8th International Scientific Conference
on Economics and Management

EMAN 2024

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8TH INTERNATIONAL SCIENTIFIC CONFERENCE
EMAN 2024

EMAN 2024 – Economics & Management: How to Cope with Disrupted Times

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Preface

The purpose of the annual EMAN conference is to support the power of scientific research and dissemination of the research results with the objective to enhance society by advancing knowledge; policy-making change, lives, and ultimately, the world. Our objective is to continue to be the foremost annual conference on cutting-edge theory and practice of economics and management through encouraging advancement via excellence and interaction.

EMAN conference aims to bring together the international academic community (experts, scientists, engineers, researchers, students, and others) and enable interactive discussions and other forms of interpersonal exchange of experiences and popularization of science and personal and collective affirmation.

The annual EMAN conference is committed to the highest standards of publishing integrity and academic honesty ensuring ethics in all its publications. Conformance to standards of ethical behavior is therefore expected of all parties involved: authors, editors, reviewers, and the publisher. The conference organizer follows the Committee on Publication Ethics (COPE) guidelines on how to deal with potential acts of misconduct.

All received full papers prior to the peer review process are subject to plagiarism check with iThenticate by Turnitin software. Any identified plagiarism automatically disqualifies a paper. Afterward, all full papers are double-blind peer-reviewed by the reviewers drawn from the editorial committee or external reviewers depending on the topic, title, and subject matter of the paper. Peer reviewers provide a critical assessment of the paper and may recommend improvements. Although the author may choose not to take this advice, editors highly recommend that the author address any issues, explaining why their research process or conclusions are correct.

Association of Economists and Managers of the Balkans headquartered in Belgrade – Serbia, along with the partner institutions, namely the Master in Economics and Management of Tourist and Cultural Activities (MEMATIC), University of Rome "Tor Vergata" – Faculty of Economics – Department of Management and Law; Faculty of Economics in Osijek, Josip Juraj Strossmayer University of Osijek – Croatia; Faculty of Economics, Administration and Business, "Stefan cel Mare" University of Suceava – Romania; School of Economics and Business, University of Sarajevo (SEBS) - Bosnia and Herzegovina, and Faculty of Business, "Aleksandër Moisiu" University of Durrës, Durrës, Albania organized Eight International Scientific Conference on Economics and Management: How to Cope with Disrupted Times - EMAN 2024. The conference was held in Rome, Italy (online/virtually/in-person) at the Faculty of Economics, University of Rome "Tor Vergata".

EMAN 2024 keynote speaker was Gjorgjina Gina Sherovska, PhD, a Marketing Management & PR Consultant from SMX Academy, North Macedonia, with the topic: HOW CAN COMPANIES COPE WITH DISRUPTIVE TIMES IN THE FIELD OF MARKETING.

Within publications from the EMAN 2024 conference:

- **20 double peer-reviewed papers** have been published in the EMAN 2024 – Economics & Management: How to Cope with Disrupted Times - Selected Papers,
- **72 double peer-reviewed papers** have been published in the EMAN 2024 – Economics & Management: How to Cope with Disrupted Times - Conference Proceedings and
- **66 abstracts** have been published in the EMAN 2024 Book of Abstracts.

EMAN 2024 publications total **more than 1,000 pages**. All full papers have DOI numbers and ORCID ID integration.

Nearly **320 researchers** from **27 different countries**, including universities, eminent faculties, scientific institutes, colleges, various ministries, local governments, public and private enterprises, multinational companies, associations, etc., participated in the conference.

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Entrepreneurship as a Catalyst for Sustainable Development in Developing Countries

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Keywords:
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Abstract: *This study employs a comprehensive literature review as a methodological approach to investigate the relationship between entrepreneurship and sustainable development in developing countries. Through academic works, policy documents, and empirical studies, the paper seeks to synthesize existing knowledge and differ patterns, gaps, and key insights. Key themes explored include the role of entrepreneurial innovation, the impact of small and medium enterprises, and the influence of policy frameworks on fostering sustainable entrepreneurial ecosystems. Additionally, this study examines challenges and opportunities faced by entrepreneurs in navigating the complex landscape of developing economies. Through this methodological lens, this study aims to contribute a synthesized body of knowledge that informs future research directions and guides practical interventions. By consolidating the existing literature, this paper aims to offer a foundation for policymakers, researchers, and practitioners to formulate evidence-based strategies that exploit the potential of entrepreneurship for sustainable development in the context of developing countries.*

1. INTRODUCTION

In the dynamic area of global development, the relationship between entrepreneurship and sustainable development plays an important role, particularly in the context of developing countries (Oana-Ramona et al., 2021; Thanasi-Boçe et al., 2023; Vig, 2023). The necessity to balance economic progress with social equity and environmental responsibility has caused a re-evaluation of traditional development paradigms. Entrepreneurship, with its inherent capacity for innovation, job creation, and adaptive problem-solving, emerges as a key player in shaping a sustainable future for nations striving to overcome developmental challenges (Chichevaliev et al., 2023; Ordeñana et al., 2020; Raimi et al., 2022).

Developing countries, characterized by diverse economic structures, cultural landscapes, and institutional frameworks, face a myriad of obstacles on their path to sustainable development (Chichevaliev et al., 2023; Raimi et al., 2022; Sergi et al., 2019; Vig, 2023). These challenges range from poverty and inequality to environmental degradation and insufficient infrastructure (Ahmad & Bajwa, 2023; Raimi et al., 2022). Against this setting, this research aims to explore and investigate the multifaceted relationship between entrepreneurship and sustainable development in developing nations.

The methodology employed in this research involves a thorough literature review, synthesizing scholarly works, policy documents, and empirical studies. By critically examining existing knowledge, this paper seeks to investigate the complex mechanisms through which entrepreneurship contributes to sustainable development goals. The literature review serves as a

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methodological tool to identify key themes, gaps, and opportunities, offering a panoramic view of the current state of research in this field. This study is structured to investigate the impact of entrepreneurship on economic growth, social inclusion, and environmental management.

Furthermore, it investigates the role of small and medium enterprises (SMEs) as well as the influence of policy frameworks in shaping conducive entrepreneurial ecosystems. Through this comprehensive analysis, this study contributes to the ongoing discourse, offering a foundation for future research endeavors and practical strategies that affect the catalytic power of entrepreneurship for sustainable development in developing countries.

The research objectives of this study are as follows:

- *Objective 1 - Exploring the entrepreneurial impact on economic growth.* The first research objective is to investigate the intricate relationship between entrepreneurship and economic growth in developing countries. This study aims to uncover how entrepreneurial activities contribute to fostering economic development, job creation, and poverty alleviation within these regions. By examining existing literature and empirical evidence, it seeks to identify the mechanisms through which entrepreneurship stimulates economic growth, fosters innovation, and drives productivity. Through this exploration, it is possible to gain insights into the specific entrepreneurial strategies and interventions that have been effective in fueling economic progress in diverse developing country contexts.
- *Objective 2 - Investigating the role of social entrepreneurship in inclusive development.* The second research objective is to analyze the role of social entrepreneurship in promoting inclusive development within developing countries. This study aims to explore how social entrepreneurs leverage innovative business models to address pressing social challenges, such as poverty, inequality, and access to basic services. Through a comprehensive review of the literature, it aims to identify the unique characteristics and impacts of social enterprises on marginalized communities and vulnerable populations. By understanding the drivers of social entrepreneurship and its contributions to inclusive development, this study aims to inform policy interventions and support mechanisms that can amplify the positive social impact of entrepreneurial ventures in these regions.
- *Objective 3 - Examining environmental entrepreneurship for sustainable practices.* The third research objective focuses on examining the role of environmental entrepreneurship in promoting sustainable practices and green growth in developing countries. This study aims to investigate how environmental entrepreneurs leverage innovative technologies, business models, and sustainable practices to address pressing environmental challenges, such as climate change, pollution, and resource depletion. Through a meticulous examination of the literature, it seeks to uncover the potential synergies between economic development and environmental sustainability within entrepreneurial ventures. By identifying successful environmental entrepreneurship models and regulatory frameworks, this study aims to provide insights that can guide policymakers and practitioners in fostering a more environmentally sustainable entrepreneurial ecosystem in developing countries.

2. LITERATURE REVIEW

Numerous studies emphasize the important role of entrepreneurship in fostering economic growth, particularly in the context of developing countries (Ajide et al., 2019; Bitzenis & Nito, 2005; Mok & Kan, 2013; Oana-Ramona et al., 2021; Ordeñana et al., 2020; Shirokova et al., 2013; Thanasi-Boçe et al., 2023; Volchek et al., 2013). Scholars argue that the dynamism and

adaptability of entrepreneurial ventures contribute significantly to job creation, income generation, and the overall expansion of local economies (Ahmad & Bajwa, 2023; Oana-Ramona et al., 2021; Ordeñana et al., 2020).

SMEs play a crucial role in this regard, serving as engines of innovation and contributors to GDP (Sergi et al., 2019). Entrepreneurship grows up in environments conducive to innovation, collaboration, and resource accessibility. The research underlines the importance of entrepreneurial ecosystems sustaining ventures that contribute to sustainable development (Ahmad & Bajwa, 2023; Chichevaliev et al., 2023; Vig, 2023). Effective ecosystems encompass supportive institutions, access to finance, mentorship networks, and a culture that values risk-taking and experimentation (Oana-Ramona et al., 2021; Ordeñana et al., 2020). Understanding the dynamics of these ecosystems is important for policymakers seeking to cultivate an environment where entrepreneurship can flourish sustainably (Cullen & Archer-Brown, 2020; da Rocha et al., 2022; Nkongolo-Bakenda et al., 2010).

Beyond economic considerations, the literature increasingly recognizes the role of entrepreneurship in fostering social inclusion and addressing societal challenges. Social entrepreneurship, in particular, emerges as a powerful force for positive social change (Ahmad & Bajwa, 2023; Chichevaliev et al., 2023; Raimi et al., 2022; Vig, 2023). Enterprises with a social mission not only contribute to poverty alleviation and community development but also exemplify the potential of business models that prioritize both profit and social impact (Ahmad & Bajwa, 2023). The impact of entrepreneurship on sustainable development is closely linked with the regulatory environment and policy interventions. Studies indicate that well-defined policies can foster an entrepreneurial culture, enhance access to finance, and create an enabling environment for business growth (Ordeñana et al., 2020; Sergi et al., 2019). However, a critical evaluation of the effectiveness of these policies, considering the contextual nuances of developing countries, remains a key point for future research. Among global environmental challenges, a growing body of literature explores the intersection of entrepreneurship and environmental sustainability.

Environmental entrepreneurship encompasses ventures that prioritize ecological responsibility, resource efficiency, and the development of green technologies (Oana-Ramona et al., 2021; Thanasi-Boçe et al., 2023). Understanding the motivations, challenges, and impact of environmental entrepreneurship is crucial for aligning economic development with environmental management (Ahmad & Bajwa, 2023; da Rocha et al., 2022; Ranjith Kumar Saravanakumar et al., 2021; Veglio & Zucchella, 2015; Wynarczyk, 2013).

3. METHODOLOGY

The methodology employed in this research is a comprehensive literature review. To identify relevant literature, a systematic search was conducted across reputable academic databases, including but not limited to PubMed, JSTOR, and Google Scholar. The search criteria were designed to capture a diverse range of sources related to entrepreneurship and sustainable development in developing countries. Keywords such as “entrepreneurship”, “sustainable development”, “developing countries”, and variations thereof were used to ensure a broad yet focused scope.

Inclusion criteria for the literature encompassed academic articles, books, and reports published between 2000 and the present. This timeframe was chosen to capture contemporary perspectives on the evolving role of entrepreneurship in sustainable development. Primary emphasis

was given to studies that provided empirical insights, theoretical frameworks, or policy implications. Non-English language sources were excluded to ensure consistency and coherence in the analysis.

The selected literature was organized thematically to facilitate a comprehensive analysis of key dimensions. Themes such as "Entrepreneurship and Economic Growth", "Innovation and Entrepreneurial Ecosystems", "Social Entrepreneurship and Inclusive Development", "Policy Interventions and Regulatory Frameworks", and "Environmental Entrepreneurship and Green Growth" were delineated to guide the review process. This thematic organization aimed to uncover patterns, trends, and gaps in the existing body of knowledge.

An iterative process of quality assessment was employed to ensure the inclusion of credible and rigorous studies. Peer-reviewed journals, academic presses, and reputable institutions were prioritized. The research methodology of each included study was critically examined to ascertain the robustness of the findings and the reliability of the methodology employed.

The synthesis process involved extracting key findings, methodologies, and theoretical frameworks from each selected source. Comparative analysis was conducted to identify converging and diverging perspectives across the literature. Through this iterative process, the research aimed to construct a cohesive narrative that encapsulates the current state of knowledge on entrepreneurship and sustainable development in developing countries.

It is important to acknowledge certain limitations inherent in the methodology. The reliance on existing literature implies a potential bias in the interpretation of findings. Additionally, while efforts were made to ensure a comprehensive search, it is possible that some relevant sources may have been inadvertently excluded.

This literature review methodology provides a structured approach to synthesizing existing knowledge, offering a foundation for understanding the complex interplay between entrepreneurship and sustainable development in developing countries. The thematic organization facilitates a nuanced analysis, allowing for the identification of key trends, gaps, and opportunities within the current literature. The subsequent sections of this research paper build upon the insights derived from this methodology to contribute meaningfully to the discourse on entrepreneurship and sustainable development.

4. FINDINGS

The main findings of this study are summarized in Table 1 highlighting the diverse ways in which entrepreneurship contributes to sustainable development in developing countries, emphasizing the need for tailored policy interventions and support mechanisms to harness the full potential of entrepreneurial activities for societal and environmental well-being.

Entrepreneurship drives economic growth in developing countries. This finding underscores the critical role of entrepreneurship in driving economic growth, particularly in developing countries where entrepreneurial activities contribute significantly to job creation, innovation, and overall productivity. Governments and policymakers need to prioritize creating an enabling environment for entrepreneurship by providing access to finance, reducing regulatory barriers, and fostering a culture of entrepreneurship.

Social entrepreneurship contributes to inclusive development. Social entrepreneurship addresses social challenges and promotes inclusive development by prioritizing social impact alongside financial sustainability. By empowering marginalized communities and addressing social inequalities, social enterprises play a vital role in promoting social equity and improving overall societal well-being. Policymakers should focus on providing support and incentives for social enterprises to scale their impact and reach underserved populations effectively.

Environmental entrepreneurship promotes sustainable practices. Environmental entrepreneurship focuses on addressing environmental challenges through innovative solutions and sustainable practices. By integrating environmental sustainability into business models, environmental entrepreneurs contribute to building a greener economy and mitigating environmental degradation. Governments can support environmental entrepreneurship through policy frameworks, incentives for green innovation, and fostering collaboration between businesses and environmental organizations.

Table 1. Main findings

Entrepreneurship drives economic growth in developing countries	Entrepreneurship plays a crucial role in stimulating economic growth by creating jobs, fostering innovation, and driving productivity. Through entrepreneurial activities, individuals seize opportunities, mobilize resources, and contribute to overall economic development. This finding underscores the importance of fostering an entrepreneurial ecosystem that supports small and medium-sized enterprises (SMEs), encourages innovation, and facilitates access to finance and markets.
Social entrepreneurship contributes to inclusive development	Social entrepreneurship addresses social issues such as poverty, inequality, and access to basic services by leveraging innovative business models. Social enterprises prioritize social impact alongside financial sustainability, thereby contributing to inclusive development. This finding highlights the transformative potential of social entrepreneurship in empowering marginalized communities, improving livelihoods, and promoting social equity. Effective policy support and capacity-building initiatives are essential to nurture and scale social enterprises for maximum social impact.
Environmental entrepreneurship promotes sustainable practices	Environmental entrepreneurship focuses on addressing environmental challenges such as climate change, pollution, and resource depletion through innovative solutions and sustainable practices. Environmental entrepreneurs develop green technologies, adopt eco-friendly production processes, and promote sustainable consumption patterns. This finding underscores the importance of integrating environmental sustainability into entrepreneurial ventures and fostering a green economy. Regulatory frameworks, incentives, and public-private partnerships are key drivers in supporting environmental entrepreneurship and promoting sustainable development.

Source: Own research

The literature review underlines the importance of entrepreneurial ecosystems in shaping the success and sustainability of entrepreneurial ventures. Effective entrepreneurial ecosystems, as identified in the literature, include not only financial support but also mentorship networks and a culture that encourages risk-taking. Tailoring these ecosystems to the specific needs and challenges of individual developing countries is crucial, recognizing that a one-size-fits-all approach may not be effective. The discussion on social entrepreneurship emphasizes its potential to drive inclusive development. Beyond economic indicators, the literature points to the transformative impact of enterprises with a social mission. As this study considers the implications, it becomes apparent that integrating social entrepreneurship into development agendas can address societal challenges and contribute to broader goals of inclusivity. Policymakers are encouraged to recognize the unique contribution of social enterprises and design strategies that support their growth, ultimately fostering a more equitable and inclusive socio-economic landscape.

The discussion on policy interventions highlights their important role in shaping entrepreneurial landscapes. While acknowledging the positive impact of well-defined policies, it is crucial to consider the contextual nuances of developing countries. This study emphasizes the need for adaptive and context-specific policy frameworks that address the diverse challenges faced by entrepreneurs. Furthermore, the research suggests that ongoing evaluation and improvement of policies based on empirical evidence are essential for ensuring their effectiveness over time. Environmental entrepreneurship emerges as a strategic path for aligning economic development with environmental sustainability.

This study finds how enterprises prioritizing ecological responsibility and green technologies can contribute to the broader goals of sustainable development. Policymakers are encouraged to explore incentives and frameworks that promote the growth of environmental entrepreneurship, recognizing its potential to address urgent environmental issues.

5. CONCLUSION AND RECOMMENDATIONS

This study underlines the important role of entrepreneurship in driving economic growth, fostering innovation, promoting social inclusivity, and contributing to environmental sustainability. Entrepreneurship, particularly embodied by SMEs, emerges as a potent force for economic growth within developing countries. The literature consistently emphasizes the capacity of entrepreneurial ventures to generate employment, foster income growth, and catalyze overall economic expansion. The discussion on entrepreneurial ecosystems highlights the importance of supportive environments that extend beyond financial assistance. Mentorship networks, a culture that encourages risk-taking, and institutional backing are identified as critical components. Recognizing the diverse contexts within developing nations, policymakers are urged to tailor entrepreneurial ecosystems to local needs, ensuring that they exploit the unique strengths of each region.

Social entrepreneurship emerges as a powerful force for addressing societal challenges and promoting inclusive development. This research suggests the integration of social entrepreneurship into development agendas, encouraging policymakers to recognize and support the unique contributions of these ventures. Policy interventions play a central role in shaping the entrepreneurial landscape. While acknowledging their potential positive impact, this study underlines the need for adaptive, context-specific policies. Ongoing evaluation and improvement based on empirical evidence are crucial to ensuring the long-term effectiveness of policies supporting entrepreneurship in developing countries. Environmental entrepreneurship emerges as a strategic path for aligning economic development with environmental sustainability. The discussion reminds policymakers to explore incentives and frameworks that promote the growth of environmental entrepreneurship, recognizing its potential to address environmental challenges.

Several recommendations arise for policymakers, researchers, and practitioners. Policymakers are encouraged to formulate adaptive and context-specific policies that foster supportive entrepreneurial ecosystems, recognize the unique contributions of social enterprises, and promote environmental entrepreneurship for sustainable and inclusive development. Researchers are suggested to go deeper into empirical investigations, exploring the complexities of entrepreneurship in diverse developing contexts. Practitioners are suggested to leverage these insights in designing and implementing initiatives that exploit the catalytic power of entrepreneurship for lasting socio-economic and environmental impact.

The research highlights the critical role of policy interventions in shaping the entrepreneurial landscape within developing countries. Policymakers are encouraged to craft adaptive and context-specific policies that foster supportive entrepreneurial ecosystems. This includes measures to provide financial assistance, mentorship networks, and regulatory frameworks that stimulate innovation and sustainable business practices.

This study underscores the transformative potential of social entrepreneurship in addressing societal challenges and promoting inclusive development. Policymakers and development practitioners are urged to recognize and integrate social entrepreneurship into broader development agendas. This involves creating an enabling environment that supports the growth of enterprises with a social mission, ultimately contributing to poverty alleviation and community development.

The research identifies environmental entrepreneurship as a strategic avenue for aligning economic development with environmental sustainability. Policymakers are prompted to explore incentives and frameworks that promote the growth of environmental entrepreneurship. This includes supporting ventures prioritizing ecological responsibility and green technologies and fostering a symbiotic relationship between economic growth and environmental stewardship.

Given the importance of entrepreneurial ecosystems, this study suggests the need for capacity-building initiatives. Educational institutions, non-governmental organizations, and government agencies are encouraged to invest in programs that equip aspiring entrepreneurs with the necessary skills and knowledge. This includes fostering a culture that encourages risk-taking, creativity, and innovation.

The research calls for scholars to explore interdisciplinary collaborations and conduct further empirical studies that unravel the contextual nuances shaping the relationship between entrepreneurship and sustainable development in specific regional and cultural contexts. This implies the need for ongoing academic inquiry to deepen our understanding of the dynamic interplay between economic, social, and environmental dimensions.

Recognizing the diverse challenges faced by developing countries, this study implies the need for global collaboration and knowledge exchange. International organizations, academic institutions, and development agencies are encouraged to facilitate platforms for sharing best practices, lessons learned, and innovative approaches to entrepreneurship for sustainable development.

Building on the literature emphasizing the importance of supportive ecosystems, the research suggests the development of entrepreneurial training programs. These programs can equip individuals with the skills needed to navigate the challenges of entrepreneurship, fostering a culture that encourages risk-taking and innovation.

Acknowledging the dynamic nature of entrepreneurship and the potential evolution of policy effectiveness, this study implies the importance of ongoing evaluation and iterative policy development. Policymakers are encouraged to regularly assess the impact of their interventions, incorporating feedback and evidence-based insights to refine and adapt policies over time.

In conclusion, the implications of this study extend beyond academic discourse to practical considerations for policymakers, practitioners, and researchers engaged in the pursuit of sustainable development through entrepreneurship in developing countries.

This study offers some limitations. The study's reliance on a literature review may limit the depth of analysis compared to empirical research methods. Future studies could complement this review with primary research, such as surveys, interviews, or case studies, to provide a more in-depth understanding of entrepreneurship and sustainable development in developing countries. The chosen timeframe (2000 to the present) may exclude earlier seminal works or recent developments. Future studies could explore historical perspectives and extend the review to ensure a more comprehensive understanding of the evolution of entrepreneurship and sustainable development initiatives.

Recognizing the diverse contexts of developing countries, future research could adopt a more nuanced approach by conducting separate analyses for specific regions or countries. This would allow for a deeper understanding of context-specific entrepreneurial dynamics and sustainable development initiatives.

Conducting longitudinal studies to track the evolution of entrepreneurship and sustainable development in developing countries over time can capture changes, trends, and the long-term impact of various interventions. Performing cross-country comparative analyses to identify patterns and differences in entrepreneurial ecosystems and sustainable development outcomes could help policymakers tailor strategies to specific regional and cultural contexts. Research focusing on understanding the cultural and regional nuances that influence entrepreneurship and sustainable development could involve collaborative efforts with local communities to ensure a more contextualized and culturally sensitive analysis. Evaluating the impact of specific policy interventions on entrepreneurship and sustainable development outcomes could involve rigorous impact assessments to gauge the effectiveness of policies in different developing country contexts.

Conducting a comparative analysis of environmental entrepreneurship models across developing countries to identify successful strategies and potential areas for improvement could inform the development of tailored policies supporting environmentally sustainable ventures. Evaluating the effectiveness of entrepreneurial training programs in developing countries can provide valuable insights for future initiatives. Exploring opportunities for global collaboration and knowledge exchange between developed and developing countries could foster a more inclusive and diverse understanding of entrepreneurship for sustainable development.

Addressing these limitations and pursuing these future research directions can contribute to a more comprehensive and nuanced understanding of the intricate relationship between entrepreneurship and sustainable development in developing countries.

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Estimating Trade Facilitation in a Regional Integration Initiative: Leveraging the Logistics Performance Index

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Abstract: *This study examines trade determinants, with a particular focus on logistics within the context of a regional integration initiative. A gap in the literature concerning the application of gravity models to the TRACECA initiative is identified through the literature review. Subsequently, an analysis of the legal framework underpinning TRACECA is undertaken. Utilizing the World Bank's Logistic Performance Index (LPI) within a gravity model framework, the study evaluates the impact of trade facilitation within the TRACECA region. Findings indicate positive associations between trade and GDP, common language, and shared borders, while distance exerts a negative influence. The research underscores the role of the LPI in facilitating trade within TRACECA, advocating for collaborative endeavors to enhance logistics, remove latent barriers, and streamline customs procedures. Furthermore, the study advocates for increased investment to strengthen TRACECA's trade facilitation initiatives, emphasizing the necessity of mutual political commitment to advance regional trade.*

1. INTRODUCTION

The enforcement of the WTO Trade Facilitation Agreement (TFA) back in 2017, switched the focus of deeper trade liberalization from classical to the many hidden non-tariff and administrative barriers to trade (NTBs). Since, numerous research articles have pointed out advantages, savings, and increments of profits if TFA is fully implemented. Despite these findings, in the period from 2017-2019, new NTBs appeared at a several times quicker pace than the pace of their elimination.

The failure of the multilateral trading system, as well as the high level of restrictiveness to trade of the old/new NTBs, pressed many national economies to undertake initiatives on deeper trade liberalization at the regional instead of multilateral level. This tendency has become even more intense since the outburst of the COVID-19 pandemic.

The initiative on the Transport Corridor Europe Caucasus Asia (TRACECA) was launched in Brussels in 1993. It is an EU initiative founded upon a program on technical assistance for the development of a transport corridor on the west-east axis from Europe, across the Black Sea, through the Caucasus and the Caspian Sea to Central Asia. In 1998, five Central Asian republics, three Caucasian republics, and four European countries, among which two EU member-states, signed the "Basic Multilateral Agreement on International Transport for Development of the Europe-the Caucasus-Asia Corridor" in Baku. Ten years later, the Islamic Republic of Iran joined the

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agreement. Thus, an initiative that covers 47 routes with a total of 45,198 km of international roads and highways, 93,474 km of railway lines, 6,960 nautical miles of ferry routes, and 16 seaports connected by Ro-Ro communication, was created. Before the COVID-pandemics the volume of total TRASECA trade exchange of goods amounted to 65 million tons of cargo, of which 40.4% were oil and oil products; 12.4% were ores; 11% were foodstuffs; 8.8% chemicals; 6.5% were construction materials; 5.4% cereals; 4.7% metals and metal ware; and 11% other goods (Permanent Secretariat of the Intergovernmental Commission TRACECA, 2020).

To enable deeper insight into the efficiency of the TRACECA initiative and to measure its achievements and failures of trade facilitation up to date, this study incorporates an LPI-variable calculated for TRACECA members in a gravity model. The structure of the paper is as follows: summary; introduction, literature review; overview of enacted legal acts within TRACECA; the gravity model and results; and conclusion.

2. LITERATURE REVIEW

Since the 1970s, gravity models, based on the Newtonian gravity theory, have been broadly used in research on trade flows. Translated in economic terms, the basic assumption in the gravity model for economic purposes is that bilateral trade flows between neighboring economies that share common borders and that have bigger GNP per capita are more intense than with trade partners geographically more distant and/or with a limited economic potential. The model may also include several different variables that measure trade facilitation and logistic performance effects. Hence, it became the theoretical framework for measuring the strengths and weaknesses of trade liberalization within different regional initiatives. Abundant literature on gravity models used for different regions in the world is available, however, published papers using this model for the TRACECA initiative cannot be found. At the same time, a paper by Bugarčić et al. (2020) includes LPI in a gravity model in assessing trade facilitation effects in Western and Eastern Europe and Western Balkan. That was the motivation to create a gravity model for TRACECA member-states that would include the LPI variable, which would enable to analysis of trade facilitation effects within the region.

Research work on trade facilitation started after the Ministerial Conference of the WTO in Singapore in 1996, as the necessity of elimination of administrative barriers to trade as a form of non-tariff barriers was never tackled under the GATT from 1947. In 2003 a research paper by Wilson et al. (2003) pointed out the strong negative impact of these kinds of barriers on the economic development in the Asia-Pacific region. Two years later, these authors researched air and maritime infrastructure, customs environment, regulatory environment, and e-business infrastructure for 75 countries using panel data in a gravity model, which pointed out that the effects of undertaking trade facilitation measures might differ among different economies. However, if such measures were implemented to the level of half of the world average in the four analyzed areas, the trade might increase by 377 billion American dollars (Wilson et al., 2005).

