Sociology and Social Policy*, Vol. 40, No. 9/10, pp. 909-927.

Ferreira, R., Pereira, R., Bianchi, I.S., and da Silva, M.M. (2021), "Decision factors for remote work adoption: advantages, disadvantages, driving forces and challenges", *Journal of Open Innovation: Technology, Market, and Complexity*, Vol. 7, No. 1, 70.

Iba, T., Yoshikawa, A., and Munakata, K. (2017), "Philosophy and methodology of clustering in pattern mining: Japanese anthropologist Jiro Kawakita's KJ method", In *Proceedings of the 24th Conference on Pattern Languages of Programs in Vancouver, Canada, 2017*, The Hillside Group, Corryton, Tennessee, United States, pp. 1-11).

Jeske, D. (2021), "Monitoring remote employees: implications for HR", *Strategic HR Review*, Vol. 20, No. 2, pp. 42-46.

Jungert, T., Gradito Dubord, M.A., Högberg, M., and Forest, J. (2022), "Can managers be trained to further support their employees' basic needs and work engagement: A manager training program study", *International Journal of Training and Development*, Vol. 26, No. 3, pp. 472-494.

Lee, K.J. (2016), "Sense of calling and career satisfaction of hotel frontline employees: Mediation through knowledge sharing with organizational members", *International Journal of Contemporary Hospitality Management*, Vol. 28, No. 2, pp. 346-365.

Ozimek, A. (2020), *The future of remote work*. Available at *SSRN 3638597*.

Petani, F.J., and Mengis, J. (2023), "Technology and the hybrid workplace: the affective living of IT-enabled space", *The International Journal of Human Resource Management*, Vol. 34, No. 8, pp. 1530-1553.

Rådman, E., Johansson, E., Bosch-Sijtsema, P., and Raharjo, H. (2023), "In search of member needs in coworking spaces", *Review of Managerial Science*, Vol. 17, No. 3, pp. 881-907.

Raghuram, S., Garud, R., Wiesenfeld, B., and Gupta, V. (2001), "Factors contributing to virtual work adjustment", *Journal of Management*, Vol. 27, No. 3, pp. 383-405.

Sánchez-Vergara, J.I., Orel, M., and Capdevila, I. (2023), "'Home office is the here and now.' Digital nomad visa systems and remote work-focused leisure policies", *World Leisure Journal*, Vol. 65, No. 2, pp. 236-255.

Sjöblom, K., Mälkki, K., Sandström, N., and Lonka, K. (2016), "Does physical environment contribute to basic psychological needs? A self-determination theory perspective on learning in the chemistry laboratory", *Frontline Learn Res,* Vol. 41, pp. 17-39.

Thompson, B.Y. (2019), "The digital nomad lifestyle:(remote) work/leisure balance, privilege, and constructed community", *International Journal of the Sociology of Leisure*, Vol. 2, No. 1-2, pp. 27-42.

Weinstein, N., and Ryan, R. M. (2010), "When helping helps: autonomous motivation for prosocial behavior and its influence on well-being for the helper and recipient", *Journal of personality and social psychology*, Vol. 98, No. 2, 222.

Xiong, A., Xia, S., He, Q., Ameen, N., Yan, J., and Jones, P. (2023), "When will employees accept remote working? The impact of gender and internet skills", *Journal of Innovation & Knowledge*, Vol. 8, No. 3, 100402.

Yang, L., Holtz, D., Jaffe, S., Suri, S., Sinha, S., Weston, J., ... and Teevan, J. (2022), "The effects of remote work on collaboration among information workers", *Nature human behaviour*, Vol. 6, No. 1, pp. 43-54.

IMPACT OF BIG FIVE, NARCISSISM AND MACHIAVELLIANISM ON ENTERPRISE POTENTIAL AND INDIVIDUAL ENTREPRENEURIAL ORIENTATION

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ABSTRACT
The paper examines the influence of dimensions of the Big Five, Narcissism, and Machiavellianism on dimensions of Enterprise potential and Individual entrepreneurial orientation. The research was carried out in Serbia, and the respondents were students, with the sample consisting of 400 respondents (students). Openness to experience has the strongest positive influence on the Enterprise potential and Individual entrepreneurial orientation dimensions, followed by Narcissism, Conscientiousness, and Extroversion. In doing so, the following influences are especially highlighted: Openness to experience on Creativity and Innovativeness; Narcissism on Leadership and Achievement; Consciousness on Proactiveness; Extroversion on Achievement and Risk-taking. The positive influence of Conscientiousness and Machiavellianism on Leadership, as well as the negative influence of Neuroticism on the observed dependent variables, should still be highlighted. The results are discussed in the paper. The theoretical significance of the work is that the influence of personal characteristics and internal mechanisms of individuals, which activate entrepreneurial potential and entrepreneurial orientation, were examined as a basis for the subsequent possible development of immediate entrepreneurial intentions. Previous research

is mainly based on examining the direct effects of personal characteristics on entrepreneurial intentions.

Keywords: *Big Five, Narcissism, Machiavellianism, Enterprise potential, Individual entrepreneurial orientation, Students, Serbia.*

1. INTRODUCTION
In this paper, the authors investigate the influence of the Big Five personality traits, narcissism, and Machiavellianism on enterprise potential and individual entrepreneurial orientation. The paper begins with an introduction that provides context and outlines the significance of the study. In the subsequent section, the authors review relevant literature to establish the theoretical foundation and identify existing gaps; also the hypotheses are lined out here. The methodology section details the research design, instruments, and data collection. Following this, the authors present the findings, which are then discussed in light of the existing literature. In the conclusion, the key findings are summarized, as well as the implications.

Entrepreneurship is one of the most important pillars of a country's economy. Entrepreneurship creates new jobs, helps grow and develop the economy, and inspires innovation (Bazkiaei et al., 2020). Countries should work on empowering the population, especially young people, and on creating such an atmosphere, that the population creates as many entrepreneurial ventures as possible in order to strengthen and preserve the economy of that region. In addition to investing in the education of young people, it is necessary to develop special programs from which the right people can use their maximum potential. Psychological traits are closely related to business creation and success (Frese and Gielnik, 2014). In some research, entrepreneurial behavior is observed only through the examination of entrepreneurial intentions, however, some authors believe that, due to the complexity of these processes, other variables should be included in the research, in order to observe the broader picture, that is, something called intrapreneurship (Mahmoud et al., 2020). Other variables can be corporate venturing, entrepreneurial orientation, or enterprise potential. Especially the Big Five personality traits are associated with entrepreneurship (Zhao et al., 2010). This is not unusual, as it is natural for certain personality traits to influence an individual's behavior. For example, extraversion in an individual can lead to behavior characterized by energy, empathy, as well as the desire to be in a group and to act according to their enthusiasm (Ariani, 2013). As entrepreneurs have to cooperate with a large number of people such as consumers, co-workers, employees, and even investors, extroversion is certainly a very useful personality trait in entrepreneurship. Also, to a certain extent, conscientiousness is an indicator of how persistent and willing a person is to work in order to achieve a goal, so it can be assumed that people with this personality trait will be more suitable as entrepreneurs compared to people who are not inclined to such behavior.

Research that examines more deeply the connection between personal characteristics and entrepreneurship is necessary for a better understanding and clarification of the profile of a successful entrepreneur (Lackéus, 2015). A better understanding can enable the development of an adequate theoretical basis that can help educate young people and thus encourage entrepreneurship in a sustainable way. This is precisely why López-Núñez et al. (2019) examined the possibility that the Big Five personality traits predict entrepreneurial intentions. According to Zhao et al. (2010), successful entrepreneurship is associated with high values of extraversion, conscientiousness, and openness and low values of agreeableness and neuroticism. In addition to the Big Five personality traits, self-confidence, and problem-solving are certainly useful for entrepreneurs (Chen et al., 2015). Specific psychological traits such as the need for achievement, locus of control, as well as the tendency to take risks

determine entrepreneurial intentions (Owoseni, 2014). Also, a higher level of emotional intelligence, which enables better handling of tense situations, as well as higher creativity and proactivity, has a positive effect on entrepreneurial intentions (Farrington et al., 2012).

Deeper research into the personality traits of entrepreneurs is important for understanding the leadership style as well as the enterprise potential of individuals. According to Ignatieva, Serbenivska, and Babina (2023), psychological profile and personal traits, such as value orientation and willingness to change, influence the leadership style, which directly affects the enterprise potential of people. Of course, in order to realize entrepreneurial potential, depends on creativity, but also on the individual's intention, which is timely and effective (Hou et al., 2022). For a successfully implemented entrepreneurial project, it is necessary, first of all, to recognize the opportunity, and then to react in a timely and effective manner to the implementation. That is the only way entrepreneurial intentions and potential come to fruition. This further implies that it is necessary to learn to recognize opportunities and choose the right time, and such internal processes depend precisely on personal characteristics. The cognitive characteristics of an individual make them sensitive enough to process certain information in a certain way so that they nurture entrepreneurial awareness and mindset, which Krueger (2007) considers crucial in the education and creation of entrepreneurs.

In addition to the mentioned personal traits, the Dark Triad of psychological traits (narcissism, Machiavellianism, and psychopathy) are also often investigated as influential factors on certain human behaviors, including entrepreneurial intentions, but the influence of the Dark Triad on enterprise potential and individual entrepreneurial orientation is rarely examined. According to some authors, these personal characteristics show a negative impact on entrepreneurship (Bouncken et al., 2020), while other authors find that narcissism and Machiavellianism have a positive effect on entrepreneurial intentions (Hanson et al., 2023; Liu et al., 2021). In their research, Burger et al. (2023) came to an interesting result according to which narcissism has a positive effect on starting a business and an entrepreneurial venture, but after a certain time, the influence of narcissism on the success of that venture becomes extremely negative.

In the landscape of entrepreneurship research, a predominant focus has traditionally centered on examining the direct effects of various personal characteristics and traits, including the Big Five dimensions, Narcissism, and Machiavellianism, on entrepreneurial intentions. While this line of inquiry is valuable, it often bypasses a critical intermediary stage in the entrepreneurial process—the nurturing of individual entrepreneurial potential and orientation. Surprisingly, there is a paucity of research that delves deeply into the mechanisms by which these personal characteristics initially stimulate and cultivate an individual's Enterprise potential, encompassing facets like Leadership, Creativity, Achievement, and Personal control, as well as their Individual entrepreneurial orientation, encompassing Risk-taking, Innovativeness, and Proactiveness.

This research addresses this significant gap in the literature. It seeks to unveil the intricate relationship between personal characteristics and the development of an individual's entrepreneurial potential and orientation, which in turn serve as pivotal indicators of entrepreneurial intentions at the firm level. By probing these uncharted territories, this study contributes to a more nuanced understanding of how personal traits shape an individual's propensity to engage in entrepreneurial activities. This research, conducted in the context of Serbia with a focus on students as respondents, thus positions Enterprise potential and Individual entrepreneurial orientation as key mediators between personal characteristics and the ultimate manifestation of entrepreneurial intentions, shedding light on an essential yet underexplored facet of entrepreneurship dynamics.

2. THEORY AND HYPOTHESES

2.1. Big Five, Narcissism, Machiavellianism and Enterprise potential

Big Five personality traits are often associated with other psychological traits, as well as with the personality type of the "perfect" entrepreneur. The literature shows that the Big Five personality traits also influence psychological factors such as achievement, initiative, and motivation (Şahin et al., 2019). Also, the Big Five personality traits are associated with ethical behavior, as well as leadership in managers (Simha and Parboteeah, 2020). In addition, the Big Five personality traits are also associated with creativity, self-confidence, and achievement (Zare and Flinchbaugh, 2018).

When it comes to the effects of the Dark Triad of psychological traits, some authors find that narcissism, Machiavellianism, and psychopathy have a very negative effect on entrepreneurial intentions (Bouncken et al., 2020), while others find that narcissism and Machiavellianism have a positive effect on creativity and achievement. (Guo et al., 2023). Similarly, narcissism and Machiavellianism can positively influence creativity in individuals, as well as higher motivation and a greater desire for achievement (Gala et al., 2020). Narcissism strongly affects achievement as well as the need for control (Martinsen et al., 2019). However, narcissism in leaders negatively affects the perceived leadership effectiveness of employees, then the work performance of employees, as well as employee creativity (Zhang et al., 2023), which can have a very negative impact on the business of any organization, including entrepreneurial ones. Exploring enterprise potential is very important because it is a fundamental economic concept and it is crucial for modern business trends, and understanding it is essential for adapting to changing economic conditions and maintaining competitiveness (Turylo and Bohachevska, 2014). Also, Gonchar et al. (2021) find that enterprise potential is vital for addressing financial challenges and ensuring economic security, especially in unstable environments (such as Serbia).

2.2. Big Five, Narcissism, Machiavellianism and Individual entrepreneurial orientation

Entrepreneurial orientation is crucial for a nation's development and it drives economic growth and innovation. Personal characteristics have a significant impact on entrepreneurial orientation, such as proactiveness and innovativeness (Koe, 2016). Not only the Big Five personality traits but also other personal traits, such as passion and perseverance, have a very strong influence on entrepreneurial orientation (Santos et al., 2020). Big Five personality traits influence entrepreneurial orientation in small and medium enterprises (Mahmoud et al., 2020). According to (Awwad and Al-Aseer, 2021), people with higher conscientious values are often oriented toward success, and are more entrepreneurially oriented.

However, dark triad personality traits also have an impact on entrepreneurial orientation. According to Wu et al. (2019), Machiavellianism and psychopathy, as personality traits, have a very negative effect on entrepreneurial orientation, while narcissism has a positive effect on entrepreneurial orientation among students in China. The influence of narcissism on entrepreneurial orientation was also noted by Leonelli et al. (2019), but it is somewhat more complex, so the exhibitionistic side of narcissism has a positive effect, while the manipulative side of narcissism has a negative effect. Another study from China confirms that narcissism in CEOs can predict entrepreneurial orientation (Li et al., 2021). In addition to narcissism, Machiavellianism also has an impact on entrepreneurial orientation. Kraus et al. (2020) find that all three traits of the dark triad influence entrepreneurial activity, entrepreneurial orientation, and entrepreneurial leadership, where Machiavellianism has the strongest influence on opportunity recognition. Also, Machiavellianism has a complex impact on fundraising, which can be important when starting an entrepreneurial venture, and according to Calic et al. (2023), some hard tactics of Machiavellianism, such as revenge and intimidation, have a negative effect, while some of the soft tactics, such as persuasion and

ingratiation, have a positive effect on fundraising. In the end, entrepreneurial orientation is of paramount importance as it plays a direct and indirect role in shaping entrepreneurial intention, which can help in developing society (Hassan et al., 2021). Entrepreneurial orientation can also influence the adoption of new technologies which can lead to better market adaptation and competitiveness (Gupta et al., 2016), both are also very important in developing markets such as Serbia.

Bearing in mind the previous considerations, four hypotheses are created in this paper:
H1: There is a statistically significant correlations between the dimensions of Big Five, Narcissism, Machiavellianism and Enterprise potential.
H2: There is a statistically significant correlations between the dimensions of Big Five, Narcissism, Machiavellianism and Individual entrepreneurial orientation.
H3: There is a statistically significant predictive effect of the Big Five, Narcissism, Machiavellianism on the Enterprise potential dimensions.
H4: There is a statistically significant predictive effect of the Big Five, Narcissism, Machiavellianism on the Individual entrepreneurial orientation dimensions.

3. METHOD

3.1. Survey instruments (measures)

The Ten Item Personality Inventory (TIPI) was used to assess personality types, created by Gosling et al. (2003). The study analyzed the following Big Five personality dimensions: openness to experience, conscientiousness, extraversion, agreeableness, and emotional stability. To determine the respondents' Big Five personality traits, their responses were rated using a seven-point Likert scale.

Narcissism was assessed using a shortened version of the Narcissistic Personality Inventory (NPI-16) (Ames et al., 2006). The same questionnaire was employed in the reference study (Mathieu and St-Jean, 2013). The questionnaire comprises 16 items, each containing two statements, and participants were required to select the value that best aligns with their perception of reality regarding themselves. A seven-point Likert scale was utilized, with a score of 1 indicating the strongest endorsement of a "non-narcissistic" statement and a score of 7 representing the strongest agreement with a "narcissistic" statement.

Machiavellianism was assessed using a questionnaire developed for the research by Pekdemir and Turan (2015), which drew inspiration from earlier studies (Dahling et al., 2009; Valentine and Fleischman, 2003). The questionnaire consists of seven items, all contributing to the measurement of the Machiavellianism dimension. Respondents provided their ratings on a seven-point Likert scale.

The entrepreneurial potential of students was assessed using the Attitude toward Entrepreneurship (ATE) questionnaire, created by Athayde (2009). This questionnaire comprises 18 items, which are categorized into four dimensions: Leadership, Creativity, Achievement, and Personal control. Participants rated their responses on a seven-point Likert scale.

To measure Individual Entrepreneurial Orientation (IEO), the questionnaire developed by Bolton and Lane (2012) was used. The questionnaire includes 10 items, which contribute to three dimensions: Risk-taking, Innovativeness, and Proactiveness. Respondents provided their evaluations using a seven-point Likert scale.

3.2. Participants and data collection

The participants in the study were students from seven faculties in Serbia. They completed the questionnaires through two methods: electronically, using the Google Forms platform, and

also by manually filling out the questionnaires. Subsequently, all responses were compiled into a single database, resulting in a total of 400 valid questionnaires.

4. RESULTS

4.1. Descriptive statisctics

Descriptive statistics for the dimensions of the Big Five, Narcissism, Machiavellianism, Enterprise potential, and Individual entrepreneurial orientation, are shown in Table 1. Cronbach's alpha values range from α=0.703 do α=0.895.

Table 1: Descriptive statistics

Names of dimensions	Abbr	N	Min	Max	Mean	Std. Deviation	α
Extroversion	E	400	1,00	7,00	5,20	1,42	0,81
Agreeableness	A	400	1,00	7,00	5,34	1,15	0,70
Conscientousness	C	400	2,00	7,00	5,78	1,12	0,77
Neuroticism	N	400	1,00	7,00	3,08	1,30	0,75
Openness to experience	O	400	1,50	7,00	5,89	1,06	0,72
Narcissism	NAR	400	1,00	6,62	3,66	1,11	0,89
Machiavellianism	MAC	400	1,00	7,00	3,62	1,21	0,77
Leadership	LEA	400	1,00	7,00	4,37	1,29	0,85
Creativity	CRE	400	1,00	7,00	5,48	1,21	0,82
Achievement	ACH	400	1,00	7,00	4,72	1,39	0,83
Personal control	PC	400	1,00	7,00	4,37	1,40	0,75
Risk-taking	RT	400	1,33	7,00	4,56	1,32	0,73
Innovativeness	IN	400	1,00	7,00	5,09	1,08	0,74
Proactiveness	PR	400	1,00	7,00	5,56	1,14	0,75

(Source: Authors)

4.2. Correlation analysis

Coefficients of correlation between the dimensions of Big Five, Narcissism, Machiavellianism, Enterprise potential and Individual entrepreneurial orientation, are shown in Table 2. Pearson's correlation was used: *p<0.05; **p<0.01.

Table 2: Correlation analysis

	LEA	CRE	ACH	PC	RT	IN	PR
E	,298**	,299**	,366**	,132**	,304**	,250**	,163**
A	-,094	,174**	,006	-,020	,111*	,142**	,173**
C	,210**	,318**	,251**	,085	,073	,198**	,458**
N	-,108*	-,143**	-,185**	-,171**	-,203**	-,210**	-,149**
O	,179**	,521**	,264**	,157**	,310**	,434**	,311**
NAR	,404**	,166**	,379**	,229**	,195**	,183**	,092
MAC	,169**	-,025	,097	,042	,084	,030	-,046

*p<0.05; **p<0.01
(Source: Authors)

4.3. Regression analysis

The predictive effect of the Big Five, Narcissism, and Machiavellianism (independent variables) on the Enterprise potential and Individual entrepreneurial orientation dimensions

(dependent variables), was examined using Multiple Regression analysis. The results of the regression analysis are given in Table 3 (statistically significant predictive effects are marked with bold font and shaded fields).

Table 3: Regression analysis

| Depend. | Independent | | | | | | | R^2 | F | Sig. |
| | E | A | C | N | O | NAR | MAC | | | |
				β						
LEA	**,146**	-,087	**,158**	,001	,070	**,317**	**,092**	**0,241**	17,829	,000
CRE	,027	,043	**,134**	,028	**,447**	**,137**	,008	**0,309**	25,087	,000
ACH	**,185**	-,026	**,144**	-,047	**,111**	**,296**	,047	**0,258**	19,517	,000
PC	-,013	-,043	,019	**-,124**	**,126**	**,199**	,009	**0,088**	5,373	,000
RT	**,156**	,084	**-,101**	-,096	**,234**	**,127**	**,100**	**0,175**	11,846	,000
IN	,001	,055	,018	-,084	**,388**	**,148**	,057	**0,226**	16,387	,000
PR	-,060	,037	**,394**	-,020	**,169**	,092	-,017	**0,242**	17,834	,000

(Source: Authors)

5. DISCUSSION
5.1. Discussion of correlation analysis results

The results of the correlation analysis (Table 2) show that, of the observed independent variables, Openness to experience has the greatest influence, followed by Extroversion and Narcissism. Openness to experience can especially encourage Creativity and Innovativeness. It is clear that innovation and creation, among other things, require a person's curiosity, unconventional approaches, and openness to everything that is new and unexplored. Extroversion has a strong effect on Achievement and Risk-taking. The explanation for these connections is that extroverted people express their enthusiasm, conspicuousness, and sociability through their achievements, which often require certain risks. The impact of the Big Five on creativity is also shown in a study (Zare and Flinchbaugh, 2018), while the impact of the Big Five on achievement was confirmed in research (Şahin et al., 2019).

Narcissism has the greatest impact on Leadership and Achievement. People with pronounced narcissism are characterized by the desire to be at the center of attention, the belief that they are exceptional and capable, the need to praise themselves and to be praised by others, and the imposition of authority, all of which cause these people to feel like leaders and want to be leaders, and they also believe that they deserve to achieve as much as possible. A large number of previous research also link narcissism and achievement (Guo et al., 2023; Gala et al., 2020; Martinsen et al., 2019). We should also highlight the strong influence of Conscientiousness on Proactiveness. It is quite certain that reliability, self-discipline, and good organization strongly favor a proactive way of thinking.

On the other hand, the independent variables Agreeableness and Machiavellianism have the weakest influence. These are, obviously, the personal characteristics that have the least impact on the Enterprise potential and Individual entrepreneurial orientation dimensions. However, it should be noted that Agreeableness has a statistically significant and positive effect on Creativity and Proactiveness. Calmness, tolerance, and compassion are characteristics that can create conditions for creativity and proactivity. Likewise, Machiavellianism has a statistically significant positive and strong influence on Leadership. Machiavellian-minded individuals may view leadership as a means to achieve certain goals. Perhaps this is at least a partial explanation for the fact that some studies show positive effects of Machiavellianism on entrepreneurial intentions (Hanson et al., 2023; Liu et al., 2021).

Finally, Neuroticism is a dimension that has negative and statistically significant effects on all observed dependent variables. Nervousness, change of emotions, worry and anxiety are certainly not qualities that can encourage Enterprise potential and Individual entrepreneurial orientation dimensions. This is a common occurrence in research on Big Five traits, so Neuroticism negatively affects entrepreneurial intentions (Brandstätter, 2011; Sahinidis et al., 2020) and entrepreneurial performance (Brandstätter, 2011).

Most of the observed correlations (Table 2) have statistically significant values, that is, dimensions of Big Five, Narcissism, and Machiavellianism, in most cases, have a statistically significant effect on Enterprise potential and Individual entrepreneurial orientation dimensions. Bearing this in mind, it can be stated that hypotheses H1 and H2 have been confirmed.

5.2. Discussion of regression analysis results

The results of the regression analysis (Table 3) show that, of the observed independent variables, Openness to experience has the strongest statistically significant predictive effect, followed by Narcissism, Conscientiousness, and Extroversion. These results are almost entirely consistent with the results of the correlation analysis discussed above.

Due to the effect of a larger number of independent variables, the predictive effect of Conscientiousness on Risk-taking has now manifested itself as statistically significant and negative. This is also the biggest difference compared to the results of the correlation analysis. Conscientious, diligent, well-organized people obviously value certainty and security, so this does not favor undertaking risky activities, as is logical. At the same time, it should be noted that the predictive effect of dimension Conscientiousness is also expressed according to most of the remaining dependent variables, which indicates that, in the sum of various independent influences, conscientiousness plays a significant role and that without conscience it is difficult to do something useful and great. In this sense, it may be particularly interesting that Conscientiousness appears as a significant predictor of Leadership, not as the strongest but very influential predictor. So, in addition to people who want to become leaders because of their narcissistic and/or extroverted nature, there are also people who want to become leaders because of their conscience, apparently ready to do something useful for their organization, because they feel it is their duty.

The values of the corrected determination indexes R^2 range from 0.088 to 0.309, and all are statistically significant. Therefore, all dependent variables are under a statistically significant predictive effect of observed independent variables. The predictive effects are strongest on the Creativity dimension, followed by the Achievement, Proactiveness, and Leadership dimensions, which is a result that is also largely consistent with the results of the correlation analysis. Based on these results for the values of the corrected determination indexes, it can be concluded that hypotheses H3 and H4 are confirmed.

6. CONCLUSION

Taking into account the results of correlation and regression analysis, it can be concluded that Openness to experience has the strongest positive influence on the Enterprise potential and Individual entrepreneurial orientation dimensions, followed by Narcissism, Conscientiousness, and Extroversion. In doing so, the following influences are especially highlighted: Openness to experience on Creativity and Innovativeness; Narcissism on Leadership and Achievement; Consciousness on Proactiveness; Extroversion on Achievement and Risk-taking. We should also point out the positive influence of Conscientiousness and Machiavellianism on Leadership, as well as the negative influence of Neuroticism on the observed dependent variables.

Another study of the influence on entrepreneurial intentions among students in Serbia (Rajković et al., 2023) showed that, of the Enterprise potential and Individual entrepreneurial orientation dimensions, the strongest influence on Entrepreneurial intentions has the dimensions Leadership, Personal control, and risk-taking. These dimensions are, in this research, dependent variables, which are most influenced by Narcissism and Extroversion, followed by Openness to experience and Conscientiousness. Thus, these personal characteristics can be considered the most influential on Entrepreneurial intentions, with the mediation of Leadership, Personal control, and Risk-taking.

This paper carries significant theoretical and practical implications. The theoretical significance lies in its unique exploration of the intricate interplay between personal traits and the internal mechanisms that act as catalysts for entrepreneurial potential and orientation. Unlike previous research, which predominantly focuses on examining the direct impact of personal traits on entrepreneurial intentions, our study delves deeper into the foundational elements that precede these intentions. This approach enhances our understanding of the underlying processes that lead individuals toward entrepreneurship. From a practical standpoint, our findings offer actionable insights for educators, institutions, and policymakers. By identifying specific groups of students who exhibit a higher potential for entrepreneurial desires and intentions, our research enables targeted interventions. Institutions can implement tailored programs aimed at nurturing, guiding, and educating these individuals, fostering entrepreneurial attitudes, and intentions, and, crucially, activating entrepreneurial behavior. Such initiatives can have a substantial impact on fostering a culture of entrepreneurship and driving economic growth by channeling the potential of those individuals who are most inclined to embark on entrepreneurial ventures. In essence, this research provides a roadmap for harnessing the latent entrepreneurial talent within our student population, potentially shaping the future landscape of entrepreneurship in our region.

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REFERENCES

Ames, D.R., Paul Rose, P. and Anderson, C.P. (2006), "The NPI-16 as a short measure of narcissism", *Journal of Research in Personality*, Vol. 40, pp. 440-450.

Ariani, D.W. (2013), "Personality and learning motivation", *European Journal of Business and Management*, Vol. 5 No. 10, pp. 26-38.

Athayde, R. (2009), "Measuring Enterprise Potential in Young People", *Entrepreneurship Theory and Practice*, Vol. 33 No. 2, pp. 481-500.

Awwad, M.S. and Al-Aseer, R.M.N. (2021), "Big five personality traits impact on entrepreneurial intention: the mediating role of entrepreneurial alertness", *Asia Pacific Journal of Innovation and Entrepreneurship*, Vol. 15 No. 1, pp. 87-100.

Bazkiaei, H.A., Heng, L.H., Khan, N.U., Saufi, R.B.A. and Kasim, R.S.R. (2020), "Do entrepreneurial education and big-five personality traits predict entrepreneurial intention among universities students?", *Cogent business & management*, Vol. 7 No. 1, 1801217.

Bolton, D.L. and Lane, M.D. (2012), "Individual Entrepreneurial Orientation: development of a measurement instrument", *Education + Training*, Vol. 54 No. 2/3, pp. 219-233.

Bouncken, R., Cesinger, B. and Tiberius, V. (2020), "Narcissism, Machiavellianism, and psychopathy of top managers: Can Entrepreneurial Orientation secure performance?", *International Journal of Entrepreneurial Venturing*, Vol. 12 No. 3, pp. 273-302

Brandstätter, H. (2011), "Personality aspects of entrepreneurship: A look at five meta-analyses", *Personality and Individual Differences (Special Issue on Personality and Economics)*, Vol. 51 No. 3, pp. 222-230.

Burger, B., Kanbach, D.K. and Kraus, S. (2023), "The role of narcissism in entrepreneurial activity: a systematic literature review", *Journal of Enterprising Communities: People and Places in the Global Economy,* Vol. ahead-of-print No. ahead-of-print.

Calic, G., Arseneault, R. and Ghasemaghaei, M. (2021), "The dark side of Machiavellian rhetoric: Signaling in reward-based crowdfunding performance", *Journal of Business Ethics*, pp. 1-22.

Chen, M. H., Chang, Y. Y. and Lo, Y. H. (2015), "Creativity cognitive style, conflict, and career success for creative entrepreneurs", *Journal of Business Research*, Vol. 68 No. 4, pp. 906–910.

Dahling, J.J., Whitaker, B.G. and Levy, P.E. (2009), "The development and validation of a new Machiavellianism scale", *Journal of Management*, Vol. 39, pp. 219-257.

Frese, M. and Gielnik, M.M. (2014), "The psychology of entrepreneurship", *Annual Review of Organizational Psychology and Organizational Behavior*, Vol. 1 No. 1, pp. 413–438.

Gala, P.B., Chauhan, R.S. and King, R.A. (2020), "Narcissism versus machiavellianism and the role of self control towards social desirability", *Marketing Management Journal*, Vol. 30 No. 1, pp. 38-63.

Gonchar, O., Khachatrian, V., Ostapchuk, O., and Bitiy, A. (2020), "Financial security assessment in enterprise potential management", *Studies of applied economics*, Vol. 38 No. 4.

Gosling, S.D., Rentfrow, P.J. and Swann, W.B.Jr. (2003), "A very brief measure of the Big-Five personality domains", *Journal of Research in Personality*, Vol. 37, pp. 504-528.

Guo, J., Zhang, J., De Fruyt, F and Pang, W. (2021), "The bright and dark personality correlates of creative potentials, creative activities, and creative achievements", *Current Psychology*, pp. 1-12.

Gupta, V. K., Niranjan, S., Goktan, B. A., and Eriskon, J. (2016), "Individual entrepreneurial orientation role in shaping reactions to new technologies", *International Entrepreneurship and Management Journal*, Vol. 12, pp. 935-961.

Hanson, S., Valentine, S. and Shultz, P. (2023), "Bright or dark, vain or villainous? How entrepreneurial fitness, Machiavellianism and narcissism relate to entrepreneurial intention", *Journal of Management & Organization,* pp. 1-24.

Hassan, A., Anwar, I., Saleem, I., Islam, K. B., and Hussain, S. A. (2021), "Individual entrepreneurial orientation, entrepreneurship education and entrepreneurial intention: The mediating role of entrepreneurial motivations", *Industry and Higher Education*, Vol. 35 No. 4, pp. 403-418.

Ignatieva, I., Serbenivska, A. and Babina, E. (2023), "Influence of Leadership Potential on the Effectiveness of Managerial Change", *International Journal of Information Technology Project Management (IJITPM),* Vol. 14 No. 1, pp. 1-8.

Koe, W. L. (2016), "The relationship between Individual Entrepreneurial Orientation (IEO) and entrepreneurial intention", *Journal of Global Entrepreneurship Research*, Vol. 6, pp. 1-11.

Kraus, S., Traunmüller, V., Kailer, N. and Tiberius, V. (2020), "The dark triad in entrepreneurship research—a systematic literature review", *Journal of Enterprising Culture*, Vol. 28 No. 4, pp. 353-373.

Krueger, N. F. and Brazeal, D. V. (1994), "Entrepreneurial potential and potential entrepreneurs", *Entrep. Theory Pract.,* Vol. 18, pp. 91–104.

Lackéus, M. (2015), "Entrepreneurship in Education. What, why, when, how. Entrepreneurship360 background paper", Available at: http://www.oecd.org/cfe/leed/BGP_Entrepreneurship-in-Education.pdf (accessed 18. July 2023).

Leonelli, S., Masciarelli, F. and Fontana, F. (2022), "The impact of personality traits and abilities on entrepreneurial orientation in SMEs", *Journal of Small Business & Entrepreneurship*, Vol. 34 No. 3, pp. 269-294.

Li, X., Wang, Y., Yang, M.M. and Tang, Y. (2021), "Owner CEO narcissism, international entrepreneurial orientation and post-entry speed of internationalization: An empirical study of exporting SMEs from China", *International Marketing Review*. Vol. ahead-of-print No. ahead-of-print

Liu, D., Zhu, T., Huang, X., Wang, M. and Huang, M. (2021), "Narcissism and Entrepreneurship: A Systematic Review and an Agenda for Future Research", *Front. Psychol*. Vol. 12, 657681.

López-Núñez, M.I., Rubio-Valdehita, S., Aparicio-García, M.E. and Díaz-Ramiro, E.M. (2019), "Are entrepreneurs born or made? The influence of personality", *Personality and Individual Differences*, No. 154, 109699.

Mahmoud, M.A., Ahmad, S. and Poespowidjojo, D.A.L. (2020), "Intrapreneurial behavior, big five personality and individual performance", *Management Research Review*, Vol. 43 No. 12.

Martinsen, Ø.L., Arnulf, J.K., Furnham, A. and Lang-Ree, O.C. (2019), "Narcissism and creativity", *Personality and Individual Differences*, Vol. 142, pp. 166-171.

Mathieu, C. and St-Jean, É. (2013), "Entrepreneurial personality: the role of narcissism", *Personality and Individual Differences*, Vol. 55, pp. 527-531.

Owoseni, O.O. (2014), "The influence of some personality factors on entrepreneurial intentions", *International Journal of Business and Social Science*, Vol. 5 No. 1, pp. 278–284.

Pekdemir, I. and Donmez-Turan, A. (2015), "The Relationships Among Love of Money, Machiavellianism and Unethical Behavior", *Canadian Social Science,* Vol. 11, pp. 48-59.

Rajković, J., Nikolić, M., Brtka, V., Terek, E., Božić, S. and Tasić, I. (2023), "Big Five, entrepreneurial orientation, and entrepreneurial intentions", *European Journal of International Management (EJIM)*, Vol. 20 No. 3, pp. 475-507.

Sahinidis, A.G., Tsaknis, P.A., Gkika, E. and Stavroulakis, D. (2020), "The Influence of the Big Five Personality Traits and Risk Aversion on Entrepreneurial Intention", In: Kavoura A., Kefallonitis E. and Theodoridis P. (eds) *Strategic Innovative Marketing and Tourism*. Springer Proceedings in Business and Economics. Springer, Cham.

Santos, G., Marques, C. S. and Ferreira, J.J. (2020), "Passion and perseverance as two new dimensions of an Individual Entrepreneurial Orientation scale", *Journal of Business Research*, Vol. 112, pp. 190-199.

Simha, A. and Parboteeah, K.P. (2020), "The Big 5 Personality Traits and Willingness to Justify Unethical Behavior - A Cross-National Examination", *Journal of Business Ethics,* Vol. 167, pp. 451-471.

Şahin, F., Karadağ, H. and Tuncer, B. (2019), "Big five personality traits, entrepreneurial self-efficacy and entrepreneurial intention: A configurational approach", *International Journal of Entrepreneurial Behavior & Research*, Vol. 25 No. 6, pp. 1188-1211.

Turylo, A.M. and Bohachevska, K.V. (2014), "Enterprise Potential: Essence, Classification and Types," *Business Inform, RESEARCH CENTRE FOR INDUSTRIAL*

DEVELOPMENT PROBLEMS of NAS (KHARKIV, UKRAINE), Kharkiv National University of Economics, Vol. 2, pp. 259-263.

Valentine, S. and Fleischman, G. (2003), "The impact of self-esteem, Machiavellianism, and perceived social capital on attorneys' traditional gender outlook", *Journal of Business Ethics*, Vol. 43, pp. 323-335.

Wu, W., Wang, H., Lee, H. Y., Lin, Y. T. and Guo, F. (2019), "How machiavellianism, psychopathy, and narcissism affect sustainable entrepreneurial orientation: the moderating effect of psychological resilience". *Frontiers in psychology*, Vol. 10, 779.

Zare, M., and Flinchbaugh, C. (2019), "Voice, creativity, and big five personality traits: A meta-analysis", *Human Performance*, Vol. 32 No. 1, pp. 30-51.

Zhang, G., Wang, H. and Li, M. (2023), "Leader narcissism, perceived leader narcissism, and employee outcomes: The moderating effect of goal congruence", *Journal of Business Research*, Vol. 166, 114115.

Zhao, H., Seibert, S.E. and Lumpkin, G.T. (2010), "The relationship of personality to entrepreneurial intentions and performance: A meta-analytic review", *Journal of Management*, Vol. 36 No. 2, pp. 381-404.

BOARDS' STRATEGIC INVOLVEMENT: SOME EVIDENCE FROM REPUBLIC OF NORTH MACEDONIA

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ABSTRACT
Boards' strategic involvement has been a prominent issue in the management literature, although the research on boards work and how board members fulfill their roles is limited. Therefore, the purpose of this study is to investigate how boards members in companies with one-tier and two-tier board systems understand the concept of boards' strategic involvement and what determines boards' members strategic involvement. For answering the defined research questions, we have designed a study that has two parts: qualitative and quantitative. The qualitative analysis has enabled us to develop two separate frameworks on boards' strategic involvement for companies with one-tier board system and for companies with two-tier board system. The results from the quantitative analysis have shown that director's participation in discussions, their knowledge and previous organization performances are statistically significant predictors of boards' strategic involvement. The frameworks we have designed, as well as the regression model can be used in future research for broadening the academic understanding of the boards' members role in strategy and their involvement in strategic decision making.

Keywords: strategy, organizational performance, boards' strategic involvement, executives, non-executive directors

JEL classification: M10, M12, M19

1.   INTRODUCTION

Boards' tasks related to strategy represent their most important function (Wommack, 1979; Rosenstein, 1987; Bezemer et al., 2023). Directors' involvement in strategy or strategic decision-making represents a separate concept that incorporates several elements: 1. director understanding of boards strategic role (Levrau and Van den Berghe, 2007), 2. directors job involvement (Ghaya, 2011), 3. understanding of the tools or mechanisms that directors have to influence the strategic process, or to be more precise understanding the depth of the concept (Bezemer et al., 2021). Therefore, the popularity of this topic remains high since it focuses on the key organizational processes, the processes that ensure organizational survival and enable organizational growth. However, this topic's popularity was additionally stimulated in the past 3 years since Covid 19 pandemic showed with how many different issues board members should cope in these specifically tough times. The Bezemer et al. (2021) study very carefully presents the variety of issues incorporated in this topic. Namely, his findings imply that in the period

between 2008 and 2020 have been published 152 articles (in 45 high quality journals) on this topic that has been focusing on: boards' strategic performance, boards' strategic processes, boards' strategic decision making and boards involvement in other topics such as executive compensation, CSR disclosure, joint venture contracts and CEO strategic behavior. Our analyses of 48 articled published in journals indexed in Scopus and SCI in the past 5 years (2019-2023), have shown that recent research on this topic analyses the board process related to strategy and their ability to impact the key strategic activities, particularly those related to strategic human resource management, as well as boards capacity to influence organizations strategic performance, that enables organizations' sustainability. The crises induced by the Covid 19 pandemic showed the need for broadening this topic, as well as the need for investigating more thoroughly the depth of this concept.

In order to contribute to this research area we have designed a study that focuses on the understanding of boards' strategic involvement in joint-stock companies in our country, Republic of North Macedonia, which is a small and open economy, but whose governing system has passed through several severe changes in the past nearly 80 years. Therefore, the history of the companies included in our research is unique and their perspectives may give different understanding on some elements of the concept. The purpose of the study is to investigate how boards members in organizations applying the one-tier and two-tier board system understand the concept of boards' strategic involvement and what determines boards' members strategic involvement. To achieve this goal we have developed the following 3 research questions: 1. What does boards' strategic involvement includes in companies with one-tier board system?; 2. What does boards' strategic involvement includes in companies with two-tier board system?; 3. What are the predictors of directors' (or board members) strategic involvement?.

The study is structured in the following manner: *literature review* that enables better understanding on the concept of boards' strategic involvement and tools used for its investigation, *methodology* that explains the design of the empirical part of the paper, *results* or presentation of findings, *discussion*, *conclusions and limitations*.

2.   LITERATURE REVIEW

Although the importance of board strategic involvement has been emphasized in numerous papers in the period between 1970s and 1990s, the academic or systematic scientific research on this topic has started at the beginning of the 1990s (Puglise et al., 2009). The need for more formal and congruent research on the concept has been identified by the practitioners in the 1970s who insisted that directors must adopt more engaged and meaningful approach in fulfilling their strategic tasks (Wommack, 1979; Cheffins, 2015). However, the scientific approach in investigating the concept of boards strategic involvement was introduced at the beginning of the 1990s, after Zahra and Pearce (1989) have *defined and explained boards' impact on organizations' strategic outcomes that lead to achieving to the targeted financial, systemic, and social organizational performance*. Basically, one of the main arguments of Zahra and Pearce (1989) is that *boards' main job is to ensure delivering strategic outcomes that lead to achieving the desired levels or financial, systemic, and social organizational performance*, that can be done by fulfilling their roles. Building on the premises of the agency and resource dependence theory, Zahra and Pearce (1989) *defined the boards' strategic role* and created the foundation for further empirical and conceptual research on boards' strategic involvement. According to Zahra and Pearce (1989) resource dependence theory implies that "directors may be actively involved in the strategic arena through *counsel and advice to the CEO, by initiating their own analysis, or by*

suggesting alternatives" (p.298). The agency theory, on the other hand, focuses more on the boards' decision-making processes and "places a premium on boards strategic contribution, specifically boards involvement and contribution to the articulation of firms' mission, the development of the firms' strategy and the setting of guidelines of for implementation and effective control of the chosen strategy" (Zahra and Pearce, 1989, p.302-303). Therefore, the models on boards' strategic involvement or boards' involvement in strategic decision-making, or specific strategic decisions that can be classified as strategic, whether conceptual or empirical, created in the subsequent years, represents the literature foundation in this research area.

The authors of this study have identified 8 models that represent the core of the concept and classified them into 3 groups, based on the analysis of their elements. The first group of models are named generic or basic models that includes the models on determinants of board strategic involvement developed by Zahra and Pearce (1990) and the model on boards' involvement in strategic decision process developed by Judge and Zheithaml (1992). Zahra and Pearce (1990) have distributed a questionnaire to companies that have critical importance to the US economy and identified the predictors of the level of boards' strategic involvement by using a regression as a data analysis method. Their findings indicate that directors' expertise and role criticality are the statistically most significant predictors of the level of board strategic involvement. On the other hand, Judge and Zheithaml (1992), use gathered qualitative and quantitative data and investigated the determinants and consequences of boards' involvement in strategic decision-making process. Judge and Zheithaml (1992) findings imply that organizations' age, level of insider representation on board and board size are statistically significant predictors of boards involvement in strategic decision-making, although the relation between board size and boards' involvement in strategic decision-making is negative. The second group of models incorporates the models called behavior models, out of which most of them are conceptual. The models within this group have been built on the assumption of agency theory about human nature, the propositions of other theories, such as strategic choice theory, stewardship theory, stakeholder theory, resource dependance approach, upper echelon theory, and other approaches close to organizational sociology and organizational psychology. In this group we have incorporated the models developed by McNultty and Petigrew (1999), Forbes and Millicken (1999), Rindova (1999) and Pye and Camm (2003). McNultty and Petigrew used interviews with company directors as data gathering method and based on a qualitative analysis, he identified the levels of directors' strategic involvement and the factors affecting boards' strategic involvement. Rindova (1999) use some evidence of the Konr/Ferrys' 1998 annual board of directors' study regarding the time directors spent on boards' work and their participation in meetings, together with an extended literature review, to create the model that defines the predictors and effects of directors' involvement in strategic decision-making. Pye and Camm (2003) by using descriptive statistics on a survey in which non-executive directors participated and their own experience have designed the models of learning board and non-executive directors' contribution. Finally, the last group of models, named integrative models, incorporates the model of Ghaya (2011) and the model developed by drew and Kaye (2007). While Ghaya (2011) relies on his profound literature review for creating the model of boards' strategic involvement, Drew and Kaye (2007) uses the literature and practitioners' experiences to create a model that enables increasing boards involvement in setting corporate direction. Drey and Kaye (2007) confirm the Zahra and Paerce (1989) argument that boards job is creating strategic outcomes that lead to improved organizational performance (financial, systemic and social) and therefore rely on the literature in which balance scorecard has been developed.

In order to enrich this literature review, we have also made a short overview of the studies that focus on investigating boards involvement in concrete or specific decisions that are tightly related to organizations strategy and impact organizational performance, and therefore can be included as part of the boards' strategic role. Namely, significant body of literature have focused on examining the predictors or determinants of boards involvement in top management or CEO succession (Dalton and Kesner, 1985; Fredrickson et al., 1988; Cragun, 2018; Datta and Guthrie, 1994; Ocasio, 1999; Shen and Cannella, 2002; Zhang and Rajagopalan, 2004; Zhang, 2006; Chen et al., 2016; Guthrie and Datta, 1997; Schepker, 2017; Berns and Klarner, 2017; LeCounte et al., 2017; Cragun, 2018; Connelly et al., 2020) and in decision related to mergers and acquisitions (McDonald et al., 2008; Levi et al., 2014; Lou, 2021). In general, it can be noted that the finding in most of the studies indicate that top management team member or CEO succession cannot be simplified to the level of a single appointment decision, but rather that it represents a serial of decisions regarding the development of the key human resources of the organizations in which board members must be involved (Kesner and Dalton, 1994; Guthrie and Datta, 1997; Cragun, 2016; Berns and Klarner, 2017; LeCounte et al., 2017; Connelly et al., 2020). Furthermore, McDonald et al., 2008 are investigating how directors experience affects acquisition performance and their findings indicate that directors' ability to develop expertise for acquisition decisions influence the acquisition performance. Levi et al. (2014) examined the impact of directors' gender on M&A decisions and conclude that female directors are more concerned with the ability for creating shareholder value through these decisions. Lou (2021) findings indicate that top management teams use experience-based intuition when making strategic M&A decisions and that these decisions are positively related to M&A performance. Additionally, Lou (2021) findings indicate that boards' strategic involvement impacts the approach that management structures are going to use in the decisions related to mergers and acquisitions.

Regarding the research of directors' strategic involvement in companies with two-tier board system, Gelther and Siems (2021) indicate that although letting companies to choose between the board systems can be a "far-sighted" strategy, the implementation of a two-tier board system can lead to a uncertainty because the strategic setting cannot be always clearly defined or limited. Furthermore, Block and Gerstner (2016) argue that in order to achieve the acquired level of integration of the supervisory board members in strategy, organizations must work on the unity of the management and supervisory boards, usually through combined and more frequent meetings. Bezemer et al. (2014) research also supports the previous statement and suggests that the complex strategic problems should be addressed in conjunction with the supervisory board members, since their processes and social interventions can be crucial for the organization. Kolatkiewick et al. (2017) have investigated the role of strategy committees on the Polish supervisory boards by analyzing interviews' data, and their findings indicate that these committees represent a structural solution for increasing supervisory boards' involvement in strategy and their engagement in the strategic process. Furthermore, the authors note that these committees in some companies are permanent structures, while in others are ad hock formed, and that their formation largely depends on organizations' size and complexity. Cindric (2021) research supervisory boards strategic involvement in a sample of Croatian companies and her findings indicate that supervisory boards actively participate in the overall strategic process, especially in time of crisis, and that their strategic involvement is determined by the boards' structural attributes.

The analysis of the literature in the past decade on boards' strategic involvement indicates that most of the research focus on boards' involvement in issues related to strategic human resource management (Aber and Torchia 2019; Nahum and Carnelli, 2019; Zenou et al. 2020; Zhu et al., 2020; Campopiano et al., 2020; Luciano et al. 2020; Klarner et al. 2021; Jung et al., 2023), on their understanding of sustainability as a strategy and their contribution in achieving sustainable performance (Kanadli et al., 2022; Amorelli and Garcia-Sanchez, 2020; Amorelli and Garcia-Sanchez, 2023). In conclusion, we can note that boards' involvement in strategy has important place in management literature, and the implication of the research on this topic are of value for the academic community, as well as for the practitioners. Furthermore, we can record that directors involvement in strategy is less investigated in a companies with two-tier board system.

3. METHODOLOGY

In order to answer the research questions defined in the introduction, the authors have designed a study that includes a qualitative and quantitative part. The aim of the qualitative part is to investigate how board members define boards' strategic involvement, which are the characteristics of the context in which strategic participation occurs and what are the constrains that they face in this process. While the aim of the quantitative part is to investigate which factors influence boards' strategic involvement through a regression analysis. Therefore, the study has been designed as an exploratory mix methods research.

The analysis of the case studies has given significant insight about how boards' actually fulfill their strategic role and participate in the strategic process. Additionally, the qualitative part has given an opportunity for identifying the determinants of boards' strategic involvement. After constructing the models, based on the analysis of the case studies, we have employed quantitative data analysis methods to investigate whether the proposed relations are statistically significant. In the quantitative part multiple regression has been used as a method for analyzing the board members' responses.

It is a fact that qualitative research methods research the process in more natural settings and although this type of research is less structured, it enables the development of new theories and deepening the understanding on certain phenomenon and processes, and the context in which it occurs. On the other hand, quantitative research enables theory testing, exercises more the point of view of the of the researcher, relies on numbers and had data and is more structured (Graue, 2015, p. 6). To conduct qualitative research, the researcher needs to be close to the objects of interest (sample units), while for the quantitative research, the distance between the researcher and the sample units is inherent (Graue, 2015). Therefore, to understand the boards' strategic involvement we combine these two approaches. As Graue (2015, p. 6) notes, the choice of research approach largely depends on the researchers' epistemologically grounded beliefs and what he sees in the data reflects who he is (Therry et al., 2017).

In order to investigate the concept of boards' strategic involvement in small transitional economy, such as the economy of the Republic of North Macedonia, the authors conducted an analysis on a sample of 12 joint-stock companies. In this study we used cases of companies that regularly publish information on their corporate governance structure and on their function (companies that are part from the some of the segments on the Macedonian stock-exchange) and companies that were willing to give more information about their work, and particularly about their boards' strategic involvement. Therefore, we can say that the sampling strategy was to focus on information-rich case studies. According to Patton (1990), the information-rich cases are those "that manifest the phenomenon intensely, but not extremely, such as good

students/poor students, above average/below average" (p.183). For identifying the so-called information-rich cases the researchers have to analyze their history and the strategic moves, or strategies implemented in a given period of time. The connections or relations with a few directors from several companies were used in order to approach the rest of the companies. As in any industry or profession, when you are recommended by someone you get the access you need. The same approach has been used by Hill (1995). From a methodological point of view, this is called snowball effect or chain sampling (Patten, 1990).An overview of the case studies included in the sample is presented in Table 1. As presented in Table 1 the sample consists of 5 organizations with one-tier board system, and 7 organizations with two-tier board system. 5 companies are from manufacturing, 2 from services and 5 of them are financial institutions. In the last group, besides bank also insurance companies have been included. However, since we are interested in analyzing the process of strategy making and strategic decision-making, as well as understanding boards and directors' role and their perception about boards' involvement in the strategic process, we do not thing that the industry in which they compete should be give more attention. Although banks are more regulated, for them there are higher standards regarding transparency about corporate governance and other relevant issues, we do not believe that bank regulation should be separately discussed in this paper. The main issue that we are researching is boards and directors' involvement in the strategic process and how and when they share their implicit knowledge regarding strategy for fulfilling their tasks. In the banks corporate governance structures are more complex, but the members of the supervisory boards often are or were managers/executives/non-executives in companies. Therefore, they use the same implicit knowledge, logic, and practices for developing strategic alternatives, evaluating them, and making strategic choices in companies, as well as for fulfilling their roles as members of the banks' boards. Regarding strategy and the strategic process, there is not much difference between companies and financial institutions, in terms of knowledge and logic employed. However, in more regulated industries there may be some limitations, such as the fact that they do not have the freedom to decide which type of board system they are going to implement. Furthermore, in more regulated industries the frequency of changes in regulatory may be higher and sometimes additional demands may be imposed. Therefore, in these industries, including bank industry, the need for regular update on regulatory changes, is more highlighted.

Table 1: Overview of the companies included in the sample

Case characteristics	1	2	3	4	5
Board system	Two-tier	One-tier	One-tier	Two-tier	Two-tier
Sector/industry Organizations' size (employee number)	Manufacturing Medium	Manufacturing Medium	Manufacturing Small	Manufacturing Medium	Manufacturing Large
Type of directors included	Executive and non-executive	Executive and non-executive	Executive and non-executive	Executive and non-executive	Executive

Case characteristics	6	7
Board system	One-tier	One-tier

Sector/industry	Service	Service
Organizations' size (employee number)	Medium	Small
Type of directors included	Executive and non-executive	Executive

Case characteristics	8	9	10	11	12
Board system	Two-tier	Two-tier	Two-tier	Two-tier	One-tier
Sector/industry	Financial institution	Financial institution	Financial institution	Financial institution	Financial institution
Organizations' size (employee number)	Medium	Large	Large	Large	Medium
Type of directors included	Executive	Executive	Executive and non-executive	Executive	Executive and non-executive

(Source: Authors analysis)

The gathered data were analyzed on a group level. The organizations were classified in two groups: the first one incorporated organization with one-tier board structure (n=5) and the second one included companies that have adopted two-tier board system (n=7). In order to better explain the context in which Macedonian join-stock companies operate, we would like to note that some of the financial institutions (such as banks) in our country in order to ably the law have to incorporate two-tier board system, while the other companies have the possibility to choose between one-tier or two-tier board system.

The data from the units (case studies) were analyzed with the application of the framework approach. As elaborated by Smith and Firth (2011), the framework approach has many similarities with the thematic analysis, especially in the initial phases, when the themes are identified, but it gives an opportunity for constant refinement of themes which leads to the development of the framework. We did not used a software for thematic analysis, the analysis was done manually. The use of a software may not identify some of the linkage within the data and the researcher may not get sufficient information regarding the context in which the process occurs. Therefore, the use of software although it may be suitable when sample is bigger, it also may be very limiting. The software is not much of a use when we intend to analyze the context and to get deeper understanding on some processes. As Terry et al. (2017) have noted that although some people claim that the use of computer program is the best way for data analysis, "any researcher needs to identify the right tools for them, in the context for their particular project" (p.26).

In the quantitative part, we used bivariate analysis and multiple regression analysis as data analysis methods. The analyses were computed with statistical software (SPSS). We used data from a questionnaire that included different types of questions. The questions related to the constructs on boards' strategic involvement, directors' knowledge, individual participation in discussions, all members participation in discussion included items measured on a five-point scale. The construct regarding decision type or decision focus also included items on which respondents need to access their level of involvement in different decisions on a five-point scale. The quantitative analysis includes the data from 35 respondents.

In the following section we describe both the results from the qualitative and quantitative data analysis.

4.   RESULTS
4.1.   Results from the qualitative analysis
4.1.1. Results from the reserch on organizations with one-tier board system

The organizations that are included in this sample have a long history and tradition. Their persistence in maintaining good corporate governance practices and offering quality products/services is what ensured their survival even in the most difficult times. However, the challenges they faced during this 32 years transitional period has imposed the need for reorganizing their operations and in some cases significantly reducing their size and scope of operations. Some of them have lost significant markets, while others faced different types of challenges.

Additionally, some of them have made changes in their boards' structure in these 32 years, since there were also several changes in the Companies Law. Furthermore, as was mentioned in the previous section, the Companies Law in our country allows the transition from one-tier to tier board system and vice versa. Some of the key findings from the case study analysis are presented in Table 2.

According to the presented analysis, the following propositions regarding boards' strategic involvement in organizations with one-tier board system can be induced:

Proposition 1: The participation of each board member in the discussions related to making strategic decisions largely depends on their role, e.g. whether they are executive or non-executive directors. In the other word, executive directors have higher level of participation and are prepared to express their thoughts regarding the strategic alternatives, while the non-executive directors are rarely prepared to express their disagreement with the alternatives defined by the management.

Proposition 2: Board size also influences the level of individual participation in strategic activities by board members. Our findings implicitly lead to the conclusion that that when boards are larger, board members are more likely to restrain their participation in the discussions.

Proposition 3: Organizational size also has an impact on boards' members individual involvement within the strategic issues and their engagement in the boards' discussions. The directors that are members of boards in larger organizations are more cautious in strongly expressing disagreement and opposing opinions, but, on the other side, contribute by gathering additional data and information, that are not part from the managements' reports.

Proposition 4: The type of strategic decision made, also influence the level of directors' involvement. In situations in which the board discuss issues related to organizational development, the level of responsibility is higher for all board members, and all of them contribute by enriching the debate, and asking critical questions.

Proposition 5: Although in some companies executives directors and/or chair tend to dominate the strategic process, in situations when developmental strategic decisions are made the board leaderships (CEO and board chair) prefer higher level of boards' members participation in the process, although the essence of each member contribution tend to be different (in accordance with their experience, expertise and access to information).

Theme 1: Individual participation

Directors role (executive or non-executive)	Executive directors have stated that they have higher level of participation all aspects of the strategic process, and have a tendency to give higher rates/grades for others' members participation in this process. The non-executive directors are not always prepared to think "outside the box", and even when their opinions differ in comparison to those of the other board members, they are not always prepared to share them. Furthermore, the non-executive directors are less likely to openly state a disagreement with managements' (executives') propositions.
Board size	The members of the larger boards are more restrained in presenting different stand points regarding large scale questions/issues.
Organization size	Organizations' size has an impact on the way directors behave and think and how they share the information on the formal board meetings. Namely, boards members in larger organizations have a higher level of caution in expressing different opinions, but on the other hand have a significant contribution in gathering additional data (outside of the information provided in the management reports). However, the additional information with which cumulate can have an impact in improving decisions quality
Decision type (classification by Nutt, 2006)	The type of decisions that are subject to a certain meet also has in impact on the directors; strategic involvement. The directors in the companies that have discussed on a board level several decisions that can be classified as developmental (according to the Nutt, 2006 classification), usually are more willing to share their information and knowledge and to involve in a fruitful debate. However, they do not have a tendency to present certain attitude towards the alternatives proposed by the management, but are more focused on asking critical questions regarding the suggested alternatives. Implicitly, we can conclude that in the process of making developmental decisions, that by definition imply more resources and undertakings with which the

	organization has no experience, the non-executive directors are ensuring that the management team (together with the executives) have on its disposal the "right" information and is aware of the different types of risks.

Theme 2: Capacity for domination of the strategic process

Executive/non-executive	The executive directors rarely state that the boards' meeting are dominated by the executive directors, or by the CEO, which was expected. Their perception regarding the flow of the boards' meeting is that every member actively participates in the discussion of the strategical issues. On the other hand, the way in which the non-executive directors think about this, differs significantly. Namely, one part of the non-executive members feel/state that the CEO or board chair dominate the meeting.
Board size	Board size is important since it influence *how* board members understand the need for discussion on the board meetings. Board members in the smaller companies resonates that the domination of the CEO and/or the board chair is expected. On the other hand, in the larger organizations the directors tend to state that all board members actively participate in the discussions, in accordance with their role within the board
Organizations' size	Regarding the impact and role of organizations' size on this topic we could not induce clear conclusions. Generally, it can be noted that some differences in the reasoning of the board members in small and medium organizations do exists. However, those differences are more likely to relate to the level of concertation in the organizations' ownership structure, than to the organizations' size.
Decision type	Decision type has impact on the intensity and depth of boards' discussions. In the process of making developmental strategic decisions the boards' leadership is more likely to insist of participation of larger number of board members, although the essence of their participation/contribution might largely differ (in accordance with their expertise, experience, access to information, are on which the decision

	is focused ect.). When the board is involved in the process of making developmental strategic decisions the domination of one person tends to decrease.

Additionally, we have identified significant differences in the description of the boards' strategic involvement (in terms of its scope and mechanisms) among directors. The way boards' strategic involvement is described significantly differs in accordance with board members' role (whether he/she is an executive or non-executive member). In this sense, for the biggest number of executive directors, boards' strategic involvement refers to active participation in the process of strategic alternatives development and preparation, in defining strategies, as well as, in initiating strategic changes. On the other hand, according to the non-executive directors' responses, their understanding for the strategic involvement process is related to the participation in the strategy definition and evaluation. Their understanding of the boards' strategic involvement includes giving general directions, which should be implemented in accordance to the analysis of the impact of others external of internal factors in the alternatives generation process. Basically, their contribution in the strategy formulation phase refers to the selection of one of the alternatives generated developed by the management and the executive directors (CEO mostly). The non-executive directors do not perceive that they should actively participate in the alternative generation process.

A crucial precondition for developing fruitful discussions that stimulate larger boards' member strategic involvement is the directors' knowledge related to the internal organizational environment and their previous board experience. The case study analysis has shown that non-executive directors tend to state that they have broader expertise and experience in different industries, while executive directors have larger experience in some functional areas within the organization. These results lead to the support of the thesis that executive directors possess broader and deeper knowledge about the organization and the industry in which the organization competes, and that their ability to share and exchange this knowledge largely influence boards' overall strategic involvement.

The analysis has shown that boards' strategic participation includes stimulating debate on boards meeting and active participation of all board members. The way and the level of boards' members participation in the formulation and evaluation of the strategic alternatives, as well as the selection of the most appropriate one, largely depends on the organization's' size, boards' size and the type of decision they are expected to make (developmental or non-developmental strategic decision).

Based on the findings in the qualitative analysis, the analysis of the case studies, a model on boards' of directors involvement in strategy has been constructed. This model includes the predictors of board of directors' strategic involvement , as well as, the essence of the concept. The model is presented in Figure 1.

Figure 1. Boards' involvement in strategy in organizations with one-tier board system
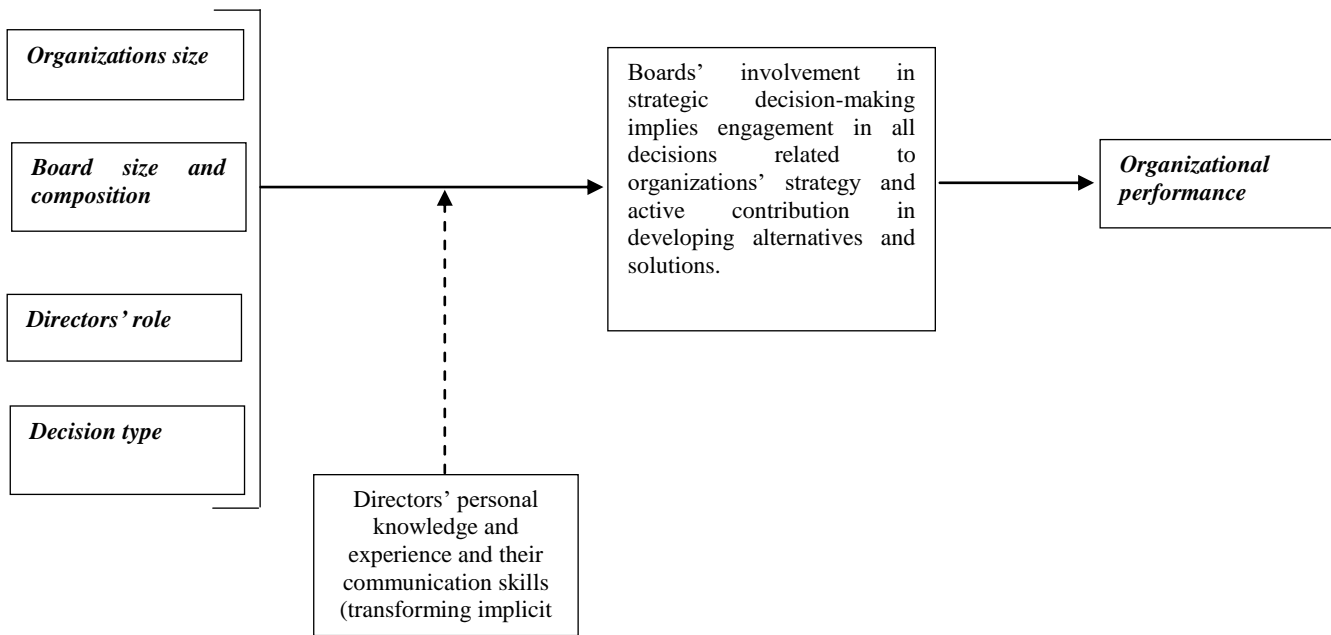
(Source: Authors' construction)

4.1.2.   Results from the reserch on organizations with two-tier board system
The strategic involvement of management and supervisory boards in companies that have adopted a two-tier board system should be analyzed separately. Namely, in this section first the involvement of management board in strategy is analyzed and afterwards, we performed an analysis of the supervisory board strategic involvement. In regard to the characteristic of the sample, it is important to be noted that most of the included corporations are large, and some of them are financial institutions (for which, in accordance with the applicable law in Republic of North Macedonia, the two-tier board system is mandatory). Understanding how the governing structures in large corporations function represents a special challenge, and in the same time an opportunity to acquire new knowledge that is not transferred through the traditional educational approaches. However, this tacit knowledge seems to be one of the crucial factors for success. The successions in some of the corporations in our country have confirmed this thesis. Namely, part of the successors that has been systematically and methodologically prepared, through step-by-step promotions in the organizational hierarchy, seems like did not acquired the implicit knowledge their incumbents had, which incorporated a mix of soft skills, ability for conceptual thinking, as well as resilience that is crucial in thought time.

Management board includes only executive directors, or the key managers in the organization. Their ability to manage the internal organizational processes, as well as the interests of the key stakeholders represents the foundation of the success of any organization. In large companies the middle level managers can also be included in several activities related to strategy formulation and can contribute to shaping the alternatives

According to the management boards' members responses, their involvement in strategic decision   making   includes   the   activities   related   to   the   iniciation   of   strategic

suggestions/alternatives, which are discussed and evaluated on boards meetings. The management board members have a crucial role in initiating issues related to undertaking corrective action.

In large organizations, the management board members actively participate in defining strategic options, as well as, in evaluating strategies. Most of the management board members highlight that iniciating strategic change is one of the ways to give a contribution in the organizations' strategic process. Additionally, most of them agree that giving directions for undertaking corrective action is also one of the ways to contribute in the strategic process. Moreover, management board members have a significant impact in society and therefore their activities related to advocacy, especially in the stakeholder management issues, should not be undermined. Although management board members have significant social capital, few of them have stated that one of their strategic tasks is increasing their networks. Additionally, management board members' role in lobbying is not perceived as a strategic activity. Namely, a significant number of the management board members state that lobbing does not represent a way of strategic participation.

The analysis of the determinants of management boards' strategic involvement is trying to estimate the factors that have potential impact on directors' active participation. The case study analysis has shown that the role of the director within the management board impact on his/her perception of the concept of board strategic involvement and his/her understanding of the participation in boards discussion. Other factors that should be analyzed include management board members tenure, the period in which they work together, as well as their connection or their relationship with the management board chair. Additionally, it was noted that the manner in which management board members communicate and share their views on crucial issues largely depends on organizations' size and the type of decisions that they should make.

Table 3: Factors affecting management board strategic involvement	
Theme 1: Individual participation	
Management board members role	According to the case studies analysis it can be noted that the management board chair, who is usually the general manger, in the same time, often thinks and resonates differently in comparison to his/her colleagues and has high level of self-esteem in expressing and presenting different views and perspectives. His/her participation in boards' discussion is crucial and he feels the comfortable to presents his/her suggestions, and to ask critical questions regarding the information that are delivered to him by the other management team members. The other management board members (those that are not chair) it can be noted that are less likely to express different opinions and to resonate in a different way in comparison with their colleagues. However, most of them feel that their task is to gather additional information, besides those obtained in the management' reports and to ask critical questions regarding the data that for the basis of their decisions.
The tenure of the management board members and the impact of the management board chair on their appointment	According to the case study analysis, it is not that when the management board members have longer experience in working together, or when they have a tenure that is longer than 4 years, some of the directors feel more comfortable to express their opinion even when it is significantly different that opinion of his/her colleagues. It is important to note that when the management board chair has a more significant role in the process of selecting and appointing the other board members (or he has suggested some candidates) he feels more comfortable in expressing his/her opinions and asking critical questions.
Organizations' size	In regard to the organizations' size it can be noted that in the larger organizations the management board members have more proactive role in the discussions and feel that they can freely express their opinion regarding the proposed alternatives, to reevaluate them and ask additional information. Furthermore, the management board members in larger organizations are more focused on gathering additional information, as a addition to the information presented by the other management team members. However, the analysis of the case studies did not provide basis for supporting the thesis that the organizations' size is related to the expression of different views regarding the kye strategic issues.
Decision type	The type of decisions which the management board

	members discuss also impacts theirs level of involvement. In organizations in which the management board members are involved in making developmental strategic decisions, the boards discussions are longer, the directors ask more questions and proactively gather information.
Theme 2: Individuals' domination	
Management board members' role	Most of the management board members agree that they have active and significant participation in the boards' meeting discussions. In most of the cases management board members state that all directors equally participate in the discussions. However, in some case studies, the management board members state that in some situations the discussion can be dominated by certain members and it is notable that the decision-making culture slightly differs between the analyzed companies.
The tenure of the management board members and the impact of management board chair on their appointment	The tenure of the management board members, according to the analysis, does not impacts the way in which they assess the directors' participation in making when making key strategic decisions. The analyses have shown that most of the directors state that the views of all management board members are taken into account and that the discussions are not dominated by one individual.
Organizations' size	The management board members in larger organizations more often state that in the process of strategic decision making boars' meetings are characterized with broard and long discussions and that there is no domination by the management board chair.
Decision type	In context in which developmental strategic decisions have to be made, some members that have specific/rare expertise, may be allowed to discuss longer, but this does not mean that they are going to dominate the discussion and the meeting. Even in this circumstances the management board chair is usually responsible for stimulating active participation by all the members.

(Source: Authors' construction)

According to analysis presented in Table 2, the following propositions regarding management board members strategic involvement can be formulated:

Proposition 1: The management board chair, who is also in the position general manger, in the process of strategic thinking is more likely to present different views that his/her collegues and has high level of self-confidance in the dissucussion regarding this perspectives. The management board members, who are not chairs, on the other hand less frequently present different views regarding the key strategic issues.

Proposition 2: All management board members feel that their task is to gather additional information, (other that those presented in the managements' reports), and to ask critical questions regarding the data and information on which they rely in the strategic decision-making process.

Proposition 3: In the circumstances in which the management board members work together for a longer period of time, they feel more freedom in expressing different perspectives.

Proposition 4: In circumstances in which the management board members are appointed on the recommendation made by the management board chair, he/she (the cair) feels more conformatable in expressing different perspectives and strategic alternatives/solutions.

Proposition 5: In larger organizations the management board members have more active participation in the discussions developed on the meeting on which strategic decisions are made and express hieger level of dedication in gathering data reated to the analysed issue.

Proposition 6: In organizations in which developmental strategic decisions are made, the discussions are longer and all management board members are focused on asking critical questions regrading the information delevired by the management.

The management boards' strategic involvement, for the most members of these boards, includes initiating strategic alternarnatives, advisisng the lover-level manager that are assigned to formulated the strategic alternatives, evaluating the achived progress in implementation phase and initiating the decisions for undertaking corrective actions.

In the assessment of their knowledge, the management board members state that they have more knowledge regrading the organizations' key operations and the organizations' weeknesses. On the other hand, they state that have less knowledge regarding the critical technologies and the threats of new entries in the industry. Furthermore, few of them state that they have experience in different industries.

When asked which of the following issues are most significant for the management board, the directors have stated that strategy evaluation and corporate governance issues are the issues with highers importance for their board. Most of the management board members have assessed strategy evaluation higher that the strategy formulation, which indicates that following the progress in the implementing strategy and assessing whether the chosen alternatives are suitable for the emerged changes in the external and internal environment is an essential element of the management boards' strategic involvement. By analyzing the information regarding the implementation of the adopted strategies the management board members are able to influence the formulation of new strategies. Therefore, the management board members state that strategy evaluation is one their most important tasks.

Regarding the themes on which the management board members have spent most of their time in the past 3 years, the answers indicate that strategic planning and evaluating organizational performances were ranked highest on management board agenda. Considering the changes that have been brought in the crises emerged because of the Covid 19 pandemic, these responses were expected. The dynamics of the changes in the organizations' environment in the past 3

years imposed the need for allocating more time on defining new strategies and adjusting the organization on the newly arise circumstances, with a final goal managing organization survival on the long run. The second theme on which management board members have spent most of their time in the past 3 years is the evaluation of the organizational performance. Evaluating organizational performance is a theme that is always highly ranked by board members. However, the Covid 19 crises amplified its importance, bearing in mind the increased level of uncertainty in the environment and the speed in which changes occurred.

In accordance with the presented data from the analyzed case studies we can synthesize one additional proposition regarding management board strategic involvement.

Proposition 7: Management board members asses that evaluation of the existing strategy represents an issues that has higher importance than the stratregy formulation. These findings indicate that considering the information on strategy implementation evaluation, the management board members can influence the process of strategy formulation.

The analysis of the supervisory board members strategic involvement gave an isight on the question how non-executive directors, in organizations with two-tier board system, understand strategic involvement, which themes are most important to them, and which factors impacts their participation in strategic decision-making.

The supervisory board members imply that their strategic involvement includes: gathering or securing sufficient information regarding the implementation of strategic decisions, following and assessing the achivments in the implementation process and raising initiatives for undertaking corrective actions, as well as generating suggestions for improving the strategic decisions. The analysis leads to a constatation that the supervisory boards focused more on overseeing strategy implementation, while in the process of strategy formulation they participate through suggestions for improvements.

According to the supervisory board members opinion, their boards main task include periodically assesing managements' work, evaluating strategies, approving annual reports, contribution in strategy formulation, advising the management, giving directions for undertaking corrective action, controlling the reports prepared by the management and by initiating strategic changes. Therefore, supervisory board members participation in the strategic process includes active contribution in the strategy evaluation (as a phase of the strategic decision-making process), giving directions for undertaking corrective actions, and initiating strategic changes. It is interesting to note that significant number of supervisory board members indicate that their contribution also includes networking and active participation in the organizations' advocacy activities. In this segment there is a significant difference with the insights from the management board members' responses. According to the analyses case studies it can be noted that the management board members define their contribution in strategy as involvement in strategy formulation and strategy evaluation, while supervisory board members are more focused on strategy evaluation and assessing the need for undertaking corrective action. Furthermore, supervisory board members believe that their contribution to strategy can be achieved also with participation in advocacy activities, which is not emphasized in the responses of the management board members. Some of the management board members state that participation in advocacy is not a task related to their boards' strategic role. According to the presented insights it can be concluded that management board members are focused on managing the internal organizational processes and defining alternatives, while the supervisory board members are more focused on the political aspects of the strategic decision-making process.

In regard to the factors that influence supervisory board members strategic participation, it can be onserved that organizations' size, the time spend working together and supervisory board members individual social capital, as well as the need for making developmental strategic decisisons have positive impact on their strategic involvement. It is notable that the members of the supervisory boards in larger organizations feel more comfortable expressing their opinions that significantly differ in comparison of the opinions of the management board members or their colleagues. Furthermore, if the directors have spent more time working together and have significant individual social capital, they feel more comfortable in presenting new information. In context in which making a developmental strategic decision is needed the supervisory board members feel greater responsibility, put more effort in gathering additional information, and feel greater need to ask critical questions related to the managements' propositions.

The analysis of the factors impacting the dynamics of the supervisory board meetings, gives slithly different insights. Whether the supervisory board meetings are going to be dominated by the char is largely determined by the organizations' size and the decision type.

Table 4: Factors affecting supervisory board members strategic involvement

Theme 1: Personal participation

Organizations' size	According to the analysis it can be noted that organizations size is related to supervisory board conformity to present different viewpoint and opinions on boards' discussions. The supervisory board members in larger organizations feel more confidence to present different perspectives and to resonate differently than management. Furthermore, the members of the supervisory boards of larger organizations stress the need for gathering additional information (outside the organization) as part of their participation in the strategic process and the need to ask critical question.
Supervisory board members tenure	When supervisory board members work together more than 4 years and have a widespread network outside the organization, are more comfortable in expressing different opinions regarding the strategic decisions, even when they significantly differ from the managements' or colleagues' positions.
Decision type	The type of decision that organizations make also impacts the level of involvement of supervisory board members. If the organization is focused on making a developmental strategic decision the supervisory board members are more engaged in assessing additional information through their personal network, as well as in asking critical questions for verifying and deepening their understanding of the information presented by the management board members and the other members of the top management team.

Theme 2: Individuals' domination

Supervisory board members tenure and the time spent working together	The insights of the responses do not indicate that the tenure of the supervisory board members and the time spent working together influence or enables domination of the organizations' strategic process by an individual.
Organizations' size	The members of the supervisory board in larger organizations may indicate that some of the boards' discussions related to strategic decision-making are dominated the boards' chair. However, the members of supervisory board in smaller organizations may indicate that all members actively participate in the discussions related to strategic decisions.
Decision type	If the organization is preparing developmental strategic decision the ability for domination of the strategic process is limited, since some members of the supervisory board possess specific and rare knowledge or information that can reveal new perspectives regarding the context in which the decision is made. In this situation, besides the char, other members of the supervisory board, as well the general director (manager) get more involved and engaged.

(Source: Authors' construction)

The propositions regarding supervisory board members strategic involvement include:

Proposition 1: The supervisory board members personal participation and engagement in the strategic process is determined by organizations' size, in terms that the members of supervisory boards in larger organizations tend to be more engaged in gathering additional information for supporting the decision-making process and are more comfortable in presenting different opinions and perspectives.

Propositio 2: The supervisory board members individual participation in making strategic decision is impacted by their tenure and time spent as member of the supervisory board (the time spent working together with other members of the same board) and their social capital. When supervisory board members have been part of the same board for a longer period and when they have significant social capital, feel more confident in expressing their perspectives.

Proposition 3: In circumstances in which the organizations make developmental strategic decisions, the supervisory board members feel more responsible for achiving higher level of participation in the process through gathering additional relevant information (widening the scope of information provided by the management) and through critical thinking and asking questions.

Proposition 4: The ability for indivudual domination of the strategic decision making process is under influence of the type of decision should be made. Namely, in situations in which developmental strategic decisions should be made the individuals with greatest expertise in the area may (sometimes unintentionally) dominate the process.

Regarding the themes on which supervisory board members have spent most of the time in the past 3 years, it can be noted that the evaluation of the organizational performance has a prominent role. The second-ranked topics are the evaluation of the general managers' (CEOs') performances and strategic planning. These responses indicate that supervisory board members have dedicated more time to assessing organizational performance than on strategic planning. For comparison, the management board members reports that spent nearly equally time on evaluating organizational performance and strategic planning. These responses correspond with

the supervisory boards' members of strategic involvement. Namely they emphasize the need for evaluating strategy and initiating strategic changes when appropriate. Consequently, they spent more time assessing organizational performance, through which they assessed the relevance of the adopted strategies.

The analysis of the issues supervisory board members rate as most important for the board in which they are appointed include: strategy formulation, assessment of the opportunities for new investments and strategy evaluation, as well as issues related to corporate governance. These responses indicated that supervisory board members find a relation between strategy formulation and assessing new investment opportunities and agree that both phases of the strategic decision-making process (formulation and evaluation) are equally important.

The following figure represents the model of the management and supervisory board involvement in strategy in organizations implementing two-tier board system, which comprises the determinants of strategic involvement, as well as, the understanding of management board strategic involvement, on the one side, and supervisory board strategic involvement, on the other side. Therefore, Figure 2 represents a model of boards strategic involvement in companies with two-tier board system.

Figure 2. Boards involvement in strategy in organizations with two-tier board system
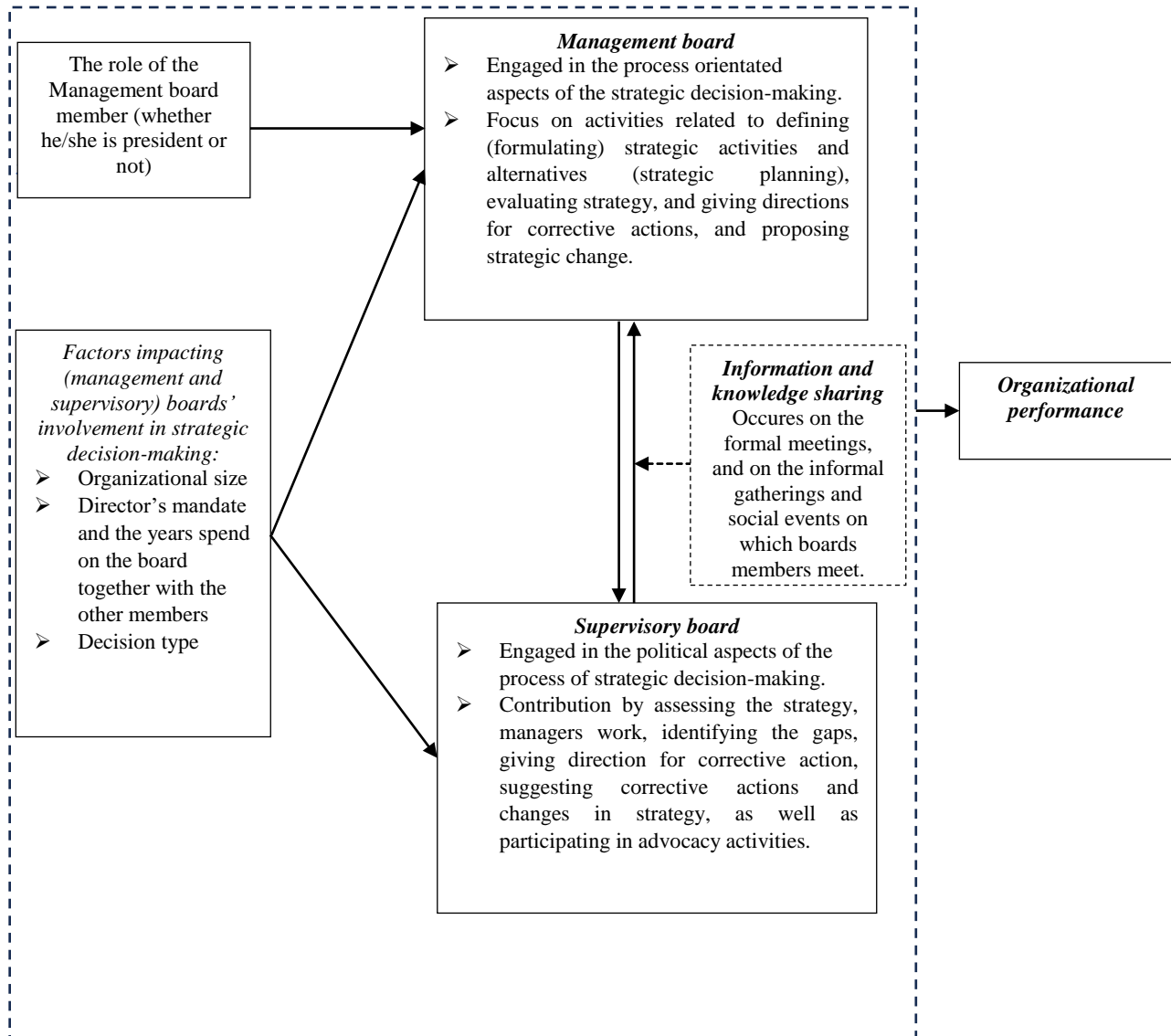
Source: authors' construction

4.2. Results from the quantitative analysis

Considering the findings from the quantitative case study analyses, we have developed a hypothesis for testing the relations presented in the models in Figure 1. and Figure 2. Namly, to test the relations presented in both models a questionnaire was distributed and a statistical analysis of the directors' responses was performed. First, we performed a bivariate analysis to identify the existence of statistically significant relation between several variables and constructed included, and afterwards we performed a multiple regression.

The main hypothesis related to factors influencing boards' strategic involvement include:

H_1: Directors' knowledge regarding the organization and industry has positive and statistically significant impact on boards' strategic involvement.

H_2: Directors individual participation in boards' discussions has positive and statistically significant influence on bords' strategic involvement.

H_3: The engagement of all boards member during boards meetings has positive and statistically significant influence on boards' strategic involvement.

H_4: The focus on developmental strategic decisions has a positive and statistically significant impact on boards' strategic involvement.

H_5: The number of topics on which board members have spent most of their time in the past 3 years has a positive and statistically significant impact on boards' strategic involvement.

H_6: Boards' strategic involvement is more likely to be increased when organizations face problems in organizational performance.

Part of the variables included in the model are constructs that include several items. On the variables that were measured with several items (the constructs) a reliability analysis was performed. After the reliability test has shown statistically acceptable values, they were included in the bivariate analysis and in the regression model. The variables that represent a construct and their reliability level (measured by Cronbach's alpha) are presented in the table below (Table 5).

Table 5: Constructs and reliability levels

Construct	Reliability levels (Cronbach's alpha)
Boards' strategic involvement (10 items)	0.798
Directors' knowledge (self-assessment with 5 items)	0.729
Individual participation in discussions (self-assessment with 3 items)	0.882
All members participation in discussion (assessment with 3 items)	0.782
Decision focus (boards involvement in making developmental decisions – 10 items)	0.718

(Source: Authors' analysis)

The results of the bivariate correlation analysis are presented in the table below (Table 6).

Table 6: Results from correlation statistical tests

	Statistical Tests	BSI	WT	DK	IPD	BMPD	DF	EN	DT	ROA	NT
							Correlations				
BSI	Pearson correlation	1									
	Sperman's rho	1,000									
	Kendall's Tau	1,000									
WT	Pearson correlation	-,189)	1								
	Sperman's rho	-,138)	1,000								
	Kendall's Tau	-,117)	1,000								
DK	Pearson correlation	,394[*]	-,220)	1							
	Sperman's rho	,389[*]	-,230)	1,000							
	Kendall's Tau	,299[*]	-,199)	1,000							

IPD	Pearson correlation	,471**	,116	-,065)	1						
	Sperman's rho	,468**	,040	,103	1,000						
	Kendall's Tau	,344**	,035	,065	1,000						
BMPD	Pearson correlation	,611**	-,139)	,406*	,199	1					
	Sperman's rho	,661**	-,194)	,465**	,418*	1,000					
	Kendall's Tau	,517**	-,174)	,368**	,347*	1,000					
DF	Pearson correlation	,100	,031	,250	-,029)	,091	1				
	Sperman's rho	,433**	,141	,365*	,171	,420*	1,000				
	Kendall's Tau	,360**	,119	,286*	,130	,318*	1,000				
EN	Pearson correlation	,130	-,151)	,189	,221	,332	,326	1			
	Sperman's rho	,192	-,468)**	,134	,213	,265	,266	1,000			
	Kendall's Tau	,119	-,404)**	,099	,170	,189	,202	1,000			
DT	Pearson correlation	-,157)	-,160)	-,232)	,147	-,009)	-,039)	-,238)	1		
	Sperman's rho	-,164)	-,160)	-,225)	,105	-,100)	-,123)	-,208)	1,000		
	Kendall's Tau	-,139)	-,160)	-,194)	,092	-,090)	-,105)	-,179)	1,000		
ROA	Pearson correlation	-,551)**	,092	-,069)	-,267)	-,454)**	,320	,451**	-,396*	1	
	Sperman's rho	-,479)**	,006	-,068)	-,322)	-,385)*	,075	,423*	-,397)*	1,000	
	Kendall's Tau	-,393)**	,006	-,061)	-,259)	-,322)*	,059	,317*	-,366)*	1,000	
NT	Pearson correlation	,367*	,166	,254	,367*	,246	,448**	,568**	-,194)	,242	1
	Sperman's rho	,345**	,097	,169	,320*	,223	,417**	,293*	-,117)	,116	1,000
	Kendall's Tau	,447**	,107	,230	,416*	,321	,529**	,313	-,130)	,130	1,000
*. Correlation is significant at the 0.05 level (2-tailed).											
**. Correlation is significant at the 0.01 level (2-tailed).											

(Source: Authors' analysis)

Explanation of the abbreviations:

BSI – board strategic involvement	EN – organizations' employee number
WT - time that board members have spent working together	DT – type of director (executive/non-executive)
DK – directors' knowledge, self-assessment on a five-point scale	ROA – identified 5 categories and each organization was put in one of the identified categories
IPD – individual directors' participation in discussions	NT – number of topics on which the board has spent most of the time in the past 3 years
BMPD – all board members participation in discussions	
DF – level of directors' participation in developmental decisions	

In order to assess the existing associations between the variables included in both models constructed on the case study analysis, we have run a bivariate analysis in which we include 10 (ten) variables. Besides the five constructs related to boards work and dynamics (boards' strategic involvement, directors' knowledge, individual participation in discussions, all members participation in discussions, and decision focus), we have add the following variables: the companies' number of employees, the boards members familiarity (do they work together more than 4 years and were they appointed by CEO/general manager proposal), directors' role (dichotomous variable measuring whether the board member is executive or non-executive director), ROA as a performance measure (in our analysis we have classified the performance measures in 5 categories) and the number of topics on which the board members has spent most of their time in the past 3 years. Besides the calculation of the Pearsons correlation (presented in Table 6), we have also calculated the Kendall's Tau correlation coefficients that are recommended in cases where the data set is small (Akogly, 2018).

The analysis of the parametric and non-parametric coefficients of correlations has shown that there is strong positive and statistically significant relation between BSI and all members participation in boards' meeting discussions (Pearson correlation is 0.611, $p<0.01$), directors' individual participation in boards' meetings discussions (Pearson correlation is 0.471, $p<0.01$), with directors knowledge (Pearson correlation is 0.394, $p<0.05$), and with the number of topics on which the board have spent most of the time in the past 3 years (Pearson correlation is 0.367, $p<0.05$). As for the construct decision focus, we have determined that there is a good and positive statistically significant relation with BSI but analyzed with the non-parametric coefficients (Sperman's rho 0.433, and Kendall's Tau 0.360, $p<0.01$). Additionally, we have identified strong and negative statistically significant relation between organizations' performances and BSI (Pearson correlation is -0.551, $p<0.01$).

The correlation analysis presents coefficients that determine whether there is any association, or relation between two variables and the direction of that relation (all coefficients can be ranked between -1 and +1, 0 meaning that there is no relation/association). However, these coefficients do not investigate whether there is a causality between the variables, or whether the variances in one variable can be analyzed as a predictor of another variable. Therefore, to test the hypothesis related to the determinants of boards' strategic involvement we have conducted additional analysis, a multiple regression analysis.

In the following section we are going to present the results from the multiple regression analysis. Considering that the sample is small we have limited the number of independent variables included in the regression model, following the recommendations for using regression analysis when the 5-1 subject-to-predictor ratio is complied (Green, 1991). Therefore, we have constructed four models and tested which of the independent variables are statistically significant predictors of the variances in the dependent variable, which is boards' strategic involvement. The results from the regression models are presented in Table 7.

The analysis of the four models presented Table 7 shows that the multivariate statistics, or the regression models have confirmed some of findings of the previous analysis. Namely, all four models indicate that all boards members' participation in discussions is one of the statistically most significant predictors of boards' strategic involvement. Additionally, directors' assessment of their own participation in the discussions and their knowledge regarding the organization's operations, weaknesses and strengths, as well as the threats from new entries has statistically significant and positive relation with boards strategic involvement. The coefficients in Model 2 and Model 3 did not support the hypothesis that when organizations are focused on developmental decision making boards get more involved in strategic decision making and the hypothesis that the number of topics on which boards spent time discussing

in the past 3 years can predict their level of strategic involvement. In the last model the coefficients show that besides the statistically significant relations between individual and group participation in discussions and directors' knowledge with boards' strategic involvement, there is a statistically significant and negative relation between organizational performances (measured by ROA) and boards' strategic involvement.

Table 7: Results from multiple regression models

	Model 1	Model 2	Model 3	Model 4
	Stan. Beta	*Stan. Beta*	*Stan. Beta*	*Stan. Beta*
Individual Directors' Participation in Discussion	0.401***	0.401***	0.377**	0.350***
All board members participation in Discussion	0.432***	0.432***	0.427***	0.289**
Directors' Knowledge	0.245*	0.242*	0.229	0.278**
Decision Focus		0.011		
Number of topics (in the past 3Y)			0.065	
ROA				-0.307)**
R^2	0.549	0.549	0.553	0.620
Adjusted R^2	0.506	0.489	0.493	0.569
F	12.592[a]	9.144[a]	9.262[a]	12,233[a]
Notes: *p<0.10, **p<0.05, ***p<0.01, [a]p<0.001				

(Source: Authors' analysis)

This finding imply that when organizations face negative trends in organizational performance, it is more likely that the level of boards strategic involvement is going to increase. These findings support Hypothesis 6. The first model explains 50.6% of the variances in the dependent variable, the second model explains 48.9%, while the third and fourth 49.3% and 56.9%, respectively. These results show that the last model, in which a measure of the organizational performance is included has the strongest explanatory power. Regarding the multicollinearity between the variables in the presented models we can report that in Model 1, Model 2 and Model 3, the Tolerance level of all variables was above 0.75, while in Model 4 only the Tolerance level of ROA was below 0.75 (it was 0.639). In general, it is considered that VIF and Tolerance as measures of collinearity in multiple regression should not be above 10 and below 0.1, respectively (Milles, 2014; Kumari, 2008, Robinson and Schumacker, 2009). If the VIF exceeds 10, then there is a harmful collinearity between the independent variable according to Mason and Perreault (1991), although the newer publications argue that VIF above 5 is also problematic. In the presented models the highest value for VIF was 1.564. Therefore, we can conclude that between the independent variables in the presented models there is no harmful level of correlation. The levels of Tolerance of the independent variables included in each of the regression models are presented in Table 8.

The models presented in Table 7 have shown that individuals directors' participation in discussions and all board members willingness to prepare and participate in discussions related to strategic decisions making are the strongest predictors of the boards' strategic involvement, together with the directors' individual knowledge. The findings can be used for further research on boards' strategic involvement and its determinants. Some of the hypotheses should be tested on a larger sample.

Table 8: Tolerance levels as a measure of multicollinearity

	Model 1	Model 2	Model 3	Model 4
	Tolerance	*Tolerance*	*Tolerance*	*Tolerance*
Individual Director Participation in Discussion	0.935	0.935	0.805	0.904
All BM participation in Discussion	0.784	0.784	0.780	0.639
Directors' Knowledge	0.813	0.770	0.764	0.803
Decision Focus		0.937		
Number of topics (in the past 3Y)			0.784	
ROA				0.751

(Source: Authors' analysis)

5. DISCUSSION

The findings in this study give an insight into boards work in small and transitional economy. The qualitative analyses of 12 case studies have provided evidence for defining boards strategic involvement in companies with one-tier and in companies with two-tier board systems, separately. According to the qualitative analysis the members of boards of directors define their strategic involvement as engagement in all decisions related to organizations' strategy and active contribution in developing alternatives and solutions. On the other hand, the management board members in companies with two-tier board system define its strategic involvement as contribution in the process-oriented aspects of strategy , emphasizing the focus on activities related to defining (formulating) strategic activities and alternatives (strategic planning), evaluating strategy, and giving directions for corrective actions, and proposing strategic change. The supervisory board members define their strategic involvement more as engagement in the political aspects of strategic decision-making and their contribution is reflected in the activies for assessing strategy, managers work, identifying the gaps, giving direction for corrective action, suggesting corrective actions and changes in strategy, as well as participating in advocacy activities. The analysis of the case studies has also enabled us to create model on boards' strategic involvement in organizations with one-tier board system, as well as a separate model on boards' strategic involvement in organizations with two-tier board system.

Although several previous studies have researched the effectiveness of boards in organizations with two-tier board system (Bezemer, 2014) and some authors analyzed the supervisory boards' role in the strategic process (Kolatkiewick et al. 2017; Cindric, 2021), none of them offer a comprehensive model of the role of both boards (management and supervisory board) in strategy. Therefore, it is notable that as result of our analysis we have constructed a model that incorporates most of the aspects of both boards (management and supervisory board) strategic involvement. The model on boards' strategic involvement in organizations implementing two-tier board system is a comprehensive framework that increases clarity of the work of both boards and can be used for future research on this topic.

Regarding the predictors of boards' strategic involvement in the, the results from the statistical analysis have supported four of the developed hypotheses. The multiple regression analysis results have indicated that all board members engagement in boards discussions, the assessment of the individual director's participation in the discussions and directors' knowledge about the organization, together with the organizational performances are the strongest predictors of boards' strategic involvement. The regression model that incorporates these four independent variables has highest explanatory power (59.9%). The results did not

support the hypothesis that decision focus (whether organizations are focused on developmental strategic decisions) is positive and statistically significantly related to boards' strategic involvement.

Regarding the previous research on determinants of board' strategic involvement we can conclude that our finding are similar and partially or fully in line in with the results presented by Zahra and Pearce (1990), Carpenter and Westphal (2001), Golden and Zajac (2001), Stiles (2001), Hyness and Hillman (2010), Hendry et al. (2010), Nielsen and Huse (2010), Oehmichen et al. (2017), Barroso-Castro et al. (2017), Lungeanu and Zajac (2018), Schonning et al. (2019). When we analyze the previous research on the relationship between directors' knowledge and boards' strategic involvement, we review the also the articles that incorporate at least one dimension indicating directors' knowledge, such as education leavel, experience or expertise. Some of the findings in those studies are presented in the following paragraphs. Similar findings has been presented by Zahra and Pearce (1990), indicating that directors expertise and role criticality are statistically significantly related to boards' strategic involvement. Carpenter and Westphal (2001) have investigated how several characteristics of boards' members, such as education level, management experience and functional background are related to directors' contribution to strategy. Their results indicate that directors' educational level (which can be analyzed as a measure of their knowledge) is statistically significantly related to directors contribution in strategic decision making. Golden and Zajac (2001) have provided evidence that boards' members occupational heterogeneity that is associated with their experience and expertise, is positive related to strategic change, but also with greater conflict and disagreement. Golden and Zajac (2001) finding also indicate that boards' process together with boards' power and the attention directors give to strategic issues influences boards' ability to impact strategy. Hayness and Hillman (2010) researching the relation between board capital and strategic change have found that board capital breath (which includes board members have different occupational experiences, in different industries and/or are connected with other industries by interlocking) is related to greater strategic variability (strategic change). Furthermore, Hayness and Hillman (2010) also indicate board capital depth (when boards members have experience and interlocking ties only in one industry) is related to less strategic change. Nielsen and Huse (2010) findings indicate that women directors' different values are positively associated with their contribution to strategic decision-making, while women's directors different professional experience is negatively associated with women's ability to influence board work. They also found evidence that show that women directors' contribution to boards' decision-making was positively related to boards' strategic involvement. Oehmichen et al. (2017) have presented results that confirm the existence of positive and statistically significant relationship between boards' industry expertise and strategic change. Furthermore, Barroso-Castro et al. (2017) argue that directors' knowledge and boards collaboration are significant for boards' strategic involvement. Lungeaunu and Zajac (2018) provide evidence that directors with deep/broad expertise are more likely to influence strategy and initiate strategic change. Schonning et al. (2019) in their research on the effects of directors' learning on boards' strategic involvement also provide evidence that there is a positive and statistically significant relation between directors' knowledge and boards' strategic involvement.