In the meanwhile, the World Bank, the World Bank Group, the OECD, and the WTO developed methodologies to follow trade facilitation impact and economic effects. A study by the World Trade Organization (2015) even stated that the increase in exports from the trade facilitation process might reach at least 9.1% and would be especially beneficial in the case of developing and less developed countries. These highly optimistic results could be realized by shortening the time needed for imports by 47%, and the time needed for exports by 91% on average.

Decreux and Fontagné (2009) in modeling trade facilitation assumed that administrative barriers behave as iceberg costs.

Zaki (2010) first used a gravity model to measure the bilateral trade effects from administrative barriers by estimating the time to export and to import, finding out that time to import has a higher negative impact on trade than time to export. In another paper, Zaki (2014) also stated that trade facilitation had an especially positive effect on sectors that show higher sensitivity to time, such as food; textiles, and electronics. He also found that the long-run welfare effects of trade facilitation are much higher than the short-run ones and that positive effects from this process led to export diversification, as well.

In their works many authors, like Beverelli et al. (2015), Moïsé and Sorescu (2013), and Fontagne et al. (2016), made estimations on various intensities of favorable effects of implementing the WTOs TFA, emphasizing its positive effect on exports.

A literature set concerning logistic performance and the LPI has a starting point that states that logistic performance is tightly correlated with international competitiveness (OECD, 2005). Hausman et al. (2005), De Souza et al. (2007), and Mustra (2011) support OECD findings, claiming that being part of the value chain, logistics is the fundament of efficiently solved transportation, storage, and packaging issues. Their research also confirms that inefficient logistics prolongs the time needed to import/export, thus significantly increasing costs and reducing turnover.

Using the World Bank's LPI for the creation of a regulatory restrictions index in the case of ASEAN, Hollweg and Wong (2009) detected a negative correlation between them, pointing out that countries that have fewer legal barriers obtain better logistic scores due to decreasing trade costs and increasing competitiveness. Shortening the time of queuing at borders, leads also to lower emission and pollution costs, which was proved in the study of Min and Kim (2010) based on the combination of LPI with Data Development Analysis.

By using LPI as an explanatory variable analysis, Korinek and Sourdin (2011) confirmed that the improvement of transport infrastructure has greater significance for exporters from middle-income countries, while at the same time improvements of administrative barriers have greater importance for importers. Using the same index, Martí et al. (2014) found that logistics is more strongly correlated to terms of transport in the bilateral trade exchange of complex goods.

An abundant literature review pointing out the usefulness and the many analytical possibilities of LPI in recent research throughout the world was published in a research paper by Aboul-Dahab and Ibrahim (2020).

3. THE LEGAL FRAMEWORK OF THE TRANSPORT CORRIDOR EUROPE–CAUCASUS–ASIA (TRACECA)

The foundational document of the TRACECA - the Basic Multilateral Agreement on International Transport for Development of the Europe–Caucasus-Asia Corridor (MLA, 1998) was initially signed for 10 years. Its validity has been continually extended for an additional period of 5 years according to Article 16.

The original agreement is ratified by all 13 member-states: Armenia, Azerbaijan, Bulgaria, Georgia, Iran, Kazakhstan, Kyrgyzstan, Moldova, Romania, Tajikistan, Turkey, Ukraine, and Uzbekistan. The MLA remains open to accession to any State or Regional Economic Integration Organizations (Article 14). In addition, there have been 4 additional Protocols for its amendment, but so far, they have not received the same recognition from the member states. Out of the 4 protocols, only 2 have entered into force.

The MLA is comprised of the Basic Agreement and the Technical Annexes on international road transport, international railway transport, international commercial maritime navigation, and customs and documentation procedures (Article 10). The Technical Annexes are an integral part of the MLA and are binding to member-states.

The MLA serves as the legal framework for promoting economic relationships, facilitating trade, and improving transport links in the regions of Europe, the Black Sea, the Caucasus, the Caspian Sea, and Asia. The main objectives are:

- Developing economic relations, trade, and transport communication in the regions of Europe, the Black Sea, the Caucasus, the Caspian Sea, and Asia;
- Facilitating access to the international market of road, air, and railway transport and commercial maritime navigation;
- Facilitating international transport of goods and passengers and international transport of hydrocarbons;
- Ensuring traffic safety, security of goods, and environmental protection;
- Harmonizing transport policy and the legal framework in the field of transport; and
- Creating equal conditions of competition between different types of transport.

The MLA stipulates that no taxes, duties, or other payments will be imposed for transport in transit, except payments for transport and customs services, services related to transport, and payments for the use of transport infrastructure (Article 5). Additionally, tariffs for transport transit services have to be established based on preferential terms - if preferential terms and tariffs are established between two Parties, then no less preferential terms and tariffs will apply to other Parties (Article 6). An exception to this is the advantages granted by Bulgaria and Romania in virtue of their membership in the EU.

Another significant instrument for TRACECA is the Agreement on the Development of Multimodal Transport. The Agreement was adopted in 2009 in Cholpon-Ata, Kyrgyzstan. It entered into force in 2011, and so far, it has been signed and ratified by six states: Armenia, Azerbaijan, Georgia, Kyrgyzstan, Tajikistan, and Ukraine.

The main objective of the Agreement is to harmonize the legislation of signatories and to compel them to implement a unified legal framework of multimodal transport (Article 2). Considering this objective, the Agreement aims to regulate broadly the rights and obligations of all participants in multimodal transport operations, including transport organizations, multimodal transport operators, consignors, consignees, and other physical and legal persons, acting on behalf of the consignor carrying goods in multimodal services.

The Agreement is only applicable to the multimodal transport of goods, when it occurs between the states-participants and transit through the territories of these countries, effected by the forwarders registered on the territory of one of the Parties with the points of departure or destination on the territories of the states of the parties, with the use of all modes of transport.

4. STYLIZED FACTS AND THE EMPIRICAL MODEL AND RESULTS

The World Bank Logistic Performance Index (LPI) is an interactive benchmarking tool created to help countries identify the challenges and opportunities they face in their performance on trade logistics and what they can do to improve their performance. The LPI provides a general picture of customs procedures, logistic costs, and quality of overland and maritime transportation infrastructure. As a weighted average, it scores the efficiency of the clearance process (i.e., speed, simplicity, and predictability of formalities) by border control agencies, including Customs; quality of trade and transport-related infrastructure (e.g., ports, railroads, roads, information technology); ease of arranging competitively priced shipments; competence and quality of logistics services (e.g., transport operators, customs brokers); ability to track and trace consignments; and timeliness of shipments in reaching destination within the scheduled or expected delivery time (World Bank, 2023). They are a valuable instrument for monitoring and comparing the logistics performance of economies.

Figure 1 shows an overview of the logistic performance measures across the TRACECA countries. These results point to an improvement in the state of logistics (average score of 2.7 in 2023, compared to 2.4 in 2007).

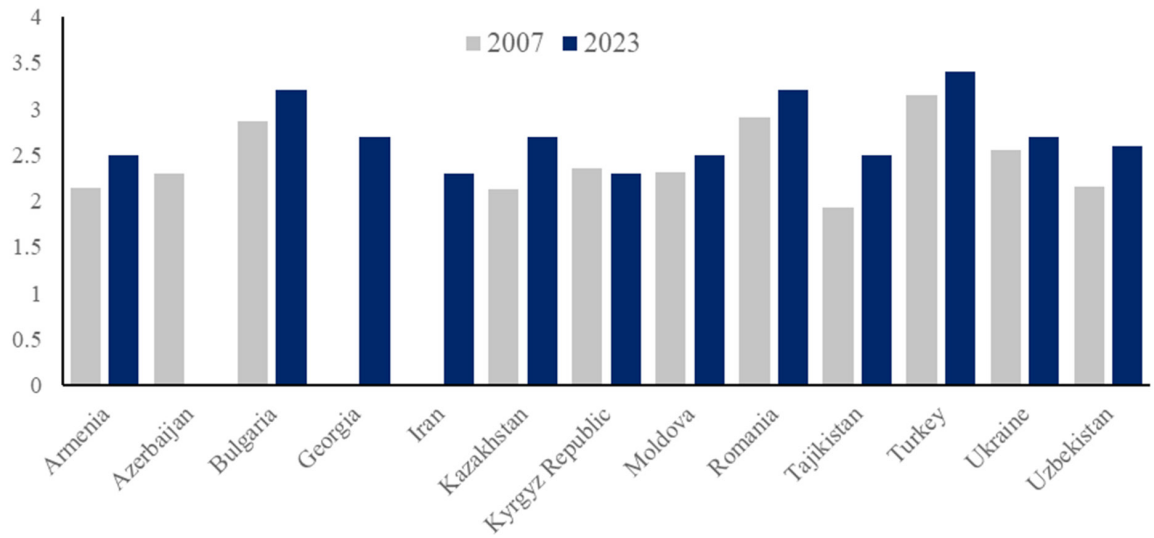

Figure 1. Overall Logistic Performance Index score in TRACECA countries, 2007 and 2023
Source: World Bank, 2023

To investigate the factors influencing the international trade patterns of member-states within the TRACECA initiative and to gauge the impact of their logistics performance, this study employed the gravity model as the conceptual framework. This model operates on the premise that bilateral trade flows are positively correlated with the economic size of two countries, as measured by their GDP. Conversely, an increase in the geographical distance between trading partners exerts a negative influence on their reciprocal trade. Distance serves as a proxy for transportation costs and is quantified by the geographical separation between the respective capital cities. Countries included in the analysis are Armenia, Azerbaijan, Bulgaria, Georgia, Iran, Kazakhstan, Kyrgyzstan, Moldova, Romania, Tajikistan, Turkey, Ukraine and Uzbekistan.

Additional variables augment the model, such as dummy variables designed to control for the effects of shared borders between countries and a common language, factors anticipated to

bolster trade volumes. Furthermore, the baseline equation incorporates a summary LPI. The estimations are conducted utilizing the STATA statistical software, employing the Ordinary Least Squares (OLS) model, without incorporating any specific effects. The dataset encompasses annual trade flow data between TRACECA member-states for the period spanning from 2000 to 2023, totaling more than 3,000 observations.

The used data sources comprise information from various databases, including the International Monetary Fund's Direction of Trade Statistics (for export data), the International Monetary Fund's World Economic Outlook Database (for GDP data), the CEPII GeoDist database (providing data on geographical distances between specific economic centers within member-states) (Mayer & Zignago, 2011), and the World Bank (for LPI data). It is worth noting that LPI scores have been available since 2007, and the database that is used encompasses overall country LPI scores for the years 2007, 2010, 2012, 2014, 2016, 2018, and 2023.

The following specification of the gravity model on panel data is used:

$$\log(EXP_{ijt}) = \beta_0 + \beta_1 GDP_{it} + \beta_2 GDP_{jt} + \beta_3 DIST_{ij} + \beta_4 LPI_t^* + \beta_5 BORDER + \beta_6 LANG + u_{ij} \quad (1)$$

where EXP_{ijt} – quantity of exports from country *i* to country *j* in year *t* expressed in millions of US dollars; GDP_{it} – GDP of country *i* in year *t*; GDP_{jt} – GDP of country *j* in year *t*; $DIST_{ij}$ – average distance between countries *i* and *j* in kilometers; *BORDER* – binary variable equal to 1 for countries that share a common border and 0 otherwise; *LANG* – binary variable equal to 1 for countries that share a common language; u_{ij} – standard error. A logarithmic transformation of the variables enables interpreting the coefficients as elasticities. It is expected that most variables included in the gravity model have a significant positive impact on total bilateral exports, except the distance variable, which should have a negative effect on exports. The larger and closer the two countries are, the higher the volume of their exports can be expected.

The focus of the paper is on examining the effects of LPI so that other variables have a controlling character. The variable LPI_t^* refers to the product of the values of logistics performance indices of both trading partners. This variable makes it possible to see jointly how changes in specific LPI affect exporters and importers. The variable LPI_t^* is constructed as the product of a specific LPI for importer and exporter.

$$LPI_t^* = LPI_{tj} * LPI_{ti} \quad (2)$$

The results from the analysis are presented in Table 1.

Table 1. Results from the gravity model

Dependent variable: Log of exports		
	(1)	(2)
Log of exporting country's GDP	0.446***	0.442***
	(0.042)	(0.043)
Log of importing country's GDP	0.652***	0.645***
	(0.042)	(0.043)
Log of distance	-1.012***	-1.012***
	(0.270)	(0.268)
Joint LPI		0.006*
		(0.006)

Common language	1.431**	1.429**
	(0.694)	(0.688)
Common border	0.379	0.381
	(0.502)	(0.498)
Constant	6.583***	6.611***
	(2.081)	(2.065)
Observations	3,462	3,462
Number of id	155	155
Standard errors in parentheses		
***** p<0.01, ** p<0.05, * p<0.1**		

Source: Own calculations

5. CONCLUSION

Results from the gravity model on the TRACECA initiative mostly convey findings of similar research in the case of other regional initiatives. However, the outcomes have yielded several noteworthy discoveries as elucidated within the confines of this scholarly exposition. The foundational specification of the model adheres entirely to the anticipated repercussions of the essential gravity model variables. Specifically, the GDP of trading partners manifests a positive and statistically significant impact on trade, whereas geographical distance exhibits a detrimental and statistically significant influence on trade. Furthermore, the inclusion of dummy variables designed to control for the presence of common borders and a shared language both yield positive and statistically significant results.

However, it is imperative to underscore that the most pivotal variable of all, denoted as the LPI, is intimately associated with the ramifications of heightened trade facilitation among member-states of the TRACECA initiative. The results point to many existing hidden and non-hidden barriers to trade that are not compliant with the trade facilitation process and create additional costs to trade. TRACECA authorities have already undertaken additional initiatives to support and enhance trade facilitation at the regional level by eliminating some of the most frequently experienced challenges by traders from member-states, among which the most visible are the need for harmonization and simplification of customs procedures; improvement of customs efficiency through digitalization and simplification of customs formalities; introducing mechanisms for systematic information exchange among customs authorities and potential use of electronic queueing systems at border crossings; elimination of existing (non)physical barriers and bottlenecks at border crossings; considering the conclusion of an Agreement on Mutual Recognition of Authorized Economic Operators, thus minimizing requirements for equipment on different checkpoints; digitalization of International Customs Transit System; and others.

Being aware of the changing geopolitics and of the potential for container transport through TRACECA corridors special emphasis is put on harmonization and simplification of transit procedures and a strong support of multimodal transport operations. The success of multimodal transportation, however, depends on the usage of internationally recognized and accepted transport transit documents. However, only five of the TRACECA countries provide usage of TIR carnet, while the Central Asian countries additionally request a permit for carriage of goods.

The underscored assertion from the empirical model confirms that by intensifying cooperative efforts aimed at enhancing logistic performance, TRACECA member-states may discern a favorable and statistically significant impact on their aggregate exports. Besides enhancing

logistical performance, TRACECA members should also increase investment and provide all necessary resources to support and continue the process of digitalization and simplification of customs procedures, to implement internationally recognized good practices and accepted forms and documents on transit, as well as to find strength to express mutual political will to support and enhance trade facilitation by all means.

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Understanding Transfer Pricing Dynamics: Evidence from Related Party Transactions in EU Public Companies

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Abstract: *This research explores the determinants influencing transfer pricing practices within the EU business landscape, driven by rising related party transactions leading to significant fiscal scandals involving companies like McDonald's France, BlackRock, and Maersk Oil and Gas in 2022. After an investigation into its transfer pricing arrangements, the US fast-food company agreed to pay €1.25 billion to the French tax authority. All these cases underscore the gravity of the issue. Data was manually collected from annual reports and databases like Thomsons Reuters and Bloomberg, focusing on companies across seven EU countries: France, Germany, Poland, Ireland, Hungary, the Netherlands, and Romania. Using multiple linear regression models, the study analyzes independent variables such as company size, leverage ratio, profitability, market to book ratio, controlling shareholders, and corporate income tax rate. The study aims to provide valuable insights into the factors shaping the concept, emphasizing the need for greater transparency, accountability, and trust in financial operations within the EU framework.*

1. INTRODUCTION

The evolving landscape of global business has fostered the expansion of multinational companies (MNCs), extending their operations beyond domestic boundaries. One significant challenge confronting these entities is the disparity in tax rates and regulations across countries.

Such variations compel MNCs to engage in transfer pricing (TP) strategies which serve as a strategic tool to optimize profit from sales (Pratama, 2018). The higher the increase in sales, the less likely the company is to engage in tax avoidance, because the high sales signify substantial profit, which may discourage management from resorting to corporate tax avoidance (Faradisty et al., 2019). However, when faced with substantial tax liabilities, companies might be tempted to engage in tax avoidance practices to minimize their tax burdens, including the strategic shifting of income to foreign affiliates in lower-tax jurisdictions (De Simone et al., 2019). Such actions can lead to penalties and damage the company's reputation. These unethical practices not only raise moral and ethical concerns but also compromise the transparency and integrity of the company's financial practices. Companies need to strike a balance between maximizing profits and maintaining ethical tax compliance to foster trust among stakeholders and uphold their corporate integrity.

Given the diverse tax regulations and rates across EU member states, TP practices among public companies within this region justify the thorough investigation. Each company's approach to tax planning and compliance is unique and influenced by a range of factors, such as company size, leverage ratio, profitability, market to book ratio, controlling shareholders, and corporate income tax rate. Future research could further explore these relationships and provide a more refined understanding of the influencing factors.

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2. LITERATURE REVIEW

Existing literature on the determinants of TP is notably limited, primarily due to a predominant focus on transactional outcomes rather than exploring the drivers of TP as a dependent variable. Researchers have traditionally concentrated on transactions involving affiliated parties, particularly sales to and purchases from related entities, often utilizing them as proxies for overall affiliated transactions. While efficient related party transactions (RPTs) play a pivotal role in advancing a company's economic objectives by minimizing transaction costs and optimizing resource allocation (Pozzoli & Venuti, 2014), it's essential to recognize the dual nature of these dealings. Abusive RPTs can lead to detrimental outcomes, facilitating an unjust transfer of value from minority shareholders to controlling shareholders, thereby eroding the overall company value (Gordon et al., 2004; Wong & Jian, 2003). Furthermore, the strategic use of RPTs for income shifting, particularly to affiliates in low-tax jurisdictions, is a common practice among MNCs to minimize global tax liabilities (De Simone et al., 2019). The monitoring and enforcement activities of tax authorities also play a critical role in shaping these practices, as stronger oversight can deter aggressive TP and enhance financial reporting quality (Hanlon et al., 2019). Consequently, while beneficial RPTs contribute positively to company performance, abusive practices underscore the critical importance of transparency and fair practices in such transactions.

Previous research has extensively examined the determinants of RPTs within corporate settings, focusing on various independent variables that influence these transactions. Among these variables, company size has garnered significant attention. Researchers have highlighted its relevance in shaping the frequency and magnitude of RPTs (Cheng & Leung, 2014). Yeh et al. (2012) further demonstrate that in the context of the Taiwan Stock Market, larger companies are more likely to participate in RPTs due to their expansive operational networks and complex ownership structures, which facilitate such transactions. However, smaller companies may have fewer resources or incentives to engage in such transactions. Thus, the following hypothesis are proposed:

Hypothesis 1: Larger companies engage in a greater frequency and magnitude of RPTs compared to smaller companies due to their complex organizational structures and diverse business operations.

Another crucial determinant explored in the literature is the leverage ratio of companies. Researchers have found that companies with higher levels of debt may be more inclined to conduct RPTs, to mitigate financial risks or optimize tax planning strategies (Jian & Wong, 2010). The presence of government intervention might also play a role in this context, as firms with government backing may face different financial pressures, impacting their RPT behavior (Berkman et al., 2009). The following hypothesis are proposed:

Hypothesis 2: Companies with higher levels of debt exhibit a higher propensity for conducting RPTs as a strategy to mitigate financial risks or optimize tax planning strategies.

Profitability is a significant factor influencing the extent and nature of RPTs. Studies have suggested that highly profitable companies may be more likely to engage in RPTs to exploit market opportunities and optimize their financial outcomes. Conversely, companies facing financial challenges may resort to RPTs as a means of enhancing their financial performance or

concealing underlying weaknesses. Chen et al. (2015) provide evidence that companies experiencing financial distress are more likely to use RPTs to manage earnings, thereby obscuring their financial difficulties and presenting a more favorable financial appearance. The following hypothesis are proposed:

Hypothesis 3: Highly profitable companies are more likely to engage in RPTs to exploit market opportunities compared to financially challenged companies, which may resort to RPTs to enhance their financial performance or conceal underlying weaknesses.

The market-to-book ratio has also emerged as a key determinant in the literature. This ratio reflects investors' expectations regarding a firm's prospects and growth potential. Research indicates that companies with high market-to-book ratios may be more prone to conducting RPTs, as they seek to align their financial activities with market sentiments and shareholder expectations (Jiang et al., 2010). MNCs often use TP strategies to shift profits across borders, and these practices are influenced by various factors, including market valuations and ownership structures (Cristea & Nguyen, 2016). Moreover, RPTs can be utilized as a mechanism for signaling value to the market, thereby influencing investors' perceptions and stock valuations (Ryngaert & Thomas, 2007). The following hypothesis are proposed:

Hypothesis 4: Companies with high market-to-book ratios are more prone to conducting RPTs, aligning their financial activities with market sentiments and shareholder expectations, which may serve as a mechanism for signaling value to the market.

Controlling shareholders exert a significant influence on RPTs, as they often possess the authority to initiate or approve transactions with related parties. Prior studies have shown that the presence of dominant shareholders correlates positively with the frequency and magnitude of RPTs, as these individuals may prioritize their interests over those of minority shareholders (Bertrand et al., 2002; Johnson et al., 2000). Moreover, controlling shareholders may RPT as a means of extracting private benefits or consolidating their control over the company (Duru et al., 2016). The following hypothesis are proposed:

Hypothesis 5: The presence of dominant shareholders positively correlates with the frequency and magnitude of RPTs, as these individuals may prioritize their personal interests over those of minority shareholders and may engage in RPTs to extract private benefits or consolidate control over the company.

Lastly, the corporate income tax rate influences companies' decisions regarding RPT. Research suggests that companies operating in jurisdictions with higher corporate tax rates may engage in RPTs as a means of tax optimization, by transferring profits to related entities located in jurisdictions with more favorable tax regimes Hanlon and Heitzman (2010). Lower corporate tax rates may reduce the incentive for companies to engage in such transactions for tax planning purposes, although other factors such as regulatory compliance and business considerations may still influence their prevalence (Clausing, 2003; Huizinga & Laeven, 2008). The following hypothesis are proposed:

Hypothesis 6: Companies operating in jurisdictions with higher corporate tax rates are more likely to engage in RPTs as a means of tax optimization by transferring profits to related entities in jurisdictions with more favorable tax regimes.

The literature underscores the multifaceted nature of RPT and highlights the diverse array of factors that influence their occurrence within corporate settings. By examining the interplay between company-specific characteristics, institutional factors, and regulatory environments, researchers can gain valuable insights into the drivers and implications of RPTs, thereby informing policymakers, practitioners, and stakeholders alike.

Each of these hypotheses can be tested empirically using statistical methods and data analysis techniques to understand the relationship between the independent variables and the occurrence of RPT within corporate settings.

3. RESEARCH METHOD

The research method employed aligns with a quantitative descriptive approach, focusing on analyzing the determinants that shape TP practices within the EU business landscape. Through the utilization of multiple linear regression models, this research aims to clarify the relationships between independent variables such as company size, leverage ratio, profitability, market to book ratio, controlling shareholders, and corporate income tax rate and RPTs among EU public companies. TP refers to a policy established by a company to determine the price of transactions conducted between the company and its affiliated entities. These transactions are measured through RPTs. It is generally presumed that companies engage in TP when conducting transactions with affiliate companies to ensure that both parties derive significant benefits from this practice (Yulia et al., 2019).

The data collection process for this study involved thorough sourcing from annual reports and databases such as Thomson Reuters Eikon (2022) and Bloomberg L.P. (2022) and the financial statements of companies for the year ending 2022. A diverse sample was drawn from seven EU countries: France, Germany, Poland, Ireland, Hungary, the Netherlands, and Romania. This selection ensures a comprehensive representation of the EU business landscape, allowing for the exploration of potential variations in TP behaviors across diverse regulatory and economic environments.

This study primarily examines RPTs, specifically related party sales and related party purchases, which serve as proxies for RPTs. They are defined as the average of the percentage of related party sales to total net sales and the percentage of related party purchases to total net purchases.

An explanation of the operational definitions of each variable used in the study is in Table 1.

Table 1. Definition of variables

Dependent Variable	**Symbol**	**Measurement**
Related party transactions	RPTs	RPTs=(Percentage RP Sales + percentage RP Acquisitions)/2
Independent Variables		
Company size	CSIZE	Ln Total Asset Natural log of total assets at the end of the year.
Leverage ratio	LEV	Firm leverage measured by total liabilities divided by total assets.
Profitability	ROA	Income before interest, tax, depreciation, and amortization divided by total assets.
Market to book ratio	MTB	Market value of equity /total stockholders' equity.
Corporate income tax rate	CIT	Corporate income tax rate of the country.

Source: Own processing

The examination of research variables progresses through multiple stages, beginning with descriptive analysis, followed by classical assumption testing, and hypothesis testing.

To test the hypothesis, this study employs the following regression model:

$$RPT_{it} = \alpha_{it} + \beta_1 CSIZE_{it} + \beta_2 LEV_{it} + \beta_3 ROA_{it} + \beta_4 MTB_{it} + \beta_5 CIT_{it} + \varepsilon_{it} \quad (1)$$

Where:
RPT_{it} = Related party transactions for companies *i* years *t*
$CSIZE_{it}$ = Size for companies *i* years *t*
LEV_{it} = Leverage ratio for companies *i* years *t*
ROA_{it} = Return on Asset for companies *i* years *t*
MTB_{it} = Market to book ratio for companies *i* years *t*
CIT_{it} = Corporate income tax for companies *i* years *t*
ε_{it} = Error for companies *i* years *t*

Results of the descriptive statistic test are shown by the values of the minimum, maximum, mean, and standard deviation of the research sample. The results of the test are presented in the following table 2.

Table 2. Results of the Descriptive Statistic Test

	N	Minimum	Maximum	Mean	Std. Deviation
DV RPT	102	0.0000000	90.58891875	11.790535	18.52154287
IV CSIZE	102	15.8365583	27.05834314	21.017089	3.038423752
IV LEV	102	0.0000000	0.611231000	.174049	.1558944134
IV ROA	102	-.417003188	2.595316978	.075336	.2717782844
IV CS	102	0.0000000	99.40264870	43.541194	29.97330473
IV MTB	102	-.441140536	10.56800509	1.896136	1.905603605
IV CIT	102	.090	.299	.19267	.058368

Source: Own processing

The standard deviation (18.52) is notably higher than the mean (11.79). This indicates that the data variation for RPT used as a proxy for TP, is relatively high, suggesting heterogeneity within the dataset. The descriptive statistics in Table 2 reveal varying degrees of data dispersion and homogeneity across the research variables, with notably higher standard deviations observed for variables such as RPT, while others such as CSIZE demonstrate relatively lower dispersion.

We used the Pearson correlation coefficient method to examine the relationships between the dependent variable and the independent variables (Table 3).

The obtained correlation coefficients, ranging from 0 to 1, indicate the presence of a positive correlation, suggesting that, generally, an increase in one variable is associated with a proportional increase in the other (Table 4).

The multiple correlation coefficient measures the strength and direction of the linear relationship between the independent variables (IVs) and the dependent variable (DV). In this model, R is 0.414, indicating a moderate positive correlation. This adjusts the R Square value to account for the number of predictors in the model and the sample size. It provides a more accurate

estimate of the proportion of variance explained by the model. Here, Adjusted R Square is 0.119, indicating that approximately 11.9% of the variance in the DV is explained by the IVs after adjusting for the number of predictors (Table 5).