Regarding the previous research on the relation between directors' individual participation in boards' discussion and their assessment of the all board members participation in boards' discussions we can conclude that our findings are find support in the research of Stiles (2001), Hendry et al. (2010) and Barroso-Castro et al. (2017). Stiles (2001) also provides evidence that the opinions directors express at board meetings and in informal discussions are important and can predict the level of boards' strategic involvement. Hendry et al. (2010)

finding indicate that boards' mechanism for influencing strategy include face-to-face, formal, and informal social exchange which supports the incorporation of individual directors' participation in the discission related to strategic issues as a variable in our model. Although, Minichilli et al. (2009) investigating boards' task performance have presented findings which imply that boards' critical debate is statistically significantly related to boards' effectiveness in advisory and networking but could not provide evidence for its relationship with boards' strategic participation. However, Minichilli et al. (2009) elaborated that critical debate is a key variable that defines boards' decision-making culture and strategic participation, and through that stimulate other research to focus on this issue.

6. CONCLUSION

The results presented in the study enabled achievement of the papers' goal and provided answers to the three research questions defined in the introduction.

Namely, the results from the qualitative analysis showed the members of board of directors understand boards' strategic involvement as active engagement in all decisions related to organizations' strategy and active contribution in developing alternatives and solutions. On the other hand, the members of the management board suggest that management boards' involvement in strategic decision making includes the activities related to the iniciation of strategic suggestions/alternatives, which are discussed and evaluated on boards meetings. Furthermore, the supervisory board members responses indicate that their strategic involvement is related to the political site of the process and that they contribute by assessing the strategy, managers work, identifying the gaps, giving direction for corrective action, suggesting corrective actions and changes in strategy, as well as participating in advocacy activities. In organizations that implement two-tier board system the opportunity for exchanging knowledge and information between the members of the management and supervisory board (whether formal and informal) is crucial, since the members of each board have the capacity to influence the strategic process in a different way.

Furthermore, findings from the quantitative analysis have shown that individual directors' participation in discussion, all board members participation in discussion, directors' knowledge and previous organizational performance are statistically significant predictors of the boards' strategic involvement. Those findings are partially or fully in line with the findings presented by Zahra and Pearce (1990), Carpenter and Westphal (2001), Golden and Zajac (2001), Stiles (2001), Hyness and Hillman (2010), Hendry et al. (2010), Nielsen and Huse (2010), Oehmichen et al. (2017), Barroso-Castro et al. (2017), Lungeaunu and Zajac (2018), Schoning et al. (2019).

The main contribution of this study is the development of the two separate models of boards' strategic involvement in companies with one-tier and two-tier board system. According to our knowledge a comprehensive framework on both boards (management and supervisory board) strategic involvement has not been previously developed. Furthermore, we introduce the construct on decision focus (based on the work of Nutt, 2006), and argue that organizations' focus on developmental strategic decisions can be significant predictor of boards' strategic involvement (although this hypothesis was not supported with the quantitative analysis). And finally, we provided some insights on how members of different boars (board of directors, management boards and supervisory board) understand their role in strategy and their boards strategic involvement. Furthermore, the quantitative analyses confirmed that the adverse trend in organizational performance is statistically significantly related to boards' strategic involvement.

In general, our findings reflect the experience and tacit knowledge of board members of organizations that have been through dramatic transformations in the part 30 years.

Furthermore, these organizations have been founded in period in which our country has had different governing system and we may conclude that all of the changes in the governing system have been indirectly incorporate in their history. Therefore, the functioning of the boards and management structures in organizations develop in such a specific environment may differ in comparison with boards and management teams functioning in other, European countries or USA.

7. LIMITATIONS

The sample size can be considered as one of the most important limitations of this study. However, the case studies method is not about a specific number of cases and sometimes even one case study can work well (Eisenhardt, 2021). Regarding the quantitative analysis that has been conducted on a sample of 35 respondents, the common rules for employing multiple regression analyses has been complied. Considering that we have followed the rule of thumb regarding the minimum number of units per independent variable proposed by Tabachink and Fidell (1989) which is 5-to-1, it can be concluded that our findings are relevant. However, the models tested on larger samples usually have higher explanatory power and therefore testing the proposed hypothesis on a larger sample in future research is welcoming. Additionally, some of the recent research on sample size when using regression as a data analysis method, have indicated that for some types of regression the minimum of 2 subject per variable is adequate (Austin and Steyerberg, 2015). Furthermore, Jenkins and Quantana-Ascencio (2020), recommend that research based on regression should use $N \geq 25$. . Furthermore, additional work on the construct regarding decision focus and its relationship with boards' strategic involvement should be embraced. Additionally, developing and testing hypothesis about boards' strategic involvement consequences is going to contribute to better understanding its relationship with subsequent organizational performance.

REFERENCES

Åberg, C., Torchia, M. (2019), "Do boards of directors foster strategic change? A dynamic managerial capabilities perspective", *Journal of Management and Governance*, Vol. 24, pp.655-684. https://doi.org/10.1007/s10997-019-09462-4

Akogly, H. (2018), "User's guide to correlation coefficients", *Turkish Journal of Emergency Medicine*, Vol. 18, pp. 91-93.

Amorelli, M. F., García-Sánchez, I. M. (2020), "Trends in the dynamic evolution of board gender diversity and corporate social responsibility", *Corporate Social Responsibility and Environmental Management*, Vol. 28, No. 2, pp. 537-554.

Amorelli, M. F., García-Sánchez, I. M. (2023), "Leadership in heels: Women on boards and sustainability in times of COVID-19", *Corporate Social Responsibility and Environmental Management*, Vol. 30, No. 4, pp. 1987-2010. https://doi.org/10.1002/csr.2469

Austin, P. C., Steyerberg, E. W. (2015), "The number of subject per variable required in linear regression analysis", *Journal of Clinical Epidemiology*, Vol. 68, pp.628-636.

Barroso-Castro, C., Villegas-Perinan, M., Dominguez, M. (2017), „Board members' contribution to strategy: The mediating role of board internal processes", *European Research on Management and Business Economics*, Vol. 23, No. 2, pp. 82–89.

Berns, K.V.D., Klarner, P. (2017), „A Review of the CEO Succession Literature and a Future Research Program ", *Academy of Management Perspectives*, Vol. 31, No.2, pp. 1-68.

Bezemer, Pieter-Jan, Peij, Stefan, De Kruijs, Laura, Maassen, Gregory (2014), „How two-tier boards can be more effective", *Corporate Governance* (Bingley), Vol. 14, No.1, pp. 15-31.

Block, D., Gerstner, A. M. (2016), „One-Tier vs. Two-Tier Board Structure: A Comparison Between the United States and Germany", *Comparative Corporate Governance and Financial*

Regulation, available at:
https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=1001&context=fisch_2016
(accessed 14th January 2020).

Campopiano, G., Calabrò, A., Basco, R. (2020), "The "Most Wanted": The Role of Family Strategic Resources and Family Involvement in CEO Succession Intention" *Family Business Review*, Vol. 33, No.3, pp. 1-26. https://doi.org/10.1177/0894486520927289

Carpenter, M. A., Westphal, J. D. (2001), „The strategic context of external network ties: Examining the impact of director appointments on board involvement in strategic decision making", *Academy of Management Journal*, Vol. 4, No.4, pp.639-660.

Cheffins, B. R. (2015), „Corporate Governance Since the Managerial Capitalism Era", *Business History Review*, 89 (4), 717-744.

Chen, J. M., Liu, H.H., Yang, Y. K., Chen, W. H. (2016), „ CEO succession in family firms: Stewardship perspective in the pre-succession context ", *Journal of Business Research*, Vol. 69, No.11, pp. 5111-5116.

Cindric, L. (2021), "Supervisory board's contribution to corporate strategy: Evidence from Croatian companies", *Studies in Business and Economics*, Vol. 16 No.1, pp.42-50.

Connelly, B. L., Shi, W., Walker, H. J, Hersel, M. C. (2020), Searching for a Sign: CEO Successor Selection in the Wake of Corporate Misconduct, *Journal of Management*, (Accepted/In press), available at: https://doi.org/10.1177/0149206320924119 (accessed on 2th February2022).

Cragun, O. R. (2018), Antecedents To The Selection Of CEOs With Higher Levels Of Narcissism And How CEOs With Higher Levels Of Narcissism Affect The CEO Succession Process, (Doctoral dissertation), available at: https://scholarcommons.sc.edu/etd/4637 (accessed 2th February 2022).

Cragun, O. R., Nyberg, A. J., & Wright, P. M. (2016), "CEO succession: What we know and where to go", Journal *of Organizational Effectiveness: People and Performance*, Vol. 3, No.3, pp. 222–264.

Dalton, D. R., Kesner, I. F. (1985), „Organizational Performance as an Antecedent of Inside/Outside Chief Executive Officer Succession: An Empirical Assessment ", *The Academy of Management Journal*, Vol. 28, No. 4, pp. 749-762.

Datta, D. K., Guthrie, J. P. (1994), „Executive Succession: Organizational Antecedents of CEO Characteristics ", *Strategic Management Journal*, Vol. 15, No. 7, pp. 569-577.

Drew, S. A., Kaye, R. (2007), „Engaging Boards in Corporate Direction-Setting ", *European Management Journal*, Vol. 25, No.5, pp.359-369.

Eisenhardt, K. M. (2021), "What is the Eisenhardt Method, really?", *Strategic Organization*, Vol. 19 No.1, pp.147-160.

Forbes, D. P., Milliken, F. J. (1999), „Cognition and Corporate Governance: Understanding Boards of Directors as Strategic Decision-Making Groups ", *The Academy of Management Review*, Vol. 24, No. 3, pp. 489-505.

Fredrickson, J. W., Hambrick, D. C., Baumrin, S. (1988), „A Model of CEO Dismissal ", *Academy of Management Journal*, Vol. 13, No.2, pp. 255-270.

Gelther, M., Siems, M. (2021), "Letting companies choose between board models: an empirical analysis of country variations", *Legal Scholarship Repository*, pp. 139-186.

Ghaya, H. (2011), „Board of Directors' Involvement in Strategic Decision Making Process: Definition and Literature Review ", Working Papers of BETA 2011-22, Bureau d'Economie Théorique et Appliquée, UDS, Strasbourg, available at: https://ideas.repec.org/p/ulp/sbbeta/2011-22.html (accessed 9th May 2021).

Golden, B. R., Zajac, E. J. (2001), „When will boards influence strategy? Inclination x Power = Strategic Change", *Strategic Management Journal*, Vol. 22, No. 12, pp. 1087-1111.

Graue, C. (2015), "Qualitative Data Analysis", *International Journal of Sales, Retail and Marketing*, Vol. 4, No.9., pp. 5-15.

Green, S. B. (1991), "How Many Subjects Does It Take To Do A Regression Analysis", *Multivariate Behavioral Research*, Vol. 26 No. 3, pp. 499-510, DOI: 10.1207/s15327906mbr2603_7

Guthrie, G. P., Datta, D. K. (1997), "Contextual influences on executive selection: firm characteristics and CEO experience", *Journal of Management Studies*, Vol.34 No.4, pp. 537-560.

Guthrie, J. P., Datta, D. K. (1997), „ contextual influences on executive selection: firm characteristics and CEO experience", *Journal of Management Studies*, Vol.34, No. 4, pp. 537-560.

Hendry, K. P., Kiel, G. C., Nicholson, G. (2010), „How boards strategize: a strategy as practice view", *Long Range Planning*, Vol. 43, No. 1, pp. 33-56

Hill, S. (1995), "The Social Organization of Boards of Directors", *The British Journal of Sociology*, Vol. 46., No.2, pp. 245-278.

https://doi.org/10.1002/csr.2079

Hynes, K. T., Hillman, A. J. (2010), „The effects of board capital and CEO power on strategic change", *Strategic Management Journal*, Vol. 31, No. 11, pp. 1145-1163

Jenkins, D. G., Quantana- Ascensio (2020), "A solution to minimum sample size for regressions", *PLoS ONE*, Vol. 15, No. 2, e0229345.https://doi.org/10.1371/journal.pone.0229345

Judge, W. Q., Zeithaml, C. P. (1992), „Institutional and strategic choice perspectives on board involvement in strategic decision process", *The Academy of Management Journal*, Vol. 35, No.4., pp. 766-794.

Jung, H., Lee, Y. G. & Park, S. H. (2023), "Just Diverse Among Themselves: How Does Negative Performance Feedback Affect Boards' Expertise vs. Ascriptive Diversity?", *Organization Science* Vol. 34, No.2, pp. 657-679. https://doi.org/10.1287/orsc.2022.1595

Kanadli, S. B., Alawadi, A., Kakabadse, N., Zhang, P. (2022), "Do independent boards pay attention to corporate sustainability? Gender diversity can make a difference" *Corporate Governance*, Vol. 22, No.7, pp. 1390-1404. https://doi.org/10.1108/CG-09-2021-0352

Kesner, I. D., Dalton, D. R. (1994), "Top management turnover and CEO succession: an investigation of the effects of turnover on performance", *Journal of Management Studies*, Vol. 31 No.5, pp. 701-713.

Klarner, P., Yoshikawa, T., Hiit, M. (2021), "A capability based view of boards: A new conceptual framework for board governance" *Academy of Management Perspectives*, Vol. 35, No. 1, pp. 123-141. https://doi.org/10.5465/amp.2017.0030

Kołankiewicz, I., Kuczara, M., Zdziarsk, M. (2017), "Practices of strategy committees of supervisory boards", *International Journal of Contemporary Management*, Vol. 16 No. 4, pp.109-118.

Kumari, S. S. (2008), "Multicollinearity: Estimation and Elimination", *Journal of Contemporary Research in Management*, pp.87-95

LeCounte, J. F., Prieto, L. C., Phipps, S. T. A. (2017), „CEO Succession Planning and Organizational Performance: A Human Capital Theory Approach", *Journal of Leadership, Accountability and Ethics*, Vol. 14, No. 1, pp. 46-57.

Levi, M., Li, K., Zang, F. (2014), "Director gender and mergers and acquisitions", *Journal of Corporate Finance*, Vol. 28 No.1, pp. 185-220.

Lou, B. (2021), *Thinking about Strategic Thinking: Putting Top Management Teams' Strategic Decision-Making Processes into a Double-Layered Contextual Model,* available at: https://eprints.lancs.ac.uk/id/eprint/158475/1/2021BowenLouPhD.pdf (accessed 15th August 2023).

Luciano, M.M., Nahrgang, J. D., Shropshire, C. (2020). "Strategic leadership systems: viewing top management teams and boards of directors from a multiteam systems perspective*", Academy of Management Review*, Vol. 45, No. 3, pp. 1-62. https://doi.org/10.5465/amr.2017.0485

Lungeanu, R., Zajac, E. J. (2018), "Thinking Broad and Deep : Why Some Directors Exert an Outsized Influence on Strategic Change". [S.l.] doi:10.2139/ssrn.3243557

Mason, C. H., Perreault, W. D. (1991), "Collinearity, Power, and Interpretation of Multiple Regression Analysis", *Journal of Marketing Research*, Vol. 28, pp.268-280.

McDonald, M.L., Westphal, J. D., Graebner, M. E. (2008), "What Do They Know? The Effects of outside Director Acquisition Experience on Firm Acquisition Performance", *Strategic Management Journal,* Vol. 29, No. 11, pp. 1155-1177.

McNulty, T., Pettigrew, A. (1999), „Strategist on the board", *Organization Studies*, Vol. 20, No. 1, pp. 47-74.

Milles, J. (2014), "Tolerance and Variance Inflation Factor", *Encyclopedia of Statistics in Behavioral Science.*

Minichilli, A., Zattoni, A., Zona, F. (2009), "Making Boards Effective: An Empirical Examination of Board Task Performance*, British Journal of Management,* Vol. 20, No.1, pp.55-74.

Nahum, N., Carmeli, C. (2019), "Leadership style in a board of directors: implications of involvement in the strategic decision-making process", *Journal of Management and Governance*, Vol. 24, pp. 199-227. https://link.springer.com/article/10.1007/s10997-019-09455-3

Nielsen, S., Huse, M. (2010), „Women directors' contribution to board decision making and strategic involvement: the role of equality perception", *European Management Review*, Vol. 7, No. 1, pp.16-29.

Nutt, P. C. (2006), „Strategic Decision-Making", in Hitt, M. A., Freeman, R. E., Harrison, J. S. (ed), *The Blackwell Handbook of Strategic Management*, Blackwell Publishers Ltd.

Ocasio, W. (1999), „Institutionalized Action and Corporate Governance: The Reliance on Rules of CEO Succession", *Administrative Science Quarterly*, Vol. 44, No. 2, pp. 384-416.

Oehmichen, J., Schrapp, S., Wolff, M. (2016), „ Who needs experts most? Board industry expertise and strategic change – A contingency perspective", *Strategic Management Journal*, Vol. 38, No.3, pp.645-656.

Patton, M. (1990), *Qualitative evaluation and research methods*, Sage, Beverly Hills, California, USA. (pp.169-186)

Pugliese, A., Bezemer, P. J., Zattoni, A., Huse, M., Van den Bosch, F. A. J., Volberda, H. W. (2009), „Boards of directors' contribution to strategy: A literature review and research agenda", *Corporate Governance: An International Review*, Vol. 17, No.3, pp. 292–306.

Pye, A., Camm, G. (2003), „Non-executive Directors: Moving beyond the 'One-size-fit-all' View", *Journal of General Management*, Vol. 28, No.3, pp.52-70.

Rindova, V. P. (1999), „What corporate boards have to do with strategy: a cognitive perspective", *Journal of Management Studies*, Vol. 36, No.7, pp. 953-975.

Robinson, C., Schumacker, R. E. (2009), "Interaction Effects: Centering, Variance Inflation Factor, and Interpretation Issues", *Multiple Linear Regression Viewpoints*, Vol. 35 No.1, pp.6-11.

Rogers, W. S., ***The Sage Handbook of Qualitative Research in Psychology***, Sage, California, USA.

Schepker, D. J., Kim, Y., Patel, P. C., Thatcher, S. M.B., Campion, M.C. (2017), „CEO succession, strategic change, and post-succession performance: A meta-analysis", *Journal of Business Research*, Vol. 28, No.6, pp.701-720.

Schonning, A., Walther, A., Machold, S., Huse, M. (2019), "The Effects of Directors' Exploratory, Transformative and Exploitative Learning on Boards' Strategic Involvement: An Absorptive Capacity Perspective", *European Management Review*, Vol.16, No.3, pp.683-698.

Shen, W., Cannella, A.A. (2002), „Power Dynamics within top management and their impacts on CEO dismissal followed by inside succession", *Academy of Management*, Vol. 45, No.6, pp. 1195-1206.

Smith, J., Firth, J. (2011), "Qualitative data analysis: the framework approach", *Nurse Researcher*, Vol. 18, No. 2, pp. 52-62.

Stiles, P. (2001), „The impact of the board on strategy: An empirical examination", *Journal of Management Studies*, Vol.38, No.5, pp. 627-650.

Tabachnick, B. G., Fidell, L. S. (1989). ***Using multivariate statistics*** (2nd. ed.). Cambridge, MA: Harper & Row.

Terry, G., Hayfield, N., Clarke, V., Braun, V. (2017), "Thematic Analysis", in Willing, C.,

Wommack, W.W. (1979), „The board's most important function", *Harvard Business Review*, 57 (5). Retrieved on 1st March 2023, from https://hbr.org/1979/09/the-boards-most-important-function#:~:text=He%20outlines%20the%20processes%20leading,future%20direction%20of%20the%20corporation

Zahra, S. A., Pearce II, J. A. (1989), „Boards of directors and corporate financial performance: a review and integrative model", *Journal of Management*, Vol. 15, No. 2, pp. 291-334.

Zahra, S.A., Pearce II, J. A. (1990), „Determinants of Boards Directors' Strategic Involvement ", *European Management Journal*, Vol.8, No.2, pp. 164-173.

Zenou, E., Allemand, I., Brullebaut, B., Galia, F. (2020), "Board recruitment as a strategic answer: Do companies' strategies for innovation influence the selection of new board members?", *Strategic Change, Special Issue: Organizational Design Products*, Vol. 29, No.1, pp.127-139.

Zhang, Y. (2006), „The Presence Of A Separate Coo/President And Its Impact On Strategic Change And CEO Dismissal", *Strategic Management Journal*, Vol. 27, No. 3, pp. 283-300.

Zhang, Y., Rajagophalan, N. (2004), „When the known devil is better than an unknown God: an empirical study of the antecedents and consequences of relay CEO successions", *Academy of Management Journal*, Vol. 47, No.4, pp. 483-500.

Zhu, Q, Hu, S., Shen, W. (2020), "Why do some insider CEOs make more strategic changes than others? The impact of prior board experience on new CEO insiderness". *Strategic Management Journal*, Vol. 41, No. 10, pp. 1–19. https://doi.org/10.1002/smj.3183

ESTABLISHMENT OF EFFECTIVE MECHANISMS FOR PRIVATE ENFORCEMENT OF COMPETITION LAW IN THE REPUBLIC OF NORTH MACEDONIA – AN INEVITABLE STEP FOR THE NEAR FUTURE, OR AN ELUSVE FICTION?

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ABSTRACT
Competition law plays a crucial role in the efficient functioning of the free market economy. It aims to deter potential infringers, detect anticompetitive behavior, sanction those behaviors, and finally, compensate the affected parties of these behaviors.
Historically, competition law has been used predominately as a deterrent mechanism, and only if violations are detected, as a mechanism to sanction the wrongdoers. Compensation of victims has played a secondary role. However, in the past decade, there were many scandals such as Dieselgate, Cambridge Analytica, and Ryanair's mass cancellation of flights, which resulted in mass harm suffered by consumers. This, coupled with the lack of capacity of many national competition agencies to discover and tackle anticompetitive actions of many large companies solely on their own, imposed the idea for the strengthening of the private enforcement of competition law.
The paper aims to analyze the latest trends in the sphere of private enforcement of competition law on a global scale, primarily through an examination of the competition laws of the USA and the EU, before focusing on the current situation in the Republic of North Macedonia.

***Keywords:** antitrust law; public enforcement of competition law; private enforcement of competition law; group representation; class actions; compensation for damages.*

***JEL classification:** K20; K21; D18*

1. INTRODUCTION

In the model of a free market economy, free competition has a key role. This model can be effective only if companies and market actors act independently of each other but are subject to the pressure exerted by their competitors. Even Adam Smith, who is widely considered the father of the free market economy, admits that there are limitations to the theoretic model in practice, admitting that actors in the same markets tend to conspire in order to reduce the market pressure and increase prices (Smith, 1776).

Consequently, for free market economies to achieve their potential, a system that would enable free competition has to be established. This is accomplished firstly through the enactment of laws for the protection of competition, and secondly through the creation of mechanisms for the effective enforcement of those laws. Regardless of the necessity to create a system for the protection of competition, from a historical perspective, it has been a relatively new creation on a global scale. According to statistical data from the OECD, in 1970, only 12 jurisdictions had a competition law, and only seven had a functioning competition authority, whereas today, more

than 125 jurisdictions have a competition law regime, and the large majority has an active competition enforcement authority (OECD, 2020).

National agencies for the protection of competition have historically been the most important institutions for enforcing competition law. As governmental agencies, they are the main bodies responsible for the public enforcement of competition law. Public enforcement is considered essential for maintaining competition and protecting consumers and businesses from anticompetitive practices. However, the primary goal of public enforcement is to deter anticompetitive behavior, protect competition, and ensure a level playing field in the market. If an anticompetitive behavior is found, a fine is issued which should act as a punishment for the infringers and as a warning and deterrence for all future market participants. However, while the monetary fines should ensure a leveled playing field, a shortfall of public enforcement is that it neither considers the damage that other market participants have suffered due to these violations nor provides compensation mechanisms.

As a result of this setback, in the last decade, there has been an ongoing trend for the promotion of private enforcement of competition law. Private enforcement allows affected parties (competitors, consumers, or suppliers) to seek damages, injunctions, or other remedies through civil litigation. Private enforcement primarily seeks compensation for the victims of anticompetitive practices, but it can also serve as a deterrent mechanism, especially in legal systems where efficient mechanisms for collective redress exist.

Today, there is broad agreement that private enforcement can substantially improve the functioning of a competition regime and that individuals and firms who suffer harm from anticompetitive conduct, should be entitled to reasonable compensation (OECD, n.d.). Public and private enforcement of competition law are two different approaches for achieving complementary objectives – public enforcement agencies play a crucial role in deterring anticompetitive behavior, while private enforcement allows individual parties to seek compensation and provides an additional check on anticompetitive practices. Consequently, they should work in tandem to achieve the goals of competition law - ensuring fair competition and preventing anticompetitive behavior in the marketplace.

In this paper, the focus is on the private enforcement of competition law as a new and emerging trend. The paper examines the global trends for private enforcement focusing on the USA and the EU, before analyzing the current state of play concerning the legal framework for private enforcement of competition law in the Republic of North Macedonia. The paper concludes with recommendations for further actions necessary for the establishment of more efficient mechanisms for private enforcement of the competition law in North Macedonia.

2. GLOBAL TRENDS FOR PRIVATE ENFORCEMENT OF COMPETITION LAW

Aside from causing harm to national economies and economic development, anticompetitive actions also cause concrete damage to competitors, suppliers, and consumers. In most cases, the consumers are the most affected, since they are at the end of the supply chain, and the cost incurred from suppliers due to the anticompetitive practices are passed on to them. Depending on the products and markets in which these anticompetitive practices occur, the inflicted damage on consumers can amount to millions of dollars or euros. This is why the existence of an effective system for private enforcement of competition law is necessary.

It is important to note that all countries that have competition laws, also have some rules related to private enforcement of competition law. However, it is very important to differentiate between countries where compensation can only be claimed on individual action and countries that have

specific rules for collective redress or class action. Collective redress is important since in many cases the amount of individual damage incurred might be dwarfed by the possible legal fees for court proceedings, which has a discouraging effect on affected parties. This disbalance is even more pronounced in countries where there is no chance of recovering the legal fees in case of a successful claim.

Traditionally in continental Europe, countries focus more on individual compensation, whereas in the USA, collective redress is more prominent. Regardless, recent events have led to significant shifts in the EU prompting changes in the methods for private enforcement. Below we analyze the mechanisms for private enforcement in the USA and the EU, before examining the situation in North Macedonia.

The relevance of the analysis of the private enforcement of competition law in the EU stems from the fact that North Macedonia is aiming to become a member of the EU, and in that process, it must align its national legislation with the *EU acquis*. On the other hand, although the enforcement of competition law in the USA does not have a direct impact on the competition law of North Macedonia, its significance for the analysis stems from the fact that many characteristics of this system have slowly been adopted by the EU, and therefore it has an indirect effect on the national legislation.

2.1. Private enforcement of competition law in the USA

The USA is a true model for the successful inclusion of all relevant actors and stakeholders in the process of exercising market pressure to achieve effective functioning of the markets and free competition. The system for enforcement of competition law in the USA is very often used as a model, both by less developed countries and by economically powerful supranational organizations such as the EU.

In the US, private enforcement of competition law has been the dominant approach. This can be attributed to the fact the US has a tradition of private enforcement of competition law dating from the Clayton Antitrust Act from 1914, which strongly encouraged the private enforcement of competition law, by providing the possibility for treble damages, declaratory relief against infringers, use of decisions against infringers as *prima facie* evidence, clear and unambiguous statutes of limitations, and well as the possibility to recover legal costs (Section 4, 6 & 16, 1914). Additionally, the characteristics of the US legal system itself have fertilized the sprout of this method: pre-trial discovery, consolidation of cases and class actions, joint and severable liability of infringers, and possibility for contingency fees are just a number of concepts that stimulate private enforcement (Jones A., 2016).

As a result, private parties have had great significance in ensuring free market competition by placing pressure on the market participants. This is also supported by statistical data. According to research conducted by Jones, 90% of all antitrust cases in the US involve private rather than public action (Jones C.A., 1999). Additionally, Professors Davis and Lande conducted research analyzing more than 60 cases for damages in civil court proceedings. The analysis showed that not only through this type of proceedings the affected parties were awarded large sums as compensation (between 33.8 and 35.8 billion US dollars) but also that without their involvement, a large part of the cases of violation of the competition law would have remained undiscovered (Davis & Lande, 2003).

However, the biggest achievement of the US competition law is the possibility for collective redress for mass harm suffered through the utilization of class actions. A class action is defined as a legal proceeding in which one or more plaintiffs bring a lawsuit on behalf of a larger group,

known as the class (Investopedia.com n.d.). Any proceeds from a class action, as well as all legal costs, are shared among all members of the class, thus making them suitable even where the individual harm is low, if there is a large number of affected parties. Class actions are deeply rooted in the US legal system. Even in the federal rules for the civil procedure from 1842, there was a possibility to consolidate claims to ensure cost-effectiveness (Equity Rule 48, 1842). In 1966, significant changes were made in the federal rules of civil procedure, which established the so-called "opt-out system" With the new rule, class actions bind and cover all members of the group (regardless of whether they are present or absent and whether they are actively involved in the proceedings or not), except for those members who will explicitly decide to withdraw (Weber Waller & Popal, 2016).

2.2. Private enforcement of competition law in the EU
From a historical standpoint, within the EU public enforcement has been more important than private enforcement (Whish & Bailey, 2012). The first step toward a more decentralized approach for the enforcement of EU competition law was the adoption of the Council Regulation (EC) No 1/2003 of 16 December 2002 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty, that allowed national courts to apply rules of EU competition law. However, the necessity for strengthening the private enforcement of EU competition law continued and has been advocated for a long period by the European Commission. Firstly, in the Commission's White Paper on damages actions for breach of the EC antitrust rules from 2008, it was estimated that due to the lack of effective mechanisms, victims fail to receive compensation of up to several billion euros annually (Commission of the European Communities, 2008). Secondly, in the Commission's Impact Assessment from 2017 Accompanying the proposal for Directive for the empowering national competition agencies, it was found that due to the existence of undetected cartels, annual losses in the amount of 181-320 billion euros accrue (European Commission, 2017). However, while there is a consensus that the mechanisms for private enforcement should be strengthened, the biggest obstacle is the fact that each EU member state has its competition law, as well as the fact that the principle of national procedural autonomy in the EU makes enforcement of EU competition law dependent on the procedural, evidential, and substantive rules governing civil litigation applicable in each of the member states (Jones A., 2016).

Regardless of these obstacles, in the last decade, two important directives were adopted that are of significance for the strengthening of the private enforcement of EU competition law:
- The Directive 2014/104/EU on certain rules governing actions for damages under national law for infringements of the competition law provisions of the Member States and of the European Union Text (hereafter Damages Directive); and
- The Directive (EU) 2020/1828 on representative actions for the protection of the collective interests of consumers (hereafter Directive on Representative Actions).

It is important to note that the directives only affect EU competition law, while national competition law remains within the exclusive domain of member states.

The Damages Directive was adopted to enable private parties to effectively obtain compensation in civil proceedings. While all member states have general provisions on torts in their law on obligations, the Damages Directive aims to introduce specific rules, tailored to the needs of the victims, enabling affected parties to obtain compensation for anticompetitive practices. The main features of the Damages Directive are:

- Acceptance of the principle of full compensation to victims of anticompetitive practices - which covers actual loss suffered, loss of profit, plus the payment of interest, but excludes punitive damages or multiple types of damages that would lead to overcompensation.
- Strengthening the legal effects of the decisions of national competition authorities – decisions of national competition authorities that establish a breach of competition law have the power of irrefutable evidence in front of courts in the same jurisdiction, whereas in courts in other member states they have the power of *prima facie* evidence.
- Introduction of the concept of disclosure of evidence – this is a concept that allows the claimants to seek courts to compel defendants to disclose documents in their possession that would support the claimant's assertion. This is justified since in most cases of anticompetitive practices affected parties have no insight into documents in the possession of the infringes which are crucial for the calculation of the damages incurred.
- Introduction of a longer statute of limitation, with a minimum of 5 years, which is favorably calculated subjectively from the perspective of the affected party.
- Introduction of joint and severable liability to infringers – which allows affected parties to seek compensation for the harm suffered from any of the infringing undertakings, regardless of whether they have made direct or indirect contact with the infringer from whom they seek compensation.
- The right of infringers to rely on the defense for the "passing on" of overcharges – this is aimed at protecting infringers from having to overcompensate - if the infringing undertaking proves that purchasers have passed on the increased price by way of charging a higher price to their customers further in the supply chain, then they would not be liable towards those purchasers.

The Damages Directive is considered a significant act in the promotion and strengthening of the private enforcement of EU competition law. It was implemented by all member states by the end of 2018 (European Commission, 2020). The Directive introduced many novelties typical for the US legal system in the hope of protecting EU consumers from harm. However, the biggest problem that remained is that it did not address the procedural challenges that affected parties face when they have to go to court to pursue a case for damages – no harmonized procedures, no minimum standards across jurisdictions, and most importantly no mechanism for collective redress. This translated into a lack of access to justice. This is why in 2020 the Directive on Representative Actions was adopted. The main features of the Directive are:
- Implementation and harmonization of existing systems for indemnification – Prior to the Directive, only 19 members had some form of legal remedy for victims of mass harm and proceedings are often lengthy and costly, especially if victims go to court individually (European Parliament, 2018). The Directive aims to set a standardized and harmonized procedure in each member state for actions for compensation due to breach of EU competition law. This would enable at least a minimum level of unified standards and procedures on the EU level.
- Collective representation – this is the by far most important novelty in the Directive. Very often consumers feel powerless and are hesitant to commence legal actions, resulting from uncertainty about their rights or procedural mechanisms available, or fearing the negative balance of the expected costs relative to the benefits of the individual action. Collective representation levels the playing field since it enables larger groups to jointly oppose infringers, thereby depleting these fears.

- Facilitated access to justice through Qualified representative entity (QRE) - Consumers are represented by a qualified entity, which can be a consumer organization, an NGO, or a public body, who acts as a claimant party, in the interests of and on behalf of these consumers. Individual consumers concerned by a representative action are not claimants but should be entitled to benefit from that action (European Commission, n.d.). However, unlike the USA, member states have the option to provide for an opt-in mechanism, opt-out mechanism, or a combination of the two.
- Broad definition of consumers – The Directive provides a broad definition of consumers, which also encompasses "personal data subjects", which would enable individuals whose personal data is misused and processed without consent, to be able to rely on the provisions for the protection of the Directive.

Although the Directive is aimed primarily towards the protection of the collective interest of consumers, its effect on the enforcement of competition law is significant. The Directive contains many novelties that should strengthen the private enforcement of EU competition law. However, currently, it is still in the process of implementation by member states, and it is too early to discuss its impact. Nevertheless, it is a significant instrument, that along with the Damages Directive should enable EU consumers to obtain compensation for anticompetitive practices.

3. CURRENT STATUS OF PRIVATE ENFORCEMENT IN NORTH MACEDONIA

The existence of competition law is a relatively new concept within the Macedonian national legislation. The country gained its independence from the Socialist Federalist Republic of Yugoslavia in 1991 and adopted the economic model of a free market economy. The first Law on Protection of Competition (hereafter LPC) was enacted only in 2005. The law was replaced with a new law in 2010, which was amended several times since its enactment.

As most countries found in a situation of adopting a new concept in their national legal systems, North Macedonia was faced with the challenge of choosing between the US and EU models of competition law. Since the country is aspiring to become an EU member, and one of its legal obligations on that path is to implement the EU *acquis*, it modeled its competition law after the EU legislation. And like the EU, public enforcement has been the dominant approach, with private enforcement having a very minimal role.

The Commission for Protection of Competition (hereafter CPC) is the central body responsible for the enforcement of the national competition law. Consequently, the enforcement of competition law in the country has to be analyzed through its work. The CPC issues annual reports on its work. The last report was published in October 2022 related to the work of the CPC in 2021. Table 1 contains information related to decisions adopted by the CPC from 2016 to 2021.

Table 1: Decisions on the CPC for the period 2016-2021

Year	Decisions on concentrations	Decisions on abuse of dominant position	Decisions on restrictive agreements, decisions and practices
2016	31	2	3
2017	50	1	6
2018	61	2	4

2019	57	/	3
2020	58	/	3
2021	81	4	1
total	338	9	20

(Source: Annual reports of the work of the CPC, kzk.gov.mk)

As evident from the statistics, most of the CPC's resources are focused on the evaluation of market concentrations, as an *a priori* method for protection of competition. While it is normal for the numbers on decisions on concentrations to be higher, it is evident that the CPC has very modest activities in the detection of abuse of dominant position (on average 1.5 cases per year), and restrictive agreements, decisions, and practices (on average 3.33 per year). However, before discussing and evaluating the achieved results of the CPC it is important to consider its capacity and the availability of resources it has, to set realistic expectations.

Table 2: Capacity of the Commission for Protection of Competition

Year	Staff	Approved budget
2016	28 employees	17,723,415.00 MKD (~288,352.47 EUR)
2017	27 employees	18,780,296.00 MKD (~305,547.48 EUR)
2018	27 employees	18,715,835.00 MKD (~304,547.09 EUR)
2019	26 employees	21,340,595.00 MKD (~347,209.81 EUR)
2020	27 employees	18,695,000.00 MKD (~304,095.34 EUR)
2021	27 employees	21,331,510,00 MKD (~346,023.42 EUR)

(Source: Annual reports of the work of the CPC, kzk.gov.mk).

As evident from Table 2, in the last 6 years, the CPC has had a budget of roughly 300,000 EUR, which is significantly lower than other countries from the region. For example, the budget of the Serbian competition agency for 2021 is approximately 3.5 million EUR (Commission for Protection of Competition of the Republic of Serbia, 2021). The budget of the Croatian Competition Agency for 2021 is approximately 1.8 million EUR (Croatian Competition Agency, 2021), and that of the Slovenian Competition Agency is 1.75 million EUR (Slovenian Competition Protection Agency, 2021).

Out of the budget of the CPC, more than 80% is delegated for wages and social contributions for the employees, leaving very limited funds for the strengthening of the capacity of the institution, such as training, education, equipment, etc. Consequently, it becomes difficult to properly assess and evaluate the functioning of the CPC given the lack of available resources.

This only illustrates the necessity for strengthening the mechanisms for private enforcement of competition law and empowering consumers and other market participants to take a proactive role in the detection and sanctioning of anticompetitive practices.

As already noted, as an aspiring EU member, North Macedonia has undertaken an obligation to align the national legislation with the EU *acquis*. In line with this requirement, the LPC is predominantly based on Articles 101-109 of the Treaty of the Functioning of the EU (TFEU) and the Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation). In addition, the country has adopted several directives related to aspects of competition law in the form of bylaws (Commission for

Protection of Competition, n.d.). However, the last implementation was conducted in 2012, which means that neither the Damages Directive nor the Directive on Representative Actions has been adopted yet.

Consequently, at present, there is a lack of specific rules that would enable affected parties, and particularly consumers, to effectively enforce the competition law.

Firstly, concerning possible violations of the competition law, it remains unclear whether the CPC is the only body that can determine a violation of the rules of the LPC, or whether national civil courts would be able to decide on such matters if an issue of competition law arises in a commercial or consumer dispute. While we believe that the answer should be positive in both instances, currently there is a lack of case law that would support this position.

Secondly, concerning compensation for damages to victims of such practices, the LPC merely contains a general rule in Article 58 that persons who will suffer harm due to a violation of competition law may seek compensation according to the law. Under the national legislation, the *lex generalis* for the compensation of damages would be the Law on Obligations, and for the procedure for indemnification, it would be the Law on Civil Procedure. However, these acts do not contain specific provisions relevant to anticompetitive conduct, since neither the Law on Civil Procedure contain rules for simplified procedures for victims of mass harm, or collective redress mechanisms in the form of class action, nor does the Law on Obligations contain guidance for indemnification of victims of mass harm for infringements of competition law.

Nevertheless, despite these obstacles, there are several interesting cases in practice related to the actions of consumers who have suffered harm from anticompetitive conduct. In 2009, the CPC issued a decision against EVN Makedonija AD, the only electricity supplier at that time, finding that it abused its dominant market position by charging households a manipulative fee in the amount of 6 MKD which equates to roughly 10-euro cents (Commission for Protection of Competition vs. EVN Makedonija AD, 2009). While this is an insignificant amount for a single household, when multiplied by the total number of households it becomes a significant amount of harm inflicted on the consumers. In principle, the total amount can be claimed as damages. However, when considering individual actions for compensation of damages, the benefit/cost ratio would likely dissuade many people. While this was the case for the vast majority, a number of people decided to commence individual legal actions against the company. All of these actions were successful in court, and victims were awarded compensation. From a legal standpoint, the claims were for unjust enrichment and not for damages, but the effect remains the same – compensation for the inflicted monetary harm.

While these individual actions are a welcome sight and a glimpse of hope, the reality is that there are many victims of anticompetitive practices that fail to receive compensation, either because these practices remain undiscovered and unsanctioned, or even worse, because they do not have the necessary mechanisms to obtain damages even when the CPC finds a violation of competition law.

4. CONCLUSION

Private enforcement of competition law is a vital part of the mechanism for effective protection of the free market economy. While its development has been reactively slow in comparison to the pace at which companies find ways to circumvent the market rules, it has gained momentum in the last decade, especially in the EU. Many initiatives have led to the adoption of specific rules for awarding damages, and procedures for collective redress which should ensure at least

minimum protection of EU consumers. In the USA, on the other hand, private enforcement has been already established as an indispensable part of the competition law system.

Unlike the USA and EU, in the Republic of North Macedonia, private enforcement of competition law is at a standstill. While the enforcement of competition law in general is at a low level, compensation of victims for suffered harm is non-existent. For a small and open market economy, the functioning of an efficient system for protection of the free competition is a vital determinant for economic development. Consequently, an effort must be made towards the strengthening of the enforcement of the competition law.

While strengthening the capacity of the Commission for the Protection of Competition has to be a priority for the future, it is undisputed that it will require significant investment and an increase in the budget, employing versatile staff, and increasing the resources spent on education, training, and equipment. This might pose a challenge since the CPC is funded from the state's budget, and it is not able to generate any own revenues.

On the other hand, the first step towards strengthening private enforcement is making legislative changes through the adoption of already recognized and widely used concepts. This requires political will, but much less funds and helps in the development of a system that would put pressure on market participants independently from the state- and state-owned bodies. There are already active organizations for the protection of consumers who can contribute towards familiarizing consumers with these concepts, advising them, and even representing them in proceedings for collective redress. While this is not an easy task and something that can be achieved in a short period, it is important to start investing in the development of a system for private enforcement to be able to achieve results in the long run.

Not only is this a necessity for the strengthening of the market competition, but for North Macedonia, it is also a legal requirement arising from the obligation to align the national legislation with the EU *acquis*. Having in mind that the EU has already started implementing mechanisms for the strengthening of the private enforcement of competition law, these mechanisms would also have to be transposed into the national laws.

REFERENCES

Commission for Protection of Competition (n.d.) *Bylaws*, *kzk.gov.mk*. Available at: http://kzk.gov.mk/category/uredbi/ (Accessed: 10 August 2023).

Commission for Protection of Competition of the Republic of Serbia (2021) *Annual report for the work of the Commission for Protection of Competition for 2021*.

Commission for Protection of Competition vs. EVN Makedonija AD (2009).

Commission for Protection of Competition, *Annual reports of the work of the Commission for Protection of Competition* (n.d.) *kzk.gov.mk*. Available at: http://kzk.gov.mk/category/godishni-izveshtai/ (Accessed: 17 August 2023).

Commission of the European Communities (2008) *White Paper on Damages actions for breach of the EC antitrust rules*. Available at: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52008DC0165 (Accessed 05 August 2023).

Croatian Competition Agency (2021) *Annual Report of the Croatian Competition Agency for 2021*.

Davis, J. and Lande, R. (2003) 'Defying Conventional Wisdom: The Case for Private Antitrust Enforcement', *Georgia Law Review,* Vol. 48.

Directive (EU) 2020/1828 of the European Parliament and of the Council of 25 November 2020 on representative actions for the protection of the collective interests of consumers and repealing Directive 2009/22/EC, *OJ L 409, 4.12.2020.*

Directive 2014/104/EU of the European Parliament and of the Council of 26 November 2014 on certain rules governing actions for damages under national law for infringements of the competition law provisions of the Member States and of the European Union, *OJ L 349, 5.12.2014.*

European Commission (2017) *Impact Assessment Accompanying the Proposal for a Directive of the European Parliament and of the Council to empower the competition authorities of the Member States to be more effective enforcers and to ensure the proper functioning of the internal market.* Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52017SC0114 (Accessed 05 August 2023).

European Commission (2020) *Antitrust: Commission publishes report on implementation of Damages Directive*, *ec.europa.eu*. Available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_20_2413 (Accessed: 10 August 2023).

European Commission (n.d.) *Representative actions directive*, *commission.europa.eu*. Available at: https://commission.europa.eu/law/law-topic/consumer-protection-law/representative-actions-directive_en (Accessed: 19 August 2023).

European Parliament (2018) *First EU collective redress mechanism to protect consumers*, *europarl.europa.eu*. Available at: https://www.europarl.europa.eu/news/en/press-room/20181205IPR21088/first-eu-collective-redress-mechanism-to-protect-consumers (Accessed: 14 August 2023).

Investopedia.com (n.d.) *Class action definition*. Available at: https://www.investopedia.com/terms/c/classaction.asp (Accessed 09 August 2023).

Jones, A. (2016) 'Private enforcement of EU competition law: A comparison with, and lessons from, the US', *SSRN Electronic Journal*.

Jones, C.A. (1999) *Private enforcement of antitrust law in the EU, UK, and USA*. Oxford University Press.

Law on Protection of Competition of North Macedonia (2010).

OECD (2020), *OECD Competition Trends 2020.* Available at: http://www.oecd.org/competition/oecd-competition-trends.htm (Accessed 11 August 2023).

OECD (n.d.) *Public and private antitrust enforcement in competition*. Available at: https://www.oecd.org/daf/competition/antitrust-enforcement-in-competition.htm (Accessed 09 August 2023).

Slovenian Competition Protection Agency (2021) *Annual Report 2021*.

Smith, A. (1776) *The Wealth of Nations*.

The Clayton Act (1914).

U.S. Federal Equity Rules (1842).

Weber Waller, S. and Popal, O. (2016) 'The fall and rise of the antitrust class action', *World Competition*, Vol. 39 (Issue 1).

Whish, R. and Bailey, D. (2012) *Competition Law*. 7th ed. Oxford University Press.

HOW TO INCREASE TRADE IN SOUTHEAST EUROPE BY APPLYING TRADE FACILITATION MEASURES?

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ABSTRACT
In this paper, we apply the 2021 edition of OECD Trade Facilitation Indicators (TFIs) in the gravity model to measure the importance of applying trade facilitation measures to increase intraregional trade among the 10 SEE countries: Albania, Bosnia & Herzegovina, Bulgaria, Croatia, Macedonia, Moldova, Montenegro, Romania, Serbia, and Slovenia. The purpose of the paper is to indicate area(s) where countries could undertake measures to facilitate trade and enhance the process of trade integration in the region of Southeast Europe. Although most of these countries trade among themselves on a preferential basis, many studies pointed out that there are still areas and barriers that hinder their mutual trade. The results of our study show that decreasing fees and charges, harmonization and decreasing the number of documents, automatizing the process of trading, and improving governance and impartiality of the Customs administration could positively influence trade among these countries. These results are additional confirmation of our previous studies in this area which firmly acknowledge the area where trade policy creators should pay due attention.

Keywords: SEE countries, OECD 2021 Trade Facilitation Indicators, gravity model, trade policy, trade facilitation.

JEL Classification: F10; F14; C23

1. INTRODUCTION

The ongoing economic and political crises in Europe, being one with the greatest negative impact upon the economies on the continent after World War II, creates a strong demand from all relevant authorities to enhance all kinds of cooperation among strategic partners not only from Europe but wider, in order to cope with its heavy negative effects. The most influential economies in the EU, such as Germany, France, and since recently the Netherlands, are facing a recession. Great Britain also faces a recession threat, although it is no longer an EU member state.

This huge crisis also affects the rest of the world, which even before the outburst of the COVID-19 pandemic and the war conflict in Ukraine, started to face serious challenges regarding the process of trade liberalization by disrespecting the most important WTO trade rules, globally accepted at the turn of the century. The implementation of the so-called Trade Facilitation Agreement (TFA) of the WTO, enforced in 2017, was fundamentally jeopardized. New non-trade barriers started to be implemented with a galloping pace, but also traditional tariff barriers were abused by the greatest world traders, among which the USA became a leader in negative terms. Just as a reminder, the Trade Facilitation Agreement was based on in-debt research by world-recognized experts who stressed the potential of full elimination of non-trade barriers in the creation of valuable economic advantages at global level. These researchers claimed that the elimination of cargo delays at borders, due to the inefficiency of customs procedures and increased delivery speed, might lower overall input costs, thus positively influencing productivity and creating additional efficiency gains. OECD estimated that full implementation of the TFA had the potential to increase world trade by 0.6% and the overall output by up to 0.5% across all country groups. This could lead to a better allocation of resources, an increase in incomes, and in the general welfare (OECD, 2021).

Being aware that trade facilitation has the potential to create valuable global economic advantages, we found the OECD Trade Facilitation Indicators to be a very useful tool for monitoring and comparing the trade facilitation performance of each economy, as they help follow up and assess policies focused on border procedures streamlining, trade costs reduction and stimulation of trade flows. Thus, at the beginning of our research within the region, we decided to construct a gravity model on CEFTA-2006 member-states that included 12 of the OECD indicators. Living in South-Eastern Europe, and being part of CEFTA-2006, we were aware of the existence and abuse of many non-trade barriers in the region that hindered the process of economic integration and deep trade liberalization within the free trade area even before the enforcement of the WTO's TFA. This reality inspired us to create a series of gravity models in order to detect some of the most problematic obstacles faced by the business community on a daily basis, thus we could define some recommendations for CEFTA-2006 policymakers that might help further trade liberalization and economic integration.

Recently, witnessing the negative impact of the COVID-19 pandemic, followed by the war conflict in Ukraine, we believed that it would be useful to include in our research countries from South-Eastern Europe that have already gained full membership within the EU, such as Bulgaria, Romania, and Slovenia. All of the included countries are neighbors of and share borders with CEFTA-2006 member-states. Our last research was conducted with data from the OECD database from 2019, while this paper updates the gravity model with data from the OECD database from 2021.