Table 3. Correlations

		RPT_{it} (DV)	$CSIZE_{it}$ (IV)	LEV_{it} (IV)	ROA_{it} (IV)	CS_{it} (IV)	MTB_{it} (IV)	CIT_{it} (IV)
Pearson Correlation	RPT_{it} (DV)	1.000	-.092	-.152	-.033	.359	-.090	-.136
	$CSIZE_{it}$ (IV)	-.092	1.000	.092	-.095	-.506	.015	.676
	LEV_{it} (IV)	-.152	.092	1.000	-.077	-.184	.103	-.027
	ROA_{it} (IV)	-.033	-.095	-.077	1.000	.196	-.094	-.134
	CS_{it} (IV)	.359	-.506	-.184	.196	1.000	-.261	-.372
	MTB_{it} (IV)	-.090	.015	.103	-.094	-.261	1.000	.069
	CIT_{it} (IV)	-.136	.676	-.027	-.134	-.372	.069	1.000
Sig. (1- tailed)	RPT_{it} (DV)	.	.180	.064	.371	.000	.183	.086
	$CSIZE_{it}$ (IV)	.180	.	.180	.172	.000	.439	.000
	LEV_{it} (IV)	.064	.180	.	.220	.032	.151	.394
	ROA_{it} (IV)	.371	.172	.220	.	.024	.173	.089
	CS_{it} (IV)	.000	.000	.032	.024	.	.004	.000
	MTB_{it} (IV)	.183	.439	.151	.173	.004	.	.245
	CIT_{it} (IV)	.086	.000	.394	.089	.000	.245	.
N	RPT_{it} (DV)	102	102	102	102	102	102	102
	$CSIZE_{it}$ (IV)	102	102	102	102	102	102	102
	LEV_{it} (IV)	102	102	102	102	102	102	102
	ROA_{it} (IV)	102	102	102	102	102	102	102
	CS_{it} (IV)	102	102	102	102	102	102	102
	MTB_{it} (IV)	102	102	102	102	102	102	102
	CIT_{it} (IV)	102	102	102	102	102	102	102

Source: Own processing

Table 4. Coefficient test

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.414[a]	.171	.119	17.384021

a. Predictors: (constant)., IV CIT, IV LEV, IV MTB, IV ROA, IV CS, IV CSIZE

b. Dependent Variable: DV RPT

Source: Own processing

Table 5. ANOVA[a]

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	5938.403	6	989.734	3.275	.006[b]
	Residual	28709.400	95	302.204		
	Total	34647.803	101			

a. Predictors: (constant)., IV CIT, IV LEV, IV MTB, IV ROA, IV CS, IV CSIZE

b. Dependent Variable: DV RPT

Source: Own processing

The regression model is statistically significant (F = 3.275, p = .006), indicating that the IVs collectively have a significant effect on RPT. This is further supported by the ANOVA results, which show that the regression model accounts for a significant portion of the variability in RPT (Regression Sum of Squares = 5938.403, Residual Sum of Squares = 28709.400). These

findings suggest that the independent variables, including CIT, LEV, MTB, ROA, CS, CSIZE, collectively influence the occurrence of RPT within the sample.

A positive coefficient for CSIZE (B = 1.364, p = .110) indicates that larger companies tend to engage in more RPTs. Similarly, the positive coefficient for CS (B = 0.264, p < .001) suggests that companies with CS are also associated with increased RPT. Variables such as LEV, ROA, MTB, and CIT do not show statistically significant relationships with RPT. Collinearity statistics indicate low multicollinearity among the IVs, reinforcing the reliability of the model's results.

Table 6. Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Correlations Zero-order	Correlations Partial	Correlations Part	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	-16.862	16.710		-1.009	.315					
	CSIZE it (IV)	1.364	.846	.224	1.611	.110	-.092	.163	.150	.452	2.210
	LEV it (IV)	-13.011	11.429	-.110	-1.138	.258	-.152	-.116	-.106	.943	1.061
	ROA it (IV)	-8.282	6.531	-.122	-1.268	.208	-.033	-.129	-.118	.950	1.053
	CS it (IV)	.264	.071	.428	3.697	.000	.359	.355	.345	.652	1.533
	MTB it (IV)	.272	.955	.028	.285	.776	-.090	.029	.027	.904	1.106
	CIT it (IV)	-47.430	40.885	-.149	-1.160	.249	-.136	-.118	-.108	.525	1.903

Source: Own processing

4. FUTURE RESEARCH DIRECTIONS

Future research in this domain could explore deeper into the nuanced dynamics of transfer pricing practices, particularly within the context of evolving regulatory landscapes and advancements in technology. With the increasing globalization of business operations and the proliferation of digital transactions, there is a growing need to explore the implications of digitalization on transfer pricing strategies and compliance frameworks. Additionally, investigating the role of emerging technologies such as blockchain and artificial intelligence in facilitating or disrupting transfer pricing practices could provide valuable insights into future trends and challenges in this field.

5. CONCLUSION

In conclusion, this study contributes to the understanding of TP practices among EU public companies by identifying key determinants influencing RPTs. The findings highlight the significant influence of company size and controlling shareholders on RPTs, underscoring the importance of transparency and ethical governance in TP arrangements. Moving forward, addressing the complexities and challenges associated with TP requires a multi-faceted approach that leverages advancements in technology, regulatory frameworks, and corporate governance practices to promote fair and sustainable business conduct in the global economy.

The positive association between controlling shareholders and RPTs underscores the need for robust governance mechanisms to prevent potential abuse of power and protect the interests of minority shareholders. Duru et al. (2016) emphasize the importance of board independence in mitigating the influence of powerful insiders, such as controlling shareholders, which is crucial in reducing the risks associated with RPTs. Moreover, the effectiveness of tax authority monitoring and enforcement in curbing aggressive TP practices should not be underestimated, as

highlighted by Hanlon et al. (2019). Their study suggests that stronger oversight by tax authorities can significantly improve financial reporting quality and reduce the likelihood of abusive RPTs. The link between tax aggressiveness and other unethical practices, such as accounting fraud, as stated by Lennox et al. (2017), highlights the broader implications of TP strategies on corporate governance and financial integrity.

However, it's essential to acknowledge the nuances and complexities inherent in transfer pricing dynamics, as highlighted by previous research. While our study identified significant relationships between company size and controlling shareholders with RPTs, other factors such as leverage ratio, profitability, market to book ratio, and corporate income tax rate did not yield statistically significant results, which contrasts findings by Jian and Wong (2010) and Hanlon and Heitzman (2010). This discrepancy underscores the need for further research to investigate deeper into the multifaceted nature of transfer pricing practices and their underlying determinants.

Moving forward, addressing the complexities and challenges associated with transfer pricing requires a multi-faceted approach that leverages advancements in technology, regulatory frameworks, and corporate governance practices. Future research endeavors should aim to explore additional factors influencing transfer pricing practices within the EU context, such as regulatory compliance, industry-specific dynamics, and the impact of global economic trends. By fostering a deeper understanding of transfer pricing dynamics and their implications, policymakers, practitioners, and stakeholders can collaboratively work toward promoting fair and sustainable business conduct in the global economy.

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Impact of COVID-19 on Sustainable Development in Western Balkans

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Abstract: *The COVID-19 pandemic, a global crisis of unprecedented scale, has caused profound impacts on societies, economies, and the environment. This study investigates the relationship between the pandemic and its effects on the Western Balkans, with a specific focus on environmental and socioeconomic dimensions. While certain positive outcomes such as a reduction in greenhouse gas emissions and a surge in the Information Technology and Communication (ITC) sector have been observed, the overall impact poses a substantial threat to sustainable development (SD). This study offers a comprehensive overview by identifying challenges faced by Western Balkans countries, assessing policy responses, and providing insights for a resilient and sustainable recovery.*

1. INTRODUCTION

The COVID-19 pandemic has started in an era of unprecedented global challenges, influencing various aspects of society, economy, and the environment (Impola, 2023; Lee et al., 2023; Mota et al., 2022; OECD, 2020). This research paper aims to analyze the relationship between the pandemic and its effects on the Western Balkans region, focusing on the environmental and socioeconomic dimensions. Drawing upon an extensive review of existing literature, this study aims to provide a comprehensive overview of the multifaceted impacts of COVID-19, shedding light on both positive and negative repercussions. The initial exploration reveals certain positive outcomes stemming from the pandemic, particularly in the context of environmental sustainability (Adams, 2006; Craiut et al., 2022; Mishra, 2022; Novillo-Villegas et al., 2022; Thanasi-Boçe et al., 2023). A notable reduction in greenhouse gas emissions has been observed, attributed to lockdowns, travel restrictions, and changes in industrial activities. Additionally, the Information Technology and Communication (ITC) sector, along with allied industries, has experienced a boost in operations, showcasing the adaptability and resilience of certain economic sectors during these challenging times (Mishra, 2022; UNDP, 2020).

However, the overall impact of the pandemic on the Western Balkans region suggests a threat to sustainable development (SD). Despite the temporary environmental benefits, the broader socioeconomic landscape has experienced significant disruptions, exposing to risk the gains achieved in sustainable development over the years (Gashi & Liça, 2023). The erosion of progress in areas such as poverty alleviation, education, and healthcare raises concerns about the long-term repercussions on the region's socio-economic structure (Borojo et al., 2022). To understand the nuances of these impacts, the paper explores the specific challenges faced by the Western Balkans countries. Factors such as the reliance on tourism, disruption of global supply chains, and the vulnerability of certain sectors have aggravated the socio-economic consequences of the pandemic (Gashi & Liça, 2023). The study also investigates the effectiveness of

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policy responses and mitigation measures implemented by the governments in the region, aiming to identify best practices and areas that require further attention.

This research paper provides a nuanced analysis of the environmental and socioeconomic impacts of COVID-19 in the Western Balkans. By synthesizing evidence from the literature, it offers insights into the complex interplay between the pandemic and sustainable development in the region. The findings contribute to a better understanding of the challenges faced by the Western Balkans countries and provide a basis for formulating targeted strategies to mitigate the negative consequences and promote a more resilient and sustainable recovery.

Finally, the objectives of this study are as follows:

1. Explore the environmental impacts of COVID-19:
    - Assess the extent of reduction in greenhouse gas emissions during lockdown periods.
    - Analyze satellite imagery and air quality data to quantify the environmental impact.
    - Explore the factors contributing to changes in emissions and their implications for environmental sustainability.
    - Investigate the role of the ITC sector in mitigating environmental impacts.
    - Assess the resilience of digital technologies in facilitating remote work and reducing the carbon footprint.
    - Identify opportunities for leveraging technological innovation to promote sustainability beyond the pandemic.
2. Investigate socioeconomic consequences:
    - Examine the pandemic's impact on poverty levels and income inequality in the Western Balkans.
    - Assess disruptions to education systems, including school closures and remote learning challenges.
    - Investigate strains on healthcare infrastructure and access to essential services, particularly for vulnerable populations.
    - Explore the differential impacts of the pandemic on various sectors, including tourism, manufacturing, and agriculture.
    - Evaluate the resilience of supply chains and the capacity of industries to adapt to changing market dynamics.
    - Identify sector-specific challenges and opportunities for sustainable development in the post-pandemic recovery phase.
3. Assess threats to sustainable development in Western Balkans:
    - Assess the extent to which gains in sustainable development are eroded by the pandemic.
    - Identify key indicators of regression, such as setbacks in environmental conservation efforts and social inclusion initiatives.
    - Explore strategies for safeguarding and reinforcing sustainable development goals amidst global crises.
    - Investigate disparities in the pandemic's impact across demographic groups, regions, and socioeconomic strata.
    - Analyze the intersectionality of factors such as gender, age, ethnicity, and geographic location in shaping vulnerability.
    - Propose policies and interventions to address inequities and foster a more inclusive and resilient society.

2. LITERATURE REVIEW

The imposition of strict lockdowns and travel restrictions across the Western Balkans resulted in an unintentional reduction in greenhouse gas emissions. The decrease in industrial activities, transportation, and overall economic slowdown contributed to improved air quality (International Energy Agency, 2020; Le Quéré et al., 2020; Mishra, 2022). Moreover, satellite imagery and air quality monitoring stations documented a visible decline in pollutants, showcasing the direct link between human activities and environmental degradation. This unintentional "green" outcome, raises questions about the long-term sustainability of achieving environmental goals through drastic, short-term measures. Contrary to sectors experiencing economic downturns, the Information Technology and Communication (ITC) sector emerged as a lamp of resilience and adaptability during the pandemic (Borojo et al., 2022; Hale et al., 2021; UNDP, 2020). With remote work becoming the norm, the demand for digital services, online communication platforms, and e-commerce experienced an unprecedented surge.

This unexpected boost not only sustained the ITC sector but also demonstrated its potential to drive economic activity in times of crisis. The accelerated digital transformation highlighted the importance of investing in technological infrastructure and fostering innovation for future environmental and economic sustainability (Di Maria et al., 2022; Jo et al., 2020; Mubarak & Petraite, 2020). While the reduction in greenhouse gas emissions and the resilience of the ITC sector present positive aspects of the pandemic, it is crucial to approach these outcomes with caution. The environmental benefits resulting from lockdowns and economic slowdowns are temporary and come at the cost of economic and social disruptions.

As countries seek to rebuild their economies, there is a need to explore sustainable practices that decouple economic growth from environmental degradation (Le Quéré et al., 2020). The stream in digitalization also brings attention to the energy consumption of the ITC sector, prompting considerations for green technologies and energy-efficient practices to ensure a harmonious balance between technological advancement and environmental stewardship (UNDP, 2020).

While the positive environmental outcomes of the pandemic offer a panorama of the potential for change, the overall impact on sustainable development in the Western Balkans shows a more complex picture. Lockdowns and economic contractions have disproportionately affected vulnerable populations, pushing many back into poverty. The interruption of educational systems and healthcare services, coupled with economic uncertainty, threatens to reverse progress made in achieving Sustainable Development Goals (SDGs) (World Bank, 2022). The dependence on tourism, a vital economic driver for many countries in the region, faced an unprecedented downturn with global travel restrictions. This not only impacted businesses directly involved in the tourism sector but also affected ancillary industries such as transportation, hospitality, and local enterprises. The consequences of this vulnerability extend beyond economic downturns to encompass social well-being, cultural preservation, and regional development.

The pandemic's impact on sustainable development has been far from uniform across society. Existing inequalities have been exacerbated, with marginalized communities facing heightened challenges. Access to healthcare, educational resources, and economic opportunities has become more unequal, emphasizing the need for targeted policies that address these disparities. The disproportionate effects on women, youth, and minority groups necessitate a nuanced approach to sustainable development that considers social equity as an integral component (Borojo et al., 2022; UNDP, 2020; World Health Organization, 2020).

3. METHODOLOGY

The methodology used in this study is focused on a comprehensive literature review framework. The objective was to synthesize existing scholarly works, reports, and articles that investigate the environmental and socioeconomic impacts of the COVID-19 pandemic in the Western Balkans. The literature review served as the primary method for data collection and analysis, drawing from diverse sources to present a holistic understanding of the subject matter.

A systematic search strategy was devised to identify relevant literature. Databases such as PubMed, Scopus, Web of Science, and Google Scholar were utilized. The search terms included variations of "COVID-19", "Western Balkans", "environmental impacts", "socioeconomic impacts", and related keywords. The inclusion criteria encompassed studies published between January 2020 and the knowledge cutoff date of January 2022, ensuring the incorporation of the most recent and relevant findings.

Articles were screened based on their relevance to the research objectives. Inclusion criteria prioritized studies specific to the Western Balkans, focusing on the environmental and socioeconomic repercussions of the COVID-19 pandemic. Peer-reviewed articles, reports from reputable organizations, and academic publications were prioritized to maintain the credibility and validity of the information.

The selected literature underwent a rigorous data extraction process. Key variables of interest included environmental outcomes (e.g., changes in greenhouse gas emissions), socioeconomic impacts (e.g., effects on employment, poverty), and sector-specific analyses (e.g., tourism, information technology). Extracted data were organized and synthesized to derive meaningful insights and identify patterns, trends, and disparities across the Western Balkans countries.

Thematic analysis was applied to categorize and interpret the literature into overarching themes. The emergent themes were then used to develop a conceptual framework that guided the organization and presentation of the findings. This thematic framework enabled a structured exploration of both positive and negative impacts, as well as specific challenges faced by the Western Balkans in the context of sustainable development.

The methodology acknowledges certain limitations inherent in a literature review approach. The potential for publication bias and variations in research methodologies across studies may influence the comprehensiveness and generalizability of the findings. Additionally, the dynamic nature of the COVID-19 pandemic presents challenges in capturing real-time data. Reflexivity was maintained throughout the review process to critically evaluate the sources, minimize bias, and ensure the robustness of the synthesized information.

Ethical considerations primarily revolved around the responsible use of existing scholarly works. Proper citation and acknowledgment of authors were ensured to uphold academic integrity. Additionally, efforts were made to select studies conducted with ethical standards, recognizing the sensitivity of research related to public health, socioeconomic disparities, and environmental impact.

Rigor and validity were maintained through a meticulous and systematic approach to the literature review. A transparent and replicable methodology, adherence to inclusion criteria, and the utilization of peer-reviewed sources contributed to the reliability of the synthesized information. Critical engagement with the literature and continuous reflexivity further enhanced the robustness of the research.

4. FINDINGS

The main findings of this study are summarized in Table 1 providing insights into the environmental, socioeconomic, and developmental implications of the COVID-19 pandemic in the Western Balkans region.

Table 1. Summary of findings

	Findings
Environmental impacts	- Significant reduction in greenhouse gas emissions during lockdown periods. - Temporary improvement in air quality observed across the Western Balkans. - Resilience of the Information Technology and Communication (ITC) sector.
Socioeconomic consequences	- Setbacks in poverty alleviation, education, and healthcare. - Disproportionate impacts on vulnerable populations. - Vulnerability of specific sectors, such as tourism and global supply chains.
Threats to sustainable development	- Erosion of gains in sustainable development, particularly in environmental conservation and social inclusion. - Unequal distribution of pandemic effects exacerbating existing disparities. - Challenges in achieving Sustainable Development Goals (SDGs).

Source: Own research

4.1. Environmental Impacts

During periods of lockdown and reduced economic activity, there was a noticeable decline in greenhouse gas emissions across the Western Balkans region. Factors such as decreased industrial output, reduced transportation, and limited energy consumption contributed to this decline. Corresponding with the reduction in emissions, there was a temporary improvement in air quality observed in many areas of the Western Balkans.

Satellite imagery and air quality monitoring stations documented lower levels of pollutants, resulting in clearer skies and better respiratory conditions for inhabitants. Despite the disruptions caused by the pandemic, the ITC sector demonstrated resilience and adaptability. The increased reliance on digital technologies for remote work, online education, and virtual communication contributed to the sector's stability and growth. This digital transformation highlighted the importance of technological innovation in fostering environmental sustainability and economic resilience.

4.2. Socioeconomic Consequences

The pandemic exacerbated existing socioeconomic disparities and posed significant challenges to poverty alleviation efforts, education systems, and healthcare infrastructure. Vulnerable populations, including low-income individuals, marginalized communities, and rural residents, faced heightened risks of economic hardship, educational disruption, and limited access to healthcare services. Vulnerable demographic groups, including women, children, the elderly, and persons with disabilities, bore a disproportionate burden of the pandemic's socioeconomic consequences. Structural inequalities in access to resources, employment opportunities, and social support networks exacerbated disparities, amplifying the vulnerability of marginalized populations to the adverse effects of the crisis.

Certain sectors of the economy, such as tourism and global supply chains, were particularly vulnerable to the disruptions caused by the pandemic. The abrupt halt in international travel and trade restrictions severely impacted tourism-dependent economies, leading to widespread job losses,

business closures, and economic downturns. Similarly, disruptions in global supply chains disrupted manufacturing and trade activities, exacerbating economic uncertainties and vulnerabilities.

4.3. Threats to Sustainable Development

The pandemic posed significant challenges to the progress made in achieving sustainable development goals in the Western Balkans. Gains in environmental conservation, social inclusion, and economic stability were eroded by the pandemic's disruptive effects, jeopardizing efforts to build resilient, inclusive, and sustainable societies. The unequal distribution of pandemic effects exacerbated existing disparities and inequalities within the Western Balkans region.

Socioeconomic factors such as income level, education attainment, and geographic location influenced individuals' and communities' vulnerability to the pandemic's impacts, highlighting the need for targeted interventions and policy responses to address systemic inequities. The pandemic underscored the interconnectedness of global challenges and the urgency of advancing sustainable development agendas. Achieving Sustainable Development Goals (SDGs) in the aftermath of the pandemic requires coordinated efforts across sectors and stakeholders, with a focus on building resilience, promoting equity, and fostering environmental stewardship.

5. CONCLUSION AND RECOMMENDATION

The Western Balkans' heavy reliance on tourism as a major economic driver has revealed inherent weaknesses. The sudden and prolonged decline in international tourist arrivals severely impacted countries that had heavily invested in tourism infrastructure. The loss of revenue not only affected businesses directly involved in the tourism sector but also reverberated through the broader economy, impacting employment, cultural preservation, and local development projects.

The disruption of global supply chains exposed vulnerabilities in the economic structures of Western Balkan countries. Industries reliant on imported raw materials and components faced production delays and increased costs, affecting both large enterprises and small businesses. This disruption highlighted the importance of building resilient, diversified economies that can face external shocks and reduce dependence on global supply chains.

Governments in the Western Balkans responded to the challenges posed by the pandemic through various policy measures and mitigation strategies. These included economic stimulus packages, support for businesses, and social safety nets. However, the effectiveness of these measures varied, and the paper aims to assess their impact on mitigating the threats to sustainable development. In summary, the threats to sustainable development in the Western Balkans brought about by the COVID-19 pandemic are multifaceted. The vulnerability of specific sectors and unequal impacts underscore the need for targeted and inclusive policies. As the region faces the recovery phase, addressing these challenges will be pivotal to ensuring a sustainable and equitable future.

The COVID-19 pandemic has caused a multifaceted impact on the Western Balkans, with consequences across environmental, socioeconomic, and developmental spheres. The positive environmental outcomes, including the reduction in greenhouse gas emissions and the resilience of the Information Technology and Communication (ITC) sector, provide insights into potential avenues for future sustainability. However, these positive aspects must be considered in the context of the broader threats to sustainable development that have emerged during this global crisis.

The erosion of hard-fought gains in poverty alleviation, education, and healthcare raises alarms about the fragility of progress achieved in the region. Lockdowns and economic contractions have disproportionately affected vulnerable populations, exacerbating existing inequalities. The interruption of educational systems and healthcare services adds urgency to the need for adaptive and inclusive policies that prioritize the most marginalized.

The vulnerability of specific sectors, such as tourism and those dependent on global supply chains, highlights the need for diversified and resilient economic structures. The heavy dependence on tourism offers economic benefits while leaving countries open to external shocks. Similarly, disruptions in global supply chains have underscored the importance of regional self-sufficiency and the need for adaptive strategies in the face of unforeseen challenges.

As the Western Balkans face the post-pandemic recovery phase, the effectiveness of policy responses and mitigation measures will be crucial. Governments have implemented various measures, including economic stimulus packages and support for businesses, yet the efficacy of these efforts remains a subject of scrutiny. The lessons learned from the pandemic should inform future policies, emphasizing the importance of sustainable practices, social equity, and economic resilience.

In moving forward, it is important to create a balance between economic recovery and environmental management, recognizing that long-term sustainability requires a holistic and inclusive approach. The challenges presented by the pandemic serve as a call to action for policymakers, businesses, and communities to re-evaluate and reshape developmental strategies.

This research contributes to the ongoing discourse on the intersection of global crises, environmental sustainability, and socioeconomic development. By understanding the Western Balkans' experience during the COVID-19 pandemic, stakeholders can gather valuable insights for building a more resilient and sustainable future.

This study provides some implications. The research underscores the need for Western Balkans countries to reassess their developmental strategies. The pandemic has exposed vulnerabilities in sectors such as tourism and global supply chains. Policymakers should consider more diversified and resilient economic structures that can withstand external shocks, ensuring sustainable development in the face of uncertainties. Given the unequal impacts of the pandemic on vulnerable populations, there is a pressing need for targeted policies that enhance socioeconomic resilience. This involves addressing disparities in access to healthcare, education, and economic opportunities.

Governments and stakeholders should prioritize inclusive measures to protect the most marginalized communities. While the reduction in greenhouse gas emissions during lockdowns provides a glimpse of environmental benefits, it is essential to balance short-term gains with long-term sustainability. Policymakers should explore sustainable practices that decouple economic growth from environmental degradation, ensuring a harmonious balance between economic recovery and environmental stewardship. The resilience of the Information Technology and Communication (ITC) sector during the pandemic highlights the importance of investing in technological innovation.

Governments and businesses should consider strategies to further develop and leverage digital technologies, not only for economic growth but also as tools for environmental monitoring and sustainable practices. The disruptions in global supply chains emphasize the importance of building

regional self-sufficiency. Western Balkans countries should explore opportunities for regional collaboration and cooperation to reduce dependence on external sources. This could involve joint efforts in research and development, resource sharing, and the creation of more resilient and integrated regional economies.

The disproportionate impacts on specific demographic groups highlight the need to prioritize social equity in recovery plans. Governments should design policies that address existing inequalities and create opportunities for marginalized populations. This includes targeted support for women, youth, and minority groups to ensure an inclusive and equitable recovery. Finally, the effectiveness of policy responses and mitigation measures should be thoroughly evaluated. Policymakers can learn valuable lessons from the success or shortcomings of implemented measures during the pandemic. This knowledge will be instrumental in shaping future crisis response strategies and building a more adaptive and resilient governance framework.

This study offers some limitations. First, it primarily focuses on the Western Balkans region. The findings may not be directly applicable to other regions with distinct economic, social, and environmental contexts. Future research could explore the comparability of outcomes across different geographical areas. Second, this study is based on available literature up to a specific cut-off date. Given the dynamic nature of the pandemic and its aftermath, there might be ongoing developments that are not captured in this study.

Researchers should consider the temporal limitations and conduct follow-up studies to assess the evolving impacts. Third, this study acknowledges correlations between the pandemic and observed outcomes but may not establish causal relationships definitively. There might be other confounding factors influencing the observed trends. Future research could employ more rigorous methodologies, such as longitudinal studies and statistical modeling, to better understand causation.

Finally, while this study refers to the vulnerability of specific sectors, a more in-depth sector-specific analysis is warranted. Future studies could explore the nuances of how individual industries within the Western Balkans were affected, identifying sector-specific challenges and opportunities for sustainable development.

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The Dynamics of Direct Procurement in Albania: A 14-Year Analysis

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Albania

Abstract: *Governments spend part of taxpayers' money through Public Procurement. Depending on the scope and requirements, public bodies use different forms of contracting: open tenders, requests for proposals, etc. By far, the most problematic form is Direct Procurement because it significantly limits the competition from the private sector, unlike other forms of procurement where competition is a given. It is precisely the scope of this study to examine the dynamics of Direct Procurement in Albania from 2009 to 2022.*

In this study period, Albania spent 581 Million Euros via Direct Procurement in 18,990 different contracts. This study finds that although savings amounted to 2.1%, significantly lower than other forms of procurement that are more competitive, Albania has been decreasing the usage of Direct Procurement. Data shows a considerable decline trend in the number of contracts and amount of funds dedicated to an un-competitive procedure such as Direct Procurement.

1. INTRODUCTION

In 2020, Public Procurement (PP) in Albania accounted for 14% of the Gross Domestic Product (GDP) (Public Procurement Agency, 2021), similar to the European Union (OECD, 2021), while on a global scale it made up 12% of GDP (Bosio et al., 2022). PP is the process in which public funds are spent for the purchase of goods, works and services in the free market (Arrowsmith et al., 2021), and due to its size, PP can have large economic effects (Ghossein et al., 2018).

Since these are public funds, governments spend these funds after a competitive process. Previous research has identified an increase in savings in cases of good competition (Shrestha & Pradhananga, 2010). Because Albania was part of the Communist Block 1945-1990, after the fall of the Berlin Wall, we have the first instances of PP with the implementation of the United Nations model law. For the first time, the concepts of transparency, non-discrimination and competition were introduced to Albania. This model regards competitive procedure as the general rule and reserves Direct Procurement (DP) as the exception (Bardhi, 2016). Since DP is considered to be the exception, it is precisely the objective of this paper to analyse the dynamics of its usage from 2009-2022 and determine whether this type of procedure is a significant portion of public procurement in Albania.

The **Hypotheses** of this paper are:
1. The usage of Direct Procurement in Albania has been diminishing over time.
2. Direct Procurement is not a significant portion of public procurement in Albania.

The interplay of these factors holds significant implications for the government's allocation of resources and influences the broader competitive environment within procurement. Recognizing and comprehending these dynamics is essential for policymakers and stakeholders alike. It serves

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as the foundation for crafting strategies aimed at nurturing a procurement landscape characterized by strong competition and transparency. By remaining vigilant of these evolving dynamics and taking proactive measures to address them, policymakers can make informed decisions that streamline resource allocation while upholding principles of accountability and fiscal prudence.

2. LITERATURE REVIEW

A large amount of firms competing for the same public contract should bring positive results to procurement (Flynn, 2018). Often competition is deemed to have the potential to increase the efficiency in the purchasing process by lowering prices and increasing the quality of goods, works and services being bought (Baily et al., 2021). Because of the large share that public procurement has on GDP, its success becomes even more relevant for government operations (Fazekaz & Blum, 2021). There are times when public procurement can become an instrument for fostering better social outcomes (Uenk & Telgen, 2019). Examples of this would be procurement contracts that develop particular parts of the country that have been under-developed for decades. Scholars have determined that the correct implementation of public procurement is considered to profoundly affect employment (Wontner et al., 2020), while other scholars have emphasized the dividends of best practices (Guarnieri & Gomes, 2019). Furthermore, research has also advocated for cost optimization of public procurement because they are ultimately shared by the taxpayers (Balaeva et al., 2019).

PP is located at the junction of public bodies and private companies, thus at considerable risk of corruption (Coviello et al., 2022). Scholars have defined procurement corruption as the aim to orient the contract to the favored bidder (Fazekas & Kocsis, 2020) although competition is considered an additional source of inefficiency in PP (Grega et al., 2019). Although competition is a well-established notion (Atkinson, 2020) because it brings efficiency in the usage of public money (Hanák & Serrat, 2018), researchers identified links between political donations and contract awards in some cases (Titl & Geys, 2019). Scholars have also identified cartel behaviour and scarcity of competition in PP (Aaltio et al., 2023; Jääskeläinen & Tukiainen, 2019). It is also important to note that public infrastructure, contracted through procurement, is a vital prerequisite for private investments (Castro et al., 2023).

Since the fall of the Berlin Wall, Albania has made considerable progress in PP, although lacks in recent studies. In 2003, only 31% of procurement contracts underwent open tenders (World Bank, 2006). The lack of transparency created major difficulties for private companies to access public procurement, bringing a large level of corruption (Kashta, 2020). This situation was significantly improved in 2009 by the implementation of an Electronic Procurement System with immediate effect. The average number of bids per tender increased from 2.2 in 2008 to 7.0 in 2009 drastically increasing competition (Public Procurement Agency, 2009).

What is Direct Procurement? The legal and Regulatory framework in Albania, just like in the EU, foresees many different forms of public procurement. The largest part of these procedures are competitive, meaning that many private companies can bid to offer the same good, work or services. At the same time, this framework anticipates that given a set of particular circumstances, public institutions can use DP to hire a private company to do the job.

Why Direct Procurement is so highly regulated? The European Court of Justice considers the wrongful application of Direct Procurement as a strong violation of EU rules in the field of public procurement (Puisto, 2019). There is a consensus among scholars that contracts with a

single offer lack the necessary competition to offer the best value for money (la Cour & Ølykke, 2017) and in some cases, there is enough evidence to result in inefficiency (Baltrunaite et al., 2021). However, due to COVID-19, many countries have softened their stringent regulation of DP for a limited time (Decarolis et al., 2020). Nevertheless, public organizations must pay attention to the usage of DP because it is not transparent and not efficient, and at times can be connected to corruption (Gallego et al., 2021). There is also evidence of electoral consequences that procurement might have (Dahlström et al., 2019).

Direct Procurement Today? We should underline the fact that most of the forms of public procurement are not DP. Although some scholars have argued that the usage of DP would increase the level of participation for small and medium enterprises (Mendoza Jiménez & Hernández López, 2022), its large-scale application would have a negative impact on the economy. This study attempts to analyze the dynamics of Direct Procurement in Albania for a 14-year study period between 2009 and 2022.

3. METHODOLOGY

We implemented a quantitative approach to gauge the level of usage of DP in Albania through a longitudinal 14-year study period that allows us to examine trends and changes. By analyzing historical data, this methodology improves model identification connected to the research objective. This method ensures rigor and accuracy in addressing the research questions.

Our primary source of data was the Public Procurement Agency (PPA), while secondary sources were the Audit Office and Public Procurement Commission. Every year PPA publishes an annual report containing information about all types of procurement forms, including DP, amounting to 1,200 pages in PDF format. We identified the most important parameters in these reports, extracted the relevant variables, and integrated them into statistical software. Some of the annual metrics used in this research are allocation of funds, expenditure of funds, funds saved, number of contracts, etc. Since the implementation of the Electronic Procurement System in 2009, our study focuses on data starting in that year, until 2023, allowing a full investigation of DP in Albania. Via statistical software, we implemented linear regression as a statistical method to determine temporal trends in all aspects of DP. We formulated a research hypothesis, which underwent considerable testing to determine whether the usage of DP is increasing or decreasing and whether its usage has a considerable effect on public procurement in general.

It is important to accept certain limitations of our research methodology. As with all quantitative analysis, there could be innate limitations to the veracity and completeness of data available via public procurement annual reports. This study does not include public-private partnerships, auctions, and secret contracts, while all values in this research do not include value-added tax, typically at 20%. By adopting a quantitative research approach and by using rigorous analysis techniques, this study attempts to create a view of DP in Albania. The findings resulting from this methodology offer a substantial contribution to understanding the challenges and opportunities in public procurement in Albania.

4. RESEARCH RESULTS

In this section, we will provide an expose of our analysis and results of this research. Our primary focus is the analysis and evaluation of the dynamics within DP for an extensive study period

of 14 years starting in 2009 and ending in 2022. We will introduce a graphical representation of the metrics we used per each Hypothesis, accompanied by linear regression to determine the trend of each metric.

4.1. Savings in Direct Procurement

Because the literature agrees that DP is not the most efficient way to spend public money because the lack of competition does not offer the best value for money, in this section we are going to analyze the incurred savings in DP for the study period.

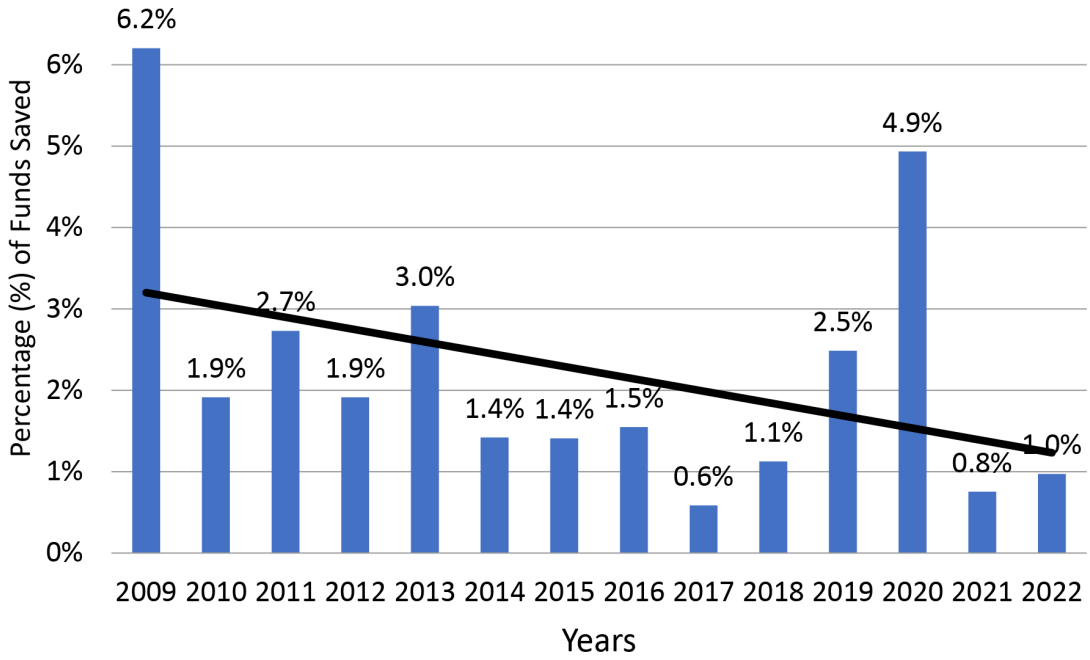

Figure 1. Percentage (%) of funds saved per each of the 14-years in the study period

Source: Authors elaboration based on PPA reports

Figure 1 identifies a negative trend in the percentage (%) of savings for DP in Albania. Although DP is considered inherently non-competitive, in 2009 savings were at 6.2% while in 2022 they were about 1.0%. It should also be noted that in 2020, during COVID-19, savings were un-normally high. However, the linear regression used demonstrates a negative trend in DP savings for the 14 years of the study period.

4.2. Funds spent in Direct Procurement

Given that DP is non-competitive and the percentage (%) of savings has been diminishing over time, it is important to analyze the amount of funds that are contracted via this procedure. If they are increasing that would mean that competition is diminishing, and the opposite would be true as well.

Figure 2 details the amounts of expenditure in DP. As seen above, although these funds have experienced an increase, the overall trend is negative. In 2009, about 29 Million Euros were spent via DP while in 2022 this amounted to 11 Million Euros. The linear regression identifies a downward trend in DP amounts. In other words, less money is spent via a non-competitive procedure such as DP, indicating the approval of Hypothesis 1.

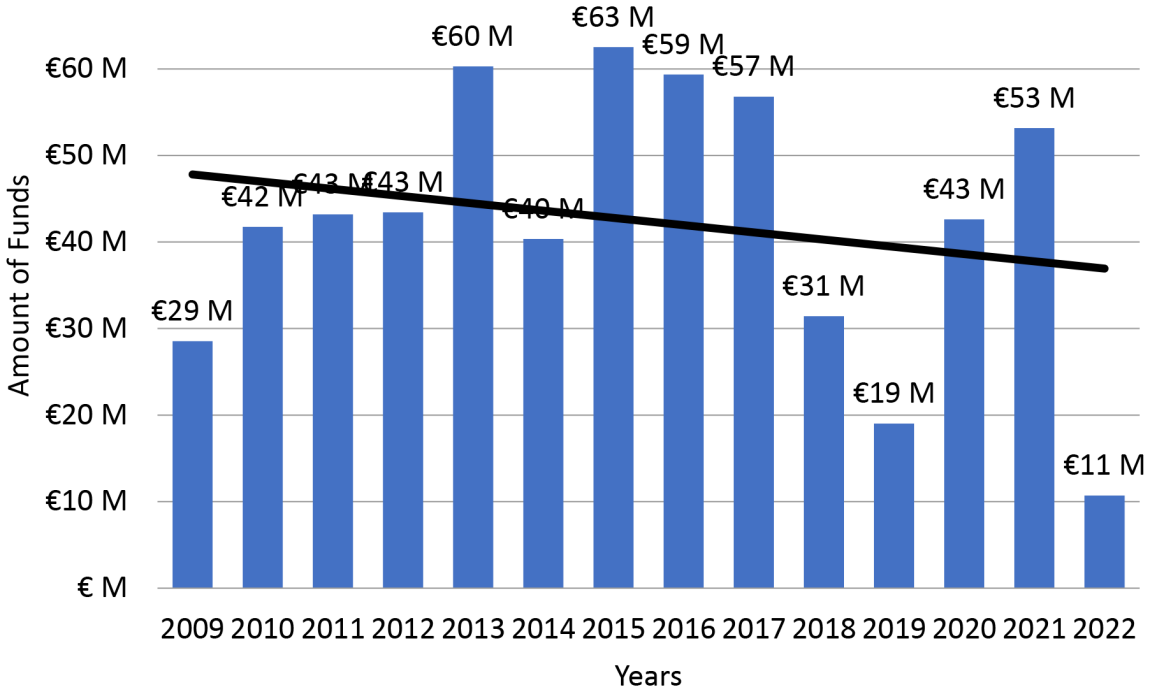

Figure 2. Amount of public funds used each year in DP between 2009 and 2022

Source: Authors elaboration based on PPA reports

4.3. Number of Contracts in Direct Procurement

In order to evaluate even better the dynamics of DP in Albania would be opportune to analyze the number of contracts conducted via this procedure. Figure 3 does precisely that.

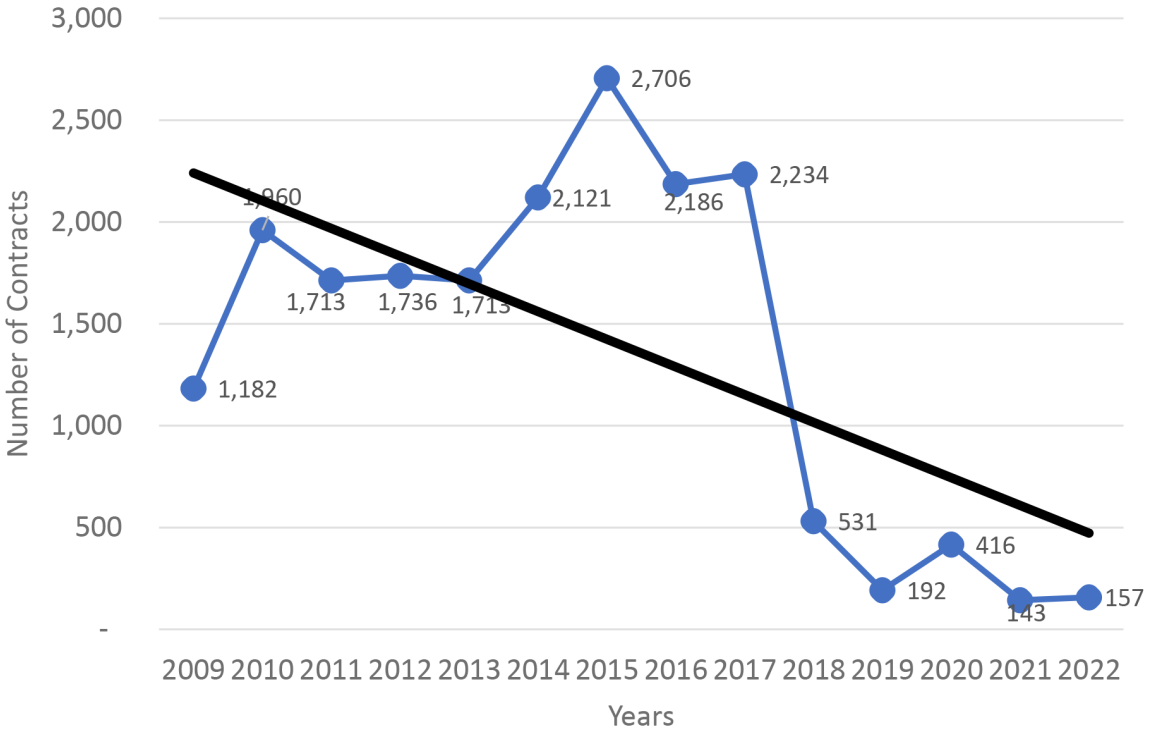

Figure 3. Number of tenders/contract in DP for the period 2009-2022

Source: Authors elaboration based on PPA reports

Figure 3 demonstrates a substantial decrease in the number of contracts for DP. They started in 2009 with 1,182 contracts and although they increased for a few years, they are reduced to only 157 in the year 2022. The linear regression offers a statistical orientation to the drastic reduction of DP contracts in Albania.

Figure 2 and Figure 3 un-ambiguously confirm Hypothesis 1. In other words, Albania is diminishing the usage of Direct Procurement, as evidenced by lowering public funds and contracts issued under this form of PP.

4.4. The significance of Direct Procurement

Previously we proved the drastic reduction of DP in Albania. Now we are going to analyze the significance of DP in the overall public procurement framework in Albania. We are now going to compare the share in percentage (%) that DP has overall.

Table 1. Percentage (%) of Funds and Contracts spent via DP

Years	% of Contracts DP/PP	% of Funds DP/PP
2009	23.39%	5.52%
2010	37.66%	17.64%
2011	28.89%	8.43%
2012	28.21%	12.73%
2013	33.25%	15.66%
2014	31.22%	11.29%
2015	42.88%	10.83%
2016	32.07%	7.75%
2017	31.81%	7.62%
2018	9.40%	3.88%
2019	3.40%	2.53%
2020	7.36%	3.01%
2021	2.53%	3.30%
2022	2.78%	0.93%

Source: Authors' elaboration based on PPA reports

It is clear from Table 1 that the percentage (%) of DP funds when compared to the overall public procurement funds is continuously diminishing. Furthermore, the percentage (%) of DP contracts when compared to public procurement contracts is even less important. This demonstrates that DP is becoming less significant when compared to the other types of procurement in Albania, approving Hypothesis 2.

5. FUTURE RESEARCH DIRECTIONS

As non-EU Balkan countries aspire to EU membership, understanding and improving public procurement practices become essential steps towards harmonization with EU standards. These countries can learn from the challenges and successes they have faced to improve their procurement policies, as well as for smooth integration into the EU. Furthermore, promoting transparency and accountability in public procurement is essential for the entire region. Transparent and competitive procurement processes foster public trust, ensuring that taxpayer funds are used efficiently and effectively to meet the needs of citizens.

Further work in this area is needed to address the issues identified and pave the way for better practices in the field of public procurement. Future research could explore the specific types of

procurement such as goods, works and services, or specific public sectors such as Health, Education, Transport, etc. Even comparative PP research between Albania and other Balkan countries could bear importance. These studies would provide even more specific/targeted results that would help policymakers focus their efforts.

6. CONCLUSION

Our analysis evidences an improvement regarding DP. In Albania, the usage of DP has become less significant. By choosing to limit this non-transparent and non-competitive procedure, Albania's progress should be evaluated positively. At the same time, it should be noted that this conclusion pertains to only a small part of Albania's public procurement, and in order to evaluate the overall procurement performance all other types of contracts should be evaluated. Regardless, the large reduction of DP should be applauded.

In conclusion, understanding the dynamics of public procurement is a fundamental aspect of ensuring good governance, sustainable economic growth and equitable development. By proactively addressing procurement challenges and continuously striving to increase competitiveness, stakeholders can foster a fair, transparent and efficient public procurement ecosystem that benefits all citizens and economies in the region.

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An Empirical Study on the Relationship Between Economic Growth and Globalization in Albania Based on a VAR Model

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Keywords:
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Economic growth;
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Var model

Abstract: *This paper examines Albania's economic trajectory over the period 1980-2022, employing a Vector Autoregression (VAR) model to unravel the intricate relationship between economic growth and globalization. As Albania underwent significant transformations during this period, marked by shifts in political structures and economic policies, our analysis seeks to disentangle the nuanced dynamics at play.*

Our findings aim to shed light on whether economic growth in Albania is a driver or a consequence of globalization, unravelling the complex interplay between domestic economic activities and global forces. In conclusion, this paper not only adds to the understanding of Albania's economic evolution but also provides a methodological contribution through the application of the VAR model.

1. INTRODUCTION

Before the '90s studies on economic growth have indeed often emphasized the role of physical capital accumulation as a driver of long-term economic development. But when the rate of physical capital accumulation surpasses the rate of population growth, it can lead to a situation where the marginal product of capital decreases, known as diminishing marginal returns to capital. This can happen due to several factors such as the limited availability of complementary factors of production (like labour or technology) or inefficiencies arising from diminishing returns in production processes (Grossman, 2015).

After the '90s, the focus of many researchers was on human capital or 'accumulation of knowledge, often known as 'technology'. International knowledge spillovers refer to the process through which knowledge developed in one country can benefit other countries and contribute to economic growth. The research has found evidence of substantial international knowledge spillovers but also shows that there is still room for further integration of the world economy to raise knowledge stocks around the globe. Trade and foreign direct investment may act as conduits for knowledge transmission. International knowledge spillovers tend to accelerate growth in all countries, as the cost of further innovation declines in every country with advances made elsewhere.

There are two offsetting effects of globalization on economic growth: 1) the scale effect and 2) the competition effect. The scale effect means that innovators can afford the opportunity to exploit their new ideas on a larger stage, boost the incentives for knowledge acquisition, and gain profits not only domestically but also on sales abroad.

The competition effect requires successful innovators to share the market not only with other domestic firms but also with those producing abroad, to present an offsetting disincentive for

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knowledge acquisition. In a more global economy, the two effects coexist and determine the overall impact on economic growth.

Globalization is a multifaceted phenomenon that brings about transformation across various aspects of global society (Moghaddam, 2012).

Albania underwent significant transformations during the period under study, including shifts in political structures and economic policies. The analysis seeks to understand the intricate relationship between economic growth and globalization in Albania. The study aims to unravel the complex interplay between domestic economic activities and global forces.

The research contributes to the broader understanding of factors influencing Albania's economic growth in the context of globalization.

The primary objective is to analyze Albania's economic trajectory from 1980 to 2022. The Vector Autoregression (VAR) model is employed to understand the relationship between economic growth and globalization in Albania.

After a brief introduction about a concise overview of the paper's objectives, section two conducts a literature review on globalization and growth, synthesizing existing scholarly contributions in these areas. It lays the groundwork for the subsequent analysis and discussion. Section three provides the methodology and results, outlining the approach used to gather data and conduct various statistical estimations. This section is crucial for comprehending the research methodology and ensuring transparency throughout the study. Section four concludes and proposes potential avenues for future research.

2. LITERATURE REVIEW

The literature underscores the symbiotic relationship between economic growth and globalization, wherein each phenomenon reinforces and amplifies the dynamics of the other. As economies become increasingly interconnected and interdependent, policymakers and scholars alike must recognize the multidimensional nature of globalization and its implications for sustainable and inclusive growth.

This literature review synthesizes key insights and perspectives on how economic growth fosters globalization and how globalization, in turn, drives economic growth.

Scholars have long recognized the catalytic role of economic growth in promoting globalization. Economic expansion generates surpluses and capital accumulation, facilitating investment in trade, technology, and infrastructure. As highlighted by Dollar and Kraay (2003) sustained economic growth enhances a country's comparative advantage in global markets, fostering specialization and exchange across borders. Empirical studies by Frankel and Romer (2009) and Sachs and Warner (2001) underscore the positive correlation between GDP growth rates and indicators of globalization, such as trade openness and foreign direct investment (FDI).

Moreover, rapid economic growth engenders structural transformations in production and consumption patterns, spurring demand for imported goods and services. This phenomenon, known as the "income effect", amplifies cross-border trade flows and market integration (Baldwin &

Martin, 2004). Additionally, rising incomes stimulate technological innovation and knowledge diffusion, driving convergence in productivity levels and fostering cross-border collaboration (Rodriguez & Rodrik, 2000).

Since the transition period, Albania has seen significant economic growth, ranking high among transition economies since 1990. Moving from a closed, centrally-planned system to an open-market economy, Albania initially had various economic challenges.

Close ties with Greece and Italy in trade, remittances, and banking make Albania vulnerable to external economic pressures from eurozone debt crises and weak growth (Tafilica, 2017).

However, the impact of globalization on Albania has been mixed, with both positive and negative effects (Tafilica, 2017).

Radonshiqi's (2017) findings support the notion that export promotion and broader trade strategies in Albania have significantly contributed to the growth of exports and the overall economic advancement of the country.

Dragusha et al. (2023) research reinforces the idea that Albania's long-term economic growth is positively impacted by factors such as trade openness, export growth, and increased imports. This indicates that a notable portion of Albania's economic progress stems from its heightened involvement in global trade and the subsequent expansion of both export and import operations.

Foreign trade plays a constructive role in fostering economic growth within Albania. Consequently, to ensure sustainable economic development, Albania should prioritize the implementation of effective and well-suited trade policies and strategies (Shahini et al., 2016).

Globalization catalyzes economic growth by expanding market access, facilitating capital flows, and promoting technological diffusion. The liberalization of trade and investment regimes, epitomized by initiatives such as the World Trade Organization (WTO) and regional trade agreements, has dismantled barriers to commerce and facilitated the international exchange of goods, services, and factors of production (Bhagwati, 2004).

Furthermore, globalization stimulates competition and efficiency gains by exposing domestic industries to international benchmarks and best practices. Acemoglu and Restrepo (2019) emphasize the role of competitive pressures in driving productivity growth and innovation, as firms strive to optimize production processes and upgrade technological capabilities to remain competitive in global markets.

Moreover, globalization enhances access to capital and technology, fostering investment inflows and knowledge spillovers across borders. Multinational corporations (MNCs), as agents of globalization, play a pivotal role in diffusing technology, managerial practices, and organizational innovations to host countries (Dunning, 2000). This process, known as "foreign direct investment-led growth", has been instrumental in driving structural transformations and industrial upgrading in emerging economies (UNCTAD, 2020).

3. METHODOLOGY AND RESULTS

Economic growth and globalization are interconnected. Economic growth can influence globalization and vice versa. Our two main hypotheses are:

Hypothesis One: Economic growth leads to globalization.

Hypothesis Two: Globalization leads to economic growth.

The first hypothesis suggests that economies that experience growth, can then contribute to increased globalization. The second hypothesis implies that the process of globalization contributes positively to economic growth. Both hypotheses highlight the bidirectional relationship between economic growth and globalization, emphasizing the complex interplay of factors driving the interconnectedness of economies in the globalized world.

We use an unrestricted autoregressive model (unrestricted VAR) to analyze the existence of the relationship between economic growth and globalization. VAR models are used to forecast systems of interrelated time series and also analyze the dynamic impact of random disturbances on the system of variables. The data set covers data for Albania for the 1980-2022 periods. We consider two variables economic growth (annual growth rate of GDP in percent) retrieved by Shane (2009), and globalization (the KOF economic globalization index) retrieved by Dreher (2006).

According to Gygli et al. (2019), the KOF Globalization Index (KOFGI) is one of the most widely used and cited globalization indexes.

Steps of the analysis:

Step 1: Unit root test of variables

Step 2: Joint lag selection and VAR

Step 3: Stability test

Step 4: Residuals' test

In our study, our variables are considered and treated as endogenous.

$$AGR_t = \alpha_1 + \sum_{j=1}^{k} \beta_j AGR_{t-j} + \sum_{j=1}^{k} \chi_j G_{t-j} + \mu_{1t} \quad (1)$$

$$G_t = \alpha_2 + \sum_{j=1}^{k} \varepsilon_j AGR_{t-j} + \sum_{j=1}^{k} f_j G_{t-j} + \mu_{2t} \quad (2)$$

Here we are re-writing our two previous equations in a matrix form.

$$\begin{bmatrix} AGR_t \\ G_t \end{bmatrix} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} + \begin{bmatrix} \beta_1 & \chi_1 \\ \varepsilon_2 & f_2 \end{bmatrix} + \begin{bmatrix} AGR_{t-1} \\ G_{t-1} \end{bmatrix} + \dots\dots\dots + \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \end{bmatrix} \quad (3)$$

We begin our analysis by making a, unit test root of the two main variables of interest AGR and KOF which we present in Table 1 below.

Table 1. Dickey-Fuller unit tests roots

	Test statistics	1% critical value	5% critical value	10% critical value	MacKinnon Approximate p-value
AGR	-4.289	-4.260	-3.548	-3.209	0.0033
KOF	-2.501	-4.242	3.540	-3.204	0.3274

Source: Own calculations and processing

Based on the Dickey-Fuller test results, the test statistic is less than the critical values at all significance levels, and the p-value is less than 0.05 (assuming a significance level of 5%), so we reject the null hypothesis of a unit root. This implies that the variable "AGR" is likely stationary. Also, we do not have sufficient evidence to conclude that the variable "KOF" is stationary. Therefore, it may possess a unit root, suggesting non-stationarity in the data. To verify these results, we perform the Phillips–Perron test that a variable has a unit root, which also confirms the stationarity for the AGR variable and non-stationarity for the KOF variable.

Since we are working with 2 different series, one stationary and the other one non-stationary, we transform the series of KOF in the first difference [which is I (1)] to -KOF namely afterward globalization.

After checking again for unit test roots, we can conclude that the series of globalization is likely stationary, indicating that it does not possess a unit root and exhibits a stable behavior over time. This approach aligns with the results achieved by Mutascu and Fleischer (2011) in a similar analysis conducted for the country of Romania.

$$globalization = \frac{KOF_t}{KOF_{t-1}} \tag{4}$$

The second step of our analysis includes the join lag selection. Based on the selection-order criteria, a lag length of 2 is selected for the VAR model with the variables "AGR" and "globalization", presented in **Table 2**.

Table 2. Var lag order selection criteria

lag	LogL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-80.8739				.520453	5.02266	5.05318	5.11336
1	-67.6826	26.383	4	0.000	.298456	4.46561	4.55717	4.73771*
2	-62.2228	10.92*	4	0.027	.274196	4.37714	4.52972*	4.83062
3	-58.0466	8.3524	4	0.079	.273566*	4.36646*	4.58008	5.00134
4	-56.4783	3.1366	4	0.535	.321874	4.51384	4.78849	5.33011

The asterisk (*) denotes the selected lag length. LR (Likelihood Ratio) Test compares likelihood between models with and without lag. Lower FPE (Final Prediction Error) indicates better forecasting. AIC balances fit and complexity, with lower values preferred. HQIC is akin to AIC but penalizes more for complexity. Lower HQIC suggests a better fit. SBIC penalizes parameters, favoring lower values for better fit and complexity trade-off.

Source: Own calculations and processing

This lag length of two is chosen for its balance between model fit and complexity. The model with lag 2 has the highest log likelihood, indicating a better fit compared to other lag lengths. The likelihood ratio (LR) test indicates a significant improvement in model fit from lag 0 to lag 1 and from lag 1 to lag 2.

Consequently, the VAR model with lag 2 is the most appropriate for analyzing the relationship between "AGR" and "globalization" within the specified timeframe.

The lagged AGR value at lag 1 has a statistically significant positive impact on the current AGR value. It is reasonable to expect that past AGR values positively influence current AGR levels in Albania. Economic growth in one period often sets the stage for continued growth in subsequent periods, driven by factors like investment, productivity gains, and consumption patterns.

However, the coefficient for the lagged AGR value at lag 2 is not statistically significant, suggesting no significant impact on the current AGR value. Our results suggest that there is insufficient evidence to conclude that changes in the AGR at lag 2 have a significant impact on the current AGR value. This lack of significance could be due to several reasons. For instance, the impact of AGR on itself may not be immediate; or lagged effects might take time to manifest, and the significance of these effects may vary over different periods.