Our new paper contains an introduction, a literature review, an explanation of the empirical model and data, comments on the results, and a conclusion with recommendations.

2. LITERATURE REVIEW

Non-tariff barriers are perceived as the most important foreign trade policy tool at the end of the 20th century, due to many successful General Agreement on Tariffs and Trade (GATT) rounds that managed to significantly decrease global tariffs. Non-tariff barriers are a very heterogeneous group of measures, that can be divided into three broad groups, according to Bjelic: Traditional non-tariff barriers or core non-tariff barriers (quantitative barriers, subventions, antidumping measures, etc.); Technical non-tariff barriers (non-tariff barriers that appear in international trade due to differences in national standards and technical regulation); and Administrative non-tariff barriers (non-tariff barriers that are derived from

national laws and regulations and administrative procedures that curtail international trade) (Bjelić, 2013). During the existence of GATT 1947, most of the traditional non-tariff barriers were regulated, while technical barriers to trade were regulated with the establishment of the World Trade Organization (WTO) in 1995. The only group that was not regulated was administrative barriers to trade.

Most authors emphasize that at the Singapore Ministerial Council of the WTO in December 1996 it was decided by consensus that the removal of administrative barriers to trade, an initiative known as trade facilitation, was one of the four issues that will be negotiated in the future (so-called Singapore issues). When the first round of multilateral trade negotiations was initiated in Doha, they opened negotiations on trade facilitation in July 2004. This sparked scientific interest in the effects of trade facilitation on the world economy. The first articles on this subject appeared in 2003, like Wilson, Mann, and Otsuki, who researched the relationship between trade facilitation and economic development in the Asia-Pacific region, concluding that the removal of administrative barriers has a significant effect on rising trade flows and economic development (Wilson, Mann and Otsuki, 2003). In their article from 2005 (Wilson, Mann and Otsuki, 2005) analyzing 75 national economies using the gravity model with panel data, they identify four measures of trade facilitation: port infrastructure (air and maritime), customs environment, regulatory environments, and e-business infrastructure. The results of their analysis suggested that raising global capacity halfway to the world average in the four areas would increase trade by 377 billion American dollars. Wilson, Mann and Otsuki in 2005 also pointed out that trade facilitation effects will differ depending on the trading patterns of the countries being examined.

The greatest achievement, and until now the only, of the WTO Doha Round was the adoption of the Trade Facilitation Agreement (TFA) in 2013, which entered into force on 22 February 2017. TFA is the single global instrument to remove administrative trade barriers. Many research show, like the WTO report from 2015 (WTO, 2015), that the full implementation of the TFA is estimated to reduce global trade costs by an average of 14.3%, with African countries and least-developed countries (LDCs) forecast to enjoy the biggest average reduction in trade costs. The WTO report also envisaged that full implementation of the TFA would reduce the average time needed to import by 47% and the average time needed to export by 91%.

Important research on trade facilitation included the development of a methodology to assess the effects of trade facilitation and generate datasets for most countries in the world. International economic organizations were mostly engaged in these cross-country studies since they gathered global trade data. The most important methodologies to determine the economic impact of trade facilitation reform in the economic literature include:

1. The World Bank Group's "Doing Business" indicators, particularly those related to Trading Across Borders Indicators (World Bank, 2014);
2. The World Bank's Logistics Performance Index (LPI), particularly the Customs Efficiency Subindex (World Bank, 2023);
3. The Organization for Economic Co-operation and Development's (OECD) Trade Facilitation Indicators (TFIs) (OECD, 2009); and
4. The World Economic Forum's Enabling Trade Index (ETI), particularly the Border Administration Subindex (WEF, 2014).

Many papers used this data to estimate the effect of trade facilitation measures on trade and other economic categories. The empirical literature has used different approaches to estimate trade effects of non-tariff measures, from the price wedge method, inventory-based approaches, survey-based approaches, risk assessment-based cost-benefit measures, to the gravity model approach (Bellanawithana, A., et al., 2011). Focusing on the NTB's effects on bilateral trade flows, for some authors it seems that the gravity model approach is "a

promising area of research" (Beghin and Bureau, 2001). In the estimation of trade effects of NTMs most authors use the gravity model, the econometric techniques of panel data are often used (for instance, Moenius, 2004 or Bao and Qiu, 2010) due to well-known advantages over cross-sectional econometric analysis.

Concerning administrative barriers to trade, Zaki (2010) wrote on effects of trade facilitation and first estimates the predicted time to export and to import, involving it in the gravity model to determine its bilateral trade effect. The conclusion is that bureaucracy, corruption, and geographic variables significantly influence transaction time to export and to import, but time to import has a higher negative impact on trade than time to export. Hornok and Koren (2012) estimate the effects of administrative trade barriers by including importer-specific trade cost variables, like the time in days and the cost of administrative procedures in the importer country, using Doing Business Indicators. Zaki in his paper from 2013 using more comprehensive measures of ad-valorem equivalents (AVEs) of red tape costs, which are computed from a gravity model, and are introduced in the CGE model, finds that trade facilitation gains are more significant for developing economies than for developed ones, whether in terms of welfare gain or increase in trade. Also, an important conclusion is that the long-run welfare effects of trade facilitation are much higher than in the short run. And, a significant conclusion is that trade facilitation improves export diversification, leading to an expansion in those sectors that are more sensitive to time, such as food, textiles, and electronics. Decreux and Fontagné (2009) in modeling trade facilitation assumed that administrative barriers are an iceberg cost. Using a dynamic computable general equilibrium model of the world economy (MIRAGE), they calculated gains associated with trade facilitation at 152 billion American dollars, with port efficiency adding 35 billion American dollars.

The papers that analyzed the effects of trade facilitation in the region of Southeast Europe, which is the focus of our research, have grown during the last decade. Bjelić, Dragutinović-Mitrović and Popović-Petrović (2013) have researched the application of two types of non-tariff barriers in CEFTA 2006 trade: administrative and technical barriers to trade. They concluded that after the trade liberalization period, non-tariff barriers have become one of the most important impediments in the Western Balkan`s trade with the EU. Toshevska-Trpchevska and Tevdovski (2014) researched the effects of Customs and Administrative Procedures on Southeast European Trade, using the gravity model in the period 2008-2012, and found that the number of days spent at the border and costs paid by both importers and exporters countries had a significant negative influence on the volume of trade in the period 2008-2012. In the article from 2016, Toshevska-Trpchevska and Tevdovski assessed the relative economic and trade impact of specific trade facilitation measures for the countries of Southeast European countries, focusing on CEFTA-2006 signatories excluding Moldova. They used trade facilitation indicators of the countries in the sample in a gravity model.

OECD and CEFTA Secretariat Report on Elimination of Non-Tariff Barriers in CEFTA, based on the Multilateral Monitoring Framework (MMF) developed by the OECD, concludes that CEFTA Parties have made the best progress in dimensions related to reducing technical barriers to trade and administrative barriers to trade. Administrative non-tariff barriers play an important role in contemporary trade policy, even in CEFTA 2006. Bjelić (2018) shows the data on the significance of these barriers and points to trade facilitation as a tool to eliminate administrative barriers to trade. Marković, Popović-Petrović and Bjelić (2021) found that CEFTA 2006 regional trade integration is not an exception with more than 100 NTBs introduced during its existence. Serbia and Albania are CEFTA 2006 signatories with the most NTBs introduced in the observed period. CEFTA has a very efficient institutional mechanism, the Subcommittee on Technical Barriers to Trade (TBT) and Non-Tariff Barriers

(NTBs), for the removal of NTBs between signatories. In bilateral trade relations of Serbia's intra-CEFTA 2006, our trade partner uses policy-oriented NTBs.

Some studies focus on individual Southeast European countries. Nuhanovic and Barakovic-Nurikic (2016) found a significant correlation between non-tariff barriers and Bosnia and Herzegovina import and export within CEFTA. The increase in administrative and technical barriers affects the reduction of imports. Sanitary and phytosanitary barriers mostly affect the export of goods and services since the obtained values of their correlation coefficients are the highest. In the 2022 conference paper, Mojsovska and Bjelić (Mojsovska and Bjelić, 2022) presented the result of the research carried out for CEFTA Secretariat on identifying non-tariff barriers in the CEFTA-2006 region in 2011. In 2022 Toshevska-Trpchevska et al. (2022) have found that undertaking measures to decrease and simplify the documents, the trading procedures and the fees and charges should have the biggest positive effect for increasing trade between the countries in Southeast Europe.

3. THE EMPIRICAL MODEL AND DATA

The paper employs a model to conduct a qualitative analysis concerning the bilateral trade relations among South and Eastern Europe (SEE) countries. Additionally, it examines the impact of OECD trade facilitation indicators on their mutual trade. The countries covered in the analysis are ten countries. These are: Macedonia, Serbia, Bosnia and Herzegovina, Moldova, Montenegro, Albania, Slovenia, Bulgaria, Romania, and Croatia. Kosovo is not considered due to insufficient data. The study finds that trade flows within the SEE region remain stable, thanks to the geographical proximity and comparable rates of economic growth among these countries. However, the region's trade orientation is predominantly directed toward the European Union.

The dataset contains annual data ranging from 2006 to 2022, comprising more than 1,500 observations for the estimations. The analysis is based on annual data. The study employs the standard gravity model OLS estimation within a panel framework. The fulfillment of the OLS regression assumptions is confirmed through a series of tests, ensuring that issues such as endogeneity and heteroscedasticity are not a cause for concern.

Originally proposed by Linder (1961) and Linnemann (1966), this model draws inspiration from Newton's theory of gravitation. It is widely utilized in research papers focusing on international trade (Deardorff, 1995; Anderson and van Wincoop, 2003). The estimates are generated using the OLS (Ordinary Least Squares) model in STATA, without incorporating any effects. The gravity model is specified as follows:

$$lnEXP_{ij,t=}\beta_0 + \beta_1 lnGDP_{i,t} + \beta_2 lnGDP_{j,t} + \beta_3 lnDISTANCE_{ij} + \beta_4 BORD_{ij} + \beta_5 LANG_{ij} + \beta_6 CEFTA_{ij} + \beta_7 ln(TFA\_X_*) + \varepsilon_{ij,t}$$

The dependent variable *export* represents the natural logarithm of the exports from country *i* to country *j* expressed in millions of American dollars. The source for export data is the International Monetary Fund, Direction of Trade Statistics.

In terms of independent variables, we are relating trade flows to distance, and economic size to which we add three binary variables accounting for a common language, a common border, and membership in the Central Eastern Free Trade Area – 2006 (CEFTA-2006). In separate regressions, we estimate the influence of each TFA indicator.

The model includes seven independent variables. The variables regarding the *Gross Domestic Product* of the home and partner country is the natural logarithm of the value of the GDP calculated in constant 2015 prices, expressed in American dollars. Data on GDP is extracted from the World Bank Database. This variable aims to capture the influence of the economic development between the countries involved in the analysis of bilateral trade.

The variable, named *distance*, is natural logarithm of the the geographical distance between the biggest cities of countries i and j, expressed in kilometers. Data on the geographical distance between the economic centers of the two countries are from the website http://www.worldatlas.com. This variable considers the spatial separation between the trading partners.

The three dummy variables, referred to *language, border, and membership in CEFTA-2006. Language* is a binary variable that takes the value 1 for countries sharing a common language and 0 otherwise. This variable seeks to identify the impact of having a shared language on bilateral trade.

Common border is a binary variable that takes the value 1 for countries sharing a common border and 0 otherwise. This variable aims to assess the influence of having a shared border on bilateral trade. This variable aims to assess the influence of having a shared border on bilateral trade. The expectation is that countries with similar languages and a shared border will experience reduced transaction costs, leading to increased bilateral trade between them. The expectation is that countries with similar languages and a shared border will experience reduced transaction costs, leading to increased bilateral trade between them.

The variable TFA_X_* represents the natural logarithm of the product of the trade facilitation indicators of both trading partners. In this context, eleven different OECD trade facilitation indicators are used, namely: information availability, involvement in the trade community, advanced ruling, appeal procedures, fees and charges, document, automatization, procedures, border agency cooperation internal, border agency cooperation – external and governance and impartiality.

Data for the Trade Facilitation Indicators is obtained electronically and directly from OECD. The indicator has been published every two years since 2012, and we have included in the database all available indicators for the years 2012, 2015, 2017, 2019 and 2021. Each indicator is rated on a scale from 0 (lowest) to 2 (highest). For the purpose of this model, the scale is rescaled to range from 0 to 10. The variable TFA_X_* is then calculated as the natural logarithm of the product of a specific TFA indicator for both the importer and the exporter.

By using this variable, the model aims to examine how changes in specific Trade Facilitation Indicators jointly affect both exporters and importers in bilateral trade relationships.

$$TFA\_X_* = TFA\_X_j * TFA\_X_i$$

The letter "X" represents a specific Trade Facilitation Indicator, denoted by letters A, B, ..., K. Since there are a total of 11 trade facilitation indicators (A to K), the analysis involves running 11 separate regressions. Different specifications of the model are necessary due to the high correlation among the trade facilitation indicator variables, as pointed out by Wilson (2010).

The high correlation among the Trade Facilitation Indicators implies that they may influence each other and have overlapping effects on the dependent variable (e.g., bilateral trade). To avoid multicollinearity issues and ensure reliable estimates, each regression focuses on one Trade Facilitation Indicator at a time, while controlling for other relevant variables. This approach allows researchers to isolate the effects of individual Trade Facilitation Indicators and obtain more accurate results.

By running 11 separate regressions, the study can gain insights into how each Trade Facilitation Indicator independently impacts exporters and importers in bilateral trade relationships, while accounting for the potential influence of other control variables.

4. RESULTS

The results from the regressions are given in Table 1. We ran 11 regressions to estimate the influence of each Trade Facilitation Indicator on trade between 10 Southeast European countries: Albania, Bosnia & Herzegovina, Bulgaria, Croatia, Macedonia, Moldova, Montenegro, Romania, Serbia, and Slovenia. The 11 regressions also confirm the robustness of the model as can be seen that the results of the variables: GDP home, GDP trading partner, distance, language, border, and CEFTA-2006 membership are stable in all regressions.

The results from the variables GDP home and GDP trading partner are positive and highly statistically significant. This means that the higher GDP of the countries has a positive influence on their mutual trade. Increasing the GDP of the countries positively impacts the trade between them.

The results for the variable distance are also statistically important and with a negative sign. It means that increasing the distance between the countries has a negative influence on increasing their bilateral trade. This fact is very common and expected in gravity models and it is the foundation of the whole gravity model theory.

The dummy variables language and border are significant and with a positive influence on trade. It means that countries that have a common language or share a common border can easily increase their mutual trade. The coefficients for the variable language are higher than the coefficients for the variable border indicating that countries that speak the same language in Southeast Europe have a higher propensity to increase their mutual trade. The results for the dummy variable CEFTA-2006 membership are positive signs but appear to be insignificant for increasing the trade in the region of Southeast Europe. These results can be explained by the fact that some of these countries are already EU members and the fact that the non-EU member countries trade more with the European Union than within the regional integration CEFTA-2006 from which they are part of. This is in line with our previous results (Kikerkova et al., 2021) where it appears that signing a bilateral trade agreement with the European Union appears to be more significant for increasing trade for these countries than being part of the CEFTA-2006 regional integration.

The results for the separate 11 Trade Facilitation Indicators show that 4 indicators are highly statistically significant (three on a level of 99% and one on a level of 95%) and with positive signs. These indicators measure fees and charges, documents, automation and governance, and impartiality. The results point out that improving the situation and the facilitation measures in these fields could increase mutual trade among the SEE countries. More precisely, if SEE countries manage to improve the facilitation indicator on fees and charges which measures decrement of fees and charges by 1%, it could lead to a 0.53% increase in their mutual trade. Improving the indicator documents (acceptance of copies, simplification, and harmonization of the documents, decreasing the number of documents needed for import, export, and transit procedures) by 1%, SEE countries could gain a 0.66% increase in their mutual trade. Improving the indicator on automation, which means applying automated solutions in trade, like electronic exchange of data, automated border and risk management procedures and electronic payments for 1%, could lead to an increase of trade by 0.16%. Improving the accountability and the ethics policy of the customs administration measured by the indicator governance and impartiality by 1% could lead to 0.16% of trade between the SEE countries.

These results should be considered in the creation of future trade policies of the region and special attention should be given to applying measures that could decrease the fees, harmonize the documents, improve the automation of the customs procedures, and improve the accountability of the Customs administration for easing trade and improving trade integration of the countries in the region of Southeast Europe. These results confirm the

previous study that we have done using the OECD TFIs for 2019 (Toshevska-Trpchevska, et al., 2022).

The indicators measuring appeal procedures, procedures, internal border agency cooperation and external border agency cooperation are insignificant for increasing the trade in Southeast Europe.

Table 1: Results of TFIs influence on SEE trade, 2021

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
No of observations	1481	1481	1481	1481	1481	1481	1481	1463	1481	1481	1474
C	-32.943 ***	-33.121 ***	-32.156 ***	-35.250 ***	-37.035 ***	-36.765 ***	-34.624 ***	-34.344 ***	-32.184 ***	-34.653 ***	-32.089 ***
Log of GDP domestic	1.386 ***	1.350 ***	1.375 ***	1.368 ***	1.327 ***	1.331 ***	1.357 ***	1.359 ***	1.333 ***	1.365 ***	1.355 ***
Log of GDP trading partner	0.710 ***	0.682 ***	0.687 ***	0.694 ***	0.652 ***	0.660 ***	0.680 ***	0.686 ***	0.669 ***	0.693 ***	0.684 ***
Log of distance	-1.775 ***	-1.740 ***	-1.804 ***	-1.762 ***	-1.441 ***	-1.603 ***	-1.790 ***	-1.777 ***	-1.735 ***	-1.765 ***	-1.752 ***
Language	1.406 ***	1.395 ***	1.421 ***	1.428 ***	1.389 ***	1.320 ***	1.393 ***	1.408 ***	1.447 ***	1.420 ***	1.412 ***
Border	0.364 ***	0.345 ***	0.318 ***	0.348 ***	0.540 ***	0.418 ***	0.335 ***	0.358 ***	0.379 ***	0.348 ***	0.383 ***
CEFTA-2006	0.014	0.035	0.072	0.092	0.118	0.150 *	0.083	0.074	0.379	0.075	0.091
log of A - Information availability	-0.608 ***										
Log of B - Involvement of the trade community		-0.266 ***									
Log of C - Advance rulings			-0.532 ***								
log of D - Appeal procedures				0.116							
log of E - Fees and charges					**0.530 *****						
log of F – Documents						**0.660 *****					
log of G – Automation							**0.163 ****				
log of H – Procedures								0.0185			
log of I - Internal border agency co-operation									-0.333		
log of J - External border agency co-operation										-0.006	
Log of K - Governance and impartiality											**0.156 *****
R-square	0.7642	0.7637	0.7623	0.7610	0.7716	0.7696	0.7617	0.7610	0.7651	0.7610	0.7616
Adjusted R-square	0.7631	0.7625	0.7612	0.7600	0.7705	0.7685	0.7605	0.7599	0.7640	0.7598	0.7604

(Source: Author's calculations)

The results have also shown that three indicators measuring information availability, involvement of the trade community, and advance rulings are statistically significant but with negative signs. This means that improving the facilitation measures in these fields should have a negative influence on trade or could lead to decreasing mutual trade among the countries. These results shouldn't discourage either researchers or policy creators. They only point out that the newest data on trade facilitation measures applied by the countries in Southeast Europe indicate that positive influence for increasing their mutual trade and improving the trade integration in the region could be achieved by improving the measures in the fields: of fees and charges, documents, automation and governance and impartiality.

5. CONCLUSION

This paper is a follow-up to our previous work on determining the importance of trade facilitation measures for increasing trade in the region of Southeast Europe. The need for this analysis derives from the fact that although most of these countries trade among themselves on a preferential basis, many studies confirmed that there are still administrative and other nontariff barriers that hinder trade in the region and disable higher and deeper integration. This is especially evident for the countries belonging to the Western Balkan region that are still not a part of the European Union: Albania, Bosnia & Herzegovina, Macedonia, Montenegro, Moldova, and Serbia. These countries enjoy preferential treatment in trade with the European Union and they are part of the free trade area CEFTA-2006, but apparently, lengthy customs and administrative procedures, as well as other non-tariff barriers still persist at their borders and make their trade integration dysfunctional.

In this paper, we have applied the gravity model with the newest OECD data on trade facilitation: Trade Facilitation Indicators, 2021 edition. The results that we have obtained have generally confirmed our previous findings and focused the main burden on the following facilitation measures: fees and charges, documents, automation and governance and impartiality. The regressions have shown that 1% improvement in the indicator measuring fees and charges could lead to a 0.53% increase in trade between the countries of Southeast Europe. 1% Improvement of the indicator documents which means increasing the acceptance of copies in trade, simplification, and harmonization of the documents, and decreasing the number of documents needed for trade procedures could positively impact trade by 0.66%. Positive effects for trade are expected with the improvement of two other indicators: increased implementation of automated solutions in trade and improved governance and impartiality of the Customs administration. Improvement in these indicators could lead to a 0.16% increase in trade between the SEE countries.

These results are confirmation of our previous studies showing that there are still additional barriers and costs in trade among the countries in the region of Southeast Europe and those barriers have negative impact upon the economic integration of the region.

We hope that our research will be given a due attention from the responsible representative authorities of the SEE countries, and the results thereof would be included in the creation of future trade policies and relevant trade facilitation measures.

REFERENCES

Anderson, J. E., & Van Wincoop, E. (2003). Gravity with gravitas: A solution to the border puzzle. American economic review, 93(1), 170-192.

Baldwin, R.E. (1970). Nontariff Distortions of International Trade, Brookings Institution, Washington.

Bao, X. & Qiu, L.D. (2010). Do Technical Barriers to Trade Promote or Restrict Trade? Evidence from China. Asia-Pacific Journal of Accounting & Economics 17, 253–280.

Beghin J. C. & Bureau, J-C. (2001). Quantitative Policy Analysis of Sanitary, Phytosanitary and Technical Barriers to Trade. Économie internationale 87, 107-130.

Bellanawithana, A., Wijerathne, B. & Weerahewa, J. (2011). Impacts of Non Tariff Measures (NTMs) on Agricultural Exports: A Gravity Modeling Approach, Asia-Pacific Trade Economists' Conference: Trade-Led Growth in Times of Crisis.

Bjelić, P. (2009). Trade Facilitation: Removing Administrative Trade Barriers. Халықаралық Бизнес Университетінің Хабаршысы 1(11) январъ-март 2009, 110-118.

Bjelić, P. (2013). World Trade Organization and the Global Risks. In: Better Business Regulation in a Risk Society, pp. 193-206 (Eds A. Alemano et. al) Springer Science+Business Media, New York.

Bjelić, P., Dragutinović Mitrović, R., Popović Petrović, I. (2013) "Administrative Barriers to Trade as Predominant Non-Tariff Barriers". In: The 3rd International Conference on International Trade and Investment, 4–6 September, Mauritius: University of Mauritius and WTO.

Bjelić, P. (2018) Trade Facilitation in the Central European Free Trade Agreement (CEFTA): an imperative to boost intra-regional trade, UNCTAD Transport and Trade Facilitation Newsletter N°78 - Second Quarter 2018, Article No. 18, Internet, https://unctad.org/news/trade-facilitation-central-european-free-trade-agreement-cefta-imperative-boost-intra-regional

Deardorff, A. V. (2011). Determinants of bilateral trade: does gravity work in a neoclassical world?. In Comparative advantage, growth, and the gains from trade and globalization: a festschrift in honor of alan v deardorff (pp. 267-293).

Decreux, Y. and Fontagné, L. (2009), 'Economic Impact of Potential Outcome of the DDA', CEPII Working Paper No. 2011-23, October, 20, 2011, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2004831.

Hornok, C. & Koreny, M. (2011). Administrative Barriers to Trade. Third Conference of GIST - International Trade, Firm Location and Services, Stockholm.

Kikerkova, I., Makrevska Disoska, E., Toshevska-Trpchevska, K. i Tonovska, J. (2021). DETERMINANTS OF THE BILATERAL TRADE FLOWS OF NORTH MACEDONIA– A GRAVITY MODEL APPROACH. *DIEM, 6* (1), 98-107. https://doi.org/10.17818/DIEM/2021/1.10.

Linder, S. B. (1961). *An essay on trade and transformation* (pp. 82-109). Stockholm: Almqvist & Wiksell.

Linnemann, H. (1966). *An econometric study of international trade flows* (No. 42). Amsterdam, North-Holland.

Marković, I., Popović Petrović, I. and Bjelić, Predrag (2021) Elimination of Non-Tariff Barriers in Regional Trade Integrations: The CEFTA 2006 Experience, Teme XLV, No.2, April – June 2021, pp. 601-620.

Moenius, J. (2004). Information versus Product Adaptation: The Role of Standards in Trade, International Business & Markets Research Center Working Paper # 1, Northwestern University.

Mojsovska, S. and Bjelic, P. (2022) Non-Tariff Measures in CEFTA 2006: Perspectives of North Macedonia and Serbia, International Scientific Conference Proceedings: ECONOMIC AND BUSINESS TRENDS SHAPING THE FUTURE, Faculty of Economics-Skopje Ss. Cyril and Methodius University in Skopje, Skopje, 10-11 November 2022, pp.213-225.

Nuhanovic, S. & Barakovic Nurikic, M. 2016. "The Analysis of the Influence of Non-Tariff Barriers on Bosnia and Herzegovina Trade within CEFTA 2006," Economic Review: Journal of Economics and Business, University of Tuzla, Faculty of Economics, vol. 14(2), pp. 33-43.

OECD (2021), Competitiveness in South East Europe 2021: A Policy Outlook, Competitiveness and Private Sector Development, OECD Publishing, Paris, https://doi.org/10.1787/dcbc2ea9-en.

OECD and CEFTA Secretariat (2012) Elimination of Non-Tariff Barriers in CEFTA, CEFTA ISSUES PAPER 4, Internet, https://www.oecd.org/south-east-europe/programme/cefta4.pdf.

Organization for Economic Co-operation and Development (OECD) (2009), Overcoming Border Bottlenecks. The Costs and the Benefits of Trade Facilitation, Paris: OECD.

Organization for Economic Co-operation and Development (OECD) (2005), "The Costs and Benefits of Trade Facilitation", Paris: OECD, Policy Brief.

Toshevska-Trpchevska, K., Makrevska Disoska, E., Kikerkova, I. & Tonovska, J. (2022) "Applying trade facilitation measures for increasing regional trade in Southeast Europe", paper presented at the 21 Scientific Conference dedicated to the 70th anniversary of the International Economic Relations and Business Department "*The Membership of Bulgaria in the European Union: Fifteen Years Later*", Faculty of International Economics and Politics, University of National and World Economy, Sofia, Bulgaria.

Toshevska-Trpchevska, K.; Tevdovski, D. (2016) Trade Facilitation Indicators and their Potential Impact on Trade between the Countries of South-Eastern Europe. Sci. Ann. Econ. Bus. 2016, 63, 347–362.

Toshevska-Trpchevska, K. and Tevdovski, D. (2014) Measuring the Effects of Customs and Administrative Procedures on Trade: Gravity Model for South-Eastern Europe, Croatian Economic Survey, April 2014, DOI: 10.15179/ces.16.1.4.

Wilson, J. S., C. L. Mann and T. Otsuki (2003), 'Trade Facilitation and Economic Development: A New Approach to Measuring the Impact', World Bank Economic Review, 17, 3, 367–89.

Wilson, John S., Mann, Catherine L. & Otsuki, Tsunehiro (2005) Assessing the Benefits of Trade Facilitation: A Global Perspective, World Economy, 28, 6, 841-871.

Wilson, Norbert, 2010, "Examining the Effect of Certain Customs and Administrative Procedures on Trade" in OECD Trade Policy Studies, *Overcoming Border Bottlenecks: The Costs and Benefits of Trade Facilitation,* Paris: OECD Publishing.

World Bank (2006b), Reforming the Regulatory Procedures for Import and Export: Guide for Practitioners, Washington DC: World Bank.

World Bank (2014), Doing Business 2015. Going Beyond Efficiency, Washington DC: World Bank.

World Bank (2023) Connecting to Compete 2023: Trade Logistics in an Uncertain Global Economy, Washington D.C.

World Economic Forum (WEF) (2014), The Global Enabling Trade Report 2014, Geneva: WEF.

World Trade Organization (2015), World Trade Report 2015: Speeding up trade: benefits and challenges of implementing the WTO Trade Facilitation Agreement, Geneva.

Zaki, C. (2010). Does Trade Facilitation Matter in Bilateral Trade? Economic Research Forum, Working Papers 472.

Zaki, C. (2014). An empirical assessment of the trade facilitation initiative: Econometric evidence and global economic effects. World Trade Review, 13(1), 103-130. doi:10.1017/S1474745613000256.

MODEL FOR IMPLEMENTING GAMIFICATION IN HEIS

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ABSTRACT
The paper focuses on the topic of gamification in higher education, with specific emphasis on different models of gamification that can be utilized. Gamification in HEIs has been a prominent topic in recent years, with many researches outlining the benefits that can be achieved. However, to ensure a successful implementation, the general recommendation is to follow existing models which comprise from several phases. The research continues by presenting existing models for implementing gamification in education, which provide the foundation to build upon when introducing a new model focused solely on higher educational institutions, since existing ones are focused on broader educational levels, including primary, secondary and tertiary education. Since higher education has differentiating characteristics, it is necessary to propose a tailor-made solution that will address potential differences and challenges. The proposed model is based on three key principles: (1) the advancement of existing models, with the goal of overcoming their inherent limitations and serving as an improved successor; (2) the development of a clear and well-organized framework, tailored for educational institutions that are new to gamification, to ensure that it can be easily understood and implemented even by individuals who are unfamiliar with gamification concepts; and (3) a strategic emphasis on sustainability. In contrast to existing models that mainly depend on operational specifics that may be rendered outdated by technological progress, this particular model employs a strategic perspective, hence reducing the potential hazards associated with obsolescence.
Based on traditional project management methodologies, the model is composed of four primary phases, namely analysis, planning, implementation, and control. By setting a clear structure for implementation and strategic goals, the proposed model aligns with wider business implementations, hence enabling a smooth comprehension for individuals responsible for designing and implementing gamification solutions within the context of higher education. Further testing of the proposed model can be performed to evaluate its efficacy in HEIs in North Macedonia and broader regions.

Keywords: Gamification, HEI, Model, Implementation

JEL classification: I21, I23

THE BUSINESS OF AIR QUALITY: GLOBAL MARKETS AND LOCAL STAKEHOLDERS

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ABSTRACT
This work investigates the global market for air quality sensors and data representation. We analyzed a comprehensive sample of players in the air quality sensor market and included a representative set of 21 very different organizations in this study. The encompasses entities, from major players like Breezometer to smaller companies focusing on hyperlocal air quality data, such as Airly and AirScape, and non-profit and community-based entities. The primary purposes of these players are to provide data and sensors, promote environmental awareness, support environmental activism projects, and assist community and government initiatives.
Air quality is a pressing issue with significant health and economic consequences, including high child mortality rates. This study delves into the challenges posed by air pollution, both globally and locally, with a particular focus on the situation in North Macedonia, whose capital, Skopje, is Europe's most polluted city and consistently exceeds EU air quality limits. The hardware and software solutions market is poised for growth, requiring substantial investment to expand community-oriented air quality efforts.
The critical need for global and localized responses to air quality challenges could be addressed through network-economy approaches. A stakeholder network of environmental pioneers, companies, government organizations, and private sensor operators contributes to powerful data sources that track polluters down and analyze specific impacts. Like historical developments like sewers and clean water access, effective air quality management must become integral to our modern world, safeguarding public health and the environment.

1. THE PROBLEM OF CLEAN AIR

Air Quality is an important and underestimated problem that impacts everybody, especially children. "More than 5,800 children and teenagers in Europe and Central Asia died in 2019 from causes related to air pollution." (UNICEF, 2023). "The World Health Organization has estimated that around 4,000 premature deaths a year in North Macedonia may be due to air pollution." (Bateman, 2020).

Skopje, the most polluted city in Europe (UNEP, 2018), exceeds the EU annual limit value for PM 2.5 (Almeida et al., 2020). Mortality rates for North Macedonia are more than double compared to the European average mortality rate (36.3). They are more than six times higher when compared with the average mortality rate attributed to household and ambient air pollution (12.86) in the five largest economies in the EU (Germany, France, Italy, Spain, and the Netherlands).

"Air pollution is bad for business. Around 1.2 billion workdays are lost globally annually due to air pollution, which could reach 3.8 billion days by 2060. Employees breathing polluted air are likelier to get sick and experience reduced cognitive performance. In 2019, air pollution cost India's economy $95 billion due to reduced productivity, work absences, and premature deaths." according to the London-based Clean Air Fund. (Daly, 2022). The economic annual cost to Skopje is thought to be between €570 and €1470 million based on health-related issues and workforce attrition. The World Bank estimated that one-third of the country's graduates lived overseas." (Bateman, 2020)

Dominant anthropogenic sources of air pollution in Skopje include large and small-scale combustion, industrial processes, transportation, waste disposal, agriculture, and land-use change. In Skopje, residential wood combustion is probably the most significant air pollution source (FMI & MOEP, 2016; Mirakovski et al., 2020; Almeida et al., 2020) and, due to specific temporal distribution, the main driver of high wintertime pollution episodes. Biomass burning remains the largest single source of ambient air pollution.

However, other significant sources, especially fuel/residual oil burning, soil dust, and open fire burning, can and must be tackled in a much shorter time frame. Open-fire burning is among the sources with the most substantial contribution during the spring and early summer. Most pollutant concentrations in the Skopje Valley originate from local emissions and are exacerbated by the local topography. Along with poor atmospheric mixing conditions, this urban area typically displays an extremely homogeneous pollution field, both spatially and by component.

2. THE AIR QUALITY GLOBAL MARKET STUDY

As part of Project CleanBREATHE [1] (Batz et al., 2022), a multinational research initiative led by the German Magdeburg-Stendal University of Applied Sciences and the Ss. Cyril and Methodius University in Skopje, global businesses involved in air pollution were analyzed. The condensed analysis result includes over 20 entities in the air quality market, providing a representative cross-section of various organizations such as for-profit corporations, NGOs, community-based organizations, and government organizations and efforts. Their contributions were evaluated using a multidimensional matrix considering hardware, software, deployment models, data analysis, and representation factors. The wide-ranging business opportunities on a local and global scope show the diversity of the approaches taken by different companies and organizations.

The target audience for the research is the stakeholders in the industry as well as all activists involved in local initiatives to provide a sense of opportunity and urgency in creating scenarios to improve air quality. Over the last five years, the indoor air quality market has matured and received a significant boost from the COVID-19 pandemic as it addresses

controllable environments in residential and corporate spaces. Managing outdoor air quality requires collaborating with many more players, from industrial and communal polluters to influencers and public authorities, to create the insights and incentives to realize the direct and indirect economic benefits and take action.

Data were collected in September 2023 using primary and secondary data collection methods, including public databases by the Word Health Organization (WHO, 2022), company websites of hardware, software, and data providers, and business research reports by Stratview Research, (2023), Verified Market Research (2021), Fortune Business Insights (2022), Markets and Markets (2023). The study focused on the field of operation, relevant business model data, and the accessibility of their data through Apps and APIs (see Table 1). Business Websites such as Crunchbase [2], Zoominfo [3], and Apollo [4] provided background information about the companies.

The scientific interest focuses on the high diversity of the approaches in the products and services offered by different companies. What are the companies' business objectives, and how do they seek to accomplish them in regional and global markets? Based on previous research, we created a search profile that yields a representative cross-section of players in the industry. The initial goal to develop clear delineations and group the players into business, non-profit, governmental, and communal groups and to structure the representation based on hardware, software, databases, and conceptual efforts was challenged by the highly diverse approaches, products, and services offered. The analysis showed a high diversity in the courses taken with few overlapping models. The selected entities cover a wide range of concepts and software and hardware solutions.

The initial research of the organization was compiled on Google and LinkedIn and complemented by published and internal business reports. From the initial overview, 21 entries were selected to cover a wide range of fields of operations and business types. In addition to a description of their activities, the table shows three parameters that can provide a direct impact on community-driven efforts: does the organization offer a customer-facing mobile app, does the organization provide an API to their solution, and can they show a local or global map to track and monitor air quality.

Table 1: Global players in the air quality market (status: September 2023)

Company	Field of Operation	Business	App	API	map
Google/Breezometer **Israel, U.S.**	Providing environmental data via Google Maps. API, Consumer App; customized map development	Sold to Google for $200M; revenue 2022: $9M; 150% growth YOY–NASDAQ: GOOG; Alphabet Corp. market cap $1.7T	✓	✓	Map
IQAir / AirVisual/AirNow **Switzerland**	Global air quality map, AQI ranking, AirVisual Outdoor Sensor ($299); AirVisual App, API, professional sensors, industry and consumer filters, face masks; IQAir foundation for kids (global); air quality sensors for underrepresented communities	Private Company, HQ: Switzerland; founded 1963 in Germany; 500 Employees, 150 in China (2020) [Wikipedia] - IQAIr Calif: $38.1M revenue	✓	✓	Map
PlumeLabs (AccuWeather) **Paris, France**	Flow: handheld consumer air quality sensor: "spring of 2023, we made the tough decision to dedicate this knowledge, system, and tech to advancing research, raising awareness, and fostering action. As a result, Flow and Flow 2 are no longer for sale." Sold to AccuWeather in 2022 [Plumelabs]	Founded in France in 2014; raised $6.1M in 4 rounds, incl. a grant; most recent EASME - EU Executive Agency for SMEs and ODINE [Crunchbase].	✓	✓	Map
AirMatters **New Zealand**	service-based consultancy specializing in environmental air quality and workplace health exposure; Mobile App	founded 2011m revenue <$5M [Zoominfo]	✓		Map

Company	Field of Operation	Business	App	API	map
amber **India**	Weather and climate solutions for the industry; multiple APIs	Inc 2017 Datair Technology Private Limited [thecompanycheck.com/] 3 rounds $1.7M [Crunchbase]	✓	✓	
South Coast AQMD **So Calif, U.S.**	air pollution control agency for all of Orange County and major portions of Los Angeles, Riverside, and San Bernardino Counties	Gov't	✓		
Pulse Eco **North Macedonia, Switzerland**	network, DIY sensor kits, and crowdsourcing platform, which gathers and presents environmental data. Our network of sensor installations and other third-party sources gathers the data and translates them into visual information.	nonprofit, community	✓	✓	Map
Air Quality in North Macedonia	(Ministry of Environment and Physical Planning -. Public effort - free sensors and N.M. map and data analysis	Gov't			Map
AirScape (airlabs) **UK**	Real Time Street-level Air Quality Data developed in Camden, London: hyperlocal sensor network	$7M revenue p.a.; 22 employees [apollo.ai]			Map
Airly **London, UK, Kraków, Poland**	smart-city solution. Low-cost sensors. Used by>500 local authorities in over 40 countries. 5,000 sensors covering 40,000 active measurement points. Warsaw 165 sensors. [Techcrunch]	Corp -raises $8.8M since3/21- $7.4m revenue [Zoominfo]			Map
Sensor Community **Stuttgart, Germany**	Sensor.Community is a contributors-driven global sensor network that creates Open Environmental Data.	Nonprofit informal group - Open Knowledge Foundation Germany e.V.		✓	Map
Clarity Movement Co. **Berkeley, Calif. U.S.**	smart-city solution; open map; low cost ($1300) sensor - free w/ subscription	founded 2014 - investors: Kickstart Ventures, Amasia, Spero; Ser. A.: $16.7M in July 2022 [Crunchbase]			Map
Earthcare / Aircare **U.S., Germany, North Macedonia**	no map; data for insurances - focus on fire; AirCare is a product of Earthcare: global map; premium app, API	Corp	✓	✓	
EPA - US Environmental Protection Agency **U.S.**	Air Date: Air Quality Data Collected at Outdoor Monitors Across the U.S. For current air quality, visit https://AirNow.gov	Gov't			Map
AirNow **U.S.**	reports air quality using the official U.S. Air Quality Index (AQI), a partnership of the U.S. Environmental Protection Agency, NOAA, National Park Service, NASA, CDC, and tribal, state, and local air quality agencies	Gov't	✓	✓	Map
Purple Air **U.S., Utah**	PurpleAir makes sensors that empower Community Scientists who collect and share hyper-local air quality data with the public.	U.S. Corp, revenue $3.8M; 20 employees (2021) [konaequity.com]	✓	✓	Map
Zaedno za Promena (togehter for change) **North Macedonia**	Independent, socially involved cooperation to improve air quality in Macedonia.	NGO			
Breeze Technologies **Hamburg, Germany**	Breeze Technologies provides hyperlocal air quality and climate data through smart, affordable indoor and outdoor sensors and actionable environmental intelligence for corporates and cities. [datanyze.com]	founded 2015; $4.8M revenue; 15 employees (2022)		✓	Map
Spectro Technology **U.S.**	Hardware and Software for Wireless Geotechnical, Structural & Environmental Monitoring. – professional air quality handheld sensors	private corp revenue <$5M (Zoominfo)			
DRAXIS Environmental	Environmental ICT solutions - SmartCity; Envi4All app integrated into hackAIR [5]	private Greek company developing software	✓		

Company	Field of Operation	Business	App	API	map
Greece					
hackAIR - Collective awareness for air quality **Greece**	Open technology platform: information on air quality, thermal comfort and probability of forest fires in EU. Web app, mobile app; API; promotes "real feel" AQ perception; open HW sensors; open-air quality datasets.	EU Project 2017 funded via EU Horizon 2020 Grant # 688363. 2021 version funded via EU Horizon 2020 grant #. 820655	✓	✓	Map

Source: Authors' text

The analysis focuses on outdoor air quality measurement and data aggregation of anthropogenic sources of air pollution. Three objectives drive the Air Quality Sensor and Data Representation market:

- Providing data and sensors to industry players (B2B)
- Environmental citizen health and eco-activist awareness projects
- Community and government-driven efforts

Company sizes and revenues cannot be compared across the categories. Breezometer (sold to Google for $250M) and Fortune500 companies like Honeywell International Inc. (US) (NASDAQ: HON), Schneider Electric (F) (SBGSY), Haier Smart Home (China) (SSE: 600690) provide high-end equipment and data intelligence to industry players. Smaller companies focus on hyperlocal data collection and representation in communities. Installations by Airly in Kraków, Poland (Shu, 2022), (Onet, 2022), (Airly, 2023), by AirScape in Camden Town, London (Carey, 2022), by Breeze Technologies in the German towns of Hennef (VKU, 2019), and Neckarsulm (Baur, 2023), and Aircare in Skopje, North Macedonia (Bateman, 2020), define hyperlocal solutions provided by companies in close collaboration with communities.

Environmental pioneers operate in low-cost to no-cost not-for-profit environments to provide responsible tools for activists to engage citizens like HackAir [5], Zaedno za Promena [6], Sensor Community [7] Stuttgart since 2015, and Pulse Eco in Skopje [8]. Grants fund international organizations like UNDP and provide local and global air quality analysis. Government organizations like the US Environmental Protection Agency [9] or the German Umweltbundesamt [10] provide official data sources and air quality alerts.

Industry market reports see strong growth in the air quality sensor market. Stratview (2023) considers a CAGR of 8.6% in the air quality market in the B2B and B2C indoor segments as the global air quality sensor market is estimated to grow from USD 4.2 billion in 2020 to USD 6.8 billion by 2026. Markets and Markets (2023) predicts a CAGR of 7.0% from 2023 to 2028.

Significant investment will be necessary for community-oriented air-quality measurement and improvement beyond isolated local projects and enthusiast-driven efforts. Air quality management needs to become a relevant player today in the same dimension as sewers and clean water became widely available in the 19th century (De Feo et al., 2014).

3. SPECIFIC CHALLENGES IN NORTH MACEDONIA

High unemployment rates, political instability, corruption, and limited economic diversification hinder North Macedonia's development. Simultaneously, the nation grapples with significant air pollution problems, primarily driven by industrial emissions and inefficient heating systems. The economic implications are multifaceted, as healthcare costs surge due to pollution-related illnesses, reduced worker productivity impacts economic output, and concerns over air quality deter foreign investments. Furthermore, the brain drain issue, linked to financial struggles and the deteriorating quality of life caused by air pollution, exacerbates the talent and human capital drain. To address these intertwined challenges effectively, North Macedonia must pursue a comprehensive approach that includes economic diversification, cleaner technologies, urban

planning, and stricter environmental regulations, ultimately fostering sustainable development and improving citizens' well-being.

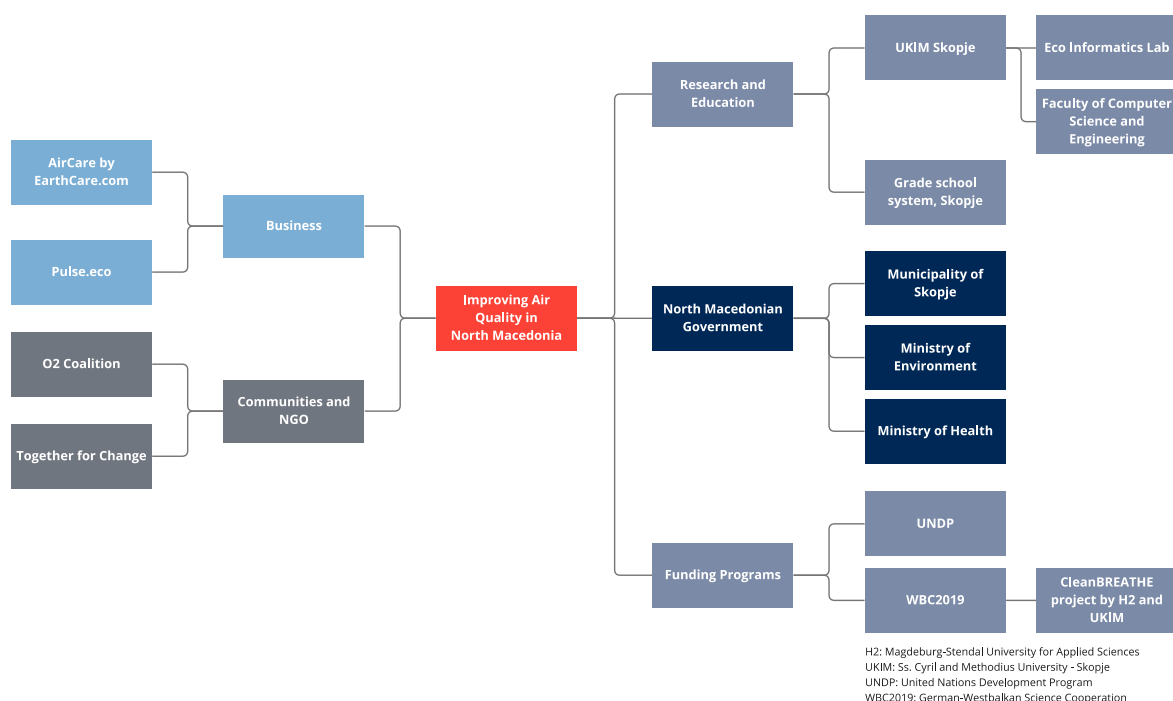## 4. MACEDONIAN AIR POLLUTION BUSINESS AND STAKEHOLDER ANALYSIS

Efforts to address the worsening air quality in Northern Macedonia and surrounding countries have resulted in significant international and local initiatives. From a business perspective, two key players are vital.

Pulse.Eco [8] is a crowdsourcing platform that collects and presents environmental data from its network of sensor installations and other third-party sources. This data is then transformed into visual and easy-to-understand information using the n-things platform [11], explicitly customized for Pulse.Eco.

On the other hand, AirCare utilizes open data from government and volunteer air quality sensors to map and visualize pollution in the Balkans and beyond. This system is highly relevant for monitoring air quality and pollution while raising public awareness. Since its launch in 2014, AirCare has been actively used (with over 100,000 Android downloads) and is particularly popular during high pollution months, demonstrating the public's interest in air quality data.

Two businesses alone will have little impact. Therefore, the work of other community organizations is essential. The O2 Coalition [12] is a civil initiative that strives to promote long-lasting environmental solutions and raise awareness among citizens and students about air pollution issues. Meanwhile, "Zaedno za Promena" [3] is a citizen movement that seeks to enhance living conditions in Macedonia, with a particular emphasis on air quality. They achieve this by distributing low-cost air quality sensors for free to citizens and local governments. As improving air quality is a societal effort, more players from research, education, government, and funding organizations must be included in the stakeholder map presented in Fig. 1.

Figure 1: Stakeholder Map Addressing Air Pollution in North Macedonia

H2: Magdeburg-Stendal University for Applied Sciences
UKIM: Ss. Cyril and Methodius University - Skopje
UNDP: United Nations Development Program
WBC2019: German-Westbalkan Science Cooperation

Source: Authors

Based on the literature on network economies, individual communities must find unique paths to combat air pollution, including companies and business opportunities. For example, Kraków, with a population of 780,000 residents, successfully reduced annual particulate mass concentrations through a program implemented from 2012 to 2020. Kraków's achievements were made possible through a €75M subsidy scheme encompassing various heating technologies and building modernization, resulting in the removal of 25,000 old heating units. Additionally, the city engaged its residents through open observatory maps, drone operations, thermal audits, and the imposition of fines for rule violations, demonstrating the power of localized efforts in mitigating air pollution (Jovanovska et al., 2023).

5. DEVELOPING A COHESIVE ECOSYSTEM

A cohesive ecosystem must emerge to combat air pollution, emphasizing collaboration and synergy among diverse stakeholders. Governments must set stringent environmental standards, encouraging industries to adopt sustainable practices. Concurrently, enterprises must partner with research institutions and innovate air pollution forecasting and detection technologies. Environmental organizations and NGOs need to foster public awareness, mobilize communities to participate in air pollution crowd sensing, support the development of open-air pollution data sets, and complement academic research and educational efforts. This synergy should be further propelled by technology innovators and startups developing advanced monitoring tools, aligning to mitigate air pollution.

Together, this collaborative ecosystem can manifest a shared commitment to fostering a sustainable environment, underscoring the significance of collective action in addressing the global challenge of air pollution and local-specific challenges.

Government bodies can generate revenue through fines imposed on non-compliant entities, including small and medium-sized enterprises, and taxes on emissions that incentivize adopting cleaner technologies. In addition, they already benefit from issuing environmental permits and certifications, promoting sustainable practices while creating a revenue stream.

Industries and corporations can establish revenue streams by selling eco-friendly products and services, supported by government incentives and subsidies for embracing sustainable practices. It is essential to mention the indirect benefit for the industry that can be identified by decreased migration of capable labor force.

Environmental organizations and NGOs rely on funding from grants and donations to support their environmental conservation and sustainability initiatives. They can also generate revenue through organizing educational events and providing consulting services related to environmental policy development and implementation.

Research institutions and academia secure revenue through research grants and partnerships, fostering technological transfer and licensing agreements related to pollution control and sustainable technologies. Hosting international conferences and seminars focused on environmental solutions further contributes to their revenue streams. Crowdfunding initiatives can provide financial support for community-led ecological projects and sustainability efforts.

Technology innovators and startups can establish revenue streams by selling or licensing advanced environmental technologies to industries and regulatory bodies. Funding from venture capitalists, private investors, and government grants further supports their growth and scalability in pursuing environmentally focused solutions.

This diverse range of revenue sources can ensure the sustained commitment of stakeholders in the ongoing battle against air pollution, laying the groundwork for a more sustainable and environmentally conscious future.

Initiating an ecosystem to combat air pollution demands a systematic approach grounded in academic principles and existing best practices. We believe that establishing such an ecosystem should include the following steps:

a) A comprehensive mapping of stakeholders, encompassing governmental bodies, academic institutions, industrial entities, non-governmental organizations, and community representatives, should be created (See Figure 1) to enable structured dialogues and establish a shared understanding of the challenges and a collective commitment to addressing air pollution.
b) Data collection and research to assess the current air quality state encompassing quantitative measurements of pollutants, their sources, and associated health and environmental impacts (Arsov, 2020). This type of research serves as a foundation for evidence-based policy formulation and targeted interventions.
c) Fostering interdisciplinary collaborations between academic research institutions and technology innovators to drive the development and deployment of state-of-the-art technologies for air quality monitoring, pollution control, and sustainable energy solutions. Emphasis should be given to integrating cutting-edge research findings into practical environmental management and mitigation applications.
d) Implementing community-based educational programs and awareness campaigns that leverage evidence-based research to inform and empower citizens about the detrimental effects of air pollution. Encourage active community participation in sustainable practices, fostering a culture of collective responsibility and engagement (Batz et al., 2022).
e) Developing a robust monitoring framework based on scientific methodologies, enabling systematic assessment of current air pollution.

We strongly believe we have addressed these steps within the CleanBREATHE project (Batz et al., 2022). However, to establish a functional ecosystem, more efforts should be realized, including:

a) Utilizing the insights derived from monitoring and evaluation to adapt and refine policies and interventions, ensuring continual improvement and progress toward sustainable air quality management.
b) Establishing strategic partnerships with governmental agencies, philanthropic organizations, and private sector stakeholders to secure funding for research projects, technology development, and community engagement initiatives. Establish a sustainable funding acquisition plan that aligns with the long-term goals of the ecosystem and emphasizes transparency and accountability in financial management.
c) Collaboration with regulatory authorities and policy experts to develop a comprehensive regulatory framework that aligns with international standards and best practices. Implementation mechanisms for effective policy enforcement and compliance monitoring, underpinned by systematic data collection and analysis.

6. CONCLUSION

Addressing the issue of air pollution on a global scale requires a diverse network of stakeholders and localized approaches. More than a one-size-fits-all solution will be required. It is essential to prioritize public data and deploy more sensors so companies and initiatives can work together to address the problem. Accessible data empowers citizens, policymakers, and researchers to make informed decisions and fosters stakeholder accountability.

The global Air Quality Sensor and Data Representation market serves three key objectives: B2B support, environmental awareness projects, and community/government initiatives. This market includes both industry giants and smaller hyperlocal-focused companies. Environmental pioneers and government agencies also contribute to data sources. The market is expected to grow at a CAGR of about 7%, but substantial investment is needed to expand community-oriented air quality initiatives. Most effective are not necessarily local companies but local projects and communal efforts working with international companies, as the successful projects in Kraków and Camden Town show. Like the historical development of sewers and clean water access, air quality management must become a prominent aspect of our modern world (De Feo et al., 2014). Developing successful implementations does not necessarily require local companies but should rely on providers showing best practices in their respective hardware and software fields. The case studies of the projects in Camden Town, London, and Kraków are other good examples of how a local project benefits from international collaboration.

REFERENCES

Airly (2023) "Air quality monitoring Airly – world's first urban network of sensors," accessible at https://airly.org/en/airly-worlds-first-urban-network-of-air-quality-sensors/. (Accessed 18 September 2023)

Almeida, S.M., Manousakas, M., Diapouli, E., Kertesz, Z., Samek, L., Hristova, E., Šega, K., Padilla Alvarez, R., Belis, C.A., Eleftheriadis, K. (2020), "Ambient particulate matter source apportionment using receptor modelling in European and Central Asia urban areas.",

Arsov, M., Zdravevski, E., Lameski, P., Corizzo, R., Koteli, N., Mitreski, K. and Trajkovik, V. (2020), "Short-term air pollution forecasting based on environmental factors and deep learning models," in 15th Conference on Computer Science and Information Systems (FedCSIS), Sofia, Bulgaria, 2020, pp. 15-22. https://annals-csis.org/proceedings/2020/drp/pdf/211.pdf,
doi: 10.15439/2020F211. (accessed 18 September 2023)

Bateman, J. (2020), "The young people fighting the worst smog in Europe," *BBC Future Planet*, available at: https://www.bbc.com/future/article/20200701-skopje-north-macedonia-the-most-polluted-city-in-europe (accessed 7 September 2023).

Batz, V., Lameski, P., A Herzog, M. and Trajkovikj, V. (2022), "Blended REsearch on Air pollution using TecHnical and Educational solutions-CleanBREATHE," in *ICT Innovations 2022 Web proceedings*, Springer (9) pp. 108-120, available at: https://proceedings.ictinnovations.org/authors/835/victoria-batz (accessed 12 September 2023)

Baur, T. (2023), "Neckarsulm: Sensormessungen für eine bessere Luft," *Tagesspiegel Background*, available at: https://background.tagesspiegel.de/smart-city/neckarsulm-sensormessungen-fuer-eine-bessere-luft, (accessed 19 September 2023).

Carey, C. (2022) "London borough launches hyper-local air quality sensor network," *Cities today, connecting the world's urban leaders*, available at: https://cities-today.com/london-borough-launches-hyper-local-air-quality-sensor-network/, (accessed 17 September 2023)

Daly, C. (2022) "How does air pollution affect businesses?" Clean Air Fund Blog 24. October 2022. https://www.cleanairfund.org/news-item/how-does-air-pollution-affect-businesses/ (accessed 21 September 2023)

De Feo, G., Antoniou, G., Fardin, H., El-Gohary, F., Zheng, X., Reklaityte, I., Butler, D., Yannopoulos, S. and Angelakis, A. (2014), "The Historical Development of Sewers

Worldwide." *Sustainability, Special Issue "Sustainability of Wastewater Treatment Processes and Management: Past, Present and Future"* 6(6), pp.3936–3974. https://doi.org/10.3390/su6063936. (accessed 19 September 2022)

Dimova Manchevska, A., Lemoin, I., Izotov, I. (2023) Behavioral change activities to reduce air pollution in Skopje. UNDP North Macedonia. https://www.undp.org/north-macedonia/blog/behavioral-change-activities-reduce-air-pollution-skopje (accessed 21 September 2023)

Environmental Pollution, Volume 266, Part 3, 2020, 115199, ISSN 0269-7491, https://doi.org/10.1016/j.envpol.2020.115199. (accessed 21 September 2023)

FMI & MOEP (2016) "Air quality improvement plan for Skopje agglomeration," Finish Meteorological Institute and Ministry of Environmental Planning, Macedonia, 2016. https://www.eeas.europa.eu/sites/default/files/activity_3.2_benchmark_3.2.1_skopje_air_quality_improvement_plan.pdf (accessed on 21 September 2023)

Fortune Business Insights (2022), "Air Quality Monitoring System Market Size, Share & COVID-19 Impact Analysis, By Type (Indoor Monitors and Outdoor Monitors) By End-User (Commercial & Residential, Public Infrastructure, Power Generation Plants, Pharmaceutical Industry, and Others), and Regional Forecast, 2021-2028," available at: https://www.fortunebusinessinsights.com/air-quality-monitoring-system-market-105614, (accessed 16 September 2023)

Jovanovska, E. M., Batz, V., Lameski, P., Zdravevski, E., Herzog, M. A., Trajkovik, V. (2023), "Methods for urban Air Pollution measurement and forecasting: Challenges, opportunities, and solutions," *MDPI Journal Atmosphere Vol. 14 (2023).*

Markets and Markets (2023), "Air Quality Monitoring System Market by Product (Indoor, Outdoor, Fixed, Portable, Wearable), Sampling, Pollutant (Chemical, Physical, Biological), End User (Govt, Petrochemical, Residential, Smart City), & Region – Global Forecast to 2028," Report AST 3795, July 2023, available at https://www.marketsandmarkets.com/Market-Reports/air-quality-monitoring-equipment-market-183784537.html, (accessed 7 August 2023).

Martinez, G. S., Spadaro, J. V., Chapizanis, D., Kendrovski, V., Kochubovski, M., & Mudu, P. (2018), "Health Impacts and Economic Costs of Air Pollution in the Metropolitan Area of Skopje," International journal of environmental research and public health, 15(4), 626. https://doi.org/10.3390/ijerph15040626. (accessed 7 September 2023)

Mirakovski, D., & Boev, B. (2020), "Urban air pollution in Skopje agglomeration – traffic vs. background case.", *Prilozi – Makedonska Akademija na Naukite i Umetnostite Oddelenie za Prirodno-Matematichki i Biotehnichki Nauki*, 41(1), 41-48. https://inis.iaea.org/search/search.aspx?orig_q=RN:52097664 (accessed 21 September 2023)

Onet (2022), "See what you breathe. Air quality report 2021, accessible at: https://oddychajpolsko.onet.pl/index_en.html, (accessed 16 September 2023)

Shu, C. (2022), "Airly fights air pollution with a network of affordable sensors," *Techcrunch* 9 November 2022, available at: https://techcrunch.com/2022/11/09/airly-fights-air-pollution-with-a-network-of-affordable-sensors/.

Stratview Research (2023), "Air Quality Sensors Market Size, Share, Growth & Forecast Analysis (2021 – 2026)". Market research Report. https://www.stratviewresearch.com/2611/Air-Quality-Sensors-Market.html. (accessed 17 September 2023)

UNEP (2018) "Putting the environment at the heart of people's lives," United Nations Environment Programme. Annual Report 2018. https://www.unep.org/resources/un-environment-2018-annual-report (accessed 21 September 2023)

UNICEF (2023) "UNICEF is calling on action for improved air quality to protect children's rights and wellbeing," https://www.unicef.org/northmacedonia/press-releases/unicef-calling-action-improved-air-quality-protect-child-rights-and-wellbeing. (accessed 7 September 2023)

Verified Market Research (2021), "Global Air Quality Sensor Market Size By Type, By Application, By Portability, By Geographic Scope And Forecast," Report ID: 61978, https://www.verifiedmarketresearch.com/product/air-quality-sensor-market, (accessed 16 September 2023)

VKU Kommunal Digital (2019), "Dicke Luft? Von wegen! Wie die Stadt Hennef ihre Luftdaten erhebt," available at: https://www.kommunaldigital.de/news/dicke-luft-von-wegen-wie-die-stadt-hennef-ihre-luftdaten-erhebt (accessed 19 September 2023).

WBC2019: German-Westbalkan Science Cooperation (2021). Press report in "Karliczek: Binding the Western Balkans even closer to the EU through joint research projects". In German.
https://www.bmbf.de/bmbf/shareddocs/pressemitteilungen/de/2021/10/281021-Westbalkan.html

WHO (2022) "World Health Organization Air quality database: Update 2022", https://www.who.int/data/gho/data/themes/air-pollution/who-air-quality-database/2022 (accessed 3 September 2022).

[1] https://cleanbreathe.eu
[2] https://crunchbase.com
[3] https://zoominfo.com
[4] https://apollo.ai
[5] https://www.hackair.eu/
[6] https://www.facebook.com/zaednozapromena
[7] https://sensor.community/en/
[8] https://pulse.eco/
[9] https://www.epa.gov/
[10] https://www.umweltbundesamt.de/
[11] https://n-things.com/
[12] https://www.facebook.com/o2inicijativa/

DETERMINANTS OF ONLINE IMPULSE BUYING BEHAVIOUR OF GENERATION Z - THE CASE OF NORTH MACEDONIA

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ABSTRACT

The phenomenon of impulse buying has been attracting the attention of researchers and practitioners worldwide for decades and it continues to attract attention in e-commerce domain in recent years. However, there are few studies on the determinants of online impulse buying behavior of young consumers especially in developing countries. Therefore, this study research aims to fill this gap and explore the influencing factors on young consumers' impulsive behaviour while online in North Macedonia. Followed by the accelerated growth of e-commerce in North Macedonia especially during and after pandemic, the interest on impulse buying behaviour of online consumers has increased from marketing and business perspective. This study examines the crucial factors impacting consumers online impulse buying behaviour based on the extended Technology Acceptance Model (TAM). A survey was conducted via an online questionnaire, among 151 young respondents from March to May 2023. Demographic data was collected as well as data considering shopping online habits and structure of goods/services shopped online. The basic constructs of the initial model, such as perceived ease of use, perceived usefulness, attitude towards use, were examined. Specific new constructs of interest were added in the research such as individual characteristics (impulsiveness) and environment mainly including website quality measured by several features in relation to impulse buying. The data analysis supports the presumption that personal tendency to buy on impulse is the most significant predictor of impulse buying intention online. The model developed in this study provides relevant theoretical and practical implications by confirming that some of the tested factors are critical in online impulsive buying behaviour of generation Z consumers in a developing country context. Findings can be instrumental in the context of web design and choice of products and/or services to be offered as items for impulse buyers in North Macedonia.

Key words: Consumer Behavior, E-commerce, Generation Z, Impulse Buying, North Macedonia

JEL classification: D12, D91, L81, O33

1. INTRODUCTION

Impulse buying behaviour as a specific type of shopping behaviour cannot be defined by one single widely accepted definition. However, most of the definitions are similar and contain the

same focal point – buying action (offline and online) that is not well considered. A very comprehensive review of the concepts and definitions of impulse buying can be found in the paper of Muruganantham and Bhakat (2013) and Iyer et al. (2020). In the earlier studies, the consumer and her personality qualities were not considered as a factor influencing spontaneous purchases. The classification of a purchase as planned or impulse began with the Stern's (1962) study where he provided the basics by dividing impulse buying behaviour as pure impulse buying, reminder impulse buying, suggestion impulse buying and planned impulse buying (the so-called impulse mix). Planned action involve time-consuming information-searching with rational decision making, whereas unplanned buying refers to all shopping decisions made without any advance planning. However, impulse buying is different from the unplanned buying in terms of very sudden decision making, a sudden, strong, and irresistible urge to buy. Researchers in the last 2-3 decades were focused on individual impulsivity by looking into the numerous behavioural characteristics of impulse purchase, as well. Prior to Rook's (1987) groundbreaking work, descriptions of impulse buying were mostly concerned with the product characteristics when predicting a purchase. According to Rook (1987), when buyers make an impulse purchase, they are overcome by an immediate, intense, and enduring desire. He defined the act of impulse buying as an unintentional, non-reflective reaction that happens quickly after being exposed to retail stimuli. He points out that "impulse buying occurs when consumers experience sudden, generally powerful and persistent urge to buy something immediately" (Rock, 1987). Authors Rook and Gardner (1993) state that impulse buying is an unexpected action characterized by hasty decision-making and a propensity for fast product acquisition.

Impulse buying has been studied from two key perspectives: the state of mind created by the shopping environment (Rook, 1987) or a specific personality trait inherent to the individual consumer (Rook and Fisher, 1995). Most of the researchers agree that impulse buying of the shopper is influenced by number of factors which could be either related to the shopping environment (web site quality in our research), shopper's personal traits, product itself and the diverse demographic and socio-cultural aspects. Various factors include advertising, product placement, peer pressure, limited time offers, and the consumer's mood or emotional state at the time of the purchase. The interaction effect of the factors is also important. The marketing and retail environments are tied to external stimuli. While the marketing environment consists of numerous sales and advertising activities, the retail environments comprise store size, atmosphere, design, and format. Internal stimuli are related to the various personality-related variables that define an individual. The internal cues and traits that an individual has that cause him or her to make impulse purchases are known as internal factors of impulse buying. Rook (1987) suggested that consumer impulsivity is a lifestyle which can be linked to materialism, sensation seeking, and recreational aspects of shopping. Hausman (2000) wrote that impulse buying is a hedonic need mainly influenced by achievement of higher order needs loosely grouped around Maslow's hierarchy of needs. Products that relate to an experience and have symbolic meanings are purchased impulsively because of emotional preferences of shoppers. Demographics (gender, age) and socio-cultural (income, education, religion) factors are studied as well and proven to be important.

It is expected that e-commerce will reach 25% of the total retail sales worldwide by 2026 (Atkins, 2023). Online impulse buying is the practice of making impulsive purchases through digital channels without much thought or care. Consumers are exposed to a wide range of goods and services because to the accessibility and ease of internet shopping, which might result in impulsive purchases. When a person is surfing websites, social media platforms, or online marketplaces, they may experience alluring product adverts, unique discounts, or persuasive

marketing strategies, which might lead to online impulsive buying. Impulsive buying is made easier by the simplicity of internet transactions, one-click purchases, and saved payment information. Additionally, internet merchants frequently use a variety of strategies like flash deals, limited time offers, or personalized recommendations based on browsing history. The emotional condition of the consumer, the need for rapid gratification, the joy of finding a great deal, the effect of online peer recommendations or influencers' advice and suggestions, and the simplicity of online pricing and product comparison are all factors pro-online impulsive buying. It's important to remember that internet shopping's convenience and the ability to research products beforehand by comparing costs and reading reviews can help consumers make better judgments, which lowers the probability of making impulsive purchases.

The Chan et al. (2017) paper provides a very thorough survey of the literature examining online impulse purchase. Existing studies of online impulse buying have consistently examined the connections between environmental cues, consumers' cognitive and affective reactions, and the resulting behaviour. They have largely referred to the environmental psychology paradigm, which is compatible with the S (which is a trigger that arouses consumers)-O (which is an internal evaluation of consumers)-R (which is an outcome of consumers' reaction) framework. The Stimulus-Organism-Response paradigm and a comprehensive analysis of studies on online impulse buying are used by the authors to pinpoint and categorize the variables influencing this behaviour. Elements of online convenience serve as stimuli, influencing consumers' cognitive and affective attitudes (organism) and resulting customers' online impulsive purchasing behaviour (response). The literature divides stimuli into two categories: object stimuli or external and social psychological stimuli, or internal. The external stimuli were website stimuli, marketing stimuli, and situational stimuli. The internal stimuli were inherent consumer characteristics. There are two types of organisms (O): cognitive and affective (emotional). Affective reactions are the emotional responses that arise when consumers interact with an environment (Wu and Ye, 2013). Cognitive reactions are the mental processes that occur when consumers interact with stimuli; they take place when consumers become aware of potential constraints during the online IB process (Parboteeah et al., 2009).

Based on this, the goal of this research is focused on the determinants of online impulse buying behaviour of generation Z in the country. More specifically this study examines the effect of perceived ease of use and convenience, perceived usefulness and added value, impulse buying tendency as internal factors and website quality as external factor on online impulse buying. The structure of the paper is as follows: after introduction, in Section 2 relevant literature review on the discussed topic is provided. Section 3 elaborates the model specification with detailed constructs description, hypothesis development and data. The detailed data analysis, and discussion of the results are presented in Section 4. The final remarks and conclusions, originality of the study, limitations of the research as well as future for research are presented in Section 5.

2. LITERATURE REVIEW

The review of the literature revealed that online impulse purchasing stimuli have both direct and indirect impacts on the response to online impulse buying. Online impulsive buying is the result of both customers' internal and responses to external stimuli (i.e., an indirect relationship). There are two main streams of research in the online impulse buying literature. The first stream of research focuses on the effect of website cues on online impulse buying such as value-added search mechanism, website characteristics etc. The second stream of research examines how offline impulse buying factors explain impulse buying behaviour in the online context. A comprehensive bibliometric review of scientific literature on online IBB can be found in Bashar

et al. (2022). Accordingly, online IBB is one of the most rapidly growing areas of research in online consumer behaviour study. Three major research streams were found and reviewed i.e.: a) online store characteristics; b) modelling of online impulse buying behaviour; c) factors influencing impulsive buying in online setup. In addition, it has been noted that social commerce as branch of e-commerce is growing which incorporates the use of social media in all kinds of commercial activities (Xiang *et al.*, 2016). Systematic literature review for online impulse buying behaviour via social media can be found in Abdelsalam et al (2020). As S-commerce is a novel phenomenon, its understanding is still limited and scattered. Therefore practitioners, information systems communities, and users of S-commerce need to understand the factors that can affect online IBB in S-commerce. Furthermore, to date, effort has not been made to consolidate IBB knowledge into the field of S-commerce.

How important in monetary terms is online impulse buying? According to a survey conducted in 2022, consumers in the United States spent an average of over 300 US dollars on impulse purchases each month, and approximately 84% of Americans have indulged in impulse buying at least once per three months (Saleh, 2022). Impulse purchases account for 40% of all the money spent on e-commerce and women (58%) are more likely to impulse buy than men (48%). Additionally, 64% of impulse shoppers purchase additional items along with their intended purchase. As published on statista.com, leading products that consumers bought on impulse in the United States in 2022, by product category are food/groceries (30 % of respondents), household items (29% of respondents), shoes (28% of respondents), technology (27% of respondents). When asked what the typical reasons to buy on impulse, the most mentioned reasons were: eenjoyment, loss aversion or thinking you've spotted a bargain, the need to stockpile, biased evaluation of use (Gitnuxblog, 2023).

What characteristics on impulse buyer has, how does a typical impulse buying persona look like? The statistics suggests that women are more likely to make impulsive purchases which could have implications for marketing strategies and consumer behaviour. 20% of all impulse purchases are made with a credit card, which can have serious financial implications if not managed responsibly. Stress may lead to an increase in impulse buying, with 67% of respondents admitting to making purchases when stressed. Impulse buying triggered by promotional messages generates an estimated $4.2 billion in annual revenue for retailers. It is important that 33% of impulse shopping occurs online and this statistic is important for businesses to consider when creating marketing strategies and understanding consumer behaviour (Gitnuxblog, 2023).

Several investigations have shown that over 50% of internet purchases are done on impulse (Zheng et al., 2019). Online impulse buyers are more likely to abandon their cart if checkout takes too long (74%). This statistic emphasizes the need of expediting the checkout process for online impulse purchasers. If the checkout procedure is overly lengthy, this can be a severe disincentive for these customers, resulting in a large loss of prospective purchases. 77% of impulse purchases are physical goods, with clothing, shoes, and accessories being the top categories. 20-30% of impulse buying is influenced by social media. It demonstrates that a sizable number of impulsive purchases are motivated by what users view on social media. Shipping charges contribute to 23% of cart abandonment for online impulse buyers, the cost of shipping can be a major factor in whether they complete their purchase. This is an important insight for businesses to consider when setting their shipping policies, as it could mean the difference between a successful sale and a lost customer (Gitnuxblog, 2023).

3.   RESEARCH BACKGROUND
3.1. Research model and hypothesis development
There are many determinants that impact consumers' impulse buying behaviour. A variety of studies focus on these determinants in traditional retailing and fewer studies examine the determinants effective on online impulse buying (Wu et.al., 2016). These factors can be internal or external in nature (Dwita, 2019). This study examines the effect of perceived ease of use and convenience, perceived usefulness and added value, impulse buying tendency as internal factors and website quality as external factor on online impulse buying.

Perceived ease of use and perceived usefulness - Technology Acceptance Model (TAM) introduced by Davis in 1986 aims to explain the general determinants of computer acceptance that lead to explaining users' behaviour across a broad range of end-user computing technologies and user populations. The basic TAM model included and tested two specific beliefs that Perceived Usefulness (PU) and Perceived Ease of Use (PEU) of the technology as two key factors that influence the individual's attitude toward using the technology. Perceived Usefulness is defined as the potential user's subjective likelihood that the use of a certain system (e.g: e-commerce systems – platforms, apps, websites, social media etc.) will improve his/her action/performance, while perceived ease of use refers to the belief that using the technology will not take too much effort (Davis, 1989). The final version of TAM was formed by Venkatesh and Davis (1996), after the main finding of both perceived usefulness and perceived ease of use were found to have a direct influence on behaviour intention, thus eliminating the need for the attitude construct. Perceived ease of use of a system is considered to influence perceived usefulness of technology. Both perceived ease of use and perceived usefulness have effects on the use of technology.

Online Convenience - More and more consumers are turning to internet shopping for its convenience since they have less time to devote to shopping and more time to pursue other interests (Shaqman et al., 2022). One of the primary motivators driving impulsive consumer buying is online convenience (Gulfraz et al., 2022). Convenience creates competitive advantage for online retailers and consumers are willing to pay for it (Jones, 2020). Online shopping convenience refers to customers' perceived expenditure of time and effort in conducting online shopping and has been one of the principal promoters of customer's predisposition to adopt online purchasing (Jiang et al., 2013) The convenience of shopping apps can trigger the impulse buying intention by promoting the arousal emotions of consumers (Uddin, 2022). Therefore, it is necessary to understand the relationship between online convenience and impulsive buying to understand the consumer base and the e-commerce business. Academic research on online convenience as a stimulus for impulsive online shopping is rare, despite its expanding importance in consumer behaviour. Some of the recent and relevant studies exploring the importance of online convenience in impulse buying are Jiang et al., 2013; Duarte et al., 2018; Shankar, 2021.

Perceived Added value - Perceived value is widely used to predict users' adoption behaviour (Zhang et.al., 2022). E-consumer tends to have the intention to consume products and services in which he or she perceives added value in the exchange process (de Souza and Baldanza, 2018). The adoption of perceived value is determined by a ratio between the perceived benefits and the sacrifices required when using some technology or innovation (Dodds et al., 1991). The perceived value theory was first proposed by Zeithaml in 1988. Zeithaml (1988) argued that some consumers perceive value when there is a low price, others perceive value when there is a balance between quality and price. Thus, for different consumers, the components of perceived value might be differentially weighted. From the perspective of customers, other scholars believe that perceived value is a decision made by customers comprehensively in many aspects, thus

perceived value includes five dimensions of social, emotional, functional, knowledge and situation, among which functional dimension is the most important in customers' purchasing behaviour (Yang et al., 2021). The improvement of perceived value can lead to higher impulsive purchase intention (Wang, 2022). The higher the perceived value, the higher the impulse buying intention was also confirmed in the research of Liang, 2011.

Impulse buying tendency - Conceptualized as buying impulsiveness, impulsive buying tendency is defined as a consumer's tendency to buy spontaneously, unreflectively, immediately, and kinetically. Though sometimes used synonymously, impulsive buying tendency, a precursor variable, is different from impulsive buying behaviour, as the former captures a relatively enduring consumer trait that produces urges or motivations for the latter (Zhang et al, 2007). This manifestation of general impulsiveness called impulsive buying tendency (Sharma et al, 2010) has been found to have a definite positive relationship with impulsive buying behaviour (Flight et al, 2012, Foroughi et al, 2013) in online shopping as well (Zhang and Shi,2022). It means that the higher the impulse buying tendency of an individual is, the (positive) impact on impulse buying behaviour is stronger. Impulsive buying behaviour is better understood by examining the impulsive buying tendency that shapes such behaviour (Badgaiyan et al., 2016).

Web site quality - Website quality refers to the overall excellence, effectiveness, and usability of a website. Website quality influence consumers' perceptions of product quality, and affect online purchase intentions (Sun, Chen, and Huang, 2014) and even continuation intentions (Chawla et al., 2015). A website can be viewed as an information technology (Gefen et al. 2003), thus online purchase intentions can be explained in part by the TAM. The website quality as well positively affects the online impulse buying behaviour (Akram et.al., 2018).

Based on the discussion above, the theoretical framework used in this research is a combination of the existing information available in the literature on impulse buying behaviour and new insights regarding the impulse buying behaviour in online context explained in previous sections. With this study, we contribute literature by testing the basic TAM constructs and extending the research on the positive and negative effects of perceived convenience, perceived added value, impulse buying tendency and website quality on online impulse buying of young people (z-gen) with four hypothetical relationships on behavioural intention. The proposed model is presented in Figure 1.

3.2.   Data

This study employs a quantitative research design, and a questionnaire was developed to be the instrument for data collection. The questionnaire was distributed by using electronic survey via Google Form (during March to May 2023). The population of interest in this research are generation Z consumers recognised as very representative sample of today's online population in the country. According to State Statistics Office (2023), in North Macedonia almost all 98.8 per cent of youth 15-24 years use the internet every day. Generation Z are true digital natives, they have been exposed to the internet, social networks, and mobile systems from earliest youth. They can be described as generation very eager and comfortable with different digital technologies and with "almost natural" online experiences. Younger consumers are more prone to making impulse purchases for different reasons including personalised recommendations from their online community, flexible payment methods. The fast desire of new items especially technology and fashion products is also recognised as important factor for any activities which generation Z undertakes both online and offline. Available statistics show that 41% of Generation Z consumers are impulse buyers, followed by Millennials at 34%, and Generation X at 32%, since they desire

newest items at a greater speed (Lina, 2022, Djafarova, 2021). Generation Z consumers are more persuasive while making purchases (Lee et al., 2022) and they want new products faster (Agrawal, 2022). Djafarova and Bowes. (2021) also argue that impulsive shopping behaviour indeed can be triggered in people belonging to the Generation Z. Generation Z are highly cognizant when they make purchases online (Tiwari and Joshi, 2020) and have superior characteristics regarding intuitively navigation online (Tiwari and Joshi, 2020).

Regarding the structure of the questionnaire, it consists of six parts. The questions in the first part refer to the demographic characteristics of the sample. All other parts comprise questions regarding the factors that define our research model; for which we assume influence the impulse buying behaviour of e-shoppers. A five-point Likert scale was included with level of agreement.

4. RESULTS AND DISCUSSION

To reach a better understanding of the respondents, the first part of the analysis was to examine their demographic data and shopping preferences. Total number of respondents was 151, which are predominantly female (66.9%) that reside in Skopje (61.4%), with mobile phone as primary device for internet access (86.6%), that mostly shop online once a month (38.9%) and spend more than 1000 denars (50.4%). When asked how often they purchase impulsively in a physical store, the results were distributed as follows: once a month (26%.0), once a week (25.2%), and several times a week (21.3%), while other options (every day, rarely or never) were included with lesser percentages.

The next step was to define the model with its constructs and hypotheses. Its graphical representation is shown in Figure 1. There are five constructs included in the model.

Figure 1: Model for online impulse buying.
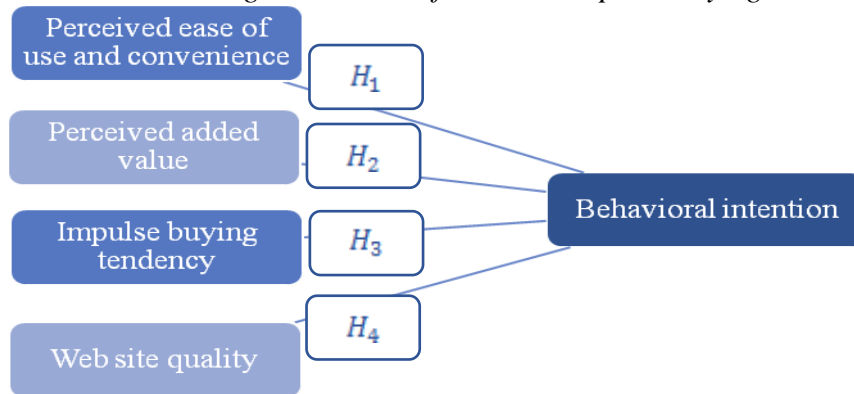
(Source: Authors representation)

All constructs are tested for their reliability using Cronbach's alpha as a measure of internal consistency of a set of test items. Cronbach's alpha can be defined as:

$$\alpha = \frac{k \times \bar{c}}{\bar{v} + (k-1)\bar{c}}$$

Where k refers to the number of scale items, $\bar{c}$ refers to the average of all covariances between items and $\bar{v}$ refers to the average variance of each item. Cronbach α is a function of the number of items, average covariance between pairs, and the variance of the total score (Goforth, 2015).

The calculated Cronbach's alpha coefficients are presented in Table 1. Behavioral intention is a construct with the highest value of Cronbach's alpha of 0.908, meaning that the included four

items have high covariances, where most of them share their covariances and probably measure the same underlying concept. This is a good result since this construct refers to the dependent variable. Other constructs including Perceived ease of use and convenience (0.659), Perceived added value (0.652) and Impulse buying tendency (0.857) have satisfactory values of Cronbach's alpha (presented in brackets). Many methodologists recommend a minimum value between 0.65 and 0.8 (or higher) to have strong construct validity. Web site quality remains the only construct with Cronbach's alpha less than 0.6 (0.527), which may question the consistency of the construct, even though the standards of what makes a "good" measure of reliability are entirely arbitrary and depend on the theoretical knowledge of the scale in question (Goforth, 2015). Authors decide to test Web site quality on the Behavioral intention and interpret the given results with caution.

After the constructs are defined and tested for their reliability, the next step is to define the hypotheses. The model has four hypotheses that are defined as follows:

- ➢ H_1 - There is a positive and significant relationship between Perceived Ease of Use and Convenience and Behavioral intention/attitude.
- ➢ H_2 - There is a positive and significant relationship between Perceived Added Value and Behavioral intention/attitude.

Table 1: Scale reliabilities for defined variables

CONSTRUCT (VARIABLE) - CRONBACH'S α	
PERCEIVED EASE OF USE AND CONVENIENCE	0.659
PERCEIVED ADDED VALUE	0.652
IMPULSE BUYING TENDENCY	0.857
WEB SITE QUALITY	0.527
BEHAVIOURAL INTENTION/ATTITUDE	0.908

(Source: Authors calculations based on survey data)

- ➢ H_3 - There is a positive and significant relationship between Impulse Buying Tendency and Behavioral intention/attitude (*individuals with high impulsiveness will experience a stronger urge to buy impulsively compared to individuals with low impulsiveness*).
- ➢ H_4 - There is a positive and significant relationship between Website Quality and Behavioral intention/attitude (*perceptions of high website quality will stimulate a stronger urge to buy impulsively compared to perceptions of low website quality*).

Single linear regression analysis is used for testing the hypotheses. Estimated coefficients and other regression results are presented in Table 2:

Table 2: Single regression models for analysed variables.

Predictor	Coef.	Std. Error	t-stat.	Sign.	R	Durbin-Watson
Perceived ease of use and convenience	-0.075	0.180	-0.418	0.677	0.037	2.115
Perceived added value	0.153	0.165	0.925	0.357	0.082	2.092
Impulse buying tendency	0.913	0.089	10.248	0.000***	0.676	2.025
Web site quality	0.369	0.142	2.596	0.011**	0.226	2.029

***Coefficient is significant at 0.01 level; **Coefficient is significant at 0.05 level

(Source: Authors calculations based on survey data)

According to the given results Impulse buying tendency has a positive and statistically significant relationship with impulsive buying behavior. This relationship has been established is similar previous research (Flight et al, 2012, Foroughi et al, 2013). Some people, more than other, seem to be more inclined to the impulse buying – they are strongly stimulated by the design of the site, do not tend to care about the price, or plan the purchase ahead. Usually, they tend to regret the decision, or ignore the consequences of buying. One interesting notion that can explain this type of behaviour is the well-established connection between the impulsive buying and dopamine (neurotransmitter that plays a crucial role in the brain's reward and pleasure system). Research on this topic can be found in Knutson et al. (2007), Sescousse et al. (2013), Breiter et al. (2001). When a person makes an impulsive purchase the brain's reward circuitry is activated and starts to release dopamine which creates a sense of pleasure and reinforces the behavior. This explains, to some extent, why some people are more prone to impulsive buying. Of course, there are other factors, sociological, psychological, or environmental, that contribute to this behavior.

Web site quality is the second factor that influences and stimulates impulsive buying. Pleasing design, easy interaction, user-friendly and safe web site can stimulate the customer's IBB.

Constructs defined as Perceived ease of use and convenience and Perceived added value do not have a statistically significant influence on the impulsive buying. The descriptive statistics presented in Table 3 show that these two constructs have high mean value.

(Table 3: Descriptive statistics for the created constructs)

Variable	Mean	Standard deviation	Skewness	Kurtosis
Perceived ease of use and convenience	4.081	0.566	-0.698	1.323
Perceived added value	3.663	0.615	0.270	-0.305
Impulse buying tendency	2.859	0.843	0.458	0.125
Web site quality	3.731	0.70	-0.107	-0.548
Behavioural intention	2.450	1.139	0.417	-0.794

(Source: Authors calculations based on survey data)

After analyzing the questions, responses and mean values of the constructs, the respondents seem to have positive attitude towards online shopping in general, thus the high average values for Perceived ease of use and convenience and Perceived added value. On the other hand, average values for constructs such as Impulse buying tendency and Behavioral intention are below 3, that reflect certain aversion towards impulsive purchases. This may lead to a conclusion that the young consumers, also known as generation Z, which are predominantly adolescents or younger, do not have the luxury of impulsive purchases since they are financially dependent, and they have yet to start earning their income. This can be considered in further research where economic factors should be part of the general model.

5. CONCLUSION

Impulse buying behaviour is specific and very complex phenomenon and can be analysed from different perspectives due to various factors that are affecting it. To better understand consumer behaviour in online impulse buying, this study proposes a theoretical model with several determinants of online IBB. More specifically this study examines the effect of perceived ease of use and convenience, perceived added value and usefulness, impulse buying tendency as internal factors and website quality as external factor on online impulse buying of generation Z. Generation Z are highly cognizant when they make purchases online and have superior

characteristics regarding intuitively navigation in the online environment. They are also recognised to be more prone to online purchases in comparison to millennials, generation X and older population. This analysis examines the effects of potential determinants in online impulse buying by application of several statistical techniques: survey, descriptive statistics, reliability analysis and linear regression model. Constructs defined as Perceived ease of use and convenience and Perceived added value and usefulness, do not have a statistically significant influence on the impulsive buying. This can be explained since generation Z are true digital natives and they have been exposed to the internet, social networks, and mobile systems from earliest youth. They can be described as generation very eager and comfortable with different digital technologies and with "almost natural" online experiences. Due to this, factors like perceived ease of use and convenience and perceived added value and usefulness of a new technology can be considered as negligible factors for young people. Personal characteristics of generation Z and their tendency to buy on impulse as well as website quality are important predictors to online IBB. Generation Z customers have different motivations that leads to impulse buying behaviour in e-commerce. Research findings suggest that, beside individual characteristics of e-shoppers, environmental factors like website quality/design and product type to be offered online (like products that create image or social status, fashion trends etc.) are important regarding the age and economic (purchasing) power of generation Z consumers in the country. Study results provide some managerial implications for online sellers to increase generation Z impulse buying behaviour in virtual stores. The originality of this study is reflected in the introduction and confirmation of the importance of new constructs like individual characteristic i.e. impulse buying tendency - impulsiveness as well as website design i.e. website quality. This paper addressed a smaller set of potential determinants of online impulse buying behaviour, mostly focusing on impulse buying tendency and website quality. In the future, the model could be complemented with other determinants that are found to be relevant in the existing literature, such as personality traits, psychological factors, economic factors etc. Regarding the results, the authors underline the limitation of generalization of the results of this research since it uses a smaller sample. With larger samples, it is possible to analyse the moderating effect of demographic factors i.e. variables related to gender, age, social status, economic power, cultural differences of the respondents could be some of the possibilities.

REFERENCES
Abdelsalam, S., Salim, N., Alias, R.A. and Husain, O. (2020), "Understanding online impulse buying behavior in social commerce: a systematic literature review". *IEEE Access*, Vol. 8, pp.89041-89058.

Agrawal, D. K. (2022), "Determining behavioural differences of Y and Z generational cohorts in online shopping", *International Journal of Retail & Distribution Management*, Vol. 50 No. 7, pp.880-895.

Akram, U., Hui, P., Kaleem Khan, M., Tanveer, Y., Mehmood, K. and Ahmad, W. (2018), "How website quality affects online impulse buying: Moderating effects of sales promotion and credit card use". *Asia Pacific Journal of Marketing and Logistics*, Vol. 30 No. 1, pp.235-256.

Atkins, D. (2023), "Ecommerce Market Share Statistics and Analysis of Growth Trends", Available at https://influencermarketinghub.com/ecommerce-market-share-statistics/ (accessed 20.06.2023)

Azizah, F.D. and Nur, A.N. (2022), "Technology Acceptance Model in Supporting the Tendency to Use Applications and Impulsive Buying on Purchase Decisions", *Golden Ratio of Mapping Idea and Literature Format*, Vol. *2* No. 1, pp.52-64.

Badgaiyan, A.J., Verma, A. and Dixit, S. (2016), "Impulsive buying tendency: Measuring important relationships with a new perspective and an indigenous scale". *IIMB Management Review*, Vol. 28 No. 4, pp.186-199.

Bashar, A., Singh, S. and Pathak, V.K. (2022), "A bibliometric review of online impulse buying behaviour". *International Journal of Electronic Business*, Vol. 17 No. 2, pp.162-183.

Breiter, H. C., Aharon, I., Kahneman, D., Dale, A., & Shizgal, P. (2001), "Functional imaging of neural responses to expectancy and experience of monetary gains and losses". *Neuron*, Vol. 30 No. 2, pp.619-639.

Chan, T.K., Cheung, C.M. and Lee, Z.W. (2017), "The state of online impulse-buying research: A literature analysis". *Information & Management*, Vol. 54 No. 2, pp.204-217.

Chawla, M., Khan, M.N. and Pandey, A. (2015), "Online buying behaviour: A brief review and update". *Journal of Management and Research*, Vol. 9 No. 2/4.

Davis, F. D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology". *MIS Quarterly*, Vol. 13 No. 3, pp. 319-340.

de Souza, D.E.S. and Baldanza, R.F. (2018), "The e-consumer in light of the perceived value theory: a study on the acceptance of mobile commerce". *Base Revista de Administração e Contabilidade da UNISINOS*, Vol. 15 No. 3, pp.238-253.

Djafarova, E., and Bowes, T. (2021), "Instagram made Me buy it': Generation Z impulse purchases in fashion industry". *Journal of retailing and consumer services*, Vol. 59, p.102345.

Dodds, W.B. (1991), "In search of value: How price and store name information influence buyers′ product perceptions". *Journal of Consumer Marketing*, Vol. 8 No. 2, pp.15-24.

Duarte, P., e Silva, S.C. and Ferreira, M.B. (2018), "How convenient is it? Delivering online shopping convenience to enhance customer satisfaction and encourage e-WOM". *Journal of Retailing and Consumer Services*, Vol. 44, pp.161-169.

Dwita, V. (2019), "The Influence Factors of Impulse Buying Online Behavior". In *Third Padang International Conference On Economics Education, Economics, Business and Management, Accounting and Entrepreneurship (PICEEBA 2019)* (pp. 112-117). Atlantis Press.

Flight, R.L., Rountree, M.M. and Beatty, S.E. (2012), "Feeling the urge: Affect in impulsive and compulsive buying". *Journal of Marketing Theory and Practice*, Vol. 20 No. 4, pp.453-466

Foroughi, A., Buang, N.A., Senik, Z.C. and Hajmisadeghi, R.S. (2013), "Impulse buying behavior and moderating role of gender among Iranian shoppers". *Journal of Basic and Applied Scientific Research*, Vol. 3 No. 4, pp.760-769.

Gitnuxblog, 2023. The Most Surprising Impulse Buying Statistics And Trends in 2023, available at https://blog.gitnux.com (accessed 18.6.2023)

Goforth, C. (2015), "Using and Interpreting Cronbach's Alpha". University of Virginia Library, Research Data Services + Sciences, available at: https://data.library.virginia.edu/using-and-interpreting-cronbachs-alpha/ (accessed 10.7.2023)

Gulfraz, M.B., Sufyan, M., Mustak, M., Salminen, J. and Srivastava, D.K. (2022), "Understanding the impact of online customers' shopping experience on online impulsive buying: A study on two leading E-commerce platforms". *Journal of Retailing and Consumer Services*, Vol. 68, p.103000.

Hausman, A. (2000), "A multi-method investigation of consumer motivations in impulse buying behavior". *Journal of consumer marketing*, Vol. 17 No. 5, pp.403-426.

Iyer, G.R., Blut, M., Xiao, S.H. and Grewal, D. (2020), "Impulse buying: a meta-analytic review". *Journal of the academy of marketing science*, Vol. 48, pp.384-404.

Jiang, L.A., Yang, Z. and Jun, M. (2013), "Measuring consumer perceptions of online shopping convenience". *Journal of Service management*, Vol. 24 No. 2, pp.191-214.

Jones, S. (2020), "Convenience is a Competitive Advantage, and Consumers Are Willing to Pay for It", available at: https://luxurysociety.com (accessed 01.05.2023)

Knutson, B., Rick, S., Wimmer, G. E., Prelec, D., & Loewenstein, G. (2007)," Neural predictors of purchases". *Neuron*, Vol. 53 No. 1, pp.147-156.

Lee, Y. Y., Gan, C. L., and Liew, T. W. (2023), "Do E-wallets trigger impulse purchases? An analysis of Malaysian Gen-Y and Gen-Z consumers". *Journal of Marketing Analytics*, Vol. 11 No. 2, pp.244-261.

Liang, Y.P., (2011), "The relationship between consumer experience, perceived value and impulsive buying behavior". In *2011 IEEE International Summer Conference of Asia Pacific Business Innovation and Technology Management*, pp. 231-234.

Lina, Y., Hou, D., and Ali, S. (2022), "Impact of online convenience on generation Z online impulsive buying behavior: The moderating role of social media celebrity". *Frontiers in Psychology*, Vol. 13, p.951249.

Muruganantham, G. and Bhakat, R.S., (2013), "A review of impulse buying behavior". *International journal of marketing studies*, Vol. 5 No. 3, p.149.

Parboteeah, D.V., Valacich, J.S. and Wells, J.D., (2009), "The influence of website characteristics on a consumer's urge to buy impulsively". *Information systems research*, Vol. 20 No. 1, pp.60-78.

Rahman, M.F. and Hossain, M.S. (2023), "The impact of website quality on online compulsive buying behavior: evidence from online shopping organizations". *South Asian Journal of Marketing*, Vol. 4 No. 1, pp. 1-16.

Redine, A., Deshpande, S., Jebarajakirthy, C. and Surachartkumtonkun, J. (2023), "Impulse buying: A systematic literature review and future research directions". *International Journal of Consumer Studies*, Vol. 47 No.1, pp.3-41.

Rook, D.W. and Fisher, R.J., (1995), "Normative influences on impulsive buying behavior". *Journal of consumer research*, Vol. 22 No. 3, pp.305-313.

Rook, D.W. and Gardner, M.P., (1993), "In the mood: Impulse buying's affective antecedents". *Research in consumer behavior*, Vol. 6 No. 7, pp.1-28.

Rook, D.W., (1987). "The buying impulse". *Journal of consumer research*, Vol. 14 No. 2, pp.189-199.

Saleh, K., (2022), "The state of impulse buying persona–statistics and trends". *Invesp. Available at* https://www.invespcro.com/blog/impulse-buying/ (accessed 05 May 2023)

Sescousse, G., Caldu, X., Segura, B., & Dreher, J. C. (2013), "Processing of primary and secondary rewards: A quantitative meta-analysis and review of human functional neuroimaging studies". *Neuroscience & Biobehavioral Reviews*, Vol. 37 No. 4, pp.681-696.

Shankar, A. (2021), "How does convenience drive consumers' webrooming intention?" *International Journal of Bank Marketing*, Vol. 39 No. 2, pp.312-336.

Shaqman, N., Hashim, N.H. and Yahya, W.K. (2022), "Influence of utilitarian shopping value, personal innovativeness and electronic word of mouth on Mobile shopping: a conceptual framework". *Asian Journal of Research in Business and Management*, Vol. 4 No. 1, pp.52-63.

Sheth, J. N., Newman, B. I., & Gross, B. L. (1991), "Why we buy what we buy: A theory of consumption values". *Journal of business research*, Vol. 22 No. 2, pp.159-170.

Statista. (2023), "Impulse purchase spending in the U.S. (2022)", available at: https://www.statista.com/ (accessed 25 June 2023),

Stern, H., (1962), "The signficance of buying impulse Today". *Journal of Maketing*, Vol. 26 No. 2, pp.59-62.

Tiwari, P., & Joshi, H. (2020), "Factors influencing online purchase intention towards online shopping of Gen Z". *International Journal of Business Competition and Growth*, Vol. 7 No. 2, pp.175-187.

Uddin, F., (2022), "Influence of Online Shopping Apps on Impulsive Buying", available at https://www.linkedin.com/pulse/influence-online-shopping-apps-impulsive-buying, (accessed on 01.06.2023)

Venkatesh, V. and Davis, F. (2000), "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies". *Management Science,* Vol. 46 No. 2, pp. 186-204.

Wang, Y. (2022), "The Impacts of Customer Perceived Value on Impulse Purchase Intention: Evidence from China". In *2022 7th International Conference on Social Sciences and Economic Development (ICSSED 2022)* (pp. 290-296), Atlantis Press.

Wu, L., Chen, Uddin K.W. and Chiu, M.L. (2016), "Defining key drivers of online impulse purchasing: A perspective of both impulse shoppers and system users". *International Journal of Information Management*, Vol. 36 No. 3, pp.284-296.

Wu, Y.L. and Ye, Y.S. (2013), "Understanding impulsive buying behavior in mobile commerce". In Pacific Asia Conference on Information Systems (PACIS). 2013. Jeju, South Korea, p. 142.

Xiang, L., Zheng, X., Lee, M.K. and Zhao, D., (2016), "Exploring consumers' impulse buying behavior on social commerce platform: The role of parasocial interaction". *International journal of information management*, Vol. 36 No. 3, pp.333-347.