Lagged globalization values at lag 1 and 2 have no statistical significance on the AGR current values. There are several reasons why this might be the case because globalization is a multifaceted phenomenon influenced by a wide range of factors, including trade policies, technological advancements, cultural exchange, and geopolitical dynamics.

The impact of lagged globalization values may be diluted or overshadowed by other more immediate or significant factors influencing current globalization levels. Furthermore, globalization trends and dynamics can change over time due to various economic, political, and social factors.

It is possible that historical patterns of globalization may not accurately predict current or future trends due to structural changes in the global economy or shifts in policy and regulations.

Table 3. Unrestricted Vector Autoregression AGR and globalization estimates

	Coef.	Std. Err.	z	P > z	[95%Conf.	Interval
AGR						
L1.	0.498	0.167	2.980	0.003	0.170	0.826
L2.	-0.283	0.214	-1.320	0.186	-0.703	0.136
globalization						
L1.	10.108	17.950	0.560	0.573	-25.073	45.290
L2.	-4.637	14.082	-0.330	0.742	-32.236	22.963
_cons	-3.447	22.242	-0.150	0.877	-47.041	40.147
globalization						
AGR						
L1.	-0.008	0.001	-5.500	0.000	-0.011	-0.005
L2.	0.005	0.002	2.530	0.011	0.001	0.008
globalization						
L1.	0.420	0.154	2.730	0.006	0.118	0.721
L2.	-0.190	0.121	-1.580	0.115	-0.427	0.046
_cons	0.805	0.191	4.220	0.000	0.432	1.179

Source: Own calculations and processing

The statistically significant negative impact of lagged AGR at lag 1 on current globalization suggests that changes in AGR in the previous period indeed influence current levels of globalization negatively. This means that when the AGR increases in the previous period, it tends to lead to a decrease in globalization in the current period. The positive impact of lagged AGR at lag 2 on current globalization may indicate delayed effects or the cumulative impact of economic growth on globalization over time.

Lagged globalization at lag 1 has a statistically significant positive impact on current globalization, suggesting that changes in globalization in the previous period lead to an increase in current globalization levels. The positive impact of lagged globalization at lag 1 on current globalization aligns with expectations, as increased globalization in one period often fosters further integration into global markets and economic networks.

The third step of our analysis is the VAR stability test. Results, presented in Table 4 below show that our VAR model is stable and suitable for making reliable forecasts and analyzing the relationship between AGR and globalization.

Table 4. VAR stability condition test (Eigenvalue stability condition)

Eigenvalue		Modulus	
-0.367	-	.7837342i	0.865
0.434	-	.6505615i	0.782
0.610	-	.2137716i	0.646
-0.144	-	.2570699i	0.294

* All the eigenvalues lie inside the unit circle. VAR satisfies stability conditions.

Source: Own calculations and processing

And as step four we will perform the residuals' test. We use the Lagrange-Multiplier test to understand whether the residuals at varying lags exhibit a correlation with each other.

Based on Table 5 below, all the p-values are relatively high and exceed conventional significance levels (such as 0.05), we fail to reject the null hypothesis (H0) at each lag order. Therefore, we do not have sufficient evidence to conclude that there is autocorrelation in the residuals at these lag orders. Furthermore, to confirm our results we use also the Portmanteau test, which provides no evidence to suggest that the residuals exhibit significant autocorrelation. With a p-value higher than 0.05 our results suggest that we fail to reject the null hypothesis, so there is no autocorrelation present in the residuals, supporting the assumption of randomness and independence. They exhibit characteristics of white noise.

Table 5. LM autocorrelation test

lag	chi2	Df	Prob>Chi2
1	2.676	4	0.613
2	3.111	4	0.539
3	4.663	4	0.324
4	1.938	4	0.747
5	1.507	4	0.825

* H0: no autocorrelation at lag order

Source: Own calculations and processing

As a fourth step, we perform the residuals test. We check if the residuals of our model exhibit heteroskedasticity. We perform the Breusch-Pagan test and find that there is no significant evidence of heteroskedasticity in the residuals of the model based on the test.

Table 6 shows that with a p-value of 0.5666, which is greater than the commonly used significance level of 0.05, we do not have sufficient evidence to reject the null hypothesis. Therefore, based on this test, we fail to reject the assumption of homoskedasticity.

Table 6. Breusch-Pagan test for heteroskedasticity

Test	BP	DF	p-value
BP Breusch-Pagan	1.136354	2	0.5665574

Source: Own calculations and processing

Performing a series of impulse functions allows us to trace the effects of shocks to one of the innovations on both current and future values of our endogenous variables, AGR (economic

growth) and globalization. Impulse response functions provide insights into how the system reacts to shocks over time. By analyzing these responses, we can understand the dynamic impact of specific shocks on the variables of interest.

For instance, if we apply a shock to economic growth (AGR), we can observe how AGR itself and globalization respond in the short term, medium term, and long term. This analysis helps in understanding the transmission and persistence of shocks, contributing to a more comprehensive understanding of the system's behavior.

Based on the IRF and FEVD results, we can make the following observations regarding the effects of shocks in AGR and globalization. Short-Term (Immediate Response): Shocks in AGR have an immediate and strong impact on AGR itself, with most of the variance explained by its own shocks. Globalization shows a relatively smaller immediate response to shocks in AGR, indicating a lagged effect or weaker connection in the short term. Medium-Term (Several Time Steps Ahead): AGR continues to exhibit a significant response to its own shocks in the medium term, although the magnitude of the response diminishes over time. Globalization's response to shocks in AGR remains significant but decreases gradually over the medium term, suggesting a slower adjustment to changes in AGR. Long-Term (Extended Time Horizons): The long-term response of AGR to its own shocks remains persistent but gradually diminishes, indicating a potential stabilization or saturation of the effect. Globalization's response to shocks in AGR converges to a stable level in the long term, suggesting a more gradual and sustained adjustment over extended periods. The results confirm the second hypothesis.

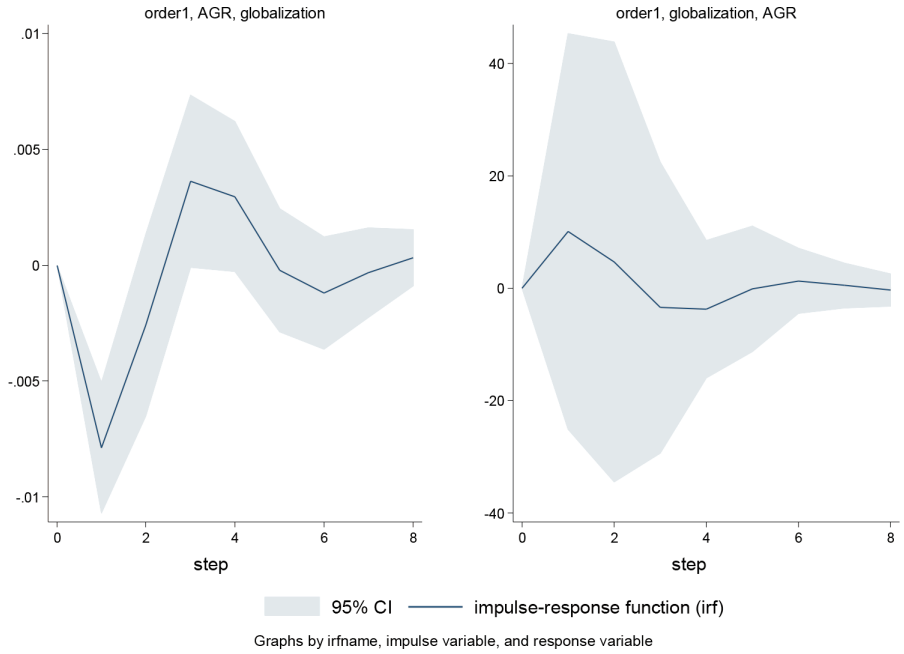

Figure 1. Accumulated Response of AGR to globalization and vice-versa

Source: Own calculations and processing

4. CONCLUSION

Based on the results of the VAR model analysis conducted on the relationship between economic growth and globalization in Albania from 1980 to 2022, several key findings emerge. The analysis indicates the presence of a causal relationship between economic growth and

globalization in Albania. Specifically, changes in globalization levels have a significant impact on economic growth in the country. The findings provide valuable insights for policymakers in Albania regarding the importance of fostering globalization to stimulate economic growth. Policies aimed at promoting trade liberalization, attracting foreign investment, and improving overall economic indicators may contribute to sustained economic growth and integration into the global economy.

Based on the results, our second hypothesis is confirmed. Globalization means that trade barriers will be reduced, increasing trade opportunities for Albania. Businesses can expand globally and export easily. Additionally, globalization attracts foreign investments, which, in turn, lead to investments in industry, infrastructure, and technology, creating more job opportunities and contributing to economic development for the country. Moreover, globalization allows firms to collaborate with other international firms, promoting efficiency, competitiveness, productivity, and innovation.

The study contributes to the existing literature on the relationship between economic growth and globalization, particularly in the context of Albania. It adds empirical evidence and insights that can inform future research and policy decisions in the country.

The study's limitations are partly attributable to significant events in Albania during 1991 and 1997. These events, which encompassed the shift from a planned to a market economy and a civil war marked by violent riots, may have introduced substantial noise and outliers into the dataset.

Future research directions could focus on examining how different sectors of the economy respond to globalization and contribute to economic growth. Moreover, future research can focus on investigating the environmental effects stemming from globalization and its relationship with economic growth.

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The Appreciation of the National Currency in Albania: Does Informality Matter?

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Abstract: *This study aims to identify the factors that contributed to the appreciation of the Albanian LEK against the EURO, given the increasing euroization of the Albanian economy. The study uses ARDL analysis and quarterly data from 2008Q1–2023Q3 to examine the primary influences on currency exchange rate variations, as per economic theory.*

The study's findings indicate that conventional economic variables have little impact on exchange rate variations. However, the study found that remittances and GDP do have a significant impact on the EUR/LEK exchange rate.

This study also leaves room to highlight the role of informality in explaining this phenomenon. Therefore, policymakers may need to intervene in this situation, through formal channel transactions (using financial institutions), which must be carried out in the LEK currency, and secondly, through a monetary intervention aimed at creating a more balanced EURO/LEK exchange rate.

1. INTRODUCTION

Over the past decade, the Albanian economy has experienced a steady and rapid appreciation of its local currency, the LEK, in comparison to the official currencies of the European Union and the British Pound. According to the Bank of Albania, between 2011 and 2023, the value of the Lek appreciated by 22% relative to the British Pound and by 23% relative to the currency of the European Union (Bank of Albania, 2023). The exchange rates between the US dollar and Swiss franc have remained relatively stable over the same period, with only minor annual fluctuations.

Since the Albanian economy is mostly integrated with European Union countries (70 per cent of Albania's foreign debt is in euro currency), this trend of the European currency exchange has brought important consequences for many actors operating in the Albanian market or that are affected by developments in the Albanian economy, such as the government, exporters and importers, incoming and outgoing tourists, individuals and families who are influenced by emigration income (remittances). Many analysts and researchers speak of a Euroization of the Albanian economy (Della Valle et al., 2018; Narazani, 2013; Xhepa, 2002). The Euro circulation in Albania seems to have created the appropriate ground for the national currency not to play its role as an official payment instrument in the country being effectively replaced by the euro currency.

All Western Balkan countries, except Albania, have either pegged their currency to the Euro or adopted it as their official currency (Lane, 2022). Serbia and North Macedonia have exchange rates that remain stable over time, with North Macedonia officially pegging the Macedonian Denar to the Euro (Jakimova et al., 2022).

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Albania is the only country in the Western Balkans with a flexible exchange regime for its official currency. The Central Bank only intervenes through the monetary offer within the country. Albania has been discussing a possible link with the euro currency for years to maintain exchange rate stability (Xhepa, 2002). However, the Bank of Albania has stated that the conditions for such a significant move for the Albanian economy have not yet matured, on the contrary, according to the Bank of Albania, it is time to think about the de-euroization of the economy (Bank of Albania, 2023a).

In the current conditions in the country, the Lek appreciation has both winners and losers. The Albanian government is a major beneficiary of this situation as it aims to reduce foreign debt service. In Albania, 70% of foreign debt is denominated in Euros. In the first quarter of 2023, the cost of external debt decreased by 6 million euros, while in 2022, it decreased by 16 million euros. However, the overvaluation of the Lek in 2022 has resulted in significant losses for Albanian exporters, particularly producers with foreign orders, who have lost 225 million euros. Additionally, Albanian families relying on remittances from emigrants would require an extra 97 million euros to maintain the same purchasing power as last year due to the devaluation of the euro in 2023 compared to 2022: this equates to approximately 506 euros per family (Deda, 2023; Revista Monitor, 2023). The figures demonstrate the extent of the phenomenon and the consequences of the high appreciation of the local currency on the Albanian economy. This research will examine the factors that determine the Lek appreciation, drawing on economic theory and various empirical studies. The reasons given by the Central Bank of Albania for the overvaluation of the local currency will be examined based on this information.

The research is divided into five sections. Section 2 presents the theoretical and empirical contributions regarding the determining factors of exchange rate fluctuations. The third section discusses the methodology and variables used, while the fourth section presents the results of the empirical research and the findings discussion. The final section presents the research conclusions.

2. LITERATURE REVIEW

Countries that fully adopt a flexible exchange rate system adjust to the open currency market based on the demand and relative supply of other currencies. Unlike countries that use a fixed exchange rate regime, markets with a flexible exchange rate are subject to fluctuations resulting from market movements, including speculative ones. The exchange rate is influenced by several factors and different theories explain exchange rate fluctuations: Interest Rate parity theory, Purchasing Power Parity theory, Demand Pull Theory, and Balance of Payment theory of exchange (Khan et al., 2019; Peel & Taylor, 2002).

According to the **interest rate parity** hypothesis, changes in the future exchange rate and the difference in short-term interest rates control the evolution of the exchange rate between two currencies. This connection is based on the idealization of markets and the flawless interchangeability of financial assets among nations. The hypothesis assumes the absence of arbitrage opportunities, meaning that investors do not differentiate between local and international assets. According to this hypothesis, a currency's appreciation or depreciation is determined by the difference in interest rates between the two countries. According to the **Demand-Pull theory**, an increase in demand for goods and services leads to an increase in their prices in the domestic market. This, in turn, causes the local currency to devalue compared to other currencies in the

international market in the long term. Similarly, the **Purchasing Power Parity theory** emphasizes that the exchange rate between two countries is in equilibrium when the purchasing power is the same in both countries. Consequently, fluctuations in purchasing power between two countries will lead to corresponding changes in the exchange rate. According to **the balance of payment theory of exchange**, a nation's exchange rate volatility depends on the supply and demand of money. If there is a negative balance of payments, the currency will devalue, and vice versa. The theory of exchange known as the Balance of Payments (BoP) emphasizes that the exchange rate is determined by the supply and demand of foreign currency, rather than solely by price fluctuations in local or international markets. This is in contrast to the Demand-Pull theory and the Purchasing Power Theory.

The International Monetary Fund notes that while there are various theories explaining exchange rate fluctuations, there is no full consensus on the macroeconomic factors that determine these fluctuations, at least in the short term. The International Fund cites various studies to explain that short-term fluctuations in exchange rates are due to market microstructure factors. However, in the long term, although not with a full consensus (referring to empirical studies), macroeconomic factors affect exchange rate fluctuations (IMF, 2003).

It is widely accepted that constant fluctuations in exchange rates create an unstable economic climate, which can negatively impact foreign trade, foreign investments, and overall economic development. Such fluctuations can also invalidate a country's monetary policies if they persist over a long period. Albania is a case in point: the general trend of the exchange rate reflects a continuous and high appreciation of the local currency (Figure 1).

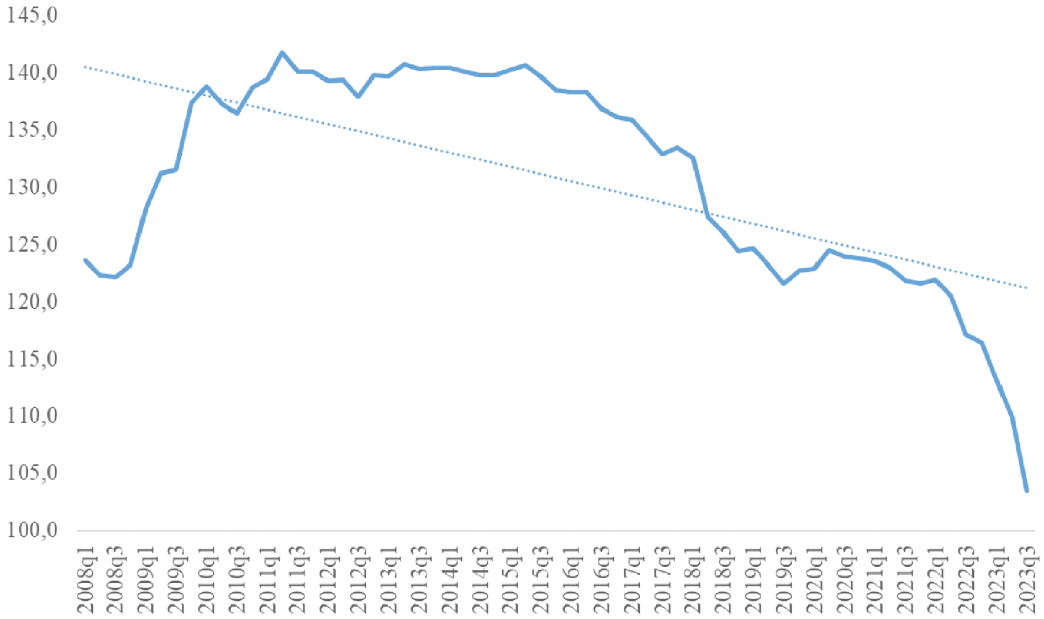

Figure 1. Exchange rate volatility Euro / Lek in Albania 2008q1 – 2023q3

Source: Bank of Albania, 2023

Various empirical studies have shown that trade openness has a positive effect on the long-term equilibrium of exchange rates, particularly in countries with continuous and unchanging market liberalization. In countries where openness to international trade fluctuates, exchange rate fluctuations tend to increase as the degree of openness to international trade increases (Gantman & Dabós, 2018; Nguyen et al., 2022; Yang & Peng, 2023).

Empirical studies consider the Samuelson-Balassa hypothesis when examining the impact of Gross Domestic Product on exchange rate fluctuations. This hypothesis explains that countries with a sustained increase in production experience a long-term appreciation of their local currency. However, there is no complete consensus on this hypothesis among studies conducted in different countries. Bordo et al. (2017) compared data from 14 countries over 100 years and found that the impact of productivity on exchange rate fluctuations varies depending on the country's monetary regime. It is important to note that different monetary regimes yield different results. Choudhri and Khan (2005) found that the Samuelson-Balassa hypothesis holds in 16 developing countries. This means that higher productivity in a country leads to a positive impact on the appreciation of the local currency. Wang et al. (2016) used the panel cointegration technique to analyse 20 developed countries and 20 developing countries. They concluded that the Samuelson-Balassa hypothesis holds in developed countries, but there is little or no evidence to support it in developing countries.

According to Lopez et al. (2007), remittances have a significant impact on exchange rate fluctuations in Latin American countries. The high level of remittances, which make up a large portion of the GDP, can cause the local currency to appreciate and affect the export level for countries with high remittance rates. Oleksiv and Mirzoieva (2022) used the Granger test and ARDL model to argue that remittances to Ukraine affect the appreciation of the local currency in both the short and long term. Khurshid et al. (2017) used the GMM approach on monthly and annual data from 1992 to 2015 in Pakistan to show that remittances affect the devaluation of the local currency and have a positive impact on the evolution of exports. According to the conclusions of this study, remittances have an appreciation effect on the local currency, only when they are used for savings. The study conducted by Nketiah et al. (2019) using data from the World Bank and the Bank of Ghana for the period 1970-2016 and applying OLS estimators concluded that remittances do not have a significant impact on the fluctuations of the exchange rate of the local currency.

The literature primarily focuses on the impact of exchange rate fluctuations on the evolution of foreign direct investment (FDI). According to Biswas and Dasgupta (2012), remittances and FDI have an appreciating effect on the local currency. They used the Johansen multivariate co-integration test to process the data for India from 1994-95Q1 to 2009-10Q4. Iavorschi's (2014) study found that an increase in FDI levels has a positive effect on the Lei/Euro exchange rate over the medium and long term. The study used multiple linear regression to analyze the Romanian market from 2007 to 2023. In an analogous way as with FDI, the improvement of the current account in the balance of payments exerts an appreciating impact on the local currency.

There is no complete consensus on the impact of government spending on exchange rate fluctuations. The neoclassical and Keynesian schools have differing views on this matter. Gidey and Nuru (2022) studied the impact of government spending in Ethiopia during the period 2001q1 - 2016q1. They concluded that government spending causes an appreciation of the local currency in an open country like Ethiopia, confirming the arguments of Keynesian economists. Miyamoto et al. (2019) investigated the impact of military government spending in 125 different countries and found that the results differ between developed and developing countries. In developed countries, a devaluation of the local currency and a decrease in consumption were observed, whereas in developing countries, the impact was different. Bajo-Rubio and Berke (2016) also found that government spending affects exchange rate fluctuations. The valuation of the Euro currency in Spain depends on whether the exchange rate is based on the CPI or export prices. In the former case, a direct relationship between government spending and the exchange rate is verified, while in the latter case, an adverse relationship is observed.

There is a limited number of studies on the factors that affect the currency rate of Albania. In their study, Ahmetaj and Bejtja (2019) analyzed the fluctuations in the Euro/Lek exchange rate between 2001Q1 and 2017Q1. They concluded that exchange rate fluctuations are influenced by net foreign assets and relative productivity. The report also highlights the stability of Albania's monetary policies concerning the volatility of currency rates in the domestic market. Kozmai (2023) investigated the effects of macroeconomic variables on exchange rate variations in Albania using quarterly data from 2008q1 to 2022q2 and the OLS regression statistical model. The study revealed that the macroeconomic factors examined had a considerable influence on fluctuations in exchange rates. However, the interventions made by the Bank of Albania to stabilize the situation did not have a significant impact. According to Balkanweb (2018) and the Bank of Albania (2023a), the appreciation of the local currency is attributed to positive economic performance, commercial developments, foreign investments, and progress of remittances resulting from structural improvements in the Albanian economy.

3. DATA AND METHODOLOGY

Table 1 shows the statistical information used by the ARDL model to simulate the volatility of the Albanian exchange rate between 2008Q1 and 2023Q3. The statistics were provided by the Bank of Albania, INSTAT, and Trading Economics.

Table 1. Variables statistical description

Variable	Obs	Mean	Std. Dev	Min.	Max.
ER – *Exchange rate (Euro/Lek)*	63	130,85	9,80	103,5	141,7
INF – *Inflation rate*	63	2,60	1,67	0,7	7,9
REM – *Remittances (% GDP)*	63	6,15	1,77	3,81	10,91
IR – *Interest Rate*	63	2,98	1,90	0,80	6,20
FDI - *Foreign Dir. Inv. (% GDP)*	63	8,33	2,12	5,59	14,45
GE – *Gov. Expenditure (% GDP)*	63	10,17	1,14	6,89	12,34
TD – *Trade Deficit (% GDP)*	63	22,96	4,2	16,54	34,32
GDP – *Gross Dom. Prod. (mill. Euro)*	63	2957	918	1925	5684

Source: Own processing

To comply with the application criteria of the ARDL approach, the above data are presented in logarithmic form in the representative equation of the ARDL model. Based on 63 observations for this study, the euro reached its highest value against the lek in the second quarter of 2011 (141.7 lek) and its lowest value, with an average of 130.85 lek, in the third quarter of 2023 (103.5 lek).

The present study is conducted by applying the Autoregressive Distributed Lag model (ARDL) analysis. Following the theoretical and empirical framework the ARDL model is derived as follows:

$$\ln ER_t = \beta_0 + \beta_1 \ln INF_t + \beta_2 REM_t + \beta_3 IR_t + \beta_4 FDI_t + \beta_5 GE_t + \beta_6 TD_t + \beta_7 GDP_t + \varepsilon_t \quad (1)$$

where ε_t is the error term, and the other variables are represented in logarithmic value.

Following the ARDL assumptions, stationarity was first checked at level I(0) and first order I(1). To rule out the possibility of stationarity at second order I(2), which would not allow the use of the ARDL approach, Table 2 shows that the results of the three tests - Phillips Perron, Dickey Fuller, and Kwiatowski-Phillips-Schmidt-Shin - confirm that the stationarity assumption is appropriate for using the ARDL model.

Table 2. Stationarity tests

Variable	Level			First Difference		
	ADF	PP	KPSS	ADF	PP	KPSS
lnER	-55,08***	-30,57***	0,18***	-249,71***	-183,45***	0,14***
lnINF	-2,55	-2,63**	0,25	-7,85***	-7,87***	0,03***
lnREM	-3,65***	-3,34***	0,24	-14,19	-22,15	0,06***
lnIR	-1,29	-1,35	0,21	-4,33***	-4,35***	0,22***
lnFDI	-6,94***	-6,95***	0,04	-13,34***	-17,88***	0,04***
lnGE	-4,77***	-4,38***	0,22***	-15,22***	-21,80***	0,06***
lnTD	-4,52***	-4,26***	0,22	-9,18***	-13,91***	0,07***
lnGDP	-0,81	0,68	0,33	-16,63***	-20,89***	0,14***
*p value < 10%; ** p value <5%; *** p-value <1%						

Source: Own processing

Another assumption that must be met is the co-integrity of variables. The bounder test is used to determine the F-statistic value to evaluate this condition. The test findings indicate that the null hypothesis, which suggests no long-term link between the variables, can be rejected in supporting the presence of cointegration when the F-statistic value exceeds the upper bound critical value for the 10%, 5%, and 1% significance levels (refer to Table 3).

Table 3. F – statistic values for co-integration test

	Critical Value Bounds for K = 7					
	significance 1%		significance 5%		significance 10%	
F-statistics = 6,521	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
	2,96	4,26	2,32	3,50	2,03	3,13

Source: Own processing

The two remaining assumptions concern the absence of autocorrelation between variables and the uniformity of the error term (absence of heteroscedasticity). The Breusch Godfrey LM test and the Durbin-Watson test can be used to verify the absence of serial correlation, while the Cameron-Trivedi decomposition test can be used to determine the absence of heteroscedasticity. Table 4 shows that there is no autocorrelation between the variables and that the error term's variance in the regression model is constant.

Table 4. Autocorrelation test and Homoscedasticity test

Tests	Value	p-value
Breusch Godfrey	0,222	0,6375
Durbin – Watson	2,00	---------
White	61	0,4397
Skewness	5,06	0,9850
Kurtosis	1,41	0,2358

Source: Own processing

4. RESULTS AND DISCUSSIONS

After confirming the stationarity and cointegration, we can look for the existence of a long-term relationship through the ARDL model with optimal lags defined through the AIC criterion (1,0,1,1,2,0,0,2). Table 5 presents the empirical results of this research (Table 5).

The regression analysis shows that only remittances and GDP have a significant impact on the fluctuation of the EURO/LEK exchange rate. An increase in remittances and GDP causes a

small increase in the appreciation of the Lek currency. Other variables, such as inflation, interest rate, government spending, foreign investments, and international trade, do not have a significant effect on the exchange rate level.

Table 5. ARDL Long run approach

Variable	Coefficient	Std. Error	t - statistic	Prob.
lnINF	0,0340	0,026	1,30	0,200
lnREM	-0,196	0,110	-1,77	0,083
lnIR	-0,0520	0,036	-1,44	0,157
lnFDI	-0,024	0,063	-0,38	0,703
lnGE	-0,098	0,293	-0,34	0,739
lnTD	0,163	0,122	1,33	0,189
lnGDP	-0,687	0,167	-4,12	0,000
Constant	1,643	0,444	3,70	0,001
R-squared	0,9842			
Adjusted R-squared	0,9794			
F – statistics	204,57			
Prob (F – statistic)	0,0000			

Source: Own processing

The study's results, which refer to other empirical studies, are unsurprising. As discussed in the literature section, macroeconomic factors do not have a clear and unidirectional influence on the fluctuation of the EURO/LEK exchange rate. However, it is questionable whether the public statements of the Bank of Albania, which constantly assert that foreign trade, foreign investments, and the level of remittances have had a significant and large impact on the appreciation of the lek, can be fully supported by the fact that the majority of macroeconomic and structural factors do not explain the fluctuation of the exchange rate. The findings of this research align with previous studies, which indicate that the euroization of the Albanian economy is not solely due to the structural or macroeconomic factors of the Albanian economy (Kozmai, 2023; Gjokutaj & Gjokutaj, 2023; Fortuzi, 2015).