Yang, F., Tang, J., Men, J. and Zheng, X., (2021), "Consumer perceived value and impulse buying behavior on mobile commerce: The moderating effect of social influence". *Journal of Retailing and Consumer Services*, Vol. 63, p.102683.

Zeithaml, V.A., (1988), "Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence". *Journal of marketing*, Vol. 52 No. 3, pp.2-22.

Zhang, M. and Shi, G. (2022), "Consumers' impulsive buying behavior in online shopping based on the influence of social presence". *Computational Intelligence and Neuroscience*, *2022*.

Zhang, Z., Zhang, N. and Wang, J., (2022), "The influencing factors on impulse buying behavior of consumers under the mode of hunger marketing in live commerce". *Sustainability*, Vol. 14 No. 4, p.2122.

Zhao, Y., Li, Y., Wang, N., Zhou, R. and Luo, X. (2022), "A meta-analysis of online impulsive buying and the moderating effect of economic development level". *Information Systems Frontiers*, Vol. 24 No. 5, pp.1667-1688.

Zheng, X., Men, J., Yang, F. and Gong, X., (2019), "Understanding impulse buying in mobile commerce: An investigation into hedonic and utilitarian browsing". *International Journal of Information Management*, Vol. 48, pp.151-160.

Research-in-progress

INCOME MOBILITY AND MIXING IN NORTH MACEDONIA

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ABSTRACT
This study presents the inaugural analysis of income mobility in North Macedonia from 1995-2021 using the Mixing Time and Mean First Passage Time (MFPT) metrics. We document larger mobility (in terms of Mixing Time) during the '90s, with and decreasing trend (in terms of mobility) until 1999. After this year the Mixing time has been consistent with a value of around 4 years. Using the MFPT, we highlight the evolving challenges individuals face when aspiring to higher income tiers. Namely, we show that there was a noticeable upward trend in MFPT from 1995 to 2006, a subsequent decline until 2017, and then an ascent again, peaking in 2021. These findings provide a foundational perspective on the income mobility in North Macedonia.

Keywords: Income mobility, Income inequality, Mixing, North Macedonia

JEL classification: D63, C14

1. INTRODUCTION

The idea of upward income mobility, epitomized by the American Dream, underscores the hope that through hard work and perseverance, individuals can achieve better economic positions in societies with minimal barriers (Corak, 2013). While this notion is well-discussed in the context of the United States, understanding such dynamics in other countries is equally crucial. Specifically, in North Macedonia: How long does it typically take for workers to improve their income status?

A swift progression in economic status within an individual's working life would indicate that North Macedonia's societal institutions are fostering economic prosperity and opportunity. In contrast, prolonged durations to climb the economic ladder may raise questions about the adequacy and efficiency of these societal and economic structures.

Until now, discussions about economic well-being in North Macedonia have predominantly concentrated on income inequality (Bartlett *et al.*, 2010; Tevdovski, 2015; Nikoloski and Gveroski, 2017). This dimension focuses on the disparity between the rich and the poor.

However, to get a holistic view, it is vital to consider the dynamic aspects of income. These dynamics delve into how individuals or households transition between various income brackets over time, providing a more comprehensive perspective on economic fluidity.

Recognizing the importance of this perspective, our study employs state-of-the-art statistical methods to present the first estimates of income mobility in North Macedonia. Using methodologies inspired by (Stojkoski, 2022; Jolakoski *et al.*, 2023), we introduce metrics such as the Mixing Time, a comprehensive measure of economic mobility, and the Mean First Passage Time. The latter offers detailed insights into the duration needed for individuals to transition between different socioeconomic tiers. These measurements provide a foundation for understanding income mobility trends, enabling policymakers and researchers to ask pivotal questions. Examples of these questions include the duration required for a minimum wage worker to reach a more comfortable income level or the variations in income. In the subsequent sections, we detail the data sources and methodologies that underpin our findings, present the results, and provide interpretations and implications based on our analysis.

2. METHODS AND DATA

Measures of income mobility: We employed two measures to understand the timeframe for Macedonian workers' income progression: the economy-wide *Mixing Time* and the individualized *Mean First Passage Time*.

1) **Mixing time:** This measure indicates how long it takes for a fresh batch of workers (like graduates) to have an income distribution similar to the current worker population. The mathematical representation involves calculating the time (in years) when the income distribution of these new entrants matches the present economy's distribution. Hence, this measure reveals the characteristic timescale of individual integration into the income distribution. We refer to (Stojkoski, 2022) for more information about quantifying mixing in real economies.

2) **Mean First Passage Time (MFPT):** The MFPT breaks down income mobility, giving the time (in years) necessary for someone to transition between income levels (current income and target income). This measure can be further detailed to show the time to reach an income goal for specific demographic subsets, like age or gender groups. For consistency and comparability, we express starting and target incomes in terms of income distribution percentiles, ensuring our findings remain valid over time and across economies. See (Jolakoski *et al.*, 2023) for more information about estimating the MFPT.

Assumptions and Model Choice: Our research hinges on several pivotal assumptions. Firstly, given the intricacy of income dynamics and limitations in granular data, we anchored our investigation on a null model, called geometric Brownian motion with stochastic resetting (Gabaix *et al.*, 2016). This choice is predicated on the belief that a worker's income trajectory typically involves phases of growth, punctuated by resetting events, such as job changes or losses, which revert the income to a preliminary level.

Non-parametric Estimation Procedure: We employed a non-parametric method, capitalizing on specific macroeconomic data points to estimate the model parameters that govern the income dynamics in North Macedonia (Stojkoski *et al.*, 2021, 2022). The essence of this method was to reconcile real-world income distribution data, specifically the share of income owned by the top 1%, with the theoretical stationary distribution posited by our geometric Brownian motion model. This reconciliation allowed us to extract growth and volatility parameters that resonate with the observed income dynamics of North Macedonia. Once these parameters were discerned for each year, they were then aptly converted into

annual values for the Mixing Time and the MFPT. The Mixing Time was estimated using the numerical method described in (Stojkoski, 2022), whereas the MFPT between any two income levels can be calculated analytically using the methods described in (Jolakoski *et al.*, 2023).

We thereby emphasize that under this methodology, the yearly estimates presented are comparable across years. They measure the mobility at a given time point, under the assumption that the economy will stay in the same state as it is in the studied year. As such, we can compare the estimates in two different years and discover whether mobility has been increasing or decreasing. Finally, we point out that higher values imply lower mobility.

Data Used in the Estimation: Our primary datasets are twofold. First, we use the share of income controlled by North Macedonia's top 1% from 1995 to 2021. This data illuminates the concentration of income, serving as a vital proxy for discerning broader income dynamics and disparities. We took this data from the World Inequality Database (Alvaredo and others, 2020). Second, we collect data on resetting events, which, in our study, is proxied by figures detailing the number of individuals who either left or transitioned to new jobs within the same timeframe. This dataset underscores the frequency and magnitude of income shifts, resonating with the stochastic resetting component of our model. This data was sourced from the State Statistical Office of North Macedonia.

3. RESULTS

Mixing Time Dynamics and Implications: The Mixing Time metric, when applied to North Macedonia's income mobility from 1995-2021, reveals distinct patterns. As illustrated in Figure 1a, the '90s showcased pronounced mobility until 1997. Afterwards, mobility declined and had its lowest value in 1999 with a Mixing Time of 4.8 years. In the subsequent years, this metric stabilized around a 4-year average. While the '90s seemed to offer a dynamic economic environment, the years that followed indicate a more consistent, albeit potentially less mobile, economic landscape. Such patterns suggest that while the earlier period allowed for greater income shifts, the latter years saw more settled income trajectories, with implications for the broader socio-economic fabric of North Macedonia.

Figure 1: Mobility in the Macedonian economy over the years.
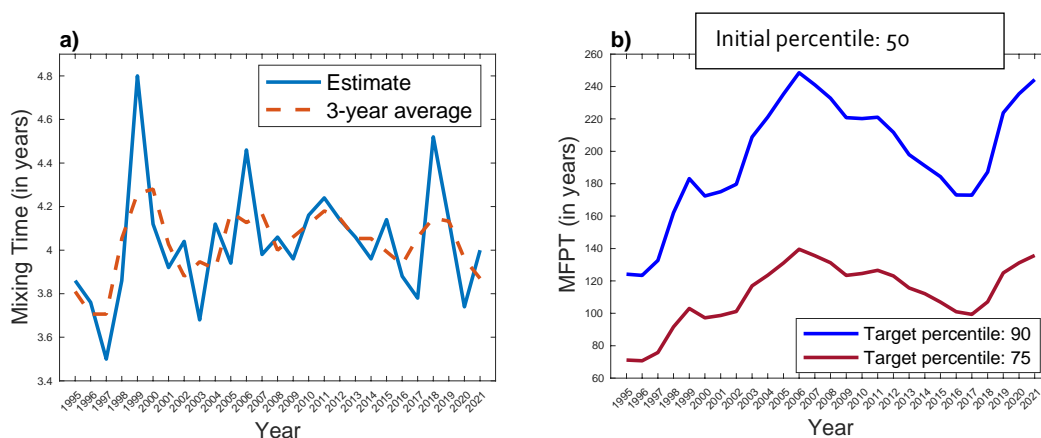
MFPT Dynamics and Implications: The Utilizing the Mean First Passage Time (MFPT), we can delve into the nuanced dynamics of individual income mobility in North Macedonia. Figure 1b, using the median income (50th percentile) as an illustrative starting point, highlights transitions towards the 75th and 90th percentiles. There's a noticeable upward

trend in MFPT from 1995 to 2006, a subsequent decline until 2017, and then an ascent again, peaking in 2021.

The observed MFPT trends suggest that income mobility in North Macedonia experienced periods of increased fluidity and others of stagnation. The widening gap in MFPT for higher percentiles post-2017 implies greater challenges in achieving top-tier incomes. Such dynamics can impact social cohesion, economic policy direction, and workforce morale, emphasizing the need for targeted interventions to enhance equitable economic progression. We leave the exact counterfactual analysis for the reasons driving the changes in economic mobility in North Macedonia as a fruitful future research direction (Chetty *et al.*, 2017, 2022).

4. CONCLUSION AND DISCUSSION

This study offers an illuminating view into North Macedonia's income mobility, unearthing key patterns in economic transitions. Firstly, the Mixing Time and MFPT elucidate periods of increased mobility interspersed with stasis, reflecting shifts in economic opportunities. These shifts are most likely linked to domestic economic policies or global economic trends. For instance, the drastic changes in the trend of the MFPT in 2006 and in 2017 correspond to changes in political regimes. But these years also correspond to years in which there were changes in the measurement of produced by the State Statistical Office. Thus, it is essential to delve deeper into the potential drivers of the changes in the mobility in the country. Such, counterfactual analysis is the subject of our current research.

Secondly, the widening MFPT for upper percentiles, notably after 2017, signals growing challenges in accessing the higher rungs of income, indicating possible economic stratification. Hence, it is essential to also create future projections about the economic mobility within the country.

However, our findings also come with inherent limitations. The reliance on geometric Brownian motion with stochastic resetting, although robust, may not encapsulate all complexities of real-world income dynamics. Furthermore, using data such as the share of income held by the top 1% and job transitions as proxies might introduce biases, overlooking nuanced individual experiences and regional disparities. Despite these limitations, policymakers should regard these results as foundational, urging a deeper dive into factors influencing the changes in income mobility over time. Tailored interventions promoting equitable economic opportunity are crucial, as they not only spur individual prosperity but also strengthen societal cohesion.

To sum up, our analysis, while revealing, is a starting point for measuring income mobility. It underscores the necessity for ongoing research and nimble policymaking, aiming for a comprehensive and inclusive economic landscape in North Macedonia.

REFERENCES

Alvaredo, F. and others (2020) *Distributional National Accounts Guidelines, Methods and Concepts Used in the World Inequality Database*. PSE (Paris School of economics).

Bartlett, W. *et al.* (2010) 'The quality of life and regional development in FYR Macedonia', *Croatian Economic Survey*, (12), pp. 121–162.

Chetty, R. *et al.* (2017) 'The fading American dream: Trends in absolute income mobility since 1940', *Science*, 356(6336), pp. 398–406. Available at: https://doi.org/10.1126/science.aal4617.

Chetty, R. *et al.* (2022) 'Social capital I: measurement and associations with economic mobility', *Nature*, 608(7921), pp. 108–121.

Corak, M. (2013) 'Income Inequality, Equality of Opportunity, and Intergenerational Mobility', *Journal of Economic Perspectives*, 27(3), pp. 79–102. Available at: https://doi.org/doi:10.1257/jep.27.3.79.

Gabaix, X. *et al.* (2016) 'The dynamics of inequality', *Econometrica*, 84(6), pp. 2071–2111.

Jolakoski, P. *et al.* (2023) 'A first passage under resetting approach to income dynamics', *Chaos, Solitons & Fractals*, 175, p. 113921.

Nikoloski, D. and Gveroski, M. (2017) 'Assessing the poverty-growth-inequality nexus: the case of Macedonia', *Eastern Journal of European Studies (EJES)*, 8(1), pp. 29–43.

Stojkoski, V. *et al.* (2021) 'Geometric Brownian motion under stochastic resetting: A stationary yet nonergodic process', *Physical Review E*, 104(1), p. 014121.

Stojkoski, V. *et al.* (2022) 'Income inequality and mobility in geometric Brownian motion with stochastic resetting: theoretical results and empirical evidence of non-ergodicity', *Philosophical Transactions of the Royal Society A*, 380(2224), p. 20210157.

Stojkoski, V. (2022) 'Measures of physical mixing evaluate the economic mobility of the typical individual', *arXiv preprint arXiv:2205.02800* [Preprint].

Tevdovski, D. (2015) 'Income inequality in Macedonia: Mechanisms and solutions', *CEA Journal of Economics* [Preprint].

THE ROLE OF EFFICIENCY WAGES IN DETERMINING THE INTER-INDUSTRY WAGE DIFFERENTIALS: EVIDENCE FROM NORTH MACEDONIA

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ABSTRACT
The efficiency wage theory states that the workers' productivity depends on their wages, thus firms find beneficial to pay higher than the market clearing wages by expecting an increase in labour productivity. Hence, this alterative approach to orthodox economic theory assumes a reversed causality established between wages and labour productivity. The efficiency wage models take into account the potential influence of institutional arrangements. For instance, the ICT industry characteristics such as possibility for platform work affect wage levels and contribute to paying wage premium (exposure to the global competition). The evolution of real wages in North Macedonia over the last decade shows an outstanding inter-industry wage differentials, where Information and communication; and Finance and insurance appear as sectors with constantly high average real wages compared to the national average level. In order to explore the possible reversed causation between labour productivity and real wages, we estimate a homogeneous panel vector autoregression (VAR) model by fitting a multivariate panel regression of each dependent variable on lags of itself and on lags of other dependent variables using generalized method of moments (GMM). The results confirm the efficiency wage theory assumption since we found statistically significant impact of real wages on labour productivity and not vice-versa. This conclusion opens a wide room for justifying the policies that favour increases of real wages by tying them to increases in productivity. The identified wage premium, particularly from working in the ICT sector, suggests that the policy need to focus on stimulating widespread adoption of digital technologies across other sectors through education and training.

Keywords: *Labour productivity, efficiency wages, industry, vector autoregression*

JEL classification: *J24, J31, E24*

1. INTRODUCTION

The labour market is the mechanism through which workers and jobs are matched. The actions of employers and workers in the labour market serve both to allocate and to set prices for various kinds of labour. From a social perspective, these prices act as signals or incentives in the allocation process, which relies primarily on individual and voluntary decisions. From the worker's point of view, the price of labour is important in determining income and purchasing power. The wage that prevails in a particular labour market is heavily influenced by labour supply and demand, regardless of whether the market involves a labour union or other nonmarket forces. The wage rate at which demand equals supply is the market-clearing wage, which is the going wage that individual employers and employees must face. In other words, wage rates are determined by the market and 'announced' to individual market participants (Ehrenberg and Smith, 2008).

Evidence on industry wage differences indicates that large differentials remain that are quite difficult to explain in terms of differences in labour quality or differences in important nonpecuniary aspects of work requiring compensating differentials. The persistence of industry wage premiums for long time periods implies that they are not just transitory

differentials arising to facilitate the sectoral reallocation of labour in a dynamic market economy. Large, persistent wage differentials for similar workers and types of jobs provide strong evidence in favour of the importance of some type of efficiency wage behaviour by many firms (Katz, 1986; Ricx and Tojeorow, 2007).

The relationship between real wages and labour productivity is complex. According to the microeconomic theory wage correspond to the marginal productivity of labour and can be derived from the profit-maximizing behaviour of firms. The relationship between wages and productivity is through the labour demand curve, given the state of technology, the price of inputs and the market price of the goods produced. Hence, the orthodox economic theory assumes that wages follow the development of productivity (Van Biesebroeck, 2015). From a position of imbalance, if marginal labour productivity is higher than the real wage, companies would consider it profitable to hire more labour and put pressure against wage increases. Conversely, if marginal productivity is less than wages, companies will find it profitable to reduce labour, thereby generating downward pressures on wages. The mechanism thereby creates a simple stability dynamic towards equilibrium (Meager and Speckesser, 2011).

In contrast, the efficiency wage theory states that the workers' productivity depends on their wages (Schlicht, 2016). Consequently, firms find beneficial to pay higher than the market clearing wages by expecting an increase in labour productivity. Hence, this alterative approach to orthodox economic theory assumes a reversed causality established between wages and labour productivity. The efficiency wage models take into account the potential influence of institutional arrangements (Bulow and Summers, 1985). For instance, the ICT industry characteristics such as possibility for platform work and associated exposure to the global competition affect wage levels and contribute to paying wage premium.

The wages as the most important part of the household disposable income in North Macedonia mark continuous increase during the last decade (ILO, 2019). At the same time, there is a relatively stable inter industry wage dispersion. Namely, outstandingly high average wages are registered in two industries: information and communication; and, financial and insurance activities. The inter-industry wage differentials arise when workers in the same occupation and the same area but in different industries are paid different wages. Inter-industry differentials reflect skill differentials. The industries paying higher wages have mostly been industries with a large number of skilled workers, while those paying less have been industries with a large proportion of unskilled and semi-skilled workers. Other factors influencing inter-industry differentials are the extent of unionisation, the structure of product markets, the ability to pay, labour-capital ratio, and the stage of development of an industry.

The analysis of the efficiency wages as a source of inter-industry wage differentials in North Macedonia has still not been in the focus of the academic research. Hence, the aim of this paper is to assess the possible reversed causality between wages and labour productivity in North Macedonia on an industry level, thus investigating the evidence about the efficiency wage hypothesis. Having in mind these considerations, the paper is structured as follows. In the next section we provide the main theoretical backgound related to wage setting mechanism and efficiency wage theory. The literature review is subject of the section 3, while in section 4 are explained the data sources. In section 5 we present the main findings from the empirical analysis, while in section 6 are stated the conclusions and policy implications.

2. THEORETICAL BACKGROUND

The market-clearing wage often cannot be reached in practice. Because labour services cannot be separated from the worker, and because labour income is by far the most important source of spending power for ordinary people, the labour market is subject to forces that impede the adjustment of both wages and employment to changes in supply or demand. Some of these barriers to adjustment are themselves the result of economic forces. For example, changing

jobs often requires an employee to invest in new skills or bear costs of moving. On the employer side of the market, hiring workers can involve an initial investment in search and training, while firing them or cutting their wages can be perceived as unfair and therefore have consequences for the productivity of those who remain (Ehrenberg and Smith, 2008).

The labour market transactions that are mutually beneficial implies that output should be produced in the least-costly manner so that the most can be obtained from scarce resources. This goal suggests how we can define what it means to be overpaid. We shall define workers as overpaid if their wages are higher than the market-clearing wage for their job. Because a labour surplus exists for jobs that are overpaid, a wage above market has two implications. First, employers are paying more than necessary to produce their output; they could cut wages and still find enough qualified workers for their job openings. In fact, if they did cut wages, they could expand output and make their product cheaper and more accessible to consumers. Second, more workers want jobs than can find them. If wages were reduced a little, more of these disappointed workers could find work. A wage above market thus causes consumer prices to be higher and output to be smaller than is possible, and it creates a situation in which not all workers who want the jobs in question can get those (McConnell *et al.*, 2003).

The idea of the efficiency wage theory is that increasing wages can lead to increased labour productivity because workers feel more motivated to work with higher pay (Bulow and Summers, 1985; Schlicht, 2016). Therefore if firms increase wages, some or all of the higher wage costs will be recouped through increased staff retention and higher labour productivity. The efficiency wage theory assumes that paying workers at their marginal productivity of labour does not provide enough of an incentive for workers to remain loyal to the company. In such a case, the company should increase the employer's wage to gain loyalty and boost productivity at work. Optimal efficiency wage is achieved when the marginal cost of an increase in wages is equal to the marginal benefit of improved productivity to an employer.

Several efficiency wages mechanisms have been put forward in the literature. A crucial assumption in all the models is the dual role played by the wage rate. In the traditional neoclassical model wages perform only an allocative role, i.e. equating supply and demand for labour, while in the efficiency wage models wages play an additional role, which varies depending on the model's assumption. For instance, the incentive-driven model states that as wage level increases, workers will be more motivated to keep their jobs and will therefore try to increase the level of their productivity. The argument is that if workers are paid a higher wage, they have more to lose from being made redundant. Therefore, if they have a job with a wage significantly higher than benefits or alternative jobs, they will have greater motivation to impress their boss and keep it.

In addition to this basic argumentation, there are other alternative theoretical models of efficiency wages. According to the 'shirking model' developed by Shapiro and Stiglitz, workers with a higher wage will work at an effort level which involves no shirking. This wage is above market-clearing levels. The 'gift exchange' model is based on the assumption that high wages change the relationship between an employer and an employee in the way that the employee will be more attached to the employer and will try to increase his own productivity. As a consequence, companies could pay wages above market-clearing levels, and in return, workers would take on more responsibility and initiative. Furthermore, higher wages reduce workers quits and labour turnover costs. Namely, higher wages discourage workers to quit, which is especially important if hiring and training new workers is a time-consuming and costly pursuit. Finally, higher wages attract more applicants and increase hires. If a company pays above the market clearing level, it will attract a better quality worker who will feel they can get a relatively better-paid job (Katz, 1986; Burki, 1995; Schlicht, 2016).

3. LITERATURE REVIEW

The low and sometimes negative growth in labour productivity in North Macedonia has been identified as a key contributing factor to the low growth rate observed during the past three decades (World Bank, 2020). In addition to its critical role for economic growth, productivity are also important in the wage setting. While more productive companies contribute fewer jobs to the economy than less-productive ones, their jobs pay more. For instance, in services wages paid by the most productive companies are 88 percent higher than those paid by the least productive. In addition, it has been detected that rise in productivity is associated with high-quality and better-paid jobs.

The relationship between labour productivity and wages in North Macedonia has been already a subject of reaearch interest. For instance, Trpeski and Tashevska (2009) found out a significant positive impact of net wages on labour productivity in several industries such as: Construction; Agriculture, fishing and forestry; and Mining and watter management. Considering this, current employers can expect that by increasing the wages of workers, they will achieve an above-proportional growth in labour productivity. Petreski and Mojsoska-Blazevski (2013) by applying panel data econometric modelling investigate the determinants of real wages in Macedonian manufacturing sector. Firstly, we found that the real wage is modestly persistent, the persistence being slightly higher in recession times, potentially suggesting that wage adjustment in recession is slower than in non-recession times. Among the industry-specific factors they did not find significant effect of productivity, but the overal unemployment rate is found to be negatively associated with the real wages. Furthermore, Nikoloski (2020) exlored the factors of labour productivity in North Macedonia and showed generally low aggregate labour productivity compared to more economically developed countries. However, several industries make exception and are characterized with higher levels of labour productivity. Those are: Electricity, gas, steam and air conditioning supply; Mining and quarrying; Financial and insurance activities; and, Information and communication. In addition, the empirical findings confirm that the higher levels of capital intensity, higher wage levels, good job experience and task-based contracts characteristic for the 'gig economy' are the most relevant factors that influence the labour productivity at industry level.

The interference of other factors in the productivity-wage nexus have been also considered by several authors. For instace, Trpeski *et al.* (2016) investigate the impact of the financial recession and found out that changes in productivity did not exert an additional impact on the real net wages during the crisis. Namely, when an economy is coming out of recession productivity tends to rise more rapidly because labour gets used more effectively, but real wages do not rise as rapidly as productivity. Trpeski *et al.* (2022) analysed the importance of the 'reverse decoupling' phenomenon in North Macedonia and concluded that there is a significant increasing gap between the labour productivity and workers' compensation that corroborates with the worldwide trends. The widespread thesis that 'a rising tide will lift all boats' does not correspond to practice, that is, there is an ever-lower increase (in some sectors and stagnation) of labour productivity in relation to the growth of workers' compensation. Nikoloski *et al.* (2023) analysed the impact of the gig economy on employment and wages in both traditional and gig economy sector by using a two-sectoral model. They concluded that the gig workers in developing countries more often face the reality of long working hours, with no social security, with relatively low wages, and with high stress related to irregularity of work or high customer demands. In this context, the main government challenge is to create a situation for gig workers to gain from the improvements in efficiency and productivity that digital platforms create, at the same time adjusting the informal dimensions of the gig in the formal economy to generate value.

4. DATA AND VARIABLES

The data are collected on quarterly basis for the period 2012-2022. With respect to industries we use the high-level aggregation of NACE Rev.2 sections into 10 categories, presented in Table 1.

Table 1. High-level aggregation of NACE Rev.2 sections

No.	Category	Description
1	A	Agriculture, forestry and fishing
2	B	Mining and quarrying
	D	Electricity, gas, steam and air-conditioning supply
	E	Water supply, sewarage, waste management and remediation
3	C	Manufacturing
4	F	Construction
5	G	Wholesale and realtrade, repair of motor vehicles and motorcycles
	H	Transportation and storage
	I	Accommodation and food service activities
6	J	Information and communication
7	K	Financial and insurance activities
8	M	Professional, scientific, technical activities
	N	Administration and support service activities
9	O	Public administration and defence, compulsory social security
	P	Education
	Q	Human health and social work activities
10	R	Arts, entertainment and recreation
	S	Other service activities
	T	Activities of households as employers

(Source: NACE Rev.2 Introductory Guidelines, European Commission)

Variables under consideration in this analysis are as follows. Nominal wages are averaged on quarterly basis from the monthly data and additionaly aggregated according to the high-level NACE sections. Consumer Price Index (CPI) is expressed at the end of the current quarter with respect to the same quarter of the previous year. Furthermore, CPI is used to calculate the real wages by dividing the nominal wages with CPI and multiplied by 100.

The labour productivity is calculated as a Gross Domestic Product divided by the number of employees in each activity. The labour productivity based on gross output shows the time profile of how productively labour is used to generate gross output. When measured as gross output per unit of labour input, labour productivity growth also depends on how the ratio of intermediate inputs to labour change. Gross output based labour productivity traces the labour requirements per unit of physical output. It reflects the change in the input coefficient of labour by industry and can help in the analysis of labour requirement by industry. The advantage of this concept can be viewed in the ease of measurement and readability. In particular, the gross output measure requires only prices indices on gross output, not on intermediate inputs as is the case for the value added based measure.

The unemployment rate is provided on quarterly basis from the Labour Force Survey for the entire economy. The vacancy rate is provided from the administrative sources of the State Statistical Office on quarterly basis and aggregated according to the high-level NACE Rev.2 sections. Furthermore, labour market tightness is calculated as a ratio between the number of vacancies and number of unemployed for each economic activity. A comprehensive overview of the variables under consideration and their description is presented in Table 2.

Table 2. Description of the variables

Variable	Description
Nominal wages	averaged on quarterly basis from the monthly data and additionaly aggregated according to the high-level NACE sections
Consumer Price Index	expressed at the end of the current quarter with respect to the same quarter of the previous year
Real wages (W)	Calculated by dividing the nominal wages with CPI and multiplied by 100
Labour productivity (PROD)	Calculated as a Gross Domestic Product divided by the number of employees in each activity
Unemployment rate	Provided on quarterly basis from the Labour Force Survey for the entire economy
Vacancy rate (VACR)	Provided from the administrative sources of the State Statistical Office on quarterly basis and aggregated according to the high-level NACE Rev.2 sections
Labour market tightness (TIGHTNESS)	Calculated as a ratio between the number of vacancies and number of unemployed for each economic activity

(Source: Author's explanation)

5. METHODOLOGY

The methodological approach in our analyses are based on vector autoregression (VAR) model with panel data, while generalized method of moments (GMM) is used as an estimation technique. Time-series vector autoregression (VAR) models originated in the macroeconometrics literature as an alternative to multivariate simultaneous equation models. All variables in a VAR system are typically treated as endogenous, although identifying restrictions based on theoretical models or on statistical procedures may be imposed to disentangle the impact of exogenous shocks onto the system. With the introduction of VAR in panel-data settings, panel VAR models have been used in multiple applications across fields (Abrigo and Love, 2016).

The vector autoregression (VAR) model with two endogenous variables (real wages and labour productivity) has the following specification:

$$\ln(W)_{i,t} = \beta_{11} \ln(W)_{i,t-1} + \beta_{12} \ln(PROD)_{i,t-1} + \varepsilon_{i,t}$$

$$\ln(PROD)_{i,t} = \beta_{21} \ln(W)_{i,t-1} + \beta_{22} \ln(PROD)_{i,t-1} + \varepsilon_{i,t}$$

In addition, the wage-setting mechanism takes into account the conditions in the labour market i.e. the thighter the labour market, the higher is the real wage (Blanchard and Katz, 1999). This negative relationship between the level of the real wage and unemployment, given the reservation wage and the level of productivity is known as 'wage curve'. The labour market tightness is potential exogenous determinant that can be represented either by the uemployment rate which is time variant but industry invariant, or by the vacancy rate which is both time and industry variant. Because the unemployment rate is observed for the entire economy, in adition to vacancy rate, we use the ratio between the number of vacancies and number of unemployed as measure of labour market tightness.

The dependence between unemployment rate and vacancy rate is observed through the Beverige curve. The Beveridge curve depicts the relationship between the unemployment rate and the vacancy rate for several distinct points in time. Hence, it shows dynamics of the matching process between workers and vacant jobs. The robust finding across countries shows that this relationship generally is negative (Destefanis & Mastromatteo, 2015). Flows

of newly hired workers depend on both unemployment and vacancies in a given economy (Blanchard & Diamond, 1989). The Beveridge curve can be interpreted as the vacancy rate at which the current unemployment rate would be in its steady state. A flow steady state is named since the Beveridge curve involves measurement of flows from one labour force status to another and occurs when these flows do not cause a change in the unemployment rate.

Having in mind the evidence from other analyses, in the next two alternative model specifications we include variables of labour market tightness as exogenous variables (Wakeford, 2003).

The vector autoregression model with two endogenous variables (real wages and labour productivity) and one exogenous variable (vacancy rate) has the following specification:

$$\ln(W)_{i,t} = \beta_{11}\ln(W)_{i,t-1} + \beta_{12}\ln(PROD)_{i,t-1} + \beta_{13}\ln(VACR)_{i,t} + \varepsilon_{i,t}$$

$$\ln(PROD)_{i,t} = \beta_{21}\ln(W)_{i,t-1} + \beta_{22}\ln(PROD)_{i,t-1} + \beta_{23}\ln(VACR)_{i,t} + \varepsilon_{i,t}$$

In addition, the vector autoregression model with two endogenous variables (real wages and labour productivity) and one exogenous variable (vacancies/unemployed ratio) is stated as follows:

$$\ln(W)_{i,t} = \beta_{11}\ln(W)_{i,t-1} + \beta_{12}\ln(PROD)_{i,t-1} + \beta_{13}\ln(TIGHTNESS)_{i,t} + \varepsilon_{i,t}$$

$$\ln(PROD)_{i,t} = \beta_{21}\ln(W)_{i,t-1} + \beta_{22}\ln(PROD)_{i,t-1} + \beta_{23}\ln(TIGHTNESS)_{i,t} + \varepsilon_{i,t}$$

The alternative VAR model specifications will be used to cheque the robustness of the model and its validity when labour market conditions are taken into consideration.

6. EMPIRICAL ANALYSIS

The evolution of real wages in North Macedonia over the last decade shows an outstanding inter-industry wage differentials. In particular, Information and communication; and Finance and insurance appear as sectors with constantly high average real wages compared to the national average level (Figure 1).

Figure 1. Dynamics of real wages in North Macedonia (2012-2022)
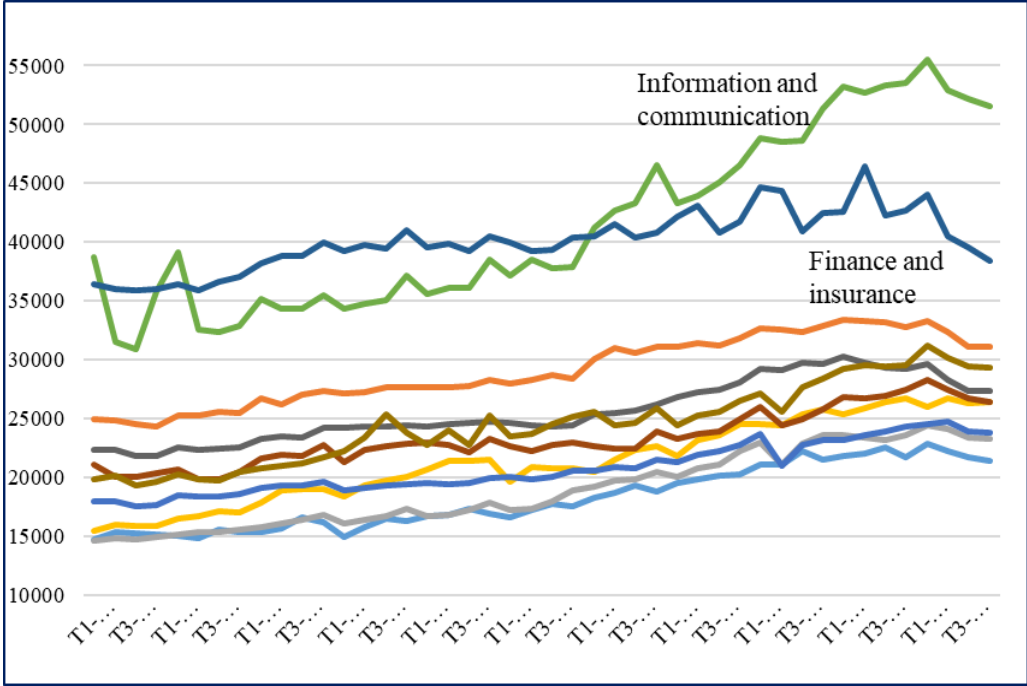
(Source: State Statistical Office)

The relationship between labour productivity and real wages by sectors shows positive association which means that sectors with lower levels of labour productivity manifest lower real wages and vice-versa (Figure 2).

Figure 2. Labour productivity vs. Real wages
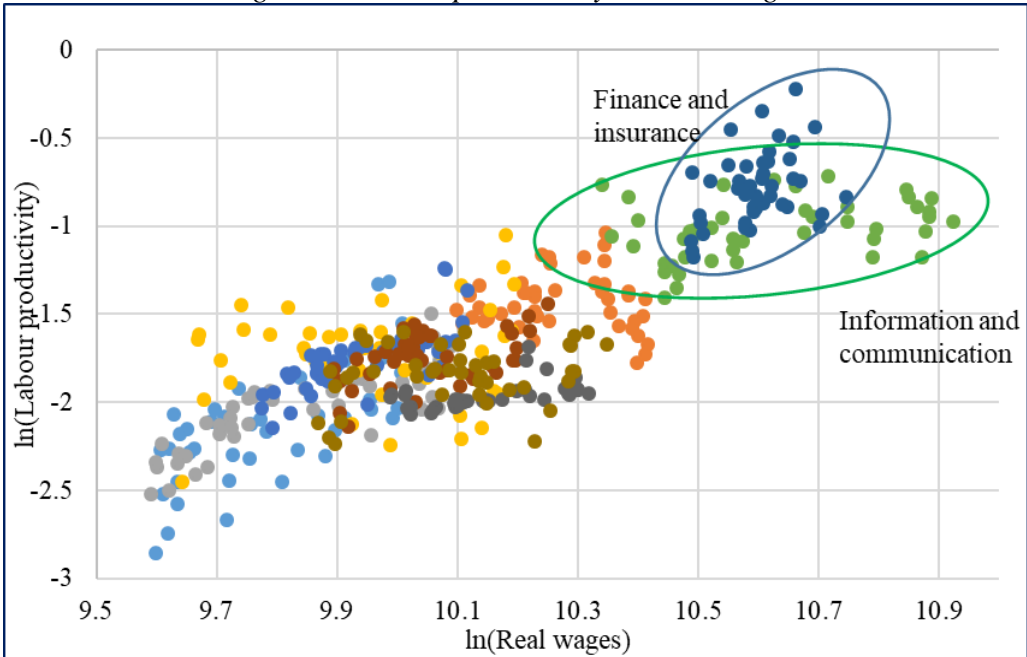
(Source: State Statistical Office)

We further estimate a homogeneous panel vector autoregression (VAR) model by fitting a multivariate panel regression of each dependent variable on lags of itself and on lags of all other dependent variables using generalized method of moments (GMM). The panel is balanced and composed of 44 time periods (quarters) and 10 economic activities (industries). All variables are logarithmically transformed, which means that the estimated parameters are interpreted as elasticity coefficients. In order to chose the optimal lag order in panel VAR specification we calculate the coefficient of determination for the first four lags as presented in Table 3.

Table 3. Selection order criteria

lag	Coefficient of determination
1	0.9954715
2	0.9957568
3	0.9956637
4	0.9960975

(Source: Author's calculations)

From Table 3 we notice that the coefficients of determination do not increase significantly with higher lags, hence we chose to use a first lag of each variable. In the first two columns are presented the dependent and independent variables respectively. As Model 1 is designated the baseline specification of the VAR model that includes only real wages and labour productivity. In Model 2 and Model 3 are additionally included the variables Vacancy rate and Labour market tightness respectively as exogenous variables.

The results from estimated econometric models together with performed Granger causality tests are presented in Table 4.

Table 4. Estimation results by using generalized method of moments

Dependent variable	Independent variable	Model 1	Model 2	Model 3
ln(real wage)$_t$	ln(real wage)$_{t-1}$	0.9794641*** (0.000)	0.974688*** (0.000)	0.8570128*** (0.000)
	ln(productivity)$_{t-t}$	0.0080803 (0.814)	0.0182425 (0.714)	0.0699862 (0.402)
	ln(vacancy rate)$_t$		-0.0003971 (0.962)	
	ln(tightness)			0.0172401 (0.421)
ln(productivity)$_t$	ln(real wage)$_{t-1}$	0.6557796*** (0.000)	0.8791676*** (0.000)	3.53375** (0.020)
	ln(productivity)$_{t-t}$	0.3907872*** (0.006)	0.1478338 (0.503)	-0.9551602 (0.223)
	ln(vacancy rate)$_t$		-0.0953021* (0.060)	
	ln(tightness)			-0.4301474** (0.038)
VAR - Granger causality Wald test				
Equation	Excluded	Chi-square	Chi-square	Chi-square
ln(real wage)	ln(productivity)	0.052 (0.819)	0.134 (0.714)	0.702 (0.402)
ln(productivity)	ln(real wage)	14.120*** (0.000)	12.256*** (0.000)	5.399** (0.020)

(Source: Author's calculations)

From Table 4, we can notice that labour productivity is not statistically significant determinant of real wages in all model specifications. In contrast, real wages appear as statistically significant determinant of labour productivity. This is the case in all three model specifications, which confirms the robustness of our econometric modelling approach. Particularly, from the last specification it is noticeable that 1 percent increase of real wages is associated with 3.5 percent increase in labour productivity. Hence, we confirm the hypothesis that labour productivity is a positive function of wages.

With respect to the labour market tightness, it is obvious that the vacancy rate and the vacancies to unemployment ratio are not statistically significant determinants of real wages. In contrast, higher labour market tightness causes reduction of the labour productivity. Hence, the labour market tightness interferes in the wages-productivity nexus only through the labour productivity channel.

In addition, the Granger causality tests in all model specifications show that labour productivity depends on real wages and not vice-versa. Therefore, firms in sectors with higher than average wage may be reluctant to reduce wages in the face of excess supply, since the associated decrease in productivity may result in an increase in labour costs. The direction of causality can be also confirmed by the impulse-response functions depicted on Figure 3.

Figure 3. Impulse-response functions
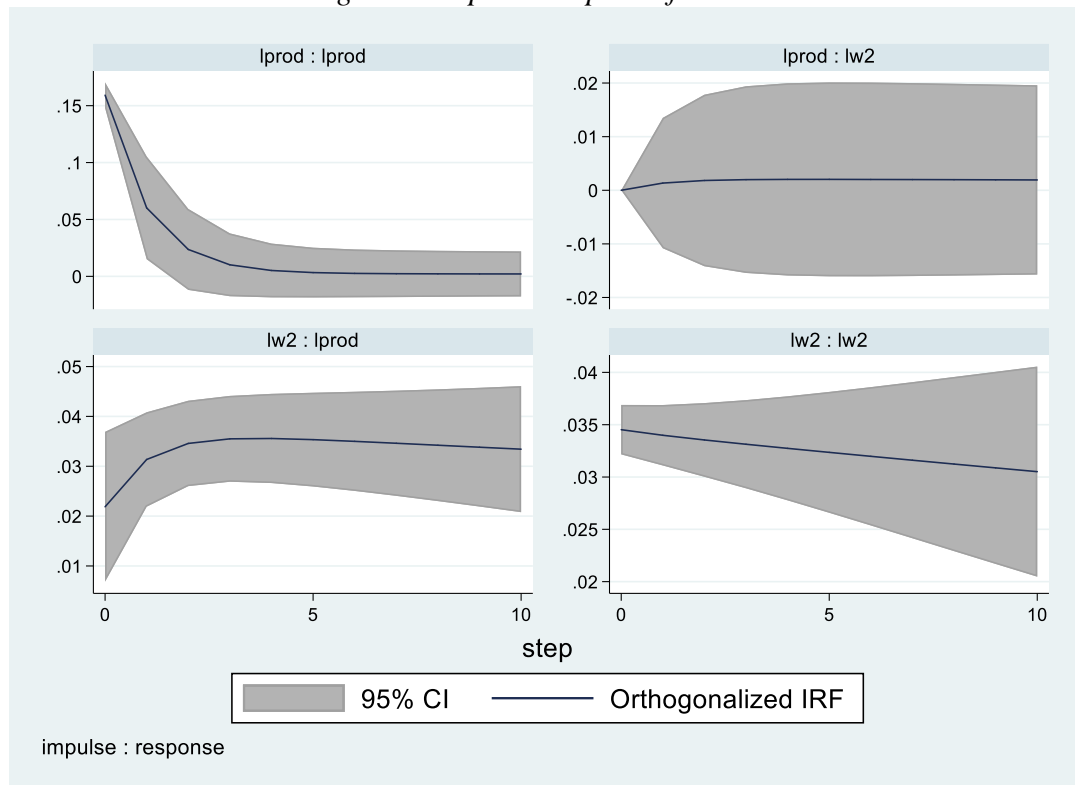
(Source: Author's calculation)

7. CONCLUSION AND POLICY RECOMMENDATIONS

Vastly different ideas are employed in the analysis and design of policies aimed at the labour market depending on where the driving and causal force is found. Without a doubt, an approach where the idea that causality goes from productivity to wages will result in a system where wage increases are regulated by the course of productivity. In this approach it is then acceptable that companies do not raise wages, as long as productivity does not increase. Otherwise, the increase in unit costs will impede competitiveness.

However, the fears cast by this logic are unfounded if real wages constitute a source for engendering changes in labour productivity. The results of this study for quarterly data from the Macedonian economy indicate that causality flows from real wages to labour productivity. As such, there is a wide room for justifying the policies that favour increases of real wages by tying them to increases in productivity.

For instance, in North Macedonia there exists a debate regarding to when to increase it and how much to increase the statutory minimum wage. The advocates for higher statutory minimum wage claim that this measure will strengthen the labour standards and will improve the living condition of the least paid employees. Other benefits include improving the mental and physical health of low-income families, increasing consumption and decreasing government spending for low-income families. On the other hand, the opponents argue that higher minimum wage will impose high cost on employers and in turn, employers will tend to reduce the employed workforce. In addition, higher wages could have upward pressure on inflation, as well as other negative effects on the economy such as increased incentives for informal employment.

The existing literature suggests that the advancement of technology, in particular digital technology, can exert a profound impact on the labour market. Although there are many studies suggesting that digital technologies contribute to wage inequality, there are also an

increasing stream of literature emphasizing the need for enhanced skills and education in generating wage premium across work clusters.

Having in mind the wage premium from working in the ICT sector, the policy need to focus on stimulating widespread adoption of digital technologies across other sectors through education and training. In this context, many developing countries appear to gain only small fraction of the advantages from the ICT sectors. Indeed, developed countries are taking the most of the advantages and opportunities brought by the use of ICT. Therefore, it is necessary to highlight the essential role and the significant relationship of ICT and education for gaining the competitive advantage.

REFERENCES

Abrigo, M. and Love, I. (2016) "Estimation of Panel Vector Autoregression in Stata", *The Stata Journal,* 16 Number 3, pp.778-804;

Blanchard, O and Katz, L. (1999) "Wage dynamics: Reconciling Theory and Evidence", *American Economic Review*, Vol. 89(2), pp.69-74;

Blanchard, O. and Diamond, P. (1989) "The Beveridge Curve", *Brooking Papers on Economic Activity*, 1:1-60;

Bulow, J. and Summers, L. (1985) "A Theory of Dual Labour Markets with Application to Industrial Policy, Discrimination and Keynesian Unemployment", *NBER Working Paper Series* No.1666;

Burki, A. (1995) "A Review of Efficiency Wage Models of Labor Market: Theory and Evidence", *Asia-Pacific Development Journal,* 1995, 2(2), 73-90;

Destefanis, S. and Mastromatteo, G. (2015) "The OECD Beveridge Curve: technological progress, globalisation and institutional factors", *Eurasian Business Review*, 5: 151-172;

Ehrenberg, R. and Smith, W. (2008) *Modern Labor Economics: Theory and Public Policy* (10th Edition), Pearsons/Addison Wesley;

ILO (2019) "*Decent Work Country Programme* 2019-2022", North Macedonia;

Katz, L. (1986) "Efficiency Wage Theories: A Partial Evaluation", *NBER Macroeconomics Annual* 1986, Volume 1, p. 235 – 290;

McConnell, C., Brue, S. and Macpherson, D. (2003) *Contemporary Labor Economics*, Sixth Edition, McGraw-Hill Irwin;

Meager, N. and Speckesser, S. (2011) "Wages, Productivity and Employment: A review of Theory and International Data", *European Employment Observatory Thematic expert ad-hoc paper*;

Nikoloski, D. (2019) "Determinants of labour productivity in the Republic of North Macedonia with an emphasis on the ICT industry", *Proceedings from the XI International Conference "Digital Transformation of the Economy and Society: Shaping the Future", Prilep, October 19-20, 2019*;

Nikoloski, D. (2020) "The Factors of Labour Productivity in the Republic of North Macedonia", *Southeast European Review of Business and Economics* (SERBE), Vol.1, Issue 2, pp.22-37;

Nikoloski, D., Trajkova Najdovska, N., Petrevska Nechkoska, R. and Pechijareski, L. (2023) "The Gig Economy in the Post-COVID Era". In: Petrevska Nechkoska, R., Manceski, G., Poels, G. (eds) *Facilitation in Complexity, From Creation to Co-creation, from Dreaming to Co-dreaming, from Evolution to Co-evolution*. Contributions to Management Science, Springer, Cham, pp.93-117;

Petreski, M. and Mojsoska-Blazevski, N. (2013) "Real Wages in the Manufacturing Industry in Macedonia: The Role of Macroeconomic Factors, with Reference to Recession Times", *Economic Research - Ekonomska Istraživanja*, 26:4, 113-126;

Petreski, M., Oviedo, A. M. and Cancho, C. (2019) "Expectations Set High: Understanding Reservation Wage in North Macedonia", *World Bank Group, Policy Research Working Paper* 9023;

Ricx, F. and Tojeorow, I. (2007) "Inter-Industry Wage Differentials: What Do We Know?", *Reflets et Perspectives de la Vie Economique* 2007/2, pp.13-22;

Schlicht, E. (2016) "Efficiency Wages: Variants and Implications", *IZA World of Labour Evidence-based policy making*;

Trpeski, P. and Tashevska, B. (2009) "Labour Productivity and Wages in the Republic of Macedonia", *The Young Economist Journal*, January 2009, pp.193-112;

Trpeski, P. Trenovski, B., Kozheski, K. and Gunter, M. (2022) "Labor Productivity and Labor Compensation in North Macedonia: Sectorial Approach", *Proceedings from the 3rd international conference "Economic and Business Trends Shaping the Future"*;

Trpeski, P., Eftimov, L. and Cvetanoska, M. (2016) "Labor Productivity and Real Wages in Macedonia: An Overview Before and After the Global Economic Crisis", *European Scientific Journal*, Vol.12, No.10, pp.352-365;

Van Biesebroeck, J. (2015) *How Tight is the Link Between Wages and Productivity? A Survey on the Literature*, International Labour Organization;

Wakeford, J. (2003) "The Productivity-Wage Relationship in South Africa: An Empirical Investigation", *TIPS/DPRU Conference*, Johannesburg, September 2003;

World Bank (2020) Republic of North Macedonia: Action Plan for Recovery of Growth and Jobs, Report No. AUS0001657, June 2020;

CORRUPTION, GOVERNMENT SPENDING AND ECONOMIC GROWTH: THE CASE OF CENTRAL AND EASTERN EUROPE

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ABSTRACT

This study delves into the relationship between corruption, government spending, and economic growth in selected Central and Eastern European countries. The high prevalence of corruption and suboptimal allocation of public resources in these countries present a significant obstacle to increasing economic growth. These issues are particularly impactful in low and middle-income countries, where corruption persists longer. The effects of corruption can distort market signals and lead to inefficient allocation of resources, especially in the public sector. In addition to hampering public consumption, corrupt practices negatively impact a country's ability to increase economic growth and bridge the gap between high and low-income countries. By utilising fixed and random effects methods, this paper employs panel regression analysis to examine the impact of government spending and corruption on the economic growth of selected Central and Eastern European countries from 2011 to 2021. The study found that government spending, corruption perception, and control of corruption have a positive and statistically significant influence on economic growth in the selected countries.

Keywords: Corruption, Government spending, Economic growth.

JEL classification: D73, O10, H54.

1. INTRODUCTION

The theoretical conceptions of establishing and maintaining economic development are continuously subject to debate among the academic community and economic policymakers. In addition to the wide range of economic and non-economic determinants of economic development, part of the theories about determinants of essential importance apostrophises the level of corruption and government spending. The complex relationship between the degree of corruption and economic development is based primarily on two theoretical approaches. The first theoretical approach, "grease the wheels", starts from the assumption that corruption positively impacts economic growth. This assumption is based on the

possibility of "bypassing" some of the strict, rigorous bureaucratic procedures that represent an obstacle to the optimal functioning of economic relations in the national economy. Part of such obstacles are the high administrative and bureaucratic barriers to starting your own business. Such bureaucratic procedures largely deter entrepreneurs from formalising their business, that is, being part of the formal economy. Hence, this theoretical assumption is because if economic agents bypass inefficient, bureaucratic, and suffocating regulations, they pave the way for increased and efficient economic activity. Contrary to this assumption, the theoretical hypothesis "sand the wheels" starts from the assumption that corruption is one of the most important factors that prevent the establishment and maintenance of stable economic development. This assumption is because widespread corrupt practices discourage innovation, entrepreneurial spirit, and suboptimal functioning of economic activities. The highly widespread corruption is one factor that contributes to a high level of mistrust towards the institutions and the inefficient allocation of resources, which will have a low or negative level on economic development. In this direction, if high corruption prevails in the economy, it leads to inefficient allocation of scarce and limited resources, especially government spending.

The two opposite theoretical views on the influence of corruption on economic activities find their application in practice. Regarding which of the theories will prevail in practice, most empirical studies point to the fact that it primarily depends on the level of corruption in individual national economies (Dzhumashev, 2014; Muritala and Taiwo, 2011). Most empirical research shows that a high level of corruption disincentive affects economic growth, especially in developing countries with low investment and pronounced mistrust in public institutions (Campos et al., 2010; Chang and Hao, 2017). Most empirical research uses the corruption perception index as an indicator of control of corruption. The corruption perception index is internationally comparable and has been used in many empirical analyses examining the relationship between corruption and economic growth (Swaleheen, 2011; Tsanana et al., 2016).

The level of corruption is also one of the factors for the efficiency in the distribution of public finances, i.e. the effectiveness of government spending (Hashem, 2014). The relationship between economic growth and government spending can also be represented as the influence of the public sector on economic growth in individual national economies. Hence, this relationship sets the basic assumption of whether the size of government spending contributes to the establishment of sustainable and long-term economic growth or is one factor that contributes to insufficient economic growth rates. In this direction, it is particularly important to distinguish between government spending in investments and government spending for current consumption. The theory starts from the fact that government investments positively impact economic growth, while government expenditures related to current consumption disincentives impact economic growth (Barro, 1990). In general, the prevailing opinion is that the increase in government spending, especially for infrastructure and human capital investments, affects the improvement of economic growth. Also, the total effect of government spending must include the connection with the private sector, that is, whether such activities directly or indirectly affect the increase of the total economic activity initially led by the private sector. The connection between government spending and the economic activity of the private sector will, first, depend on whether and to what extent investments in infrastructure, education, health, and social transfers are aimed at establishing an optimal business environment for the business sector.

Government plays a multifaceted role in fostering economic development and enhancing resource allocation. It can establish the necessary economic infrastructure to facilitate growth while ensuring social harmony and bolstering labour force productivity through transfer payments. Investments in healthcare and education further contribute to a dynamic and

productive labour force. Empirical research confirms the complexity of the analysis between government spending and economic growth, especially because of the impossibility of completely distinguishing government spending from current consumption and government investments. The empirical results show a significant negative impact of the increase in government spending on economic growth, while the rest come to a statistically insignificant causality of this relationship (Agell et al., 1999; Fölster and Henrekson, 2001). What is important to emphasise is that a small part of empirical research is focused on the impact of government spending on economic growth in developing countries. Some of the analyses in developing countries show that government spending positively impacts economic growth regardless of current or investment consumption (Adams et al., 1991). On the other hand, some of the empirical studies emphasise the negative connection of government spending with economic growth, as well as significant budget deficits and increased public debt as a direct result of the inefficiency of government spending.

In this paper, an attempt has been made by applying panel regression analysis with the methods of fixed and random effects to analyse the impact of government spending and corruption on the economic growth in the case of selected countries from Central and Eastern Europe for the period 2011- 2021 year. For our research, to analyse the impact of public spending and corruption on economic growth, we use data from Albania, Bosnia and Herzegovina, North Macedonia, Serbia, Bulgaria, Croatia, Romania, Slovenia, Estonia, Latvia, Lithuania, Czech Republic, Hungary, Poland, and Slovakia for the period 2011-2021.

This research analyses how government spending and corruption contribute to Central and Eastern European economic growth. A significant contribution is made by applying a methodology that has been applied in other analyses in this field, with which the obtained results can be compared to other empirical studies. The paper is structured in the following way: after the introduction, a brief review of the relevant empirical literature will be made, and in the other part, the appropriate methodology will be presented. Next, the results are discussed, and finally, the concluding findings are given.

2. EMPIRICAL LITERATURE REVIEW

Corruption is a pervasive issue that hinders economic development and can negatively affect a country's growth prospects. Various studies have shown that corruption can reduce investment in physical and human capital, political stability, and government spending, negatively affecting growth. However, some studies have indicated that controlling corruption and government effectiveness can positively impact average growth rates. Thus, it is essential to understand the complex relationship between corruption and economic growth to develop effective policies and measures to tackle this issue.

Corruption significantly negatively impacts economic growth, as shown by various studies. Ahmad et al. (2012) found that decreased corruption had an inverted U-shaped effect on economic growth that remained robust across alternative econometric specifications. Corruption reduces investment in physical and human capital, political stability, and government spending, negatively affecting growth. However, it could foster growth by increasing trade openness, but the net effect remains negative, as per Hodge et al. (2011).

Meanwhile, Evrensel (2010) research indicates that control of corruption and government effectiveness significantly negatively impact average growth rates. Bai et al. (2013) found that government corruption is more prevalent in poorer countries, but corruption could potentially subside as poor countries experience economic growth. Gründler and Potrafke (2019) analysed new data from 2012 to 2018 and showed that corruption negatively affects economic growth, especially in autocracies. Similarly, Swaleheen (2011) study utilising

advanced dynamic panel data techniques found that corruption has a notable influence on the growth rate of real per capita income, and this effect is non-linear.

Saha and Ben Ali (2017) study suggests that a reduction in corruption is possible through the interactive relationship between economic and political freedoms and the government size. However, the study also highlights the concerning trend that an increase in income correlates with an increase in corruption in natural-resource-rich countries. Finally, research by Shera et al. (2014) reveals that corruption deters investors, reduces productivity and public expenditures, distorts resource allocation, and ultimately lowers economic growth. In summary, corruption remains a significant obstacle to sustainable economic growth, and it is crucial to address it through effective policies and measures.

The studies conducted by Aidt et al. (2008), d'Agostino et al. (2012), and Del Monte and Papagni (2001) all suggest that corruption can have significant negative impacts on economic growth. Aidt et al. (2008) found that the political institutions quality determines the relationship between corruption and economic growth. They identified two governance regimes and concluded that corruption hinders growth significantly in the regime with high-quality institutions. At the same time, it does not impact growth in the regime with low-quality institutions. Del Monte and Papagni (2001) show how bureaucratic corruption can reduce the efficiency of public expenditure, leading to a significant negative impact on productivity and public investment that has long-term effects on economic growth. d'Agostino et al. (2012) explored the impact of corruption and government spending on economic growth and found strong negative impacts on economic growth.

Similarly, Goel and Nelson (1998) analysed state-level data from 1983 to 1987 to investigate the impact of government size on corruption among officials. They found that state government spending has a strong positive influence on corruption. Gupta and Abed (2002) also analysed various research studies and explored how corruption can hinder economic growth, exacerbate poverty, and negatively impact governance. They delved into factors contributing to corruption, such as civil service wages, natural resource availability, and the growth of small and medium-sized enterprises. They also examined the effects of corruption on a country's income distribution, government spending and the need for structural reforms to combat it.

Furthermore, Kotera et al. (2012) found that the relationship between government size and corruption is inconsistent. They analysed data from 82 countries between 1995 and 2008 and found that increasing government size can decrease corruption if the democracy level is high enough, and vice versa. Arvate et al. (2010) analysed data from developed and developing Latin American countries from 1996 to 2003 and discovered that larger government size caused corruption in both samples. Thus, the authors recommend reducing government involvement in private markets to promote good governance and combat corruption.

Finally, Dzhumashev (2014) shows that the interplay between corruption and governance affects public spending efficiency, affecting economic growth. Corruption benefits economic efficiency only when the government size exceeds optimal levels and decreases as economic development progresses. Targeting tax evaders is a more effective approach to reducing corruption and enhancing an economy's growth potential. Tanzi and Davoodi (2000) comprehensively analysed the various channels through which corruption impinges on economic growth and found that corruption can adversely affect enterprises, the allocation of talent, and investment and even have implications on certain aspects of public finance. Similarly, Tanzi and Davoodi (1997) found that corruption, particularly political or "grand" corruption, has a damaging impact on the decision-making process of public investment projects, leading to decreased productivity, reduced spending on operations and maintenance, lower quality public infrastructure, and decreased government revenues.

The studies cited in the text suggest that corruption significantly negatively impacts economic growth and that the quality of political institutions plays a crucial role in the relationship between corruption and growth. Corruption can reduce the efficiency of public expenditure and lead to a significant negative impact on productivity and public investment, which has long-term effects on economic growth. The impact of government size on corruption is inconsistent, and corruption negatively affects enterprises, talent allocation, investment, and certain aspects of public finance.

3. DATA AND METHODOLOGY OF EMPIRICAL RESEARCH

The empirical research of this paper is based on the extended Solow model with the public sector expressed in Cobb-Douglas production function form. The Cobb-Douglas production function is a fundamental model in economics that is widely used to analyse the relationship between inputs, such as capital and labour, and output, such as economic growth.

$$Y(it) = F[K(it), A(it)L(it)] = K(it)^{\alpha}(A(it)L(it))^{1-\alpha}, 0 < \alpha < 1 \tag{1}$$

where Y represents the output, A is the total factor productivity that measures technology and efficiency, K is the capital input, L is the labour input, and α is the output elasticity of capital that represents the share of output attributed to capital.

To incorporate the impact of government size and corruption into this framework, we modify the production as follows:

$$\begin{aligned} Y(it) &= F[K(it), G(it), C(it), A(it)L(it)] \\ &= K(it)^{\alpha}G(it)^{\beta}C(it)^{\gamma}(A(it)L(it))^{1-\alpha-\beta-\gamma}, (\alpha + \beta + \gamma) < 1 \end{aligned} \tag{2}$$

where G represents government spending as a share of GDP, β represents the elasticity of output related to government spending that indicates how government spending affects economic growth, C represents the level of corruption in the economy, and γ represents the elasticity of output related to corruption that indicates how corruption affects economic growth.

To conduct the empirical analysis, we estimate the values of α, β and γ using various panel data analysis techniques. This extended Solow model with the public sector expressed in the Cobb-Douglas production function form enables the analysis of both government spending (through β) and corruption (through γ) on economic growth while considering the traditional capital and labour factors.

This research analysed a sample of 15 countries in Central and Eastern Europe, specifically Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Romania, North Macedonia, Serbia, Slovakia, and Slovenia, between 2011 and 2021. The production function used in this model incorporated the size of government and corruption and is in the Cobb-Douglass production function form (Baklouti and Boujelbene, 2016; Pulok, 2010).

The variable Y in the above specifications represents the real GDP per capita, a substitute for income per worker. We collected the data for real GDP per capita (in 2015 US$) from the World Bank's World Development Indicators database. This variable is often used to measure a country's economic growth in most empirical literature related to this paper. Gross fixed capital formation (as a percentage of GDP) is used to measure physical capital formation, represented by K in the above equations. We sourced this data from the same base as real GDP per capita. We used employment (in thousands) from the International Labour Organization database to measure the labour factor denoted by L.

We used two proxies to measure government spending: general government final consumption expenditure (% of GDP) from the World Development Indicators database and government effectiveness from the World Governance Indicators of the World Bank. General government final consumption expenditure (% of GDP) is an important indicator that measures the proportion of a country's gross domestic product (GDP) spent by the government on providing public goods and services. It includes government spending on education, healthcare, defence, and social welfare. The Government Effectiveness indicator is a measure the World Bank uses to assess a country's governance quality. It considers factors such as the effectiveness of public services, the quality of the civil service, and the level of corruption. A high score on this indicator indicates that the government can deliver services efficiently and transparently. In contrast, a low score suggests that there are significant challenges in the way the government operates.

We used the corruption perception index from Transparency International and the control of corruption from the World Governance Indicators of the World Bank to measure corruption levels. The *corruption perception index* is a tool used by Transparency International to rank countries based on their perceived levels of corruption. It collects data from surveys and assessments to assign a score to each country, ranging from 0 (highly corrupt) to 100 (very clean). The C*orruption* PI helps to identify trends, track progress, and formulate targeted anti-corruption strategies. However, it's important to note that the C*orruption* PI is a perception-based assessment, not an exact measure of corruption. Despite many countries improving their scores, corruption remains a persistent global challenge that Transparency International advocates for greater transparency and accountability to combat. The control of corruption indicator is a vital tool for measuring corruption levels. It's a Worldwide Governance Indicators project component and relies on surveys to assess corruption's prevalence in the public sector. The indicator's scale ranges from -2.5 to +2.5, with higher scores indicating lower levels of corruption. Governments and policymakers can use the indicator to identify areas of weakness and implement effective anti-corruption measures. However, it's important to note that subjective perceptions may influence the indicator's accuracy.

Additionally, we used the institutional variable index of economic freedom from the Heritage Foundation. The index of economic freedom is an annual report created by the Heritage Foundation that assesses countries' economic freedom worldwide. This comprehensive index ranks countries on a scale of 0 to 100, with a higher score indicating greater economic freedom. It evaluates four key pillars of economic freedom: rule of law, government size, regulatory efficiency, and open markets. The index provides valuable insights into the impact of economic policies and reforms on a country's prosperity and overall well-being. It is essential for governments, policymakers, investors, and businesses to make informed decisions.

Using these variables, we created two models. The first model used the logarithm of real GDP per capita (Log GDP) as the dependent variable and the logarithm of gross fixed capital formation (Log GFCF), the logarithm of employment (Log Employment), the logarithm of general government final consumption expenditure (Log GFCF), corruption perception index (Corruption PI), and the index of economic freedom (IEF) as the independent variables. The second model used the logarithm of GDP per capita as the dependent variable and the logarithm of gross fixed capital formation, the logarithm of employment, government effectiveness (GE), control of corruption (CC), and the index of economic freedom as the independent variables. The equations can be written as follows.

$$Log(GDP_{it}) = \beta_0 + \beta_1 Log(GFCF)_{it} + \beta_2 Log(Employment)_{it} + \beta_3 Log(GFCE)_{it} + \beta_4 CorruptionPI_{it} + \beta_5 IEF_{it} + u_t \tag{3}$$

$$Log(GDP_{it}) = \beta_0 + \beta_1 Log(GFCF)_{it} + \beta_2 Log(Employment)_{it} + \beta_3 GE_{it} + \beta_4 CC_{it} + \beta_5 IEF_{it} + u_t \qquad (4)$$

There are different ways to evaluate the above equations. Fixed effects and random effects models are popular techniques for panel data. The fixed effects model assumes that the unobserved factors that affect the dependent variable are constant over time. On the other hand, the random effects model assumes that the unobserved factors are random and uncorrelated with the independent variables. Both models have advantages and disadvantages, and the choice of model depends on the nature of the data and the research question being addressed.

In addition to panel data methods, we used other techniques, such as correlation analysis and descriptive statistics, to analyse the data. We conducted various tests to check the robustness of our results, such as the Hausman test, the Breusch-Pagan test, and the White test. We used a rigorous and comprehensive approach to analyse the data and test our hypotheses. Our findings are robust, informative, and can contribute to the existing literature on economic growth and development determinants.

4. RESULTS AND DISCUSSION

In this section, we present the results of our empirical analysis following the research methodology explained above. Firstly, we give descriptive statistics about our variables. We have 165 observations for all variables, so we are working with balanced data. Although we had missing data issues, we solved them using interpolation techniques and median values in some cases.

The mean GDP per capita is 12,040 US dollars, with the minimum being 3,678 US dollars in Albania in 2011 and the maximum being in Slovenia in 2021 with 24,745 US dollars. The mean gross fixed capital formation is 21.98% of GDP, with Serbia in 2014 having the minimum investments to GDP at 15.95 and Estonia in 2020 having the maximum investments to GDP at 31.18. The mean employment is 3.4 million employers, with Estonia in 2011 having the minimum number of workers at 603 thousand and Poland in 2021 having the maximum number of employers at 16.7 million.

In 2012, Albania had the highest percentage of GDP spent on general government final consumption expenditures with 10.85%, while in 2020, Croatia had the highest with 24.02%. The mean percentage for all countries is 18.12%. The government effectiveness score ranges from a minimum of -1.045 for Bosnia and Herzegovina in 2020 to a maximum of 1.383 for Estonia in 2021, with a mean score of 0.446. Regarding corruption, the mean corruption perception index is 48.97. The minimum index score of 30.5 was obtained by Albania in 2011, while the maximum score of 75 was achieved by Estonia in 2020. Furthermore, the mean control of corruption score is 0.18, with a minimum score of -0.78 for Albania in 2012 and a maximum score of 1.61 for Estonia in 2020. The average economic freedom index is 67.24. In 2012, Bosnia and Herzegovina had the lowest index of 57.3, while Estonia had the highest of 79.1 in 2017.

Table 1: Descriptive statistics of the variables used in the empirical analysis

Variable	Mean	Std. Dev.	Min	Max	Observations
GDP	12040.13	5607.643	3678.047	24744.84	165
GFCF	21.978	3.014	15.950	31.179	165
Employment	3354.314	4007.668	603.197	16656.14	165
GFCE	18.124	2.702	10.845	24.016	165
Corruption	48.965	10.189	30.5	75	165

PI					
CC	0.179	0.536	-0.779	1.610	165
GE	0.446	0.540	-1.045	1.383	165
PS	0.460	0.444	-0.820	1.120	165
IEF	67.242	5.075	57.3	79.1	165

(Source: Authors' calculations)

Following that, we will showcase two bubble charts. The first one will depict the correlation between the logarithm of GDP per capita, the logarithm of general government final consumption expenditure, and the corruption perception index. The second chart will showcase the correlation between the logarithm of GDP, government effectiveness, and control of corruption. These bubble charts will help us more intuitively visualise the relationship and interplay between the mentioned variables. By analysing these charts, we can better understand the impact of corruption, government spending, and GDP on each other. These charts will be important to our data analysis and help us make more informed decisions.

It's interesting to see the correlation between government spending, GDP per capita, and corruption perception index in the first bubble chart. The data suggests that countries with higher government expenditures as a percentage of GDP tend to have higher GDP per capita. Additionally, there appears to be a positive correlation between higher corruption perception index and higher GDP per capita. These insights can provide a valuable starting point for further research and analysis.

Figure 1: Bubble chart between GDP, GFCE and Corruption PI
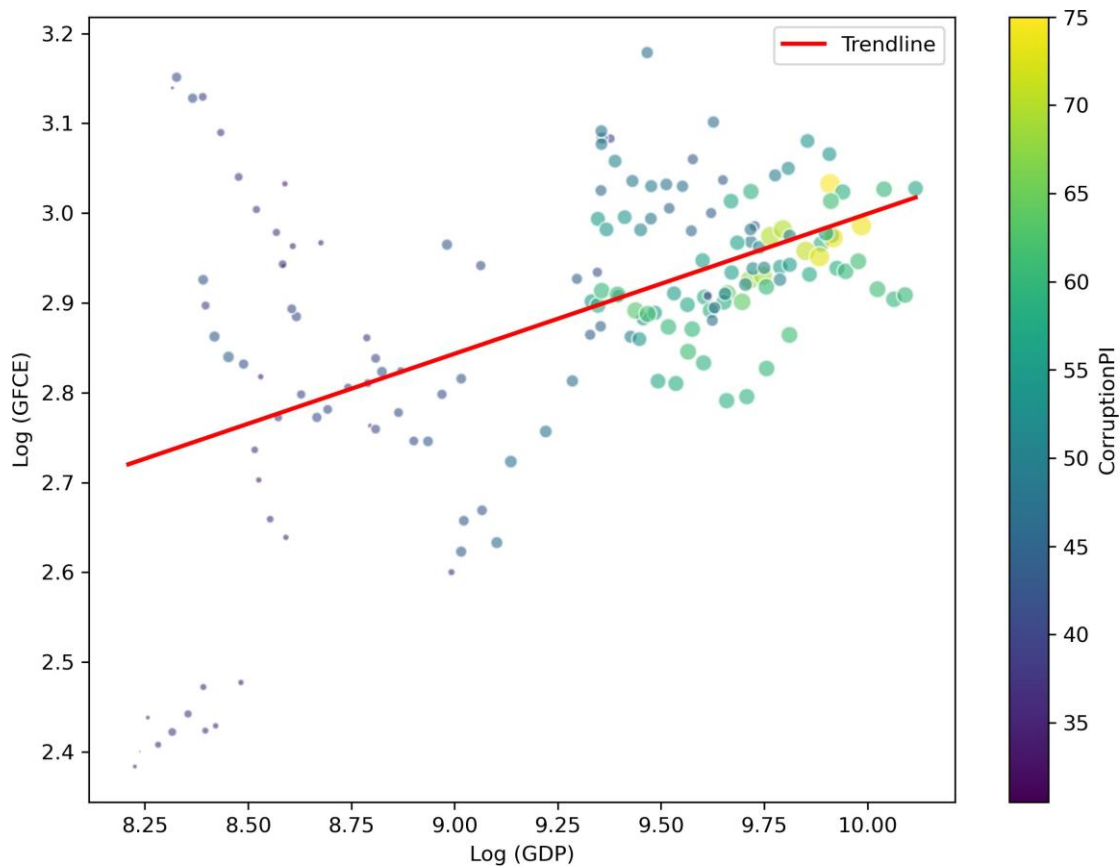
(Source: Authors' calculations)

In the second chart, we can observe that countries with higher scores in government effectiveness and control of corruption tend to have higher GDP per capita. This suggests that a strong and effective government, coupled with a low level of corruption, can positively impact a country's economic growth and prosperity. Conversely, countries with weak governments and high levels of corruption tend to have lower GDP per capita and struggle with economic development. Good governance is crucial to a country's overall well-being and success. These bubble charts provide a great visual representation of the correlation between various economic and governance indicators. By analysing the charts, we can gain valuable insights into the interplay between these variables and how they impact each other. Good governance, low corruption, and effective government are all crucial to a country's economic success, and these charts emphasise the importance of focusing on these factors.

Figure 2: Bubble chart between GDP, GE, and CC
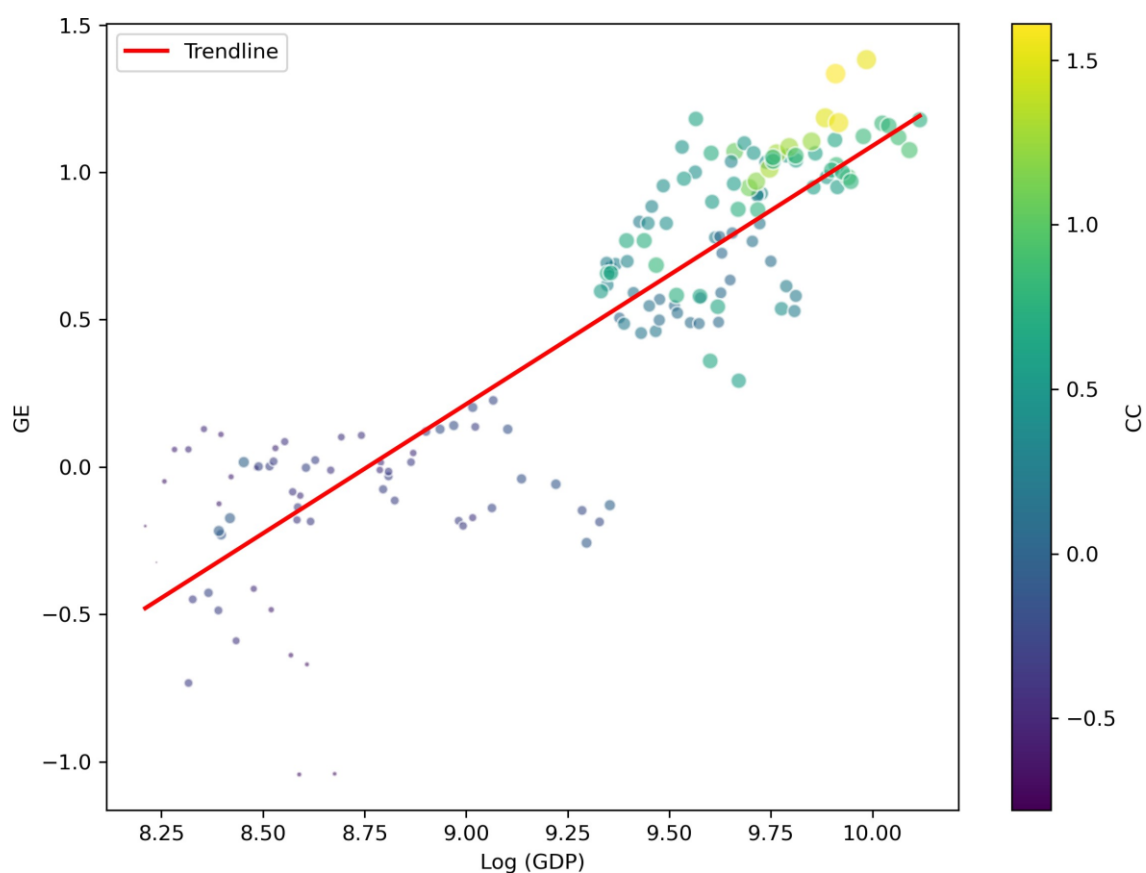
(Source: Authors' calculations)

We can draw the same conclusion from the correlation matrix. The GDP has positive and statistically significant correlation coefficients with general government final expenditure (0.457), government effectiveness (0.880), corruption perception index (0.821), and control of corruption (0.858).

Table 2: Correlation matrix for the variables used in the empirical analysis

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) GDP	1.000								
(2) GFCF	0.052	1.000							

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(3) Employment	0.055	-0.135	1.000						
(4) GFCE	0.457*	-0.141	-0.045	1.000					
(5) CorruptionPI	0.821*	0.037	0.154*	0.361*	1.000				
(6) Control of corruption	0.858*	0.080	0.113	0.414*	0.962*	1.000			
(7) Government Effectiveness	0.880*	0.064	-0.007	0.275*	0.833*	0.866*	1.000		
(8) Political Stability	0.806*	-0.018	0.196*	0.248*	0.651*	0.678*	0.837*	1.000	
(9) IEF	0.452*	0.392*	0.032	-0.099	0.586*	0.585*	0.553*	0.399*	1.000

*, denotes significance level at 5%;

(Source: Authors' calculations)

These findings suggest that a strong and effective government promotes economic growth and development. Moreover, the results imply that reducing corruption and improving governance can enhance the overall economic performance of a country. However, it is important to note that correlation does not necessarily imply causation and further research is needed to establish a causal link between governance and economic growth. Nonetheless, the correlation coefficients provide a useful starting point for investigating the relationship between these two variables.

As we are dealing with panel data, it is necessary to test the integrative characteristics of the series before providing regression analysis. This helps to determine whether the series is stationary or not. In this case, the variables of GDP per capita (GDP), gross fixed capital formation as a share of GDP (GFCF), employment (Employment), and general government final consumption expenditure as a share of GDP (GFCE) are all represented as logarithm transformed values. However, the control of corruption (CC), government effectiveness (GE), political stability (PS), and the index of economic freedom (IEF) are in their original values. The results from Table 3 show that all the variables are stationary at the level, and we can continue further.

Table 3: Integrative characteristics of the variables used in the empirical analysis using the Levin-Lin-Chu unit-root test

Variable	Statistic	p-value
Log (GDP)	-4.786	0.000
Log (GFCF)	-4.654	0.000
Log (Employment)	-4.678	0.000
Log (GFCE)	-1.494	0.068
CorruptionPI	-1.999	0.023
CC	-4.713	0.000
GE	-1.496	0.067
PS	-4.040	0.00
IEF	-2.397	0.008

(Source: Authors' calculations)

These are the results of two regression analyses and diagnostic tests, including the Hausman test. The general government final expenditure logarithm coefficient is positive and

statistically significant at 0.01 in both fixed effects regression (0.310) and random effects regression (0.260). This means that if the expenditures as a share of GDP increase by 1%, economic growth will be boosted by approximately 0.3%, assuming all other factors remain unchanged. The coefficient before the corruption perception index is also positive and statistically significant at 0.01 for fixed effects regression (0.004) and random effects regression (0.005). Although the effect is small, it is still positive and statistically significant. Additionally, the index of economic freedom has a positive and statistically significant impact on economic growth.

The R-squared values for the fixed and random effects regressions illustrate how much of the variation is accounted for by the models. The fixed effects model accounts for 0.629 of the variation, while the random effects model accounts for 0.595. To check for heteroscedasticity, both the Breusch and Pagan Lagrangian multiplier test and the Breusch-Pagan test were utilised. The results of both tests showed statistically significant outcomes, indicating the presence of homoscedasticity. Additionally, the Modified Wald test and Pesaran's test suggested the presence of homoscedasticity. The Hausman test was then conducted to choose between fixed and random effects. It indicated that the fixed effects model is preferred over the random effects model, with a statistic of 23.56 and a p-value of 0.000, less than 0.01.

Table 4: Results of fixed effects regression and random effects GLS regression for the first model

	Fixed effects regression			Random effects regression		
Log (GDP)	Coef.	St. Err.	p-value	Coef.	St. Err.	p-value
Log (GFCF)	0.074	0.071	0.302	0.124	0.079	0.115
Log (Employment)	0.695^{***}	0.093	0.000	0.363^{***}	0.069	0.000
Log (GFCE)	0.310^{***}	0.092	0.001	0.260^{***}	0.099	0.004
Corruption PI	0.004^{***}	0.002	0.010	0.005^{***}	0.002	0.004
IEF	0.021^{***}	0.003	0.000	0.026^{***}	0.003	0.000
Const.	1.202	0.757	0.115	3.350^{***}	0.645	0.000
R^2	0.629			0.595		
Number of obs.	165			165		
Number of groups	15			15		
F(5,145) / Wald chi2 (10)	49.06^{***}			191.68^{***}		
Prob > F / chi2	0.000			0.000		

	Fixed effects regression		Random effects regression	
	Statistic	p-value	Statistic	p-value
Breusch and Pagan Lagrangian multiplier test			436.33^{***}	0.000
Breusch-	355.680^{***}	0.000	399.587^{***}	0.000

	Statistic	p-value		
Pagan test				
Modified Wald test	157.07***	0.000		
Pesaran's test	13.530***	0.000	15.385***	0.000

	Statistic	p-value
Hausman test	23.56***	0.000

*, **, *** denotes significance levels at 10%, 5% and 1%, respectively;
(Source: Authors' calculations)

In Table 5, we can see the results of the second regression model that considers the control of corruption, government effectiveness, political stability, and the index of economic freedom. According to the fixed effect regression and random effects regression, the coefficient before the control of corruption is positive and statistically significant at 0.01 (0.189 and 0.224, respectively). This means that a 1 unit increase in control of corruption can lead to an approximate economic growth of 0.19% and 0.22%, respectively, with all other variables remaining unchanged. The coefficient before government effectiveness is negative in the fixed effects regression (-0.050) and positive (0.003) in the random effects regression. However, both are statistically insignificant. The coefficient between the index of economic freedom is like the previous model, being positive and statistically significant in both regressions.

The R-squared values for the fixed and random effects regressions are 0.618 and 0.542, respectively. To check for heteroscedasticity, both the Breusch and Pagan Lagrangian multiplier test and the Breusch-Pagan test were utilised. The results of both tests showed statistically significant outcomes, indicating the presence of homoscedasticity. Additionally, the Modified Wald test and Pesaran's test suggested the presence of homoscedasticity. The Hausman test was then conducted to choose between fixed and random effects. It indicated that the fixed effects model is preferred over the random effects model, with a statistic of 34.09 and a p-value of 0.000, less than 0.01 (1%).

Table 5: Results of fixed effects regression and random effects GLS regression for full sample for the second model

	Fixed effects regression			Random effects regression		
Log (GDP)	Coef.	St. Err.	p-value	Coef.	St. Err.	p-value
Log (GFCF)	0.066	0.072	0.357	0.122	0.086	0.155
Log (Employment)	0.663***	0.094	0.000	0.250***	0.057	0.000
CC	0.189***	0.048	0.000	0.224***	0.056	0.000
GE	-0.050	0.046	0.279	0.003	0.054	0.952
PS	0.032	0.034	0.346	0.065	0.040	0.106
IEF	0.023***	0.003	0.000	0.028***	0.003	0.000
Const.	2.458***	0.654	0.000	5.045***	0.498	0.000
R^2	0.618			0.542		
Number of obs.	165			165		
Number of groups	15			15		
F(5,145) /	38.80***			170.61***		

Wald chi2 (10)		
Prob > F / chi2	0.000	0.000

	Fixed effects regression		Random effects regression	
	Statistic	p-value	Statistic	p-value
Breusch and Pagan Lagrangian multiplier test			230.99***	0.000
Breusch-Pagan test	347.061***	0.000	360.185***	0.000
Modified Wald test	360.16***	0.000		
Pesaran's test	13.231***	0.000	15.253***	0.000

	Statistic	p-value
Hausman test	34.09***	0.000

*, **, *** denotes significance levels at 10%, 5% and 1%, respectively;
(Source: Authors' calculations)

5. CONCLUSION

The high level of corruption and low efficiency in spending public funds is one of the specifics that characterise Central and Eastern European countries. The high level of corruption, followed by low efficiency in state spending, negatively impacts national economies' capacity to establish and maintain stable economic development. Corruption contributes to suboptimal and inefficient allocation of available resources, especially those of the central government, thus reducing government spending efficiency. Hence, the main reason for analysing the effect of corruption and inefficiency in public spending in Central and Eastern European countries is their potential negative impact on the economic growth of Central and Eastern European countries. That is, to determine whether the high level of corruption, followed by the low level of efficiency of government spending, are part of the obstacles to generating below-average levels of economic growth in Central and Eastern European countries.

A comprehensive examination of the level of economic development among Central and Eastern European countries, as assessed by GDP per capita, reveals significant disparities. Significant heterogeneity persists despite an overall mean GDP per capita of 12,040 US dollars across these countries. Specifically, in certain countries, GDP per capita stands as low as 3,678 US dollars, while in the most developed countries, it reaches 24,745 US dollars.

The present study employs correlation analysis to examine the relationship between several economic and non-economic factors that affect the variation in economic growth in Central and Eastern European countries. The results show a statistically significant and positive relationship between GDPs per capita and government spending and corruption perception and control of corruption. This finding underscores the pivotal function of these determinants in promoting sustainable economic growth in these countries.

The results of the coefficients from the two independent regression models point to the conclusion that the level of employment, government final consumption expenditures, corruption perception index, and gross fixed capital formation have a statistically significant and positive impact on economic growth in Central and Eastern European countries. The regression models were created using the fixed and random effects methods. The value of the coefficient for the corruption perception index is positive and statistically significant, which points to the inverse relationship between the level of corruption and economies' ability to generate sustainable economic growth rates. The results show that the increase in the value of the corruption perception index contributes to the additional growth of GDP per capita, which points to the fact that the reduction of corruption contributes to the increase of GDP per capita in the Central and Eastern European countries.

The results indicate that corruption is more prevalent in poor and middle-income countries and persists for longer. The high level of corruption in these countries contributes to the distortion of market signals and leads to inefficient and suboptimal allocation of resources, especially public finances. Corrupt practices adversely affect public consumption, resulting in suboptimal economic growth rates that have lasting effects on economies' capacity to generate sustainable economic growth rates and close the development gap with other highly developed European countries.

The contribution of this research lies in its inclusion of government spending in the analysis, specifically examining the impact of public spending on economic growth, notably within Central and Eastern European countries. This study adds value to the empirical literature, particularly by applying a methodology previously utilised in similar analyses, allowing for objective comparisons with other empirical research.

Government expenditure is one of the most important factors in achieving advanced economic growth and managing state affairs. An analysis of Central and Eastern European countries reveals the relationship between government spending, corruption, and economic growth. The results of this study support the theory that high perceived levels of corruption, gross fixed capital formation, and government spending are significant factors in determining economic development.

REFERENCES

Adams, F.G., Behrman, J.R., Boldin, M., 1991. Government Expenditures, Defense, and Economic Growth in the Ldcs: A Revised Perspective. Conflict Management and Peace Science 11, 19–35.

Agell, J., Lindh, T., Ohlsson, H., 1999. Growth and the public sector: A reply. European Journal of Political Economy 15, 359–366.

Ahmad, E., Ullah, M.A., Arfeen, M.I., 2012. Does Corruption Affect Economic Growth? Latin American Journal of Economics 49, 277–305.

Aidt, T., Dutta, J., Sena, V., 2008. Governance regimes, corruption and growth: Theory and evidence. Journal of Comparative Economics 36, 195–220.

Arvate, P.R., Curi, A.Z., Rocha, F., Sanches, F.M., 2010. Corruption and the size of government: causality tests for OECD and Latin American countries. Applied Economics Letters 17, 1013–1017.

Bai, J., Jayachandran, S., Malesky, E.J., Olken, B.A., 2013. Does Economic Growth Reduce Corruption? Theory and Evidence from Vietnam. Working Paper Series. https://doi.org/10.3386/w19483

Baklouti, N., Boujelbene, Y., 2016. Impact of government size and corruption on economic growth. International Journal of Accounting and Economics Studies 4, 81. https://doi.org/10.14419/ijaes.v4i2.6150

Barro, R.J., 1990. Government Spending in a Simple Model of Endogeneous Growth. Journal of Political Economy -Chicago-. https://doi.org/10.1086/261726

Campos, N., Dimova, R., Saleh, A., 2010. Whither Corruption? A Quantitative Survey of the Literature on Corruption and Growth (IZA Discussion Paper No. 5334). Institute of Labor Economics (IZA).

Chang, C.-P., Hao, Y., 2017. Environmental performance, corruption and economic growth: global evidence using a new data set. Applied Economics 49, 498–514.

d'Agostino, G., Dunne, P.J., Pieroni, L., 2012. Government spending, corruption and economic growth. MPRA Paper, MPRA Paper.

Del Monte, A., Papagni, E., 2001. Public expenditure, corruption, and economic growth: the case of Italy. European Journal of Political Economy 17, 1–16.

Dzhumashev, R., 2014. Corruption and growth: The role of governance, public spending, and economic development. Economic Modelling 37, 202–215.

Evrensel, A.Y., 2010. Corruption, growth, and growth volatility. International Review of Economics & Finance 19, 501–514.

Fölster, S., Henrekson, M., 2001. Growth effects of government expenditure and taxation in rich countries. European Economic Review 45, 1501–1520. https://doi.org/10.1016/S0014-2921(00)00083-0

Goel, R.K., Nelson, M.A., 1998. Corruption and government size: A disaggregated analysis. Public Choice 97, 107–120. https://doi.org/10.1023/A:1004900603583

Gründler, K., Potrafke, N., 2019. Corruption and economic growth: New empirical evidence. European Journal of Political Economy 60.

Gupta, S., Abed, G.T., 2002. Governance, Corruption & Economic Performance. International Monetary Fund.

Hashem, E.A., 2014. The Effects of Corruption on Government Expenditures: Arab Countries Experience. Journal of Economics and Sustainable Development 5, 120.

Hodge, A., Shankar, S., Rao, D.S.P., Duhs, A., 2011. Exploring the Links Between Corruption and Growth. Review of Development Economics 15, 474–490. https://doi.org/10.1111/j.1467-9361.2011.00621.x

Kotera, G., Okada, K., Samreth, S., 2012. Government size, democracy, and corruption: An empirical investigation. Economic Modelling 29, 2340–2348.

Muritala, T., Taiwo, A., 2011. Government expenditure and economic development: empirical evidence from Nigeria. MPRA Paper, MPRA Paper.

Pulok, M.H., 2010. The Impact of Corruption on Economic Development of Bangladesh:Evidence on the Basis of an Extended Solow Model. MPRA Paper, MPRA Paper.

Saha, S., Ben Ali, M.S., 2017. Corruption and Economic Development: New Evidence from the Middle Eastern and North African Countries. Economic Analysis and Policy 54, 83–95. https://doi.org/10.1016/j.eap.2017.02.001

Shera, A., Dosti, B., Grabova, P., 2014. Corruption impact on Economic Growth: An empirical analysis.

Swaleheen, M., 2011. Economic growth with endogenous corruption: an empirical study. Public Choice 146, 23–41. https://doi.org/10.1007/s11127-009-9581-1

Tanzi, V., Davoodi, H.R., 2000. Corruption, Growth, and Public Finances.

Tanzi, V., Davoodi, H.R., 1997. Corruption, Public Investment, and Growth.

Tsanana, E., Chapsa, X., Katrakilidis, C., 2016. Is growth corrupted or bureaucratic? Panel evidence from the enlarged EU. Applied Economics 48, 3131–3147.

IMPACT OF BANK CONCENTRATION ON VOLATILITY – THE CASE OF EUROPEAN ECONOMIES

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ABSTRACT

The goal of this paper is to investigate the impact of concentration in the banking sector on the economic and financial stability. Having in mind that the European countries are predominantly bank-centered, we begin with the assumption that too much power concentrated in a small number of financial institutions could have a significant impact on the entire economy. Therefore, our aim is to examine the impact of concentration in the banking sector on the stability of both the financial system and the economy.

For the purpose of the study, we have created a sample of 44 European countries, with data covering the period 2000-2021. The methodology involves two econometric techniques: logistic regression and the Generalized Method of Moments procedure to address the problem of possible endogeneity of the data.

Using a set of independent variables representing the level of concentration and competition, as well as a set of controlling variables, the results show that the higher concentration of assets among the largest banks has a negative impact on economic stability, while the impact on financial stability is undetermined. The remaining variables show that the countries with higher growth rates and higher capital investments exhibit more stable growth, while the impact of inflation is generally negative.

Keywords: *financial sector, banks, competition, economic stability, financial stability.*

JEL Classification*: D40, E44, G01, G21*

1. INTRODUCTION

In the current economic settings, one cannot overlook the importance of the level of financial development for the overall economic development of a country (Schumpeter, 1912; Goldsmith, 1969; Levine and Zervos, 1998). However, the financial sector itself has sometimes been the source of strong headaches for the government officials, when it, as a result of its structure and characteristics, brings volatility into the economy and becomes more a problem instead of a solution.

The first issue of importance is the level of development of the financial system. In many countries, especially in Europe, which is in the center of our interest, it comes down to the development of the banking sector, since most of continental Europe has the characteristics of being bank centerred. The second important issue is the structure of the banking sector, i.e., the

level of concentration of banking activity, which determines the conduct and the performance of the banks, with inevitable consequences for the entire economy.

The developed financial sector is said to have a positive impact on the overall economic activity through the provision of financial support, setting the cost of capital which serves as a benchmark for the adoption of investment projects, allocation of capital to the most efficient sectors of the economy, etc. On the other hand, the development of the financial sector above a certain threshold is seen as an obstacle to the economy as it drives away resources from the rest of the economy or its size and importance become a source of economic instability. The role the financial or the banking sector will have in the economy depends not only on the size of the sector, but also on its structure (banking, vs. stock market) and concentration (number of players in the sector).

In this paper we want to explore the impact of the structure of the financial sector on the stability of the economy and the banking sector in the case of the European economies. For that purpose, we have constructed a sample of 44 European countries and gathered data for the period 1998-2021. Using a set of independent and control variables, our basic goal is to investigate the importance of the structure of the banking sector for the stability of the banking sector and the overall volatility of the economy. The focus is on the banking sector, as it represents by far the most dominant part of the financial sectors of the European economies. Due to the nature of the problem, we apply two econometric procedures: Logistic regression (Logit) and Generalized Method of Moments (GMM). We include several widely used variables to represent the structure of the banking sector, which also limits the potential of the study as not all of them are available in sufficiently long time series of data.

The expected contribution of this paper to the existing literature is to shed more light on the nexus between the financial sector composition and the economic and financial stability in Europe. Most of the reviewed literature on this topic covers different parts of the world and various groups of countries, some of the papers refer to the European Union economies, but the whole of Europe has not been the subject of study, to the best of our knowledge. Bearing in mind the specifics of our continent, we find it important that the policymakers are provided with the relevant knowledge on this topic, so that they could adjust their policies accordingly.

The results of the GMM model indicate that higher concentration in the banking sector negatively affects the economic stability of a country, while the logit results related to the financial sector crises are not conclusive. A possibly unexpected finding is that the higher level of financial development contributes to the economic volatility. The remaining variables are pretty much in line with the expectations.

After the introduction, the first section contains a review of the existing literature in this field. The second section describes the research methodology and the sources of data used in the regression. The next section includes the regression results and their interpretation. The final part of the paper covers the conclusions of the study.

2. LITERATURE REVIEW

The importance of the financial sector development in the overall economic development of a country has been researched thoroughly (Schumpeter, 1912; Goldsmith, 1969; King and Levine, 1993; Levine and Zervos, 1998; Rajan and Zingales, 1998; Fisman and Love, 2004). The general conclusion is that up to a certain level, the financial sector development has a positive influence on economic growth. These benefits arise from several sources. The larger size of the financial

sector increases the amount of capital in the economy available for investments (McKinnon 1973; Greenwood and Jovanovic, 1990). The higher supply of capital lowers the cost of capital for the prospective investors (Rajan and Zingales, 1998), the more developed financial market provides allocation of capital to its most efficient uses (King and Levine, 1993; Mishkin, 2002); the financial system provides efficient and innovative payment services (Kindleberger, 1993), etc. However, in spite of the aforementioned studies supporting the premise, economic science is not unambiguous about the impact of financial development on the level of economic development. More recent studies indicate a weakening of the relationship between a country's financial and economic development (Nili and Rastad 2007, Barajas, Chami and Yousefi 2013). According to Rousseau and Wachtel (2011), the oversized banking sector is often a reason for the occurrence of banking crises, which often serve as a trigger for economic recessions. Other negative consequences of the intensive financial development of a country are the concentration of professional staff in the financial sector and the extraction of that intellectual potential from other economic sectors (Cecchetti and Kharroubi, 2015), as well as the fact that the oversizing of the financial sector brings with it itself great complexity and increases the sources of risk for the economy (Gennaioli, Shleifer and Vishny, 2012). In a recent study of the EU and OECD economies, Prochniak and Wasiak (2017) conclude that the excessive size of the stock market or the banking sector (excessive lending) has a detrimental impact on economic growth.

Another issue that attracted research interest has been the structure of the banking sector and its impact on the efficiency of the sector and the economic growth. According to the basic economic postulates, less concentration and more competition should be favourable for the economy. The "too big to fail" argument from the past financial crisis (2008-2009) provided empirical support for this concern. However, the findings of researchers with respect to this issue are not straightforward. Demirgüç-Kunt and Levine (2000) find no significant relationship between bank concentration and the efficiency of the banking sector, as well as with the level of financial development. Ratti et al. (2008) use a sample of firm-level data from European companies, to explore the impact of banking sector concentration. Their conclusions are somewhat unexpected, as they find that in more concentrated systems, the firms are less financially constrained. Their explanation is linked to the information theory, as the higher the market power exhibited by banks, the more able they are to obtain borrower-related information. Similar findings are reached by Liu and Mirzaei (2013). Ricky-Okine et al. (2020) use a sample of 37 Sub-Saharan countries and find that the presence of larger banks is supportive to economic growth, but this is more emphasized in the countries with more competitiveness in the sector, which is characteristic for the Anglophone compared to the Francophone countries. Owen and Pereira (2018) differentiate between banking sector concentration and the level of competitiveness in the sector. Their research on a sample of 83 countries shows that greater concentration in the banking sector has a positive impact on the financial inclusion, provided that a sufficient level of competitiveness is present. Similar are the results of Arsov and Naumoski (2020) who analyze a sample of 22 post-socialist economies and conclude that the higher concentration of assets among the five largest banks has a positive impact on the level of financial development.

Another stream of research investigates the relationship between the banking sector concentration and the stability of the financial system and the overall economic stability. The results of these studies are no less surprising than those about the relationship between banking concentration and growth. Beck, Demirgüç-Kunt and Levine (2003) conclude that concentration in the banking sector has a stabilizing effect on the overall sector. On the other hand, they differentiate between concentration and competition, so that better institutions and policies

promoting competition have a positive impact on the prevention of banking crises. Similar are the findings of Beck et al. (2003), who study a sample of 89 countries in the period 1980-1997 and conclude that the higher concentration of the banking sector has a positive impact on economic stability. Căpraru and Andrieş (2015) find that a higher degree of competition could promote the financial stability in EU countries, but its role diminishes in the case of crises. Ben Ali et al. (2018) conclude that the concentration in the banking sector has a positive impact on financial stability during crisis periods, but no effect during normal periods. Smolo (2022) explores a sample of 49 Islamic countries and concludes that the concentration in the banking sector has no significant impact on economic volatility.

3. METHODOLOGY AND DATA

Having in mind the basic goal of the paper, it is the **economic and financial stability which is to be taken as a dependent variable**. Therefore, we will have at least two regression equations. However, the problem is to find appropriate proxies for these variables.

One of the best options to represent *economic stability* (or volatility) is the standard deviation of economic growth (we apply the 3-year standard deviation of the annual growth rate of real GDP per capita). The source of data for GDP is the World Bank World Development Indicators Database (WBWD).