The study suggests that in the context of a heavily euroized Albanian economy, the effectiveness of monetary policy is limited, a view accepted and shared by the Bank of Albania. This situation has a significant impact on the Central Bank's objectives and outcomes. According to economists, the euroization of Albania is influenced by non-structural and non-macroeconomic factors. This study supports statistically this opinion accentuating the fact that the Albanian economy is heavily reliant on the euro, and there are unclear legal and/or illegal monetary flows that contribute to this growth.

5. CONCLUSION

Albania is the only Western Balkan country with a fully flexible exchange rate. This monetary policy has advantages for a small economy, as demonstrated by economic theory. However, the effectiveness of this policy appears to have diminished significantly. In large part, the LEK has been replaced by the EURO in the Albanian market, which weakens the role of the Central Bank in maintaining a flexible exchange rate regime.

This article analyses the exchange rate fluctuations during the period 2008q1 – 2023q3 and the macroeconomic factors that may affect these fluctuations using the ARDL approach This study concludes that, apart from remittances and GDP, macroeconomic factors, in general, do not

have a significant impact on the strong fluctuation of the exchange rate, and therefore the euroization of the Albanian economy cannot be solely or mainly attributed to economic growth or structural strengthening of the Albanian economy, as stated by Central Bank of Albania.

This study shows that due to economic dynamics, the strong trade relations with European Union countries, and the impossibility of controlling informality, it seems necessary to review the flexible exchange rate regime. If Albania is not prepared to adopt the euro currency, it should consider the monetary pegging of the national currency to the euro. All countries in the Western Balkans, which share similar economic characteristics with Albania, are either formally or informally pegged to the euro currency or have adopted it as their official currency. Such as monetary pegging would create a stable economic environment, which is necessary for all economic actors to operate effectively.

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Does the Customs Clearance Process Affect Economic Growth? A Panel VAR Data Analysis*

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Abstract: *The scope of this paper is to investigate whether the Customs clearance process can affect the economic growth in Greece. With the term growth, we mean the GDP per capita and a more general concept as it is expressed in the Human Development Index which is addressed by the term development. The considered variables are the "Logistics Performance Index: Efficiency of the customs clearance process (1=low to 5=high)", the "Human Development Index", the "GDP per capita growth rate" and other development and governance indicators from the World Bank. The results stem from the econometric design of the panel VAR approach where the "Logistics performance index: Efficiency of customs clearance process (1=low to 5=high)" is the considered dependent variable and the other variables are the independent variables while the period is from 2000 to 2021 in our study.*

1. INTRODUCTION

The traditional role of customs is collecting public revenue and simultaneously protecting public health, the environment, cultural artifacts, etc. On the other hand, in today's world of free trade, it should also facilitate efficient cross-border movement of people and goods. A balance between the two needs to be struck. Vigilance by customs and regulatory authorities in many nations has been motivated by the increasing risk to persons and the private and public sectors represented by global commodities shipments (Hoffman et al., 2018). A key component of logistics and trade facilitation is customs. As a result, research on trade facilitation and logistics contains the majority of studies on the effects of the customs environment. The function of customs has undergone substantial modification in the last fifty years in order to accommodate the growth of global trade. Goods were transported in bulk via boxes or nets in a ship's hold before containerization. The process of unloading the cargo piece by piece took many days, allowing the customs officials ample time to process the products and collect the duties. In addition to facilitating international trade, transportation and logistics services are crucial to the expansion and improvement of the regional economy. A deficient logistics infrastructure and operational procedures can be a major barrier to global trade integration, therefore the caliber and effectiveness of logistics services can be important for international trade (Devlin & Yee, 2005). Since each import and export are handled separately during the transaction-by-transaction process of customs clearance, volume has a direct impact on these processes. Customs administrations in the 27 European Member States examined 11.7 million tons of air cargo and 1.545 million tons of sea freight in 2007. 183 million customs declarations were processed, or 5.5 declarations every second (Truel & Maganaris, 2015). Conversely, increased trade volume and economies of scale and scope in distribution and production

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activities can be achieved through better trade-related logistics and a liberalized economic environment. Investors require a friendly business environment to be willing to undertake risks (Siriopoulos et al., 2021). The decrease in asymmetric information would prompt certain companies to adopt greater transparency policies (Daskalopoulos et al., 2016).

2. LITERATURE REVIEW

Sectoral linkages within the local economy are made possible through logistics services. Additionally, it establishes a link between the national and global economies. One of the goals of producers is to safely and economically deliver their goods to consumers with the least amount of delay possible. In order to satisfy the demand for goods and services for both domestic consumption and international markets, a nation that adopts an open economy must engage in international trade. When a nation can produce more goods and services than it needs domestically, it will engage in exporting these goods and services to customers overseas. GDP is a crucial tool for helping investors and policymakers make strategic decisions. The literature on international trade flows emphasizes time and time again the influence of GDP, PPP, and logistics performance on the volume of international trade. It has been stated that logistics is essential to trade facilitation, which in turn promotes a country's economic growth. GDP growth can be bolstered by increased export activity and the productivity of goods and services. Logistics management, an international trade chain that includes organizing, carrying out, and managing the flow of goods and services effectively and efficiently, including transportation, storage, distribution, regulatory matters, and information exchange between producers and consumers, is a major determinant of exportation activities (Utami & Sitorus, 2015). A measure of the effectiveness of logistics management, which aids in the inflow of goods and services, is logistics performance. A nation's logistics performance is measured by an indicator value known as the Logistics Performance Index (LPI), which takes into account many factors, including the effectiveness of the customs agencies' operations (hereafter referred to as Customs Efficiency). The World Development Indicator's LPI values are presented as index scores ranging from 1 to 5, with a higher LPI value indicating a better level of logistics performance in the nation. Some researchers have previously acknowledged the importance of logistics performance to the economy. For example, Demilie and Meron (2016) found that enhancing logistics performance can have a significant impact on economic development based on their analysis of panel data from countries in sub-Saharan Africa. Low-GDP countries typically have ineffective logistics systems. This indicates that sustainable economic growth can be determined by implementing efficient logistics systems by raising the value of LPI dimensions, such as the effectiveness of customs clearance. (Sharipbekova & Raimbekov, 2018). The effectiveness and efficiency of the logistic system boosts the macroeconomic competitiveness of the country and the microeconomic competitiveness of businesses (Sezer & Abasiz, 2017). Nevertheless, if we look at how the GDP and logistics performance dimensions of customs efficiency compare year over year, we can see that an increase in customs efficiency does not always translate into an increase in GDP. Anderson and Van Wincoop (2004) investigated how and to what degree the customs efficiency index (CEI) mediates the relationship between trade costs (TC) and GDP. Trade costs are influenced by a variety of factors and can have a significant impact on a nation's trade and economic growth. A significant portion is made up of trade barriers related to borders, transportation, and wholesale and retail distribution. Streamlining and facilitating customs procedures boost productivity and create an atmosphere that is more favorable for commerce and economic growth (Saslavsky & Shepherd, 2014). Bensassi et al. (2015) emphasized the significance of logistics measures at the regional level and the positive impact that the quantity, size, and quality of logistics facilities have on export flows. A few studies have looked

at the impact of logistics performance on imports and exports across national borders using an income-level approach, demonstrating that there are differences in overall LPIs between high-income and low- and middle-income economies and that these differences have gotten a little worse between low- and high-income economies since 2007 (Gani, 2017). Service time is a useful metric for measuring the effectiveness of the Customs and Excise clearance process, which assesses the ease and speed of customs service procedures for both import and export. In the case of the CIS, logistics effectiveness influences a nation's future international development in addition to its economic growth (Sharipbekova & Raimbekov, 2018). Exports are significantly harmed by delays in the customs clearance process, according to Martincus et al. (2013). Specifically, longer customs delays result in slower export growth rates, which can naturally have a negative impact on GDP. Apostolakis and Papadopoulos (2019) employed a panel VAR model in order to investigate the relationship between financial stress, inflation and growth in nineteen advanced countries over the period 1999-2016. Moreover, Mihci and Akkoyunlu-Wigley (2009) aimed to analyze the effects of the Customs Union on technology-led growth in Turkey. Furthermore, Pedroni (2013) proposed a structural approach to VAR analysis in panels and illustrated that the SVAR panel method could be used to improve inference, not only for properties of the sample distribution but also for dynamics of individual members of the panel that lack adequate data for a conventional time series SVAR analysis. Boiwo et al. (2015) found that the EAC Customs Union has had a positive effect on trade and economic growth in Kenya through a linear model approach. Many other papers are related to customs themes. This work is according to our knowledge the first that attempts to study the impact of the quality of the customs clearance process on economic growth and to the economic development under a panel VAR framework.

The structure of this paper is the following: in section 2, the approach of panel VAR is described, in section 3 our model is developed and in section 4, the conclusions are drawn.

3. THE PANEL VAR APPROACH

These models are widely used in the field of applied macroeconomics. The rationale behind the use of these models is the capture of the dynamic interdependencies that are present in the data using only a few restrictions. Shock identification can then be studied using impulse response analyses. In VAR models, all variables are treated as endogenous and interdependent. In the panel version, the structure is the same but a cross-sectional dimension is added to the representation. Following Sigmund and Ferstl (2021), we consider an extended panel VAR model that allows for p lags of m endogenous variables, k predetermined variables and n strictly exogenous variables. The representation of this model is the following:

$$y_{it} = \mu_i + \sum_{i=1}^{p} \boldsymbol{A}_i y_{i,t-l} + \boldsymbol{B} x_{i,t} + \boldsymbol{C} s_{i,t} + \varepsilon_{it} \quad (1)$$

Let $y_{i,t} \in R^m$ be an $m \times 1$ vector of endogenous variables for the ith cross-sectional unit at time t. Let $y_{i,t-l} \in R^m$ be an $m \times 1$ vector of lagged endogenous variables. Let $x_{i,t} \in R^k$ be an $k \times 1$ vector of predetermined variables that are potentially correlated with past errors. Let $s_{i,t} \in R^n$ be an $n \times 1$ vector of strictly exogenous variables that neither depend on ε_t nor on ε_{t-s} for $s_{=1,\ldots,T}$. Moreover, the disturbances ε_{it} are independently and identically distributed (i.i.d.) for all i and t with $E[\varepsilon_{it}]=0$ and $Var[\varepsilon_{it}] = \Sigma_\varepsilon$. Σ_ε is a positive semidefinite matrix. We assume that all unit roots of $\boldsymbol{A}$ all inside the unit circle to assure covariance stationarity. Moreover, the cross-section i and the time section t are defined as follows $i_{=1,\ldots,N}$ and $t_{=1,\ldots,T}$. In this specification, we assume parameter homogeneity for A_l $(m \times m)$, B $(m \times k)$ and C $(m \times n)$ for all i.

3.1. The Data

The data are variables from the World Bank. The main variable we attempt to study is the ***"Logistics performance index: Efficiency of customs clearance process (1=low to 5=high)"***. This variable is based on a World Bank survey and the scores are the averages among all the respondents. Details of the survey methodology and index construction methodology can be found in the Logistics Performance Index (LPI) Report (World Bank, n.d.). This work attempts to study whether the aforementioned variable can affect the growth or the development of the whole economy.

The variables we consider that reflect this condition are the following:

Firstly, the ***"Human Development Index" (HDI)*** which is published by the United Nations Development Programme (UNDP) and the data was found in the "Our World in Data" (OWID), a non-profit organization which is a scientific online publication with the mission to publish the "research and data to make progress against the world's largest problems". The data can be found in the Human Development Index (HDI) (Herre & Arriagada, 2023).

Secondly, the ***"GDP per capita growth rate"*** is a World Bank development indicator and displays the annual percentage growth rate of GDP per capita based on constant local currency. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for the depletion and degradation of natural resources.

An exogenous variable that may affect the relationship between the Customs efficiency variable and the economic development and growth variables are considered to be the ***"Trade (as % of GDP)"*** which is also a development indicator from the World Bank and the World Bank governance indicators which are: the ***"Control of Corruption: Estimate"*** which captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

Furthermore, the ***"Government Effectiveness: Estimate"*** captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

Additionally, the ***"Political Stability and Absence of Violence/Terrorism: Estimate"*** measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. Estimate gives the country's score on the aggregate indicator, in units of standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

Moreover, the ***"Rule of Law: Estimate"*** captures perceptions of the extent to which agents have confidence in and abide by the rules of society and in particular the quality of contract

enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate gives the country's score on the aggregate indicator, in units of standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

Finally, the ***"Regulatory Quality: Estimate"*** captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Estimate gives the country's score on the aggregate indicator, in units of standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

3.2. Selection of the Panel

The panel Data are selected through the consideration of 2 criteria. The first criterion is the consideration of the Country Similarity Index for Greece, so in the panel are included the 10 most similar countries with Greece, and the second criterion contains the countries which are top importers and/or exporters of the country of Greece.

Country Similarity Index (Objective Lists, 2020)**:** This index attempts to quantify how similar countries are to each other relative to other countries. The index is a statistically-based way to measure this. The index weights equally five major aspects of countries: their demographics, culture, politics, technology, and geography.

Finally, the panel includes Greece, China, Russia, Iraq, Germany, Italy, Turkey, Cyprus, Portugal, Spain, Croatia, Montenegro, Bulgaria, Slovenia, Romania, and North Macedonia. The Dependent variable is the "Logistics performance index: Efficiency of the customs clearance process (1=low to 5=high)" and the independent variables are the "Human Development Index" (HDI) and the GDP per capita growth rate. Moreover, as variables that affect the Logistics performance of the clearance process, are considered the "Control of Corruption: Estimate", the "Government Effectiveness: Estimate", the "Political Stability and Absence of Violence/Terrorism: Estimate", the "Rule of Law: Estimate", the "Regulatory Quality: Estimate" and the "Trade (as % of GDP)". These variables are incorporated into our model as exogenous variables.

4. THE DEVELOPMENT OF THE MODEL

The scope here is to specify a suitable design for the data to study the impact of the Customs to growth and/or development and vice-versa.

The considered model is the following:

$$
\begin{aligned}
&y_{i,t} = c_0 + \sum_{i=1}^{p} \boldsymbol{A}_i x_{1_{custom\ variable,t-\#\ of\ lags}} + \sum_{j1=1}^{q} \boldsymbol{A}_{j1} x_{2_{GDP,t-\#\ of\ lags}} + \\
&\sum_{j2=1}^{r} \boldsymbol{A}_{j2} x_{3_{HDI,t-\#\ of\ lags}} + k_1 Control\ of\ Corruption\text{: } Estimate + \\
&k_2 Government\ Effectiveness\text{: } Estimate + \\
&k_3 Political\ Stability\ and\ Absence\ of\ Violence.Terrorism\text{: } Estimate + \\
&k_4 Rule\ of\ Law\text{: } Estimate + k_5 Regulatory\ Quality\text{: } Estimate + \\
&k_6 Trade\ (as\ \%\ of\ GDP) + \varepsilon_{it}
\end{aligned}
\tag{2}
$$

where $y_{it}=(y_{1,t},...,y_{N,t})'$ is a vector of three variables in the model: Efficiency of Customs clearance process, Human Development Index (HDI) and annual growth of GDP per capita. The variables were extracted from the World Bank databases. The summary statistics of the input data, spanning the period from the end of 2000 to 2021 are presented in Table 1.

Table 1. Descriptive Statistics of the Panel

Efficiency of Customs clearance process								
Country	**Mean**	**Median**	**MIN**	**MAX**	**St. Dev.**	**Skewness**	**Kurtosis**	**Test for Normality (Jarque-Bera)**
Greece	2.9107	2.9570	2.3800	3.3608	0.2385	-0.8225	3.3423	2.5877 (0.274)
Germany	3.9889	3.9475	3.8700	4.1930	0.1173	0.4470	1.5671	2.6148 (0.271)
Cyprus	2.9216	2.8989	2.7700	3.1776	0.1470	0.3438	1.6477	2.1098 (0.348)
Turkey	2.9613	3.0000	2.5875	3.2327	0.1847	-0.5141	2.5537	1.1517 (0.562)
Bulgaria	2.6250	2.4950	2.4000	2.9700	0.1939	0.5813	1.6802	2.8359 (0.242)
Italy	3.3283	3.3439	3.1900	3.5409	0.1261	0.1899	1.6175	1.8844 (0.390)
China	3.1512	3.1825	2.9900	3.3715	0.1446	0.0289	1.3740	2.4267 (0.297)
Russia	2.0838	2.0600	1.9400	2.4200	0.1486	0.6902	2.3601	2.1221 (0.346)
Iraq	1.9796	2.0394	1.7500	2.0700	0.1084	-0.6824	1.9691	2.6815 (0.262)
Portugal	3.2555	3.2450	3.1700	3.3732	0.0417	0.7472	4.7805	4.9531 (0.084)
Spain	3.3996	3.4175	3.1700	3.7505	0.2084	0.1596	1.5902	1.9152 (0.384)
Croatia	2.7095	2.7300	2.3600	3.1028	0.3194	-0.0286	1.1577	3.1141 (0.211)
Montenegro	2.3348	2.1925	2.1700	2.8322	0.2137	0.8660	2.3253	3.1668 (0.205)
Slovenia	2.9414	2.8050	2.5900	3.4200	0.2374	0.6042	2.1657	1.9764 (0.372)
Romania	2.6304	2.6000	2.3600	3.0000	0.1469	0.8743	3.7436	3.3097 (0.191)
North Macedonia	2.2207	2.2608	2.0000	2.5500	0.1876	-0.0612	1.5506	1.9393 (0.379)
Human Development Index								
Country	**Mean**	**Median**	**MIN**	**MAX**	**St. Dev.**	**Skewness**	**Kurtosis**	**Test for Normality (Jarque-Bera)**
Greece	0.8626	0.8660	0.8100	0.8890	0.0223	-0.9195	2.9221	3.1055 (0.212)
Germany	0.9257	0.9285	0.8890	0.9480	0.0171	-0.5993	2.3370	1.72 (0.4232)
Cyprus	0.8560	0.8605	0.7970	0.8970	0.0293	-0.3754	2.3006	0.96523 (0.617)
Turkey	0.7592	0.7555	0.6700	0.8420	0.0625	0.0351	1.4229	2.2844 (0.319)
Bulgaria	0.7823	0.7920	0.7250	0.8100	0.0273	-0.7336	2.2361	2.5083 (0.285)
Italy	0.8766	0.8820	0.8410	0.8970	0.0151	-0.8885	2.9179	2.9007 (0.235)
China	0.6881	0.6955	0.5840	0.7680	0.0594	-0.2889	1.8094	1.6055 (0.448)
Russia	0.7960	0.8020	0.7320	0.8450	0.0346	-0.3821	1.9002	1.6442 (0.440)
Iraq	0.6416	0.6445	0.5790	0.6960	0.0388	-0.1087	1.4839	2.1504 (0.341)
Portugal	0.8312	0.8320	0.7910	0.8670	0.0251	-0.0654	1.6226	1.7549 (0.416)
Spain	0.8694	0.8700	0.8250	0.9080	0.0259	-0.1304	1.8131	1.3538 (0.508)
Croatia	0.8215	0.8235	0.7590	0.8610	0.0304	-0.5274	2.2377	1.5526 (0.460)
Montenegro	0.7995	0.8095	0.7560	0.8370	0.0293	-0.4022	1.6347	2.3018 (0.316)
Slovenia	0.8865	0.8905	0.8210	0.9210	0.0274	-0.8007	2.8739	2.3655 (0.306)
Romania	0.7893	0.8075	0.7150	0.8320	0.0384	-0.8121	2.1031	3.1556 (0.206)
North Macedonia	0.7334	0.7395	0.6750	0.7840	0.0358	-0.2480	1.6857	1.8091 (0.405)

GDP per capita growth (annual %)								
Country	**Mean**	**Median**	**MIN**	**MAX**	**St. Dev.**	**Skewness**	**Kurtosis**	**Test for Normality (Jarque-Bera)**
Greece	0.0034	0.0122	-0.1002	0.0902	0.0486	-0.5966	2.7253	1.3744 (0.503)
Germany	0.0113	0.0117	-0.0545	0.0587	0.0246	-0.7788	4.3396	3.8686 (0.144)
Cyprus	0.0136	0.0286	-0.0637	0.0609	0.0382	-0.8161	2.3702	2.8054 (0.246)
Turkey	0.0369	0.0421	-0.0714	0.1051	0.0442	-0.8805	3.6216	3.1968 (0.202)
Bulgaria	0.0419	0.0443	-0.0338	0.0852	0.0337	-0.7023	2.7482	1.8666 (0.393)
Italy	0.0011	0.0082	-0.0853	0.0758	0.0323	-0.6174	4.6997	4.0459 (0.132)
China	0.0809	0.0799	0.0200	0.1364	0.0243	-0.0039	3.9001	0.74264 (0.690)
Russia	0.0360	0.0434	-0.0783	0.1046	0.0438	-0.7516	3.3070	2.1577 (0.34)
Iraq	0.0163	0.0232	-0.3856	0.4903	0.1492	0.5597	7.8341	22.57 (<0.01)
Portugal	0.0065	0.0139	-0.0840	0.0522	0.0295	-1.3669	5.2203	11.37 (<0.01)
Spain	0.0068	0.0153	-0.1176	0.0541	0.0365	-1.8787	7.2503	29.501 (<0.01)
Croatia	0.0284	0.0399	-0.0818	0.1799	0.0520	0.3723	5.3554	5.5938 (0.061)
Montenegro	0.0265	0.0331	-0.1521	0.1343	0.0549	-1.4386	6.7755	20.655 (<0.01)
Slovenia	0.0215	0.0309	-0.0838	0.0792	0.0370	-1.2959	4.5899	8.4744 (0.014)
Romania	0.0454	0.0477	-0.0473	0.1114	0.0436	-0.5734	2.7460	1.2647 (0.531)
North Macedonia	0.0248	0.0297	-0.0592	0.0630	0.0295	-1.3429	4.5493	8.8124 (0.012)

Source: Own research

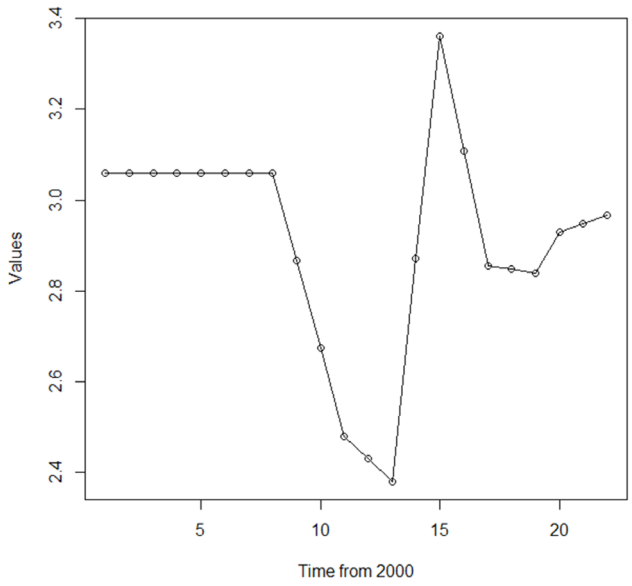

Figure 1. Evolution over time for Customs Clearance Process Efficiency in Greece

Source: Own research

For the efficiency of the Customs clearance process, Germany, Italy, China, Portugal and Spain display value over 3, while Greece is below this number. However, the evolution over time for the country has its interest. In the last 3 years, the customs clearance process displayed an upward trend but is below 3. Since 2015 the country has been above 3 in this index.

According to the annual growth of GDP per capita, we observe that China displays the greatest growth and is the only country with no year of negative economic growth in terms of annual

growth of GDP per capita. This displays a constant increase in the people's standard of living in terms of money. The countries that follow are Romania, Bulgaria and Turkey, with the latter displaying a clear difference between mean and median which shows no constant growth. Following the Human Development Index (HDI) which takes into account the dimensions of health, education and income Iraq has the lowest level which is expected. This country is followed by China which displays very low HDI and these 2 countries are the only with HDI lower than 70%. The countries that follow are Turkey, Bulgaria and North Macedonia and they display (in terms of mean and median) values under 80%. Normality cannot be rejected only for the Efficiency of the Customs clearance process variable overall. To check the stationarity of the panel data, we use the cross-sectionally augmented Im, Pesaran and Shin (IPS) test for unit roots in panel models and variables found to be stationary.

4.1. Construction of the PVAR Model

The selection of lags is done via the BIC criterion and are considered models with 1-to-8-year lags. The variables are exogenous (uncorrelated with the error idiosyncratic term for all periods). Additionally, in this work, we use the Generalized Method of Moments estimators, with r forward orthogonal deviations transformation. The implementation of the model is realized through the R package *panelvar* (Sigmund & Ferstl, 2021).

Table 2. Estimation of the PVAR model

Dependent variable	Customs Variable	HDI	GDP per capita growth
• **Lag 1 Customs Variable**	0.6453*** (0.1493)	0.0101 (0.0752)	0.0075 (0.1643)
• **Lag 1 HDI**	0.1195 (0.1854)	-0.0005 (0.0243)	-0.0736 (0.1393)
• **Lag 1 GDP per capita growth**	-0.0615 (0.2031)	0.0582 (0.1235)	-0.1433 (0.1607)
• **Trade (%.of.GDP)**	0.0018 (0.0013)	0.0006 (0.0006)	0.0008 (0.0009)
• **Control of Corruption: Estimate**	-0.1149 (0.1388)	-0.0024 (0.0237)	0.1491 (0.2232)
• **Government Effectiveness: Estimate**	0.2506** (0.1234)	-0.0025 (0.0631)	0.0033 (0.1073)
• **Political Stability and Absence of Violence/Terrorism: Estimate**	0.0481 (0.2103)	-0.0164 (0.0420)	0.0178 (0.0951)
• **Rule of Law: Estimate**	-0.0351 (0.1573)	0.0099 (0.0325)	0.1243 (0.0906)
• **Regulatory Quality: Estimate**	-0.1568 (0.2232)	-0.0369** (0.0184)	0.0233 (0.1693)

Note: No. of obs. = 320, No. of panels = 16, No. of Instruments: 1908. Robust standard errors in parentheses.
*** denotes significance at the 1% level. ** denotes significance at the 5% level. * denotes significance at the 10% level.

Source: Own research

The Sargan-Hansen-J-Test states that all the overidentifying restrictions are valid, thus the model is correctly specified and all eigenvalues of the matrix lie inside the unit circle, thus the model satisfies the stability condition. Some coefficients of the exogenous variables found to be statistically significant and we want to notice that only the ***"Regulatory Quality: Estimate"*** *was* found to have a significant impact on the Customs variable.

4.2. Granger Causality

Using the dependent variables of our model, the finding is that the "***Efficiency of customs clearance process"*** Granger-cause ***"GDP per capita growth rate"*** (is the only significant relationship at the 1% level and the only coefficient with the expected sign) and vice-versa while "Human Development Index" (HDI) Granger-cause "Efficiency of customs clearance process". The panel Granger (non-)causality test is a combination of Granger tests (Granger, 1969) performed per individual. The test is developed by Dumitrescu and Hurlin (2012), and a shorter exposition is given by Lopez and Weber (2017). The Ztilde test is used and 2 lags are included in the auxiliary regressions. The implementation of the test is performed using the R package plm (Croissant & Millo, 2008).

Table 3. Granger causality between variables

Variable	Eff._customs_cl. pr.	HDI	GDP per capita gr. rate
Eff._customs_cl. pr.		-0.73818	12.382***
HDI	-1.7422*		
GDP per capita gr. rate	-1.7648*		

Note: *We have a balanced panel here. The dependent variable is on the x-axis and the independent variable on the y-axis. The ZTilde statistics are reported.* *** denotes significance at the 1% level. ** denotes significance at the 5% level. * denotes significance at the 10% level.

Source: Own research

4.3. Panel Impulse Response Analysis

The impulse response analysis in a vector autoregression context is concerned with the response of one (endogenous) variable to an impulse (shock (exogenous impulse)) in another (endogenous) variable. In this work, is used the orthogonal impulse-response. Moreover, we used the customs variable and is measured the impact of this variable on economic growth (GDP per capita growth rate) and economic development (Human Development Index). Furthermore, is measured the impact of these variables on the customs variable. Figure 2 displays these graphs.

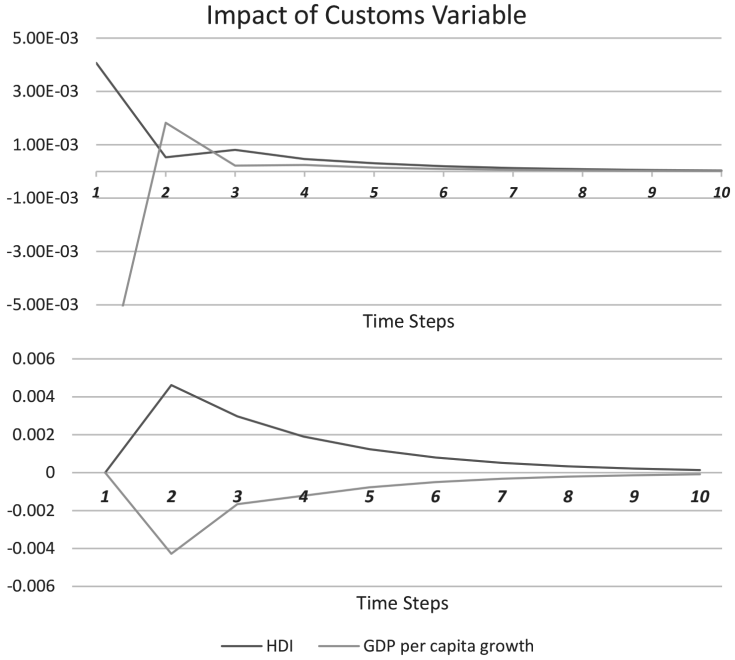

Figure 2. Impulse Response Analysis of variables

Source: Own research

Based on Figure 2, the Customs variable is expected to affect economic growth (GDP per capita growth rate) negatively by 0.9% after 1 year (its rational because money is needed in order to perform a shock in the infrastructure for example) and all the other periods positively (are expected the gains from this "shock"). Furthermore, the economic development (Human Development Index) variable is expected to affect the Customs variable positively 1.07% after 5 years and 1.27% after 10 years.

5. SUMMARY AND FUTURE RESEARCH DIRECTIONS

In this work, we attempted to link customs efficiency with economic growth and with the more general concept of development. For this purpose, we considered the variable "Logistics performance index: Efficiency of customs clearance process (1=low to 5=high)" to represent the customs efficiency, the variable "GDP per capita growth rate" to represent the economic growth and the variable "Human Development Index" (HDI) to represent economic development. The vehicle to implement this linkage is the panel VAR model. Next, we defined our panel through the consideration of 2 criteria (similarity index and/or top importers and/or exporters with the country of Greece) and the model is estimated through the Generalized Method of Moments (GMM) estimator. A Granger causality and an impulse-response analysis close the analysis. One future step is to construct a panel with all countries that reflect the complete set of interactions. Another future research direction could be the detection and the use of more targeted exogenous variables that are uncorrelated with the error idiosyncratic term for all periods and the use of more targeted predetermined variables that are uncorrelated with the contemporaneous and all future idiosyncratic errors but might be correlated with past errors. A third research direction could be the use of alternative models such as a structural VAR (SVAR) model. Finally, a future research plan is the adaptation of our model under the umbrella of other models such as the Solow Growth Model, and the checking of the ability of our model for forecasting tasks. It is noted that the study has the limitation of the selection of the panel according to some characteristics.

6. CONCLUSION

The main conclusion is that the Customs variable Granger-cause economic growth (GDP per capita growth rate), thus an increase in the efficiency of Customs can affect positively the GDP per capita growth rate. Economic policy should take this fact into account and the increased quality of the Customs clearance process can lead to an increased GDP growth rate. Of course, economic growth and more general economic development can lead to an increased quality of the Customs clearance process. Finally, if an economic shock for customs takes place, is expected to affect economic growth (GDP per capita growth rate) positively after 1-year.

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Investment in Renewable Energy Sources: Economic Profitability Factors in Croatia

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Abstract: *Green projects have become essential in contemporary economic conditions due to an increasing emphasis on environmental preservation and sustainable development. including investing in renewable energy sources. The main aim of this study is to explore the factors influencing the economic viability of investing in photovoltaic systems, including initial investments, return on investment, access to financing, infrastructure availability, maintenance costs, system reliability, price competitiveness of output, and the legislative framework in Croatia. The study addresses the extent to which some of these factors influence the decision to invest in renewable energy sources using photovoltaic systems. The research was conducted on 103 respondents who are users of photovoltaic systems. The first hypothesis, that the decision to invest in renewable energy sources by investing in photovoltaic power plants is influenced not only by subsidies but also by investment returns, increased property value, increased energy independence, and long-term protection against rising electricity prices is accepted. The second hypothesis was not confirmed because legislative and other constraints do not affect investment decisions alongside an excellent financial investment structure.*

1. INTRODUCTION

Socially ambitious energy-climate goals, technological progress, and dynamic development demand accelerated development and implementation of new technological solutions in renewable energy sources. Due to their crucial role in achieving sustainable development or energy-climate goals, investment opportunities analysis ranges from investments in photovoltaic power plants to producing and using green hydrogen. In order to achieve ambitious energy-climate goals and intensify investments in renewable energy sources, it is necessary to explore the factors influencing the economic viability of investing in renewable energy sources in Croatia.

Subsidies and new technologies offer entrepreneurs a real opportunity to reverse stagnant conditions. The decision to invest in photovoltaic systems or other forms of renewable energy sources depends on various factors that may vary depending on the context, including the situation in Croatia.

Relevant studies exploring the factors influencing entrepreneurial decision-making regarding investment in renewable energy sources, one of the most frequently mentioned reasons for investing is undoubtedly the return on investment. For instance. Aziz and Jahan (2023) investigated the impact of development mechanisms on investments in renewable energy sources in developing countries. Based on data from 86 developing countries, the study revealed that regulatory support for renewable energy and various types of public investments play a significant

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role. The results aimed to provide policymakers with more specific guidance on the need for public investments supporting investments in renewable energy sources. Liu et al. (2023) found that investment in green energy with financial incentives and targeted environmental policies promotes the long-term transition to sustainable energy. Their research results indicate that the interaction between financial incentives and environmental regulations has a more substantial impact than their individual effects. Effective environmental regulations guide the flow of financial resources towards the transition to renewable energy. Policymakers should formulate integrated policies to strengthen environmental regulations and develop the financial sector, reducing financial barriers and introducing new green financial products.

Increasing investments in sustainable energy are influenced by efficient production technologies, regional differences in social acceptance, land availability for energy infrastructure, global production conditions, and reduced fossil fuel sector investments (Schmidt et al., 2019).

Social acceptance (Segreto et al., 2020) has proven to be a significant obstacle in implementing renewable energy systems. While general acceptance of renewable energy sources is high, local acceptance poses a barrier to developing renewable energy projects. A qualitative analysis of 25 case studies concludes that understanding the impact of social acceptance enables the creation of strategies that promote the development of investments in renewable energy by mitigating public opposition. In a study related to investments. Kasumović and Altumbabić (2020) conclude that by identifying relevant factors of industrial competitiveness. industrial policy will focus on them, thus avoiding the wastage of scarce resources and facilitating the achievement of industrial policy goals. Meanwhile, Serpe et al. (2022) argue that innovation is one of the main factors leading to increased competitiveness of investments through the improvement of products, processes, organisation, and marketing, thereby enabling an increase in market share.

The main goal of this paper is to explore the extent to which factors influence the investment process in renewable energy sources. Investment factors in photovoltaic systems and their significance in achieving the set energy-climate goals are often interconnected and complex and may vary depending on specific conditions and circumstances. Therefore, the final decision to invest in photovoltaic systems in Croatia depends on analyzing all relevant factors.

2. ECONOMIC POTENTIAL OF INVESTING IN RENEWABLE ENERGY

The global economy has failed to address the challenges of increasing climate change risks (Đukić & Mahmutefendić, 2021). Managing these risks requires long-term solutions, and the increased business uncertainty demands constant adaptation. In the coming decades. society will need to focus more on systematic macro-risk management, utilising project economics knowledge and skills to achieve sustainable business practices. Organisations must adopt a purpose-driven approach in a sustainable economy, a prerequisite for achieving goals in an ever-evolving business landscape.

Hariadi et al. (2023) explore whether investment in residential solar photovoltaic (PV) systems can be increased through government policies, encouraging residents to invest in solar PV systems. The study examines the impact of PV system penetration on the distribution grid. It identifies the penetration level that complies with current regulations. It determines whether the investment policy in PV systems for these customers can be without disrupting the distribution grid's operation.

Moon et al. (2023) determine priority factors through an analytical hierarchy process based on a survey of energy experts. The study highlights the importance of active policy implementation and consistency for renewable energy market development. It emphasizes the need for improved grid infrastructure and system integration measures to support solar energy development. The involvement of various stakeholders' interests during policy-making can support stable market growth.

Solar energy. presented as a significant alternative to conventional energy sources (Fernández Rodríguez & Pardo, 2023) faces a significant obstacle in its more comprehensive application due to limited energy storage capabilities. Various factors affect the economic viability of investing in PV systems. One of them includes how solar radiation impacts PV panel output (Gol & Ščasný, 2023). The study investigates whether an automatic single-axis solar tracking system is economically optimal. Research innovations aim to utilize flexible solar panels on curved and unconventional surfaces (Esmaeili Shayan et al., 2022).

Zhang et al. (2023) analyze the economic feasibility of investing in PV systems using net present value, dynamic payback period, and internal rate of return. They compare green energy trading with overall carbon power trading and conduct sensitivity analysis. The study concludes that investing in China is profitable. and distributed PV production is essential for addressing climate change and promoting rural revitalization.

Unlike conventional energy systems. PV power plants do not require fuel consumption or human presence. Annual maintenance costs for PV power plants (Jäger-Waldau, 2014) are approximately 1.5% to 2% of total investment costs annually.

The Levelized Cost of Electricity (LCOE) is an economic measure to assess electricity production costs from a specific source. It represents the price at which electricity must be produced from a particular source to cover all project costs over its lifetime. LCOE is considered a universal parameter defining each technology's overall competitiveness (De Bastiani et al., 2023) crucial for decision-making on project initiation. It can be calculated for different time horizons but may vary depending on location, size, and technology.

From the research above. numerous interrelated and complex factors affect the economic viability of investing in PV systems. In this study, two hypotheses are set. The first hypothesis states that the decision to invest in renewable energy sources by investing in PV power plants depends on the financing structure, through various financial and non-financial indicators such as financial incentives/subsidies reducing initial investment costs, return on investment within a reasonable timeframe, increased property value with solar panel installation, reduced dependency on traditional energy sources, and increased energy independence, long-term protection against rising electricity prices. The second hypothesis states that legislative and other constraints and an excellent financial investment structure influence investment decisions.

3. METHODOLOGY

The study's main objective is to explore critical factors influencing the decision to invest in renewable energy, using PV systems as an example, and their significance in achieving set energy-climate goals. The study investigates factors affecting the economic viability of investing in PV systems, including initial investments, return on investment, access to financing,

infrastructure availability, maintenance costs, system reliability, price competitiveness of output, and legislative framework in Croatia. The methodology employed a questionnaire survey for primary data collection and analysis. The research was conducted from October 15th to November 1st. 2023.

Respondents used a five-point Likert scale ranging from 1 - do not agree at all to 5 - always agree to answer specific questions. The non-parametric Kruskal-Wallis H Test was used to test the hypotheses in the SPSS program.

The total number of respondents is 103, including 99 individuals and four legal entities. Most respondents (92%) use grid-connected PV systems, while the remaining 8% use off-grid systems.

Results indicate that 69% of respondents' PV systems are in Continental Croatia, 9% in the Istria and Northern Croatian Coast, and 18% in the Southern Croatian Coast. In comparison, 4% are across Croatia.

Most respondents (54%) have been using PV systems for 0 to 2 years, 35% for 3 to 10 years, 7% for more than 10 years, and 4% are installing PV systems.

The main research variables (Table 1) necessary for investment decision-making include financial incentives that reduce initial investment costs, reasonable return on investment, increased real estate value with the installation of solar panels, reduced dependence on traditional energy sources and increased energy independence, long-term protection against rising electricity prices, and financial structures of investment. The variable Reducing dependence on traditional energy sources and increasing energy independence received the highest average rating of 3.76.

Table 1. Descriptive Statistics

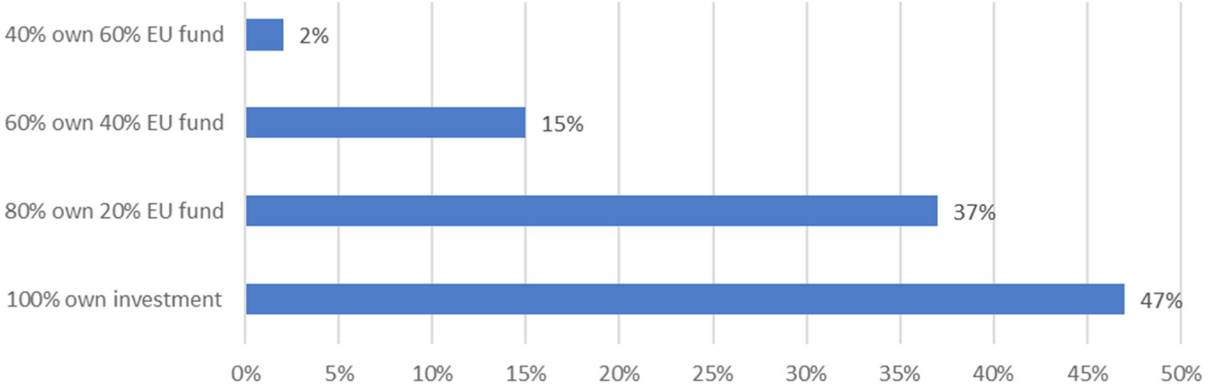
Investing elements	N	Mean	Std. Dev.	Min.	Max	Percentiles		
						25th	50th (Median)	75th
Financial incentives that reduce initial investment costs	103	1.79	1.185	1	5	1.00	1.00	2.00
Return on investment in a reasonable period	103	1.92	1.289	1	5	1.00	1.00	3.00
Increased real estate value with the installation of solar panels	103	1.67	1.175	1	5	1.00	1.00	2.00
Reducing dependence on traditional energy sources and increasing energy independence	103	3.76	1.133	1	5	3.00	4.00	5.00
Long-term protection against rising electricity prices	103	3.56	1.218	1	5	3.00	4.00	5.00
Financial structures of investment	103	1.72	.785	1	4	1.00	2.00	2.00

Source: Own calculations

4. RESULTS OF RESEARCH AND DISCUSSION

Green projects involve producing or developing products, technologies, or supply chain components primarily for renewable energy systems. The EU funds a variety of projects and programs. The priorities of the Cohesion Fund include the Ministry of Economy (European Parliament, 2021), promoting the production and distribution of energy derived from renewable sources and supporting energy efficiency in all sectors. In 2021, approximately 3.500 GWh of

electricity was generated from renewable sources, accounting for 23.1% of total production, excluding large hydroelectric plants (Ministry of Economy, 2022). An investigation of 103 respondents gave factors influencing decision-making in investing in Croatia's photovoltaic (PV) power plants. Cronbach's alpha was calculated for each variable to test the scale's reliability. According to the general rule of thumb, a result above 0.7 is considered good. Forty-seven per cent (47%) of respondents financed the investment with their funds, while 53% utilised some form of state incentives. Of these, 37% received 20% financial support for PV installation, 15% received 40%, and only 2% received 60% non-refundable funds (Graph 1).



Graph 1. Financial structure of investment

Source: Own research

Results of the Kruskal-Wallis H test (Table 2) indicate a significance level of 0.01 for the variables financial incentives that reduce initial investment costs (sig = 0.000) and increased real estate value with the installation of solar panels (sig = 0.011). Results of the Kruskal-Wallis H test indicate a significance level of 0.05 for the variables: and long-term protection against rising electricity prices (sig = 0.025), reducing dependence on traditional energy sources and increasing energy independence (sig = 0.043) and return on investment in a reasonable period (sig = 0.053).

Table 2. Kruskal Wallis Test of the Investment Decision

	Chi-Square	Df	Asymp. Sig.
Financial incentives that reduce initial investment costs	19.487	3	**.000**
Return on investment in a reasonable period	7.667	3	**.053**
Increased real estate value with the installation of solar panels	11.103	3	**.011**
Reducing dependence on traditional energy sources and increasing energy independence	8.146	3	**.043**
Long-term protection against rising electricity prices	9.361	3	**.025**

a. Kruskal Wallis Test

b. Grouping Variable: Financial structures of investment

Source: Own calculations

According to the Kruskal-Wallis H test, the alternative hypothesis is accepted. According to the results of the analysis, Hypothesis One: The decision to invest in renewable energy by investing in photovoltaic power plants depends on the structure of funding sources through various financial and non-financial indicators such as financial incentives/subsidies that reduce initial investment costs, return on investment in a reasonable period, increased real estate value with the installation of solar panels, reducing dependence on traditional energy sources and increasing energy independence, long-term protection against rising electricity prices, is accepted.

Increasing energy independence is directly related to protection against long-term price increases. The results show that 80% of respondents are satisfied between 75% and 100% of their energy needs using photovoltaic power plants, while 9% are satisfied between 50% and 75%. Only 11% of respondents produce more electricity than they need. i.e., for sale.

The questionnaire investigated how much users' electricity bills decreased after the installation of photovoltaic power plants (solar systems). Overall, for the entire territory of the Republic of Croatia, 96% of users of photovoltaic power plants achieve significant financial savings by reducing their bills by more than 50%, while 4% report reductions ranging from 25% to 50%. These results confirm the effectiveness of photovoltaic power plants in providing financial benefits for electricity bills in the Republic of Croatia.

The price of electricity is a factor that directly affects the economic viability of investing in photovoltaic power plants. It determines how much electricity costs respondents can save. The higher the price of electricity, the more profitable the investment. The payback period is an indicator that denotes the time required to recoup the initial investment costs in a specific project or investment. The average lifespan of investments in photovoltaic power plants is 25 years. The payback period, as the ratio of profit to invested capital, is calculated in this case as the ratio of the annual fee for the supplied electricity delivered to the distribution network (the result of the multiplication of the produced electricity and the price of electricity (euro/kWh)) and the annual fee for the supplied electricity.

Table 3. Limitations of investing in solar panels

Test Statistics[a,b]			
	Chi-Square	**Df**	**Asymp. Sig.**
Preparation of Documentation	13.292	3	.004
Obtaining Permits	2.652	3	.448
Maintenance and Repair of Panels	9.935	3	.019
Initial Capital	1.158	3	.763
Installation on the Roof	5.193	3	.158

a. Kruskal Wallis Test
b. Grouping Variable: Financial structures of investment

Source: Own calculations

From Table 3, it is evident that the results of the Kruskal-Wallis H test indicate a significance level of 0.01 for the variable preparation of documentation, which is statistically significant (p=0.004), and a significance level of 0.5 for the variable maintenance and repair of panels, which is also statistically significant (p=0.019). The remaining variables are not statistically significant. Therefore. Hypothesis Two: Legislative and other constraints influence investment decisions with an excellent financial investment structure is not accepted. Based on the above data, the constraints are not significant for decision-makers.

The economic evaluation of a project is the process of assessing the economic benefits and costs. As the world increasingly turns to renewable energy sources to reduce greenhouse gas emissions and ensure a sustainable energy future, understanding the financial aspects of solar systems becomes indispensable. Due to the promotion of technological development and the reduction of investment costs (in the case of solar power plants, fixed costs are practically the only operating costs, as the cost of the energy source is approximately zero), there has been an exponential increase in the penetration of renewable sources in the electricity sector (Matić, 1995). Evaluating the economic potential of photovoltaic power plants is crucial in planning solar energy projects.

The majority of respondents, 77.7%. expect a return on their investment within 6 to 10 years, 12.6% within five years, and 9.7% in more than ten years. Croatian residents are culturally inclined towards property ownership. Therefore, respondents expect installing solar panels will also increase property value.

5. GUIDELINES FOR FURTHER RESEARCH

Future research needs to expand to the economic sector. To support the transition to a low-carbon economy in all sectors by promoting renewable energy production and distribution (European Parliament, 2021). The economic sector, both private and public, is the primary driver of development in any country. Given the reporting requirements for sustainability (European Commission, 2022) and the new EU sustainability standards (European Commission, 2023). it is necessary to investigate further the profitability of investments, subsidies, and barriers that arise for entrepreneurs in more efficient management of renewable energy use.

6. CONCLUSION

The European Green Deal (European Commission, 2019) is a basis for the green transition. It aims for climate neutrality by 2050, strengthening the economy with green technology, creating a sustainable industry, and reducing pollution. In an ever-changing environment, changes happen while constantly seeking opportunities and possibilities for sustainability, and socially, and environmentally efficient management of global resources to manage risks and control adverse outcomes, primarily economically.

The results of empirical research demonstrate the relationship between individual factors influencing the decision to invest in photovoltaic power plants. The empirical research analyses proposed factors: the structure of the initial investment, return on investment, availability of infrastructure, maintenance costs, system reliability, price competitiveness of outputs, and legislative framework in Croatia. The research results highlight that the potential for significant long-term savings on energy bills proved to be the most influential factor. The highest percentage of respondents rated the highest score of 5. 69% of respondents gave an extremely high rating of 5 for the financial viability of photovoltaic systems, while 29% rated it with a score of 4. Green finance promotes transparency and accountability regarding financial activities' environmental and social impacts. Only through continuous alignment with advanced practices can the economic benefits of renewable energy be maximized.

This research can benefit all individuals and legal entities in making investment decisions in photovoltaic power plants, as well as government services in overcoming constraints in project implementation. Solar energy is one of the critical resources in diversifying Croatia's energy portfolio. Continued solar energy investment provides a foundation for sustainable and energy-efficient economic development. Although the Republic of Croatia has recognized the potential of solar energy in reducing dependence on traditional energy sources, there is a need for improvement and increased efficiency of the administrative system for faster and easier implementation of green energy projects. Increasing the capacity of solar power plants encourages the growth of green jobs, contributing to reducing greenhouse gas emissions. Croatia aims to increase renewable energy consumption through subsidies and co-financing programs, thereby creating its energy independence. Considering the natural potential for exploiting various forms of energy such as wind energy, hydroelectric power plants, biomass energy, and solar energy. Croatia needs an efficient and modern energy system that promotes innovation and utilizes modern infrastructure solutions.

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Portfolio Diversification in a New Era of Financial Markets

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Abstract: *The main purpose of this study is to understand the movements between Fintech and AI stock indices, namely the Global Fintech, Artificial Intelligence & BigData Index (IAIQ), Blockchain Index (ILEGR), Disruptive Technology Index (IDTEC), in order to understand whether they behave as diversifying assets for India's main stock index (Nifty 50). The results show no evidence that the Fintech and Artificial Intelligence (AI) stock indices, as well as other related indices such as Blockchain and Disruptive Technology, behave as diversifying assets concerning India's main stock index, the Nifty 50, during the period from January 2020 to January 2024. In conclusion, investors should adopt a prudent approach when considering including these assets in their portfolios and seek effective diversification through a variety of assets and strategies.*

1. INTRODUCTION

The rise of fintech companies is driving a significant transformation in the banking ecosystem, inducing notable impacts on competitive dynamics, innovation, the expansion of financial inclusion and the promotion of sustainable development. Fintechs employ technology to provide a diverse range of financial services, including payment transactions to lending, investment and insurance solutions (Mumthas, 2022; Siska, 2022).

The COVID-19 pandemic has catalysed the accelerated adoption of digital technologies within the banking sector, giving FinTechs substantial advantages. At the same time, traditional banks, reacting to the intensification of competition from fintechs, are investing in innovation and sustainability strategies in order to safeguard their position in the market and meet growing customer demands for agile financial services that adapt to changing technologies (Le et al., 2021).

India is an emerging market for Fintech, fuelled by a vast population of almost 1.3 billion. A significant proportion of this population is unbanked or underbanked, which places India as a globally attractive scenario for developing and adopting financial technologies. Fintech companies are acknowledged as catalysts for change and bearers of innovative disruptions that have the potential to redefine established financial industry paradigms. Over the last five years, the fintech sector in India has experienced exponential growth, and the outlook is for even greater expansion in the immediate future. This growth is driven by the convergence of factors such as growing internet penetration, increased smartphone adoption and the demand for accessible and convenient financial solutions (Bhatnagar et al., 2022; Mumthas, 2022; Yadav, 2023).

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The study's purpose is to analyse the combined movements between the Fintech and Artificial Intelligence (AI) stock indices, specifically the Global Fintech, Artificial Intelligence & BigData Index (IAIQ), Blockchain Index (ILEGR) and Disruptive Technology Index (IDTEC), to determine whether they have the characteristics of diversifying assets against India's main stock index, the Nifty 50.

This research makes a significant contribution to the existing body of academic literature. This study examines the feasibility of Fintech and AI stock indices acting as diversification mechanisms in periods of uncertainty in the global economy. It is a crucial question for investors and portfolio managers looking to mitigate the risks associated with their investment portfolios. Currently, the literature on the impact of Fintech on capital markets is relatively limited. This study helps to fill this gap by comprehensively analysing the interrelationships between Fintech stock indices and India's main stock index. From a practical point of view, understanding the interconnection between Fintech and capital markets is crucial for sustainable economic development. This study offers important insights to help policymakers and market participants make more informed decisions about fostering financial innovation and promoting economic growth.

This paper is divided into Section 2 for the literature review, and Section 3 provides the data and methodology. The results are discussed in Section 4. Section 5 provides the conclusion.

2. LITERATURE REVIEW

Fintechs ubiquitously dominate the contemporary financial fabric, characterised by their effective integration with technological advances in digitalisation, the internet, blockchain technology and artificial intelligence tools. This phenomenon has led to a significant transformation in the financial industry, with the introduction of innovative and sophisticated technological processes, which aim to provide a wider range of financial products and services at an affordable cost, thus democratising access to these resources and making it possible for economic agents to make broader and more informed decisions (Alaassar et al., 2023; Li et al., 2022).

Alshater et al. (2024), Zhou and Li (2022), and Wang et al. (2023) analysed the dynamic relationship between fintechs and traditional financial institutions. Zhou and Li (2022) show changing correlations between fintechs and the real estate sector, covering both their development and operations. However, the dynamic connection between fintechs and the traditional financial sector has decreased since the outbreak of the 2020 pandemic. On the other hand, Alshater et al.'s (2024) study highlights the considerable levels of Fintech connectivity in the Asia-Pacific region, including Japan.

Furthermore, the short-term impacts between regional Fintech indices are substantially more pronounced than long-term relationships. Wang et al. (2023) examined the interrelationship of Fintech with various thematic indices. The authors identified an overall correlation between these indices, highlighting that the MSCI USA benchmark index has the widest range of interactions with emerging industries but does not significantly correlate with other stock market benchmarks.

In a complementary way, the study performed by Ha (2023) investigated the interrelationships between the ETF indices ARK Fintech Innovation (ARKF), the ETF Global X Fintech (FINX) and sustainable environmental assets. The author identified significant movements between fintech indices and green bonds, calling into question the portfolio diversification hypothesis. Moreover, Sharma et al. (2023) analysed the resilience of different asset classes during the pre

and post-COVID-19 outbreak periods. The results revealed that Fintech-based assets proved to be the most resilient class, followed by artificial intelligence (AI) funds and, finally, green funds. In addition, the authors emphasised that AI funds and green assets exhibited characteristics of diversifying assets in the long term. In contrast, Fintech-based assets manifested diversification properties in both the short and long term, suggesting their usefulness as hedge and refuge assets in times of uncertainty in the global economic scenario.

3. MATERIALS AND METHODS

3.1. Data

The indices used in the study are the price indices of Fintech-related indices, such as the Global Fintech, Artificial Intelligence & BigData Index (IAIQ), Blockchain Index (ILEGR), Disruptive Technology Index (IDTEC) and the Indian stock market (Nifty 50), for the period from 1 January 2020, to 31 January 2024, and were obtained from the Thomson Reuters Eikon database.

3.2. Methodology

This research began with the characterisation of the sample, using the main descriptive statistics and the Jarque and Bera (1980) adherence test, which proposes the normality of the data. In the second stage, the stationarity of the time series was validated using the panel unit root tests of Breitung (2000), Levin et al. (2002), and Im et al. (2003). The Dickey and Fuller (1981), and Phillips and Perron (1988) tests with Fisher's transformation were estimated to validate the results and the quantile graphs. The VAR Granger Causality or Block Exogenety Wald Test model, which uses the Wald statistic, was estimated to assess whether the independent (or exogenous) variables contain information that helps explain the behaviour of the dependent variable and answer the research question.

4. RESULTS

Figure 1 illustrates the trajectory of the returns of the Artificial Intelligence & Big Data Index (IAIQ), Blockchain Index (ILEGR), Disruptive Technology Index (IDTEC) and the benchmark Indian stock market index (Nifty 50) from January 2020 to 31 January 2024.

An analysis of these indices clearly and indisputably reveals the occurrence of significant structural disturbances in the markets in question. These disruptions, particularly marked in the first few months of 2020, coincide with the emergence of the first wave of the COVID-19 pandemic. In addition, 2022 saw notable fluctuations in the time series, indicative of further structural disruptions. This particular volatility was driven by the Russian invasion of Ukraine and subsequent concerns about the resulting rise in inflation. The authors Galvão and Dias (2024) and Dias et al. (2024) also validated these results for the international financial markets.

Table 1 shows a summary of the main descriptive statistics in terms of returns for the time series of the Artificial Intelligence & Big Data Index (IAIQ), Blockchain Index (ILEGR), Disruptive Technology Index (IDTEC) and the benchmark Indian stock market index (Nifty 50), over the period from January 2020 to 31 January 2024. Regarding the mean returns, it can be seen that the markets have positive values. Concerning the standard deviation, the IAIQ stock index has the highest value (0.0161), indicating greater dispersion in relation to the average.