For the *financial sector stability,* we use a banking crisis dummy (taking values of 1 or 0). The banking crisis variable is also found in the WBWD.

The basic independent variable is the level of **banking sector concentration or competition**.

The WBGFD database provides sufficiently long series of the 3-bank and 5-bank ratios, which is the percentage of banking assets held by the three or five largest banks in the country, respectively.

However, as mentioned above, it is not only concentration of assets that matters, but the level of competition (or collusion) among the banks, as well. For this purpose, the H-statistic, the Lerner index and the Boone indicators are suggested. The H-statistic represents the link between the sales price and the cost of the inputs. Under perfect competition, the companies respond linearly to the increase in input prices by increasing the output prices. The Lerner index measures the level of monopolistic power through the difference between the output price and marginal costs. The Boone indicator is a measure of the competition and is calculated as the elasticity of profits to changes in marginal costs. These indicators are available at country level in the World Bank Global Financial Development database, but unfortunately not all of them cover the entire analyzed period, so that some of our regressions suffer from the limited length of the time series. Due to the insufficient coverage of the H-statistic, it is excluded from our analysis.

In addition, the model includes several **control variables**, to capture the effects of other factors which also influence the level of economic or financial stability. Among them, we use variables that represent the specifics of the banking sector and general economic variables.

The bank-specific control variables are:
- The level of financial development, which is usually represented by the size of the banking activity, proxied by the amount of **credit extended by banks to the private sector** divided by GDP.
- Net-interest margin, which is the average annual difference between the active and passive interest rates for the banking sector.

The general economic variables are those related to the general national or global economy, as they also have impact on the dependent variable. In this paper, we include:

- Level of economic development (represented by the annual GDP per capita);
- Rate of inflation (represented by the GDP deflator);
- Trade openness of the economy (proxied by the sum of exports and imports divided by GDP);
- Gross capital formation (annual gross capital formation divided by GDP);
- Global financial crisis dummy. We use this variable in the Logistic regression as it is compatible with the dependent variable. We put 1 for the years 2008 and 2009 and 0 for the rest of the analyzed years and we expect this to serve as a kind of a test for the model's validity.
- Adoption of EURO (dummy variable representing if the country has become a member of the Eurozone, not adopted the EURO as a currency, like Montenegro). The variable takes value of 1 for the years the country became a member of the EURO area onwards and 0 otherwise). This is a variable we have not met in the existing literature and our expectation is that the membership in the Eurozone has an impact on the banking sectors, through the special regulations it imposes on the member countries.

Our sample consists of 44 European countries, which is actually all of Europe (Turkey, Azerbaijan and Georgia included), except for the smallest several states. Data for all the numerical variables above are taken from the WBWD and WBGFD databases. The dataset covers the period 2000-2021, while data for the 2 prior years are used to derive the necessary averages. All the variables, except those representing the bank concentration measures and the dummy variables are used in their log forms.

The basic model of interest is the following:

$$Stability_{i,t} = \alpha\, CONC_{i,t} + \beta B_{i,t} + \gamma C_{i,t} + \varepsilon_{i,t} \qquad (1)$$

Where:
- $Stability_{i,t}$ is a measure of economic stability or financial crisis in country i in period t
- $CONC_{i,t}$ is a measure of concentration/competitiveness in the banking sector for country i in period t
- $B_{i,t}$ is a vector of bank-specific control variables
- $C_{i,t}$ is a vector of general economic control variables
- $\varepsilon_{i,t}$ is a residual value

In the regression where the dummy variable *banking crisis* is used as a dependent variable, we apply Logistic regression (logit) and probit as a robustness check.

In the other regression, with the *volatility of growth* as a dependent variable, the first choice is to use a panel regression. However, there is a possible endogeneity among the variables in the model, i.e., the explanatory variables might also be affected by the dependent variable. Namely, there could be a bi-directional causality among the economic and financial stability on one side and the economic growth and financial development on the other. In order to overcome this problem, we apply the dynamic panel GMM econometric tool, first described by Arrelano and Bond (1991) and further developed in Arrelano and Bover (1995) and Blundell and Bond (1998). The basic equation is thus transformed to:

$$Stability_{i,t-1} = \alpha\, Stability_{i,t-1} + \beta\, CONC_{i,t} + \gamma B_{i,t} + \delta C_{i,t} + \eta_i + \mu_t + \varepsilon_{i,t} \qquad (2)$$

Where η_i are unobserved and country-specific fixed effects, μ_t are unobserved time-specific effects and $\varepsilon_{i,t}$ is the error term.

We apply the first-difference GMM model, by using lagged values of explanatory variables as instruments. Period effects can be solved by using time-specific dummy variables. The instruments should be variables that are correlated with the endogenous variables, but not directly with the dependent variable. For simplicity, lagged values of the independent variables are often used as instruments.

4. RESULTS AND DISCUSSION

First, we present the descriptive statistics to provide some basic insight into the sample used.

Table 1: Descriptive statistics

	Standard deviation of growth	Assets owned by 5 largest banks	Lerner index	Boone indicator	Credit to private sector by banks ratio	Net interest margin	GDP growth	Trade openness	Gross Capital Formation	Inflation
Mean	0.0198	81.19	0.230	-0.082	84.52	3.547	0.026	102.12	24.26	5.15
Median	0.0134	83.43	0.242	-0.057	64.00	2.990	0.023	89.394	23.22	2.65
Maximum	0.1206	100.00	0.709	2.177	525.64	21.358	0.285	351.13	57.99	86.82
Minimum	0.0003	29.93	-1.746	-1.572	5.188	0.180	-0.159	45.418	12.65	-18.84
Std. Dev.	0.0190	15.57	0.168	0.279	76.74	2.636	0.044	48.973	5.570	8.740

Source: Authors

Table 1 contains the basic statistical data about all the variables in the regression, except for the dummy variables. For some of the variables, it is obvious that there are large variation margins. The relatively high concentration of assets among the largest banks is obvious from the mean and median in the second column, indicating that, on average, the 5 largest banks own more than 80% of the entire banking sector assets per country. The average GDP growth rates are slightly above 2%, while inflation rates have been modest around 2.6%, excluding outliers.

Table 2 contains the results of the first regression, i.e., the logit model and the robustness check with the probit model.

Table 2: Regression results – logit and probit (Banking crisis as a dependent variable)

	Logit			Probit		
Constant	3.953	3.4604	4.5520	1.6662	1.0933	1.8475
	(0.197)	(0.371)	(0.212)	(0.305)	(0.593)	(0.344)
Bank concentration (5 largest banks)	-0.0040			-0.0017		
	(0.655)			(0.703)		
Lerner index		-0.2158			-0.0750	
		(0.814)			(0.884)	
Boone indicator			-1.0545*			-0.5234
			(0.096)			(0.130)
Financial development	0.5069**	0.5228*	0.4326	0.2147	0.2518*	0.1935
	(0.047)	(0.065)	(0.111)	(0.100)	(0.096)	(0.182)
Net-interest margin	-0.0117	-0.1554	-0.2741	0.0219	-0.0707	-0.1257
	(0.965)	(0.606)	(0.354)	(0.879)	(0.664)	(0.436)
GDP growth	-10.950***	-15.553***	-17.753***	-6.0604***	-8.5842***	-9.8143***
	(0.003)	(0.003)	(0.000)	(0.002)	(0.002)	(0.000)
Trade openness	0.4251	0.6636*	0.6800**	0.2739*	0.4134**	0.4092**
	(0.156)	(0.067)	(0.039)	(0.086)	(0.031)	(0.022)
Gross Capital	-3.5698***	-3.7730***	-3.9759***	-1.7722***	-1.8279***	-1.9569***

Formation	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Inflation	0.3632**	0.3435*	0.3709**	0.1759**	0.1725*	0.1845**
	(0.027)	(0.055)	(0.034)	(0.036)	(0.067)	(0.045)
Adoption of Euro	0.4430	0.7173*	0.5281	0.1967	0.3457	0.2426
	(0.242)	(0.086)	(0.177)	(0.312)	(0.116)	(0.245)
Global Financial Crisis	3.0605***	2.7551***	2.6229***	1.6513***	1.4778***	1.4075***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log likelihood	-181.81	-131.431	-147.276	-183.281	-132.675	-148.771
Wald Chi^2 (9)	266.58	165.06	176.845	393.263	234.318	250.818
Prob Chi^2	0.000	0.000	0.000	0.000	0.000	0.000
McFadden R^2	0.3156	0.377	0.358	0.310	0.3707	0.352
No. of countries	44	44	44	44	44	44
Observations	855	855	855	855	855	855

Standard errors in parentheses.

*, **, *** - denote significance at 10%, 5% and 1% respectively

Source: Authors

First, the comparison between the logit and probit regression results confirms the high level of consistency among them, and thus the robustness of the logit regression. With respect to the results of the regression, the results from the logit regression do not provide any conclusive evidence about the concentration-volatility relationship. The remaining variables indicate that the level of financial development has a negative impact on banking stability (the dependent variable is Crisis), while the strongest support is achieved for the variables where it was most expected: the countries exhibiting highest growth rates are less prone to banking crises, inflation has negative impact on stability, and the eurozone countries are not less susceptible to banking crisis. The global financial crisis variable unequivocally confirms the link between the global crisis and the crises in particular countries of Europe, which serves as an additional test for the validity of our model.

Table 3: Regression results – Generalized Method of Moments (Growth volatility as dependent variable)

Volatility of growth $_{t-1}$	0.6542**	0.4558***	0.4327**
	(0.020)	(0.000)	(0.032)
Bank concentration (5 largest banks)	0.0005***		
	(0.000)		
Lerner index		0.0117**	
		(0.023)	
Boone indicator			0.0057**
			(0.012)
Financial development	0.0167***	0.0216***	0.0230***
	(0.000)	(0.007)	(0.000)
Net-interest margin	-0.0122**	0.0100	0.0152***
	(0.023)	(0.355)	(0.001)
GDP growth	-0.1336***	-0.1565**	-0.1456***
	(0.000)	(0.009)	(0.000)
Trade openness	-0.0367***	-0.0872***	-0.0941***
	(0.000)	(0.000)	(0.000)
Gross Capital Formation	0.0087*	0.0034	-0.0035
	(0.057)	(0.343)	(0.378)
Inflation	0.0039***	0.0063***	0.0068***

	(0.000)	(0.000)	(0.000)
Adoption of Euro	0.0176***	0.0220*	0.0195**
	(0.000)	(0.064)	(0.031)
Sargan test (p-value)	0.23	0.26	0.31
AR (1)	0.01	0.01	0.02
AR (2)	0.73	0.50	0.72
No. of countries	44	44	44
Observations	467	467	467

Standard errors in parentheses.
*, **, *** - denote significance at 10%, 5% and 1% respectively
Source: Authors

According to the GMM model, the countries with higher concentration in the banking sector exhibit higher volatility in the growth rates of GDP. Therefore, more concentrated banking sectors are detrimental to the economic stability. This is in line with the results of Boyd et al. (2006) and Berger et al. (2009) who explain this through the higher risk concentrated in the portfolios of large and dominating banks. Also, the higher level of financial development is associated with higher economic volatility, while countries growing at faster rates and more open economies are more economically stable. Higher inflation contributes to economic volatility, while a bit surprising finding is that the eurozone countries exhibit larger oscillations in their growth rates. In this regression, the impact of net-interest margin and gross capital formation are ambiguous and insignificant, respectively.

5. CONCLUSION

The goal of the paper was to determine if the concentration in the banking sector has any impact on the economic and financial stability, on the basis of a sample of 44 European countries and a dataset covering the 2000-2021 period. The regression model used required two different procedures to be implemented: a logistic regression and a difference GMM procedure in order to overcome the possible endogeneity among the variables.

Having in mind both regressions, we can conclude that highly concentrated banking sectors lead to greater economic instability, but their effect on the financial sector itself is not conclusive. Also, more financially developed economies are at higher risk of both financial and economic crises, while higher rates of economic growth reduce economic volatility. Inflation contributes to economic instability, while higher rates of capital investment and trade openness of the economy have preventative effect.

The value of this paper is that it analyzes an issue which is not sufficiently explored, and the analysis is based on a sample covering the entire European continent. It provides a piece of advice for the policymakers that they should pay closer attention to the structure of their banking sectors as it might become a source of instability. It also confirms some well-known postulates that higher growth rates, higher levels of investment and trade openness are necessary preconditions for a stable economic progress, while the need to prevent higher rates of inflation is accentuated again.

The limitations related to this paper refer to the possible imperfection of the variables used to represent the concentration in the banking sector. Namely, there are several solutions suggested in the literature, but not all of them are equally useful, nor the data on them are available. The World Bank has even discontinued publishing data on the Lerner and Boone measures. Therefore, this research issue deserves to be revisited again once more convenient data becomes available.

REFERENCES

Arellano M., Bond S. (1991), "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations". *Review of Economic Studies* 58: 277-297.

Arellano, M., O. Bover (1995), "Another look at the instrumental variable estimation of error-components models." *Journal of Econometrics*, 68, 29-52.

Arsov, S., A. Naumoski (2020), "The impact of bank concentration and competetiveness on financial sector development in the post-transition economies of Eastern Europe", *Proceedings from the International Conference TIMTED-2021*, June, 2021, Timisoara

Barajas, Adolfo, R. Chami, S. R. Yousefi (2013), "The Finance and Growth Nexus Re-examined: Do All Countries Benefit Equally?" *IMF Working Paper 13/130*, International Monetary Fund, Washington.

Berger, A.N., Klapper, L.F., and Turk-Ariss, R. (2009). Bank Competition and Financial Stability. *Journal of Financial Services Research*, 35 (2): 99-118.

Beck T., A. Demirgüç-Kunt, R. Levine (2003), "Bank Concentration and Crises", *NBER Working Paper No. w9921*

Ben Ali, M. S., T. Intissar, R. Zeitun (2018), "Banking Concentration and Financial Stability. New Evidence from Developed and Developing Countries", *Eastern Economic Journal* vol. 44

Blundell, R., S. Bond (1998), "Initial conditions and moment restrictions in dynamic panel data models" *Journal of Econometrics*, 87(1), 115-143

Boyd, J.H., De Nicolo, G., and Jalal, A.M. (2006). Bank risk-taking and competition revisited: new theory and new evidence. IMF Working Paper, 06/29.

Căpraru, B. & Andrieş, A.M. 2015. "Nexus between concentration and fragility across EU banking systems", *Procedia Economics and Finance*, 32: 1140–1147.

Cecchetti, Stephen G., E. Kharroubi (2015), "Why Does Financial Sector Growth Crowd Out Real Economic Growth?" *BIS Working Paper 490*, Bank for International Settlements, Basel.

Demirguc-Kunt, A. & Levine, R. 2000. Bank concentration: Cross-country evidence, World Bank, Online at https://documents1.worldbank.org/curated/ar/79371468780328170/310436360 _20050276035212/additional/wdr27828.pdf

Fisman R., I. Love (2004), "Financial Development and Intersectoral Allocation: A New Approach", *The Journal of Finance*, Vol. 59, No. 6, pp. 2785-2807

Gennaioli, Nicola, A. Shleifer, R. Vishny (2012), "Neglected Risks, Financial Innovation, and Financial Fragility." *Journal of Financial Economics* 104 (3): 452–68.

Goldsmith, R. W. (*1969*), *Financial Structure and Development*. New Haven: Yale University Press.

Greenwood J., B. Jovanovic (1990), "Financial Development, Growth, and the Distribution of Income", *The Journal of Political Economy*, Vol. 98, No. 5, Part 1, pp. 1076-1107

McKinnon R (1973), *Money and Capital in Economic Development* Washington, D.C: The Brookings Institution

Kindleberger C. (1993), *A financial history of Western Europe* 2ed, New York, Oxford University Press

King, R. G., R. Levine (1993), "Finance, Entrepreneurship, and Growth-Theory and Evidence" *Journal of Monetary Economics*, Vol. 32, 3: 513-542.

Levine, R., S. Zervos (1998), "Stock markets, banks and economic growth", *American Economic Review*, vol 88, pp 537–58.

Liu, G., A. Mirzaei, (2013), "Industrial Growth: Does Bank Competition, Concentration and Stability Constraint Matter? Evidence from developed and emerging economies", Working Paper No. 13-23

Nili, M., M. Rastad (2007), "Addressing the Growth Failure of the Oil Economies: The Role of Financial Development." *Quarterly Journal of Economics and Finance* 46 (5): 726–40.

Owen, Ann L., Javier M. Pereira (2018), "Bank concentration, competition, and financial inclusion", *Review of Development Finance* 8 (2018) 1–17

Prochniak, M., K. Wasiak (2017), "The impact of the financial system on economic growth in the context of the global crisis: Empirical evidence for the EU and OECD countries". *Empirica* 44 (2):295–337. doi:10.1007/s10663-016-9323-9.

Rajan, R. G., L. Zingales (1998), "Financial dependence and growth", *American Economic Review*, 88(3), 559-86.

Ratti, R. A., Lee, S., & Seol, Y. (2008). "Bank concentration and financial constraints on firm-level investment in Europe". *Journal Of Banking And Finance*, 32(12), 2684-2694.

Ricky-Okine, C., T. Amankwaa, E. Anane, (2020), "Banking Sector Competition and Financial Development in Sub-Saharan Africa", International Journal of Technology and Management Research 5

Rousseau, Peter L., P. Wachtel (2011), "What is happening to the impact of financial deepening on economic growth?", *Economic Inquiry*, Vol. 49, Issue 1: 276-288

Sahay R., M. Čihák, P. N'Diayeet al., (2015) *Rethinking Financial Deepening: Stability and Growth in Emerging Markets*, International Monetary Fund

Schumpeter, J. (1912), *The Theory of Economic Development*, Cambridge, MA: Harvard University Press

Smolo, Edib (2022), "Bank Concentration and Economic Volatility in the OIC Countries: The Role of Financial Development", *Croatian Economic Survey*, Vol.24, No.2.

DETERMINANTS OF LEVERAGE OF THE COMPANIES LISTED ON THE OFFICIAL MARKET OF THE MACEDONIAN STOCK EXCHANGE

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ABSTRACT

The decisions pertaining to the choice of the type of financing are ones of paramount importance for every company, since they have a direct impact on its profitability. Adequate choice of capital structure can minimize the overall cost of financing, which, in turn, leads to maximizing the value of the company.

The focus of this paper is to establish and examine the determinants that influence the leverage of the companies listed on the Macedonian Stock Exchange. For this purpose, the Fixed Effects Panel Regression model is used on a sample data that consists of 36 companies, out of which 16 are on the exchange listing and the remaining 20 are on the mandatory listing on the Macedonian Stock Exchange. The data for the analysis is collected from the audited financial statements of these companies for a period of 5 years, starting from 2017 to 2021.

The results of the research imply that only two of the total five analyzed variables have certain impact on the capital structure of the companies, while the other three are statistically insignificant and have a negative impact on the leverage. Profitability and tangibility are variables that have statistically significant influence on the leverage of the Macedonian companies, while liquidity, free cash flow and the size of the companies are not statistically significant variables according to this analysis.

Key words: Leverage, capital structure, Fixed Effects Panel Regression

JEL classification: G32, C33

1. INTRODUCTION[1]

The purpose of the existence of every private company is to maximize its profit and increase its market value, which would result in higher earnings in the form of dividends for the shareholders and bonuses for the management. Hence, the interests of both interested parties coincide, but the idea of how to achieve this purpose may differ.

One of the decisions that significantly affect the profitability of the company is the choice of the sources of financing, i.e. the proper ratio of the liabilities in the company's balance sheet. Despite the many theories that have been developed so far, as well as the extensive research literature on this subject, science does not have yet provided a precise and unique answer on the

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best ratio between the company's sources of financing. This is expected, because, in addition to the economic justification when choosing which source of financing to prevail and in what ratio to be represented, the structure of financing depends on the numerous internal and external factors present at the specific moment, but also on the plans for the future development of the company.

The goal of this research is to establish the determinants that affect the structure of the sources of financing of the companies in the Republic of North Macedonia. Fixed Effects Panel Regression model is used on a sample of 36 companies listed on the Macedonian Stock Exchange.

Research hypotheses are:

H1: The size of the company has a positive impact on leverage,
H2: Free cash flow has a negative impact on leverage,
H3: Liquidity has a negative impact on leverage,
H4: Tangibility has a positive influence on leverage, and
H5: Profitability has a positive impact on leverage.

The results obtained indicate that only two out of the total five variables affect the structure of the sources of financing of the companies, while the remaining three variables are statistically insignificant, with a negative sign. Variables that have a statistically significant impact on the leverage of the Macedonian companies are profitability and tangibility, while liquidity, free cash flow and the size of the company are not statistically significant variables according to this analysis.

This paper does not cover the tax aspects that affect the choice of the financing structure.

The limitations in the research may arise from the representativeness of the sample that is subject of analysis, given that the vast part of companies that have "facilitated" access to external financing are listed on the official market of the Macedonian Stock Exchange. Nevertheless, publicly available audited financial data exists only for these companies.

The research is to be considered a contribution to the literature in this field in the Republic of North Macedonia, while the results may be helpful for the financial decision makers in the companies.

In the future, the research can be expanded by analyzing more explanatory variables, covering a longer period of time, given that our panel data refers to a period that includes extreme conditions such as the Covid-19 pandemic and the energy crisis, which were inevitably reflected on the balance sheets of the companies. Moreover, samples of companies with different activities can be analyzed, for example companies from the manufacturing sector, trading companies, etc.

In addition to the introduction, the paper briefly presents results and knowledge obtained from previous research and contributions to the literature on this subject, the applied methodology and the data used for the research. At the end of the paper, the results of the research are discussed and the conclusions are presented, along with the possibility of applying the knowledge gained, as well as the possibility of continuing the research.

2. LITERATURE REVIEW

The literature on the structure of the sources of financing examines several aspects, including: analysis of theories that attempt to explain the optimal structure of the sources of financing; the

determinants affecting the structure of the sources of financing; the impact of different ratios between these sources on the companies' profitability, etc.

Myers, S. C. (2001) makes observations of three prevailing theories: the trade-off theory, the pecking order theory and the free cash-flow theory, and draws a conclusion that there is relevant evidence to support each of these theories, but none provides a generally accepted explanation for choosing the most appropriate financing strategy. Hence, testing them on a large, heterogeneous sample of companies may be unhelpful, i.e. uninformative. In certain cases, researchers arrive at results that are consistent with two of the theories or with a particular theory, while a different financing model is implemented in practice. The theories on the optimal structure of the sources of financing differ in the interpretation they provide of the factors that influence that structure. Thus, the trade-off theory emphasizes taxes, the pecking order theory emphasizes the concept of asymmetric information, and the free cash-flow theory emphasizes the agency costs. The trade-off theory claims that the companies strive for a level of indebtedness that balances the positive effects of the tax shield from additional borrowings against the possible financial distress costs. Consequently, this theory predicts moderate indebtedness of the companies that are taxpayers. The pecking order theory considers that the companies will decide to borrow and then issue additional capital, exclusively in cases where the internal cash flows are not sufficient to finance capital investments. According to this theory, the amount of indebtedness reflects the cumulative need for external financing. The free cash-flow theory argues that the significantly high levels of indebtedness will increase the value of the company, regardless of the threat of financial crisis, in cases where the cash flow from operating activities significantly exceeds the profitable investment opportunities. This theory is designed for "mature" companies with a significant volume of investments.

Harris, M., & Raviv, A., (1991) analyze the available relevant literature on the various theories of the structure of the sources of financing of the companies (more than 150 studies are included), relating the theories to the empirical results of current research, in a way that shows which research is a confirmation or negation of the individual theoretical claims. They exclude the theories that are primarily based on the tax shield. The results of their research identify a huge number of potential determinants of the structure of the sources of financing, but empirical research does not prove which of them are relevant in different time contexts.

According to these authors, the models that attempt to explain the structure of the sources of financing based one the agency costs are one of the most successful. These theoretical models predict that the leverage is positively correlated with: 1. the higher value of the company (Hirshleifer and Thakor, 1989; Raviv, 1990, Stulz, 1990, as cited in Harris, M., & Raviv, A., 1991), 2. the probability of failure (Harris & Raviv, 1990, as cited in Harris, M., & Raviv, A., 1991), 3. the free cash-flow (Jensen, 1986, Stulz, 1990, as cited in Harris, M., & Raviv, A., 1991), 4. the liquidation value of the company (Williamson, 1988, Harris & Raviv, 1990, as cited in Harris, M., & Raviv, A., 1991), 5. the threat of the company being targeted for takeover (Hirshleifer & Thakor, 1989, Stulz, 1990, as cited in Harris, M., & Raviv, A., 1991) and 6. the importance of management reputation (Hirshleifer & Thakor, 1989, as cited in Harris, M., & Raviv, A., 1991). On the other hand, the analyzed models show that the leverage is negatively correlated with: 1. the growth opportunities (Jensen & Meckling, 1976, Stulz, 1990, as cited in Harris, M., & Raviv, A., 1991), 2. the interest coverage ratio, the research costs of companies' announcements and the probability of reorganization in case of operational problems (Harris & Raviv, 1990). Additionally, some implications suggest that the restrictive contractual provisions of the creditors restrict the owners from pursuing risky projects (Jensen and Meckling, 1976, as

cited in Harris, M., & Raviv, A., 1991) and that the companies with longer credit history have lower default rates and lower costs of debt (interest) (Diamond, 1989, as cited in Harris, M., & Raviv, A., 1991).

The theories that are based on the concept of asymmetric information held by the stakeholders analyze the changes (reactions) of the value of the shares in cases where the debt increases and consider that the companies follow certain order in making the choice of financing (pecking order theory). Harris, M., & Raviv, A., (1991) conclude that empirical research confirms the theoretical claims, except in the following two cases: 1. leverage increases along with the increase in free cash flow, and 2. leverage is positively correlated with the probability of failure. Research has confirmed opposite theses, i.e. claims.

A large number of studies in the literature in this field also examine the determinants of capital structure, as well as its impact on the profitability of the companies on different markets and regions. In general, similar or identical variables are often used in the analysis, with certain modifications in the calculation of the relative indicators of profitability, liquidity, indebtedness and efficiency in the operations of the companies.

In the Republic of North Macedonia, there are several research papers on the structure of the sources of financing. The results of the dynamic panel regression of Jovanović, B. (2015) on a sample of 194 Macedonian companies analyzed in the period 2000-2014[2], show that the size of the company and the development opportunities (shown through the growth rate of assets) are positively correlated, while profitability, tangibility and the tax shield against costs that are not related to debt, are negatively correlated with the leverage.

The mean leverage[3] for 47 listed companies on the Macedonian Stock Exchange, calculated for the period 2009-2013, is about 35% (Arsov, S., 2015). The results of this research show that the total indebtedness of the companies has a negative impact on their profitability, while the size of the company has a positive impact. The other analyzed variables, such as investments[4], income growth, tangibility and the profit tax rate do not have a statistically significant impact on the profitability of the companies.

In addition to the authors mentioned above, for the preparation of this paper, other research studies in this field were also consulted, such as those of: Acaravci, S. K. (2015), establishing the determinants affecting 79 manufacturing companies listed on the Istanbul Stock Exchange; Akhter, A. G. J. (2018), examining the impact of the structure of the sources of financing on the profitability of 35 pharmaceutical companies listed on the stock exchange; Chandra et al. 2019; Yapa, D. (2015), etc.

3. DATA AND METHODOLOGICAL APPROACH TO THE RESEARCH

For the purposes of the analysis, a fixed effects panel regression model is used with six variables, five of which are independent and one is a dependent variable.

The leverage of the companies is used as the dependent variable, while the liquidity, profitability, tangibility, free cash flow and the size of the companies are used as the independent variables.

The data for the analysis are summarized from a selected sample consisting of 36 companies listed on the Macedonian Stock Exchange. The data is publicly available, i.e. data from the audit

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[2] The analyzed period actually covers two sub-periods: 2000-2009 and 2013-2014, due to lack of data.
[3] Leverage is calculated as the ratio of the companies' total debt and their total assets.
[4] Investments from the previous three years in relation to the total assets are used as a variable.

reports published on the website of the Macedonian Stock Exchange, covering a period of five consecutive years, i.e. from 2017 to 2021. In the sample consisting of 36 companies, 16 are part of the stock market listing, and the remaining 20 are part of the mandatory listing on the official market of the Macedonian Stock Exchange. It is important to mention that the sample does not include companies from the banking and insurance sectors, taking into account that these companies have a different structure of the annual accounts, which is primarily characterized by a high (incomparable) leverage with the rest of the companies in the sample, due to the specificities of their activities. Hotels are also excluded from the sample (due to the non-representative years as a result of the Covid-19 crisis), as well as state-owned companies and companies that are on the "Watch List" on the Macedonian Stock Exchange.

The variables "Size" and "Free Cash Flow" included in the models as time series are expressed in logarithmic values, while the stationarity of the other four variables: "Leverage", "Liquidity", "Profitability" and "Tangibility" is confirmed through the Unit Root Test (Dickey Fuller).

3.1. Explanations for the variables used as determinants of the structure of the sources of financing

The variables included in the model are of particular importance as financial indicators for the companies' operations and have a great impact on the companies' decision regarding their future borrowings. Hence, a more detailed explanation for their inclusion in the analysis is hereby provided, as well as for the method of their calculation.

Leverage is a relative indicator of the companies' indebtedness. Usually, the companies finance their activities with a combination of debt and equity. Although debt can contribute to the faster growth of the companies, excessive indebtedness, on the other hand, can lead to challenges in their functioning, which is why this indicator is one of the basic ones used by creditors when analyzing the justification for approving additional borrowing. The level of indebtedness or leverage in the literature can be calculated in several ways, but the following ratios are most often used: debt to total assets; debt to equity; debt to EBITDA, etc. This paper uses the first indicator, i.e. debt to total assets (or total sources of financing), as the most comprehensive indicator of the company's indebtedness.

As an indicator of the *size*, the assets of the companies are used, i.e. the sum of their total assets. In the literature, in addition to the value of assets, the revenues, number of employees, market value of the company, etc. are usually used as indicators of the size. The assumption in this research is that the size has a positive impact on the leverage, which is in line with the trade-off theory, because there is a lower probability of bankruptcy for large companies, which allows them to attract more debt. According to this theory, leverage should be positively correlated with the size of the company, because large companies also have less variation in profits, which makes them more tolerant of higher levels of leverage (Castanias, 1983; Titman & Wessels, 1988, as cited in Alipour, M., Mohammadi, M. F. S., & Derakhshan, H., 2015). Some research indicates that the size of the company does not have a significant impact on its leverage (Karadeniz et al., 2009, as cited in Alipour, M., Mohammadi, M. F. S., & Derakhshan, H., 2015), but there are also studies which prove that size is inversely correlated with leverage, which is consistent with the pecking order theory in choosing the sources of financing, as asymmetry in information increases with the increase of the size of the company (Marsh, 1982, as cited in Alipour, M., Mohammadi , M. F. S., & Derakhshan, H., 2015).

Tangibility is calculated as the ratio of tangible assets to total assets of the company. In certain research, this relative indicator is calculated as the ratio between the sum of tangible assets and

inventories, in relation to the total assets. Usually, creditors are more willing to approve a loan to a company whose tangibility is greater. The positive relationship between tangibility and leverage is confirmed in several studies (Ferri & Jones, 1979; Titman and Wessels, 1988; Rjan and Zingales, 1995; Gaud et al., 2005, as cited in Jovanovic, B., 2015).

Several indicators are used as indicators of *liquidity* in the literature: current liquidity ratio, "quick" liquidity ratio, net working capital ratio (net working capital in relation to total assets), etc. For the calculation of liquidity in this model, the quick ration for liquidity is used, calculated as the ratio between current assets, reduced by the amount of inventory (considering the existence of a certain period for their turnover) and current liabilities. This ratio is taken into account given the assumption that the companies that are sufficiently liquid do not need to borrow, because every new borrowing reduces net profit and available future dividends to the company's owners.

In addition to the relative liquidity indicator, the model also includes *cash flow at the end of the year* as money and cash equivalents at the end of the year (free cash flow). It represents a sum of cash flows from operating activities, cash flows from investment activities, cash flows from financing activities and cash assets at the beginning of the year. The absolute value of the cash flow is also logarithmic. In the literature, there are studies that confirm the pecking order theory in financing, i.e. the claim that the companies that are liquid have less need for external financing (Myers & Rajan, 1998; Eldomiaty & Azim, 2008; Deesomsak et al., 2004; Eriotis et al., 2007; Sheikh & Wang, 2011, as cited in Alipour, M., Mohammadi, M. F. S., & Derakhshan, H., 2015). This claim is in line with the free cash-flow theory, as well as with the theory of agency costs.

Profitability, for the purposes of this model, is calculated as operating profit margin, i.e. ratio between operating profit and total revenues (sales). In the respective literature, there are also several options for this variable, such as ROA, ROE, EBIT in relation to total assets, etc. Myers & Majluf, 1984, as cited in Alipour, M., Mohammadi, M. F. S., & Derakhshan, H., 2015, concluded that the companies with higher profitability are less inclined to external financing, which is consistent with pecking order theory in choosing the financing, because with the increase in profitability, the company has more of its own capital accumulation available for financing and accordingly has less need for external financing, which results in less debt. However, the trade-off theory argues otherwise. Namely, investors and creditors are more willing to approve a loan or invest in more profitable companies because the probability of debt repayment is higher in these companies. Again, there are studies in the literature that indicate a positive correlation between these two variables (Fama & French, 2002; Rajan & Zingales, 1995; Graham, 2000; Lasfer, 1999; Ezeoha, 2008; Sogorb-Mira & How, 2005; Huang & Song, 2006; Al-Najjar & Taylor, 2008; Karadeniz et al., 2009; Lemmon & Zender, 2010; Al-Fayoumi & Abuzayed, 2009; Yu & Aquino, 2009; Deloof & Overfelt, 2008; Brav, 2009; Kim et al., 2006; Gaud et al., 2005; Hall et al., 2004; Abor & Biekpe, 2009; Heshmati, 2001; Ezeoha, 2011; Eldomiaty, 2007; Amidu, 2007; Sheikh & Wang, 2011; Viviani, 2008; Strebulaev, 2007, as cited in Alipour, M., Mohammadi, M. F. S., & Derakhshan, H., 2015), their negative correlation (Chittenden et al., 1996; Al-Sakran, 2001, as cited in Alipour, M., Mohammadi, M. F. S., & Derakhshan, H., 2015), but also excluding any relationship of profitability and leverage (Hovakimian et al., 2004; El-Sayed Ebaid, 2009, as cited in Alipour, M., Mohammadi, M. F. S., & Derakhshan, H., 2015).

Table 1: Expected signs of the variables included in the model

Variable	Abbreviation used in the model	Expected sign of the variable

Leverage	Lev	
Size	Size	+
Cash flow	Cf	-
Liquidity	Liq	-
Tangibility	Tang	+
Profitability	Prof	+

(Source:Author)

The basic model used in this paper to consider which determinants affect the leverage is the fixed effects panel regression model. The sample includes 36 companies listed on the Macedonian Stock Exchange. Although this method has some flaws and random errors, it is still one of the most powerful methods used in regression analysis. Based on this model, the regression function is evaluated on a certain sample, which is an approximation of the theoretical regression function. This means that the score b_0 is closer to the actual parameter B_0, the score b_1 is closer to the actual parameter B_1, when the actual parameters B_0 and B_1 are not known.

The model specification reads as follows:

$$Y\ Lev_{i.t} = b_0 + b_1 X\ Size_{i.t} + b_2 X\ Cf_{i.t} + b_3 X\ Liq_{i.t} + b_4 X\ Tang_{i.t} + b_5 X\ Prof_{i.t} + u_{i,t}$$

i represents the specific company, t refers to the year, while u stands for the error in the model.

Abbreviations used for the variables:
$Y\ Lev$ - Leverage
$X\ Size$ - Size of the company
$X\ Cf$ - Cash flow
$X\ Liq$ - Liquidity
$X\ Tang$ - Tangibility
$X\ Prof$ - Profitability

Table 2: Descriptive statistics of the variables included in the model

	Leverage	Size	Cash flow	Liquidity	Tangibility	Profitability
Mean	0.382017	6.136535	4.293295	2.600781	0.407190	0.066361
Median	0.329083	6.126123	4.316972	1.007531	0.342809	0.038969
Maximum	1.784761	7.166114	6.547498	45.64137	6.694271	0.940833
Minimum	0.005541	4.128399	1.690196	0.107619	0.008734	-0.525158
Std.Deviation	0.342298	0.511632	1.020756	5.758169	0.511329	0.157904
Skewness	1.916580	-0.389557	-0.389557	5.081483	10.41885	1.701952
Kurtosis	7.890160	2.943771	2.943771	31.66723	128.4659	11.13294
Jarque-Bera	289.5508	5.097952	4.576342	6938.220	121319.2	582.9842
Probability	0.000000	0.078162	0.101452	0.000000	0.000000	0.000000
Sum	68.76313	1104.576	772.7931	468.1405	73.29424	11.94506

Sum Sq.Dev.	20.97308	46.85636	186.5077	5935.015	46.80085	4.463109
Observation	180	180	180	180	180	180

(Source: Own calculations)

Table 2 displays the descriptive statistics of the collected data and includes the following central tendency measures: the mean and median value, the minimum and maximum value of the data, as well as the standard deviation.

Table 3: Mean value of the variables included in the model

Leverage (debt to equity)	Leverage (debt to total assets)	Liquidity	Profitability	Tangibility
68.2%	38.2%	2.6%	6.6%	40.7%

(Source: Own calculations)

4. RESULTS OF THE RESEARCH AND DISCUSSION

The table below shows the results of the research.

Table 4: Presentation of the research results

Variable	Coefficient	Std.Error	T-Statistic	Prob.
C	0.552414	0.926099	0.596496	0.5518
Size	-0.028745	0.149509	-0.192265	0.8478
Cash Flow	-0.001743	0.012601	-0.138292	0.8902
Liquidity	-0.00338	0.002662	-1.269.354	0.2064
Tangibility	0.088643	0.036187	2.449.561	0.0155
Profitability	-0.208310	0.064861	-3.211.642	0.0016

Adjusted R^2	0.946183
Akaike info criterion	-2.031.363
Schwarz criterion	-130.478
F-statistic	7.967.722
Prob (F-statistic)	0.000000

α=5%   α=1%

(Source: Own calculations)

Considering the results obtained from the analysis and shown in Table 4, it can be concluded that out of total of five independent variables, only two are statistically significant, namely: tangibility and profitability of the companies, with a significance level of 5% in tangibility and

1% in profitability. The other three variables: size, cash flow and liquidity, are statistically insignificant, with a negative sign.

From the expected signs of the variables, shown in Table 1, compared to the results obtained of the model, it can be concluded that only two of the variables differ in their sign, namely the size and profitability, while the remaining three variables (cash flow, liquidity and tangibility) match the expectations, but the results obtained are insignificant. In other words, the size of the company has a negative impact on its leverage, which means the more the company's size increases, its leverage decreases, which is in line with the pecking order theory in choosing the financing. This can be illustrated by a simple example, the bigger the company, the more it dominates on the market, and thus dictates the business conditions of its customers in its favor, in order to enable more liquidity and less need for borrowing for which it needs to pay interest.

The profitability variable, which also has a negative sign, shows that every increase in the profitability of the company causes a decrease in its financial leverage, i.e. more profitable companies have less need for borrowing, which is also in line with the pecking order theory in choosing the financing. The companies that are more profitable accumulate a larger amount of assets than the profit they earn and use it as a cheaper source of financing of their activities.

Tangibility affects leverage with a significance level of 5%. The results of the model show that if tangibility increases by 1, leverage will increase by 0.0886 if all else remains unchanged (ceteris paribus). This positive relationship can be explained by the fact that the companies that have more tangible assets are more acceptable for borrowing, because they have something to offer as collateral. However, the rest of the suppliers also see greater stability and security for the collection of their claims if there is greater tangibility.

Liquidity and cash flow of the companies indicate an inverse relationship with leverage, which is expected, since the companies that have sufficient funds to finance their business activities do not need external financing. Again, this is in line with the pecking order theory in choosing the financing.

Hence, the hypotheses set at the beginning of the research are rejected or accepted respectively, as shown in the table below.

Table 5: Display of accepted/rejected hypotheses

	Hypothesis	**Result**
H1	The size of the company has a positive impact on leverage.	Rejected (statistically insignificant)
H2	Free cash flow has a negative impact on leverage.	Rejected (statistically insignificant)
H3	Liquidity has a negative impact on leverage.	Rejected (statistically insignificant)
H4	Tangibility has a positive influence on leverage.	Accepted (significance level 5%)
H5	Profitability has a positive impact on leverage.	Rejected (significance level 1%)

(Source:Author)

5. CONCLUSION

The purpose of this paper was to establish and examine the determinants that influence the structure of the sources of financing of the companies in the Republic of North Macedonia. Using the fixed effects panel regression model on a sample consisting of 36 companies listed on the Macedonian Stock Exchange, the influence of the following five independent variables, namely the size, profitability, tangibility, liquidity and cash flow, was tested on the dependant variable - leverage.

The results of the research show that only two, out of the total of five analyzed variables, influence the structure of the sources of financing of the companies, while the remaining three are statistically insignificant and have a negative sign. Variables that have a statistically significant impact on the leverage of the Macedonian companies are profitability and tangibility, while liquidity, cash flow and the size of the companies are not statistically significant.

The reasons for this can be found in the weak development of the capital market, where no corporate bonds are issued and the companies are predominantly financed by the accumulated own capital and debt. Debt (in total, including liabilities to suppliers, borrowings and bank loans) in the analyzed period and sample of companies accounts for an average of 38%. The liquidity of the analyzed companies is on average 2.6%, and the profitability is 6.6%, in the analyzed 5-year period.

The theory does not offer a single answer for the ideal ratio of the sources of financing, because there is no unified answer that would be appropriate for every type of company. Namely, in certain periods of the company's economic development, financing by indebting may be more appropriate, while in others, financing with own funds. This especially refers to the beginning while sufficient reserves and retained earnings are accumulated, under the assumption that loan interest rates are not high, i.e. enable profitable operation. But securing sufficient external funds can be a problem at first, as creditors and investors may demonstrate reservations if the company fails to provide historical financial data.

Notwithstanding, the decision on the structure of the sources of financing largely depends on the "financial literacy" of those in charge of managing finances, i.e. of the financial managers of the companies and on the moment when that decision should be made. Namely, if the interest rates on external borrowing allow profitable operation, and the market conditions allow an increase in sales, managers may combine funds from accumulated profits and borrowings as long as the marginal increase in sales allows profitable operation (is greater than the marginal cost of capital). Still, if the external financiers and investors are not willing to approve additional loans, then the management is obliged to plan the operation of the company based on its own assets. "Financial literacy" is indeed particularly important when presenting the company's project to external financiers.

The contribution of this scientific research is aimed at expanding the respective literature in the Republic of North Macedonia, and the results may be useful to the financial decision makers in the companies.

The research can further be supplemented and continued with the analysis of more explanatory variables, as well as over a longer period of time, given that in the analyzed years there were extreme situations such as the Covid-19 pandemic and the energy crisis, which were reflected on the companies' balance sheets. Furthermore, the companies can be analyzed depending on the activity in which they operate, for example separately for manufacturing and trading companies,

but with such a division, there is a risk of being faced again with a limited sample of companies for which there are publicly available audited financial statements.

REFERENCES
Acaravci, S. K. (2015), The determinants of capital structure: Evidence from the Turkish manufacturing sector. *International journal of economics and financial issues*, *5*(1), 158-171.
Akhter, A. G. J. (2018), Impact of Capital Structure on Profitability: An empirical analysis of listed firms in India. *Asian Journal of Managerial Science*, *7*(2), 1-6.
Alipour, M., Mohammadi, M. F. S., & Derakhshan, H. (2015), Determinants of capital structure: an empirical study of firms in Iran. *International Journal of Law and Management*, *57*(1), 53-83.
Antoniou, A., Guney, Y., & Paudyal, K. (2008), The determinants of capital structure: capital market-oriented versus bank-oriented institutions. *Journal of financial and quantitative analysis*, *43*(1), 59-92.
Arsov, S. (2015), Impact of the company's leverage on its profitability through the example of the Macedonian companies. *Yearbook of the Faculty of Economics, 2015.*
Arsov, S (2016), Financial management. Second edition. Skopje: Faculty of Economics, UKIM, 367-394.
Chandra, T., Junaedi, A. T., Wijaya, E., Suharti, S., Mimelientesa, I., & Ng, M. (2019), The effect of capital structure on profitability and stock returns: Empirical analysis of firms listed in Kompas 100. *Journal of Chinese Economic and Foreign Trade Studies*, *12*(2), 74-89.
Harris, M., & Raviv, A. (1991), The theory of capital structure. *the Journal of Finance*, *46*(1), 297-355.
Jovanovic, B. (2015), *Determinants of corporate capital structure: Evidence from Macedonian panel data*. Economic Analysis.
Myers, S. C. (2001), Capital structure. *Journal of Economic perspectives*, *15*(2), 81-102.
Yapa Abeywardhana, D. (2015), Capital structure and profitability: An empirical analysis of SMEs in the UK. *Journal of Emerging Issues in Economics, Finance and Banking (JEIEFB)*, *4*(2), 1661-1675.

Internet sources:
CFI, https://corporatefinanceinstitute.com/resources/accounting/capital-structure-overview/ (accessed on 30 May 2023)
National Bank of the Republic of North Macedonia, https://www.nbrm.mk/content/Regulativa/Odluka_metodologija_%20za_krediten_rizik_nova.pdf (accessed on 1 June 2023)
Macedonian Stock Exchange, Electronic information system for listed joint stock companies, https://seinet.com.mk (accessed on 7 June 2023)

UNVEILING GLOBAL ROAD ACCIDENT PATTERNS: INSIGHTS, ANALYTICS, AND IMPLICATIONS FOR SAFER DRIVING PRACTICES

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ABSTRACT

Every day, we are confronted with alarming news of serious injuries and fatalities resulting from car accidents. In the past decade, these incidents have been on the rise, posing a significant concern for individuals and societies worldwide. The impact of these accidents is particularly devastating when innocent lives, including children, are affected by the long-lasting consequences. While driver behavior remains a major contributing factor to road accidents, there are also other indirect reasons such as infrastructure issues and weather conditions. Addressing this global problem is of utmost importance to safeguard lives and create a safer driving environment for everyone.

Sunkpho and Wipulanusat (2020) utilized Business Intelligence (BI) methods, specifically data visualization and analytics, to analyze accident data and provincial data obtained from the Talend Data Integration tool, loaded into a MySQL database, and visualized using Tableau. Their aim was to provide insights into highway accidents and advise the Thai government on adopting this system for formulating strategy options and contingency plans to improve the accident situation. Nour et al. (2020) employ advanced data analytics methods, specifically predictive modeling techniques, to predict injury severity levels and evaluate their performance using publicly available road accident data from the UK Department of Transport spanning 2005 to 2019. Golhar and Kshirsagar M (2021) propose and implement various strategies using the Map-Reduce framework, combining video surveillance and big data analytics, to address the issues of increasing on-road traffic, road congestion, rule violations, and road accidents, aiming to improve road traffic management and make urban population life more comfortable. Yuksel and Atmaca S. (2021) use accelerometer and gyroscope sensor data and applied various machine learning algorithms, including C4.5 Decision Tree, Random Forest, Artificial Neural Network, Support-Vector Machine, K-Nearest Neighbor, Naive Bayes, and K-Star algorithms, to model and evaluate risky driving behaviors, ultimately developing a highly accurate and cost-effective system capable of recording and identifying risky driving behaviors, with potential applications in usage-based insurance policies to incentivize safe driving practices. Mesquitela et al. (2022) use a data fusion process, incorporating information from various sources such as road accidents, weather conditions, local authority reports, traffic, and fire brigade, to analyze and identify geo-referenced accident hotspots in urban areas using ArcGIS Pro and Kernel Density and Hot Spot Analysis tools, aiming to evaluate the factors influencing accident severity and provide

knowledge for local municipalities to improve their infrastructure and quality of life, with the results validated by an expert committee, and the approach being applicable to other cities with similar data availability.

Based on our Scopus search on "road accidents" and "analytics," no existing references were found directly aligned with our research idea. This highlights the originality of our paper, which aims to raise awareness about road accidents as a significant global issue and provide a comprehensive understanding of their key contributing factors through the analysis of road accident data from six representative countries across different continents including the UK, USA, Chile, Australia, Japan/UAE, and South Africa/Egypt. Our research sheds light on critical aspects of these incidents, explores trends, identifies influential factors, determines countries with low accident rates and casualties, and evaluates the potential impact of data analysis techniques on enhancing road safety. We will use datasets from the selected representative countries, focusing on road accidents that occurred between 2021 and 2022. By employing various analytical methods, we will explore the data from different angles, including descriptive analytics, diagnostic analytics, predictive analytics, prescriptive analytics, and cognitive analytics. Each method will contribute valuable insights to our analysis and understanding of the problem. We will employ Power BI for descriptive and diagnostic analytics, Python for predictive analytics using multilinear regression, Power BI for visualizing regression results, MaxDea Lite and Microsoft Excel for prescriptive analytics such as Data Envelopment Analysis (DEA) and Linear Programming, and also simulations to aid decision-making.

Through our analysis, we will address key questions related to road accidents and their impact. For instance, we will determine whether the number of road accidents decreased or increased from 2021 to 2022 and identify the major contributing factors. Furthermore, we will assess the countries with the lowest accident rates and casualties based on ratios per million inhabitants for both years. By leveraging visualization techniques in Power BI, we will present the findings in an accessible and informative manner, enabling stakeholders to grasp the insights easily. The visualization and analysis will provide a deeper understanding of the trends, underlying factors, and the potential of data analysis techniques, such as DEA and Linear Programming, in addressing road safety.

The importance of this research lies in its potential to generate significant impact. By shedding light on road accidents as a pressing global issue, the findings will raise awareness among individuals worldwide. Understanding the data from the six representative countries will enable comparisons, identification of best practices, and the formulation of informed strategies to reduce accidents and casualties. The results will benefit researchers, policymakers, and organizations involved in road safety initiatives. The insights gained will help shape evidence-based decisions, implement targeted interventions, and promote safer driving practices to prevent tragic outcomes caused by road accidents.

Key words: road accidents, analytics, road safety