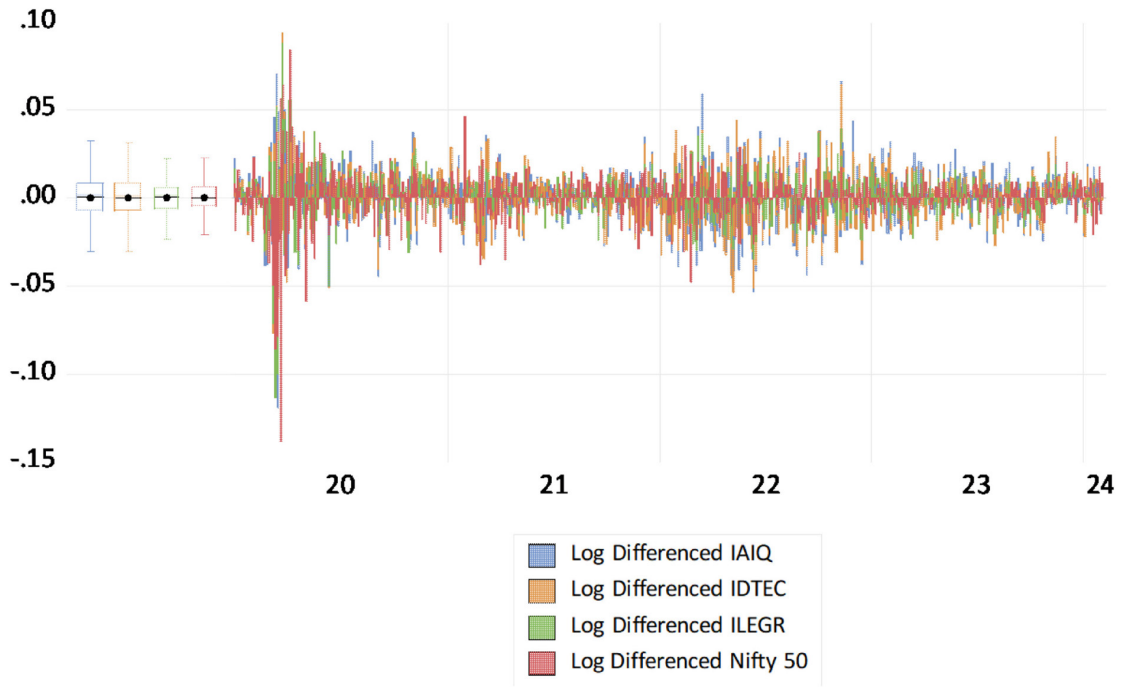

Figure 1. Evolution, in returns, of the financial markets analysed from 1 January 2020 and 31 January 2024

Source: Own elaboration

The asymmetry and kurtosis coefficients were estimated to assess whether the return distributions follow a normal distribution. The values obtained for asymmetry and kurtosis were different from 0 and 3, respectively, suggesting that the distributions are not symmetrical and do not have a shape similar to the normal distribution. The Jarque and Bera (1980) test was used to validate these observations, which rejected the null hypothesis of normality of the distributions at a significance level of 1%. This indicates that the returns of the stock indices analysed do not follow a non-Gaussian distribution. The authors R. T. Dias et al. (2023), Santana et al. (2023), and R. M. Dias et al. (2023) have also shown the presence of non-Gaussian distributions in the time data related to the price indices of the international financial markets.

Table 1. Summary table of descriptive statistics, in returns, for the markets in question for the period between 1 January 2020 and 31 January 2024

	IAIQ	IDTEC	ILEGR	NIFTY 50
Mean	0.00057	0.00025	0.00034	0.00053
Std. Dev.	0.0161	0.0154	0.0121	0.0124
Skewness	-0.5721	-0.4389	-1.1244	-1.8073
Kurtosis	9.1936	8.5989	18.0030	25.4217
Jarque-Bera	1768.6290	1431.9382	10260.7830	22996.0931
Probability	0.0000	0.0000	0.0000	0.0000
Observations	1070	1070	1070	1070

Source: Own elaboration

The stationarity assumptions of the time series for the stock price indexes Artificial Intelligence & Big Data Index (IAIQ), Blockchain Index (ILEGR), Disruptive Technology Index (IDTEC) and the Indian stock market (Nifty 50), for the period from January 2020 to 31 January 2024, were validated by estimating the panel unit root tests, namely Breitung (2000), Levin et al. (2002), Im et al. (2003), in validation, the Dickey and Fuller (1981), Phillips and Perron

(1988) tests with Fisher Chi-square transformation. Stationarity was achieved by transforming the original data into logarithmic first differences and validating stationarity by rejecting H_0 at a significance level of 1% (see Table 2).

Table 2. Summary table of the unit root tests, in returns, for the analysed markets for January 2020 and 31 January 2024.

Group unit root test: Summary				
Method	**Statistic**	**Prob.****	**Cross-sections**	**Obs**
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-95.3434	0.0000	4	4270
Breitung t-stat	-41.5422	0.0000	4	4266
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-62.4319	0.0000	4	4270
ADF - Fisher Chi-square	1053.5631	0.0000	4	4270
PP - Fisher Chi-square	1053.5631	0.0000	4	4272

Notes:** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Source: Own elaboration

The quantile graphs in Figure 2 provide a visual representation of the distributions of the price index returns of the Artificial Intelligence & Big Data Index (IAIQ), Blockchain Index (ILEGR), Disruptive Technology Index (IDTEC) and the Indian stock market (Nifty 50), from January 2020 to 31 January 2024.

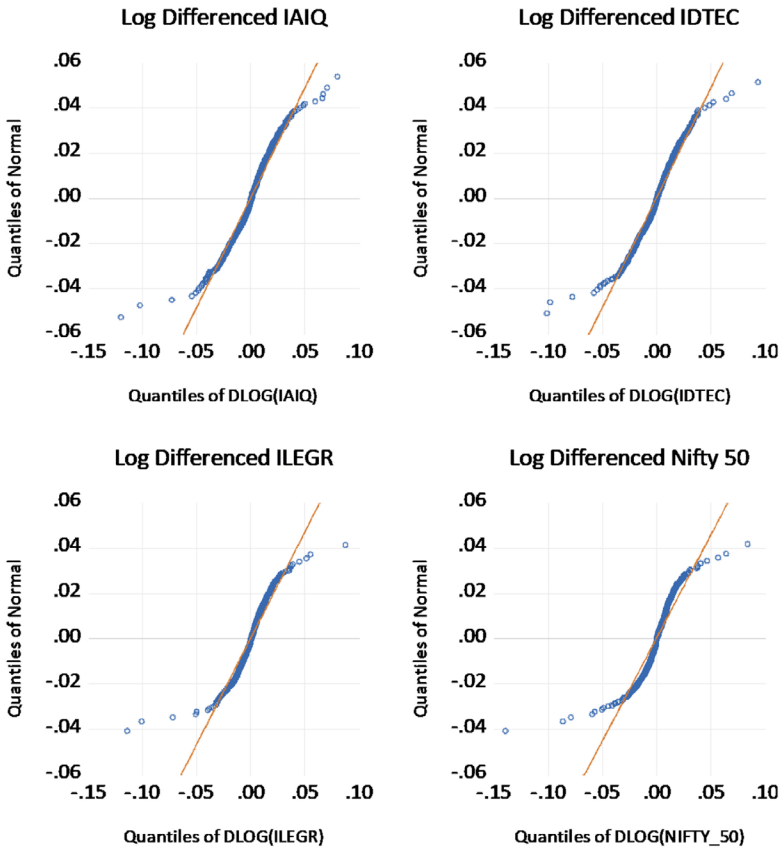

Figure 2. Quantile evolution of the financial markets analysed between 1 January 2020 and 31 January 2024

Source: Own elaboration

The graphs show two distinct lines: one in orange, representing the normal distribution curve, and the other in blue, depicting the data distribution for each time series. When assessing the dispersion of the time series data in relation to the normal distribution curve, we see that none of the series completely overlaps the orange line, which suggests a certain asymmetry in the return distributions. This lack of overlap indicates that the return distributions of the assets analysed do not adhere perfectly to a normal distribution. In other words, the data is not symmetrically distributed around the mean. Instead, there is an asymmetry in the distributions, which suggests the presence of extreme events or a greater concentration of data at one end of the distribution compared to the other.

Figure 3 shows the residual structure of the Autoregressive Vector Model (VAR) with Cholesky decomposition, applied to the Artificial Intelligence & Big Data Index (IAIQ), Blockchain Index (ILEGR), Disruptive Technology Index (IDTEC) and the Indian stock market (Nifty 50), over the period from January 2020 to 31 January 2024. To ensure the absence of autocorrelation in the residuals, the LR information criterion was used, specifically the modified LR sequence test (each test with a significance level of 5%), with a lag of 7 days. Subsequently, the LM test was estimated, and autocorrelation was found to be absent for lag 8. Based on these results, it can be inferred that the conditions for robustness in the SVAR results are met, due to the stationarity of the returns and the absence of autocorrelation in the residuals.

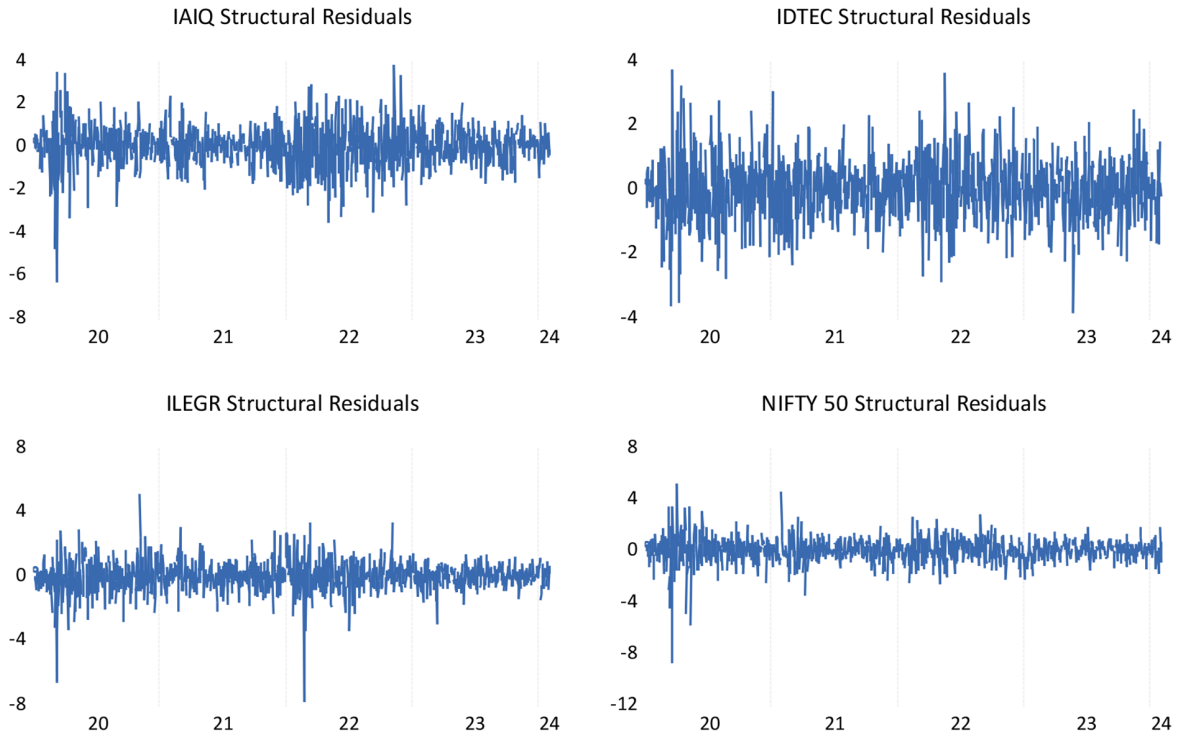

Figure 3. VAR Structural Residuals using Cholesky Factors between 1 January 2020 and 31 January 2024

Source: Own elaboration

The results of the Granger causality tests, as detailed in Table 3, stand out in the context of financial market analysis. The tests reveal the presence of 12 causal relationships between the various indices analysed, representing all possible connections. Specifically, the stock indices related to financial technology (Fintech) and artificial intelligence (AI), notably the Global Fintech and Artificial Intelligence & BigData Index (IAIQ), Blockchain Index (ILEGR), Disruptive Technology Index (IDTEC), as well as the Indian stock market (Nifty 50), show bidirectional shocks.

This phenomenon suggests that the Fintech and AI stock indices, together with the Nifty 50 index, do not have hedging or safe harbour characteristics. This lack of hedging or safe harbour characteristics raises significant questions about the effectiveness of portfolio diversification. In other words, the ability to reduce risk through diversification may be jeopardised, given the interrelationships observed between these market indices. These results are also validated by the authors Teixeira et al. (2023), R. M. T. S. T. Dias et al. (2023), and R. M. Dias et al. (2023), who show sharp movements in the international financial markets as a result of the events of 2020 and 2022.

Table 3. Granger Causality / Block Exogeneity Wald Tests, for the full period

Null Hypothesis:	Obs	F-Statistic	Prob.
IDTEC does not Granger Cause RIAIQ	1063	1.8582	0.0730
IAIQ does not Granger Cause IDTEC		1.5306	0.1529
ILEGR does not Granger Cause IAIQ	1063	5.6723	0.0000
IAIQ does not Granger Cause ILEGR		3.6168	0.0000
NIFTY 50 does not Granger Cause IAIQ	1063	5.6362	0.0000
IAIQ does not Granger Cause NIFTY 50		22.0275	0.0000
ILEGR does not Granger Cause IDTEC	1063	4.7877	0.0000
IDTEC does not Granger Cause ILEGR		3.2523	0.0000
NIFTY 50 does not Granger Cause IDTEC	1063	5.7334	0.0000
IDTEC does not Granger Cause NIFTY 50		28.3796	0.0000
NIFTY 50 does not Granger Cause ILEGR	1063	6.7376	0.0000
ILEGR does not Granger Cause NIFTY 50		26.1243	0.0000

Source: Own elaboration

5. CONCLUSION

This study aimed to investigate the movements between Fintech and AI stock indices, including the Global Fintech, Artificial Intelligence & BigData Index (IAIQ), Blockchain Index (ILEGR), Disruptive Technology Index (IDTEC), to determine whether these assets behave as diversifiers for India's main stock index (Nifty 50).

The results of the Granger causality tests revealed 12 causal relationships between the indices analysed, covering all possible connections. Specifically, the indices related to financial technology (Fintech) and artificial intelligence (AI), together with the Nifty 50 index, show bidirectional shocks. This observation suggests the absence of hedging or safe harbour characteristics in these indices. The lack of such characteristics raises important questions about the effectiveness of portfolio diversification.

In conclusion, the ability to reduce risk through diversification may be compromised due to the interrelationships observed between these market indices. The analysis, therefore, highlights the need for more sophisticated approaches to risk management and asset allocation in an environment characterised by complex and interdependent relationships between the various financial instruments.

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Further Unravelling Cryptocurrency Behaviour

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Long memories;
DFA;
Arbitrage

Abstract: *The primary purpose of this study is to compare the levels of efficiency between the Islamic cryptocurrency (HelloGold), the ecological cryptocurrencies Cardano (ADA) and Stellar (XLM) and the traditional digital currencies Bitcoin (BTC) and Ethereum (ETH) over the period from 24 February 2022 to 28 January 2024. Analysing the DFA exponents reveals different types of memory in the digital currencies time series. The Islamic digital currency HelloGold (HGT) exhibits short-term memory, suggesting profit opportunities based on recent trends. In contrast, the green cryptocurrency Cardano (ADA) shows long-term memory, indicating the influence of long-term events and trends on prices. The digital currency Stellar (XLM) does not show a clear short-term or long-term memory trend, making it difficult to predict future movements. Meanwhile, Bitcoin (BTC) and Ethereum (ETH) exhibit long-term memory, suggesting that their prices are affected by long-term trends. These results have important implications for investors and traders when adjusting their trading strategies according to the behaviour observed in cryptocurrency prices.*

1. INTRODUCTION

Since Nakamoto's (2008) description of a digital cryptocurrency, Bitcoin, the cryptocurrency markets have expanded, and their total market capitalisation reached 800 billion dollars in January 2018. However, these markets subsequently went through a crisis, and their total market capitalisation fell to 100 billion dollars at the end of 2018. Thus, the changes in market capitalisation suggest that investors treat cryptocurrencies as an asset, but that does not necessarily mean they do not treat them as, for example, a currency. Moreover, economists consider that research into the efficiency of the cryptocurrency market in the sense of Fama (1970) is essential to evaluate the price mechanism of financial markets. Therefore, several recent studies on cryptocurrency markets aim to determine whether these markets are efficient (Chambino et al., 2023).

Islamic cryptocurrencies represent a recent innovation that is based on tangible assets such as physical gold or fiat currencies. These technologies have been developed to meet the religious needs of certain investors, using existing blockchain structures. The first cryptocurrency to be certified by Al Maali Consulting under Islamic principles was OneGram. Each unit of OneGram is backed by at least one gram of physical gold, ensuring a stable minimum price. Other cryptocurrencies, such as HelloGold and X8X, have also obtained certification from Amanie Advisors and the Shariyah Review Bureau (SRB), respectively. HelloGold offers a certified

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alternative for asset preservation, backed by physical gold, while X8X uses a portfolio of eight coins and gold to fight inflation while maintaining its liquidity. These initiatives aim to provide Islamic investors with options that comply with Sharia principles (Emna & Anis, 2020; Wasiuzzaman et al., 2023).

Islamic cryptocurrencies are designed to comply with the financial principles of Islam, avoiding speculation. In contrast to conventional cryptocurrencies, whose valuations are influenced by subjective factors and external events, Islamic cryptocurrencies are generally linked to real assets such as gold or silver, providing an intrinsic value that facilitates valuation. Some are issued by companies with a history of profitability and dividend distribution, adding a more solid basis to their valuation (Ali et al., 2023; Alois, 2016).

Financial markets are complex and often unpredictable due to investors' copycat behaviour, in which they follow the actions of other investors without considering economic or financial fundamentals. Recent studies, such as those by Dias, Chambino, Palma, et al. (2023), have shown that stock markets have become more efficient during the COVID-19 pandemic due to a reduction in this copycat behaviour. However, in emerging cryptocurrency markets, as demonstrated by Ballis and Drakos (2020), investors tend to mimic and act irrationally, possibly due to the lack of solid cryptocurrency fundamentals. This imitation behaviour has also been observed in Islamic markets, as justified by Mnif et al. (2019) and partially confirmed in certain capital markets by Chaffai and Medhioub (2018).

The main purpose of this study is to compare the efficiency levels between Islamic cryptocurrencies (HelloGold), green cryptocurrencies (Cardano, Stellar) and traditional cryptocurrencies (BTC and ETH) in the period from 24 February 2022 to 28 January 2024. As far as is known, there is a gap in the literature regarding the comparison between these three families of cryptocurrencies. For example, the author Rufino (2023) shows that the announcement of the 2020 pandemic caused the price of BTC to fall by 46%; however, the authors Garcia and Tolentino (2021) show the presence of long memories in the digital currencies BTC and ETH. Furthermore, the authors Thazhungal Govindan Nair (2022) show exaggerated reactions to the persistence of the digital currency markets during the 2020 pandemic.

Further to the introduction, the rest of the study is structured as follows. Section 2 reviews the relevant literature. Section 3 details the data and methodology adopted in the analysis. The empirical results are discussed in section 4, while section 5 concludes the study and discusses its implications.

2. LITERATURE REVIEW

The 2020 pandemic has changed consumer behaviour in the cryptocurrency market, seen functionally as online economic activities and institutionally as transactions carried out by participants. Before the pandemic, there was great enthusiasm for Bitcoin, but soon after the start of the COVID-19 pandemic, its return fell by 46.5 per cent in one day. However, Bitcoin recovered quickly and began a rise that lasted almost a year, with daily increases of 59.6% (Rufino, 2023).

Hawaldar et al. (2019) studied the efficiency of Bitcoin and Litecoin concerning the U.S. dollar, finding evidence of random walk. On the other hand, the authors Mnif et al. (2019) investigated imitation behaviour in the Islamic stock and Sukuk markets, observing the greater intensity

of imitation in Islamic stocks. Ballis and Drakos (2020) analysed the cryptocurrency market and found evidence of copycat behaviour, indicating possible signs of (in)efficiency.

In 2023, the authors Dias, Chambino, Alexandre, et al. (2023) showed that cryptocurrencies have positive and negative autocorrelations, which can reduce volatility and moderate price fluctuations. The results also show persistence in cryptocurrency returns, suggesting long-term market trends or patterns that individual and institutional investors can exploit. In a complementary way, Galvão and Dias (2024) demonstrate that clean energy indices, such as digital currencies classified as "dirty", show autocorrelation in their returns and that prices are not independent and identically distributed (i.i.d).

3. MATERIALS AND METHODS

3.1. Data

The data is the index prices used in the study, Islamic cryptocurrency (HelloGold), green cryptocurrencies (Cardano, Stellar) and traditional digital currencies (BTC and ETH) from 24 February 2022 to 28 January 2024. The data was extracted from the Thomson Reuters Eikon database in U.S. dollars.

3.2. Methodology

The research will be developed over several stages. The sample will be characterised using descriptive statistics to check that the data follows a normal distribution, as well as the graphs. The panel unit root tests of Breitung (2000), Levin, Lin et al. (2002), and Im et al. (2003), which postulate the same null hypotheses (unit roots), will be used to ensure that the time series follows white noise (mean = 0; constant variance). The Dickey and Fuller (1981) and Phillips and Perron (1988) tests with Fisher's chi-square transformation and Choi's (2001) unit root tests were also estimated to ensure the results are robust.

The Detrended Fluctuation Analysis (DFA) model will be used to understand whether the geopolitical event has led to long memories in Islamic, ecological and traditional digital currencies. DFA is an analysis method that examines time dependence in non-stationary data series. By assuming that the time series are non-stationary, this technique avoids spurious results when analysing the long-term relationships of the data series. The DFA has the following interpretation: $0 < \alpha < 0.5$ série anti-persistent series; $\alpha = 0.5$ series shows random walk; $0.5 < \alpha < 1$ persistent series. The function of this technique is to examine the relationship between the values x_k and x_{k+l} at different points in time. For a better understanding, see the articles by Zebende et al. (2022), Guedes et al. (2022), and Santana et al. (2023).

4. RESULTS

4.1. Descriptive Statistics

Figure 1 shows the evolution, in returns, of the Islamic cryptocurrency (HelloGold), the ecological cryptocurrencies Cardano (ADA) and Stellar (XLM) and the traditional digital currencies Bitcoin (BTC) and Ethereum (ETH) in the period from 24 February 2022 to 28 January 2024. Graphical observation shows the extreme volatility of these digital currencies in 2022, which

can be associated with the Russian invasion of Ukraine. On the other hand, the XLM digital currency shows a very significant drop in structure in the second half of 2023 (June), which can be associated with an investigation opened by the SEC against Ripple Labs, the company that co-founded Stellar.

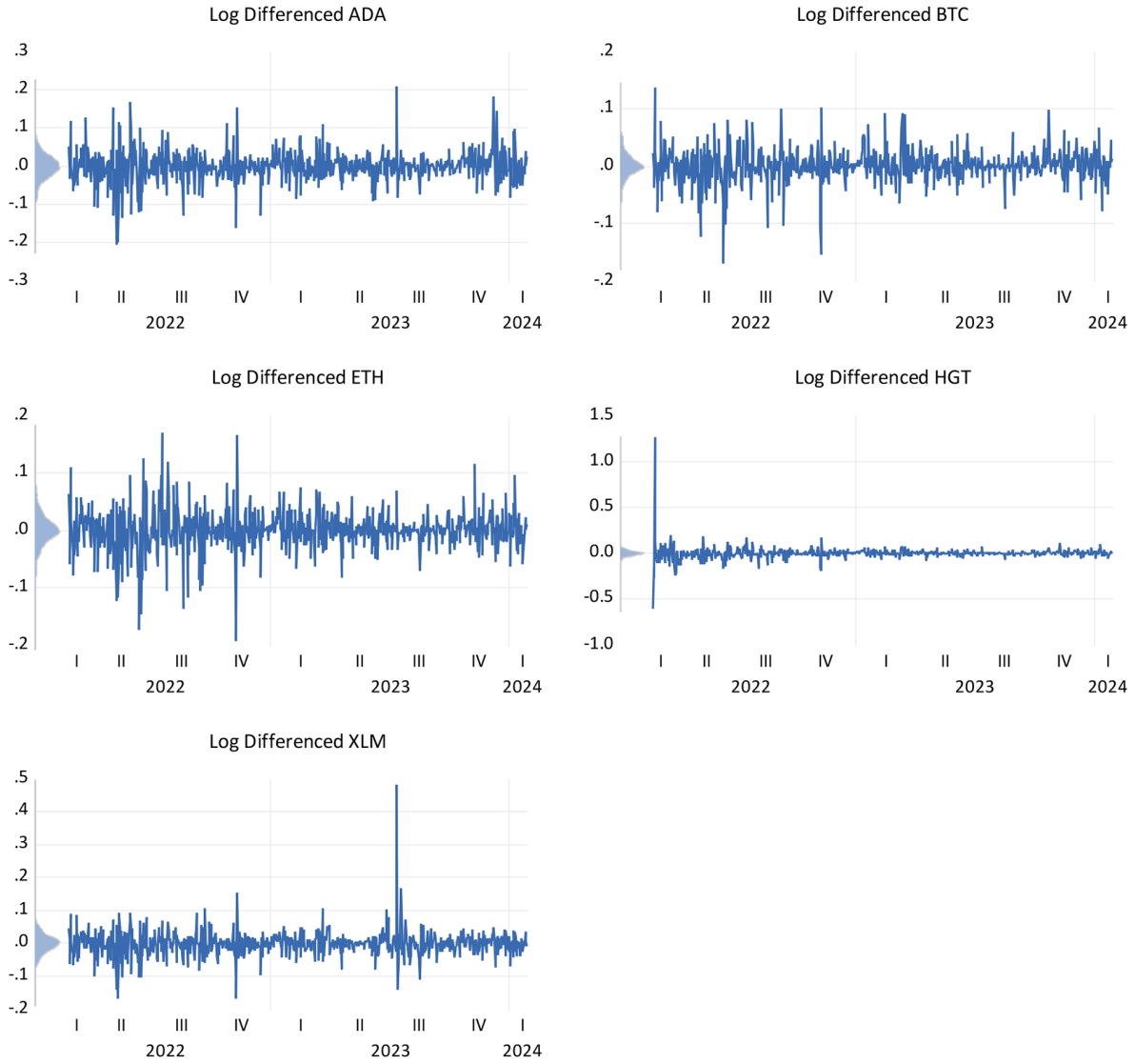

Figure 1. Evolution, in returns, of the cryptocurrencies analysed from 24 February 2022 to 28 January 2024.

Source: Own elaboration

Table 1 shows the evolution, in returns, of the Islamic cryptocurrency (HelloGold), the ecological cryptocurrencies Cardano (ADA) and Stellar (XLM) and the traditional digital currencies Bitcoin (BTC) and Ethereum (ETH) from 24 February 2022 to 28 January 2024. Based on the results, most returns during this period of uncertainty in the global economy are negative, except for the cryptocurrency BTC (0.00015). Regarding the standard deviation, it was found that the Islamic digital currency shows the highest dispersion in relation to the mean HGT (0.06948), but no cause-effect could be found as it is the only cryptocurrency that works collaterally. In order to verify that we are dealing with a Gaussian distribution, we tested the asymmetry and kurtosis to see if we had the reference indicators (0 for asymmetry and 3 for kurtosis). The asymmetry values are different from zero (≠ 0), with the Islamic currency HGT (7.3748) once again

standing out, and concerning kurtosis, HelloGold (165.373) also shows a value different from its benchmark (≠ 3). To validate, we estimated the Jarque and Bera test (1980) and found that the null hypothesis postulating the normality of the data was rejected at a significance level of 1%.

Regarding whether the time series are Gaussian distributions, asymmetry and kurtosis were tested to verify whether reference indicators were met (0 for asymmetry and 3 for kurtosis). The asymmetry values are different from zero (≠ 0), with the Islamic currency HGT (7.3748) once again standing out, and concerning kurtosis, HelloGold (165.373) also shows a value different from its benchmark (≠ 3). Jarque and Bera's (1980) test was used to validate the data, and the null hypothesis of normality was rejected at a significance level of 1%.

Table 1. Summary table of the main descriptive statistics for the cryptocurrencies analysed from 24 February 2022 to 28 January 2024

	ADA	BTC	ETH	HGT	XLM
Mean	-0.00076	0.00015	-0.00017	-0.00137	-0.00065
Std. Dev.	0.04173	0.02868	0.03607	0.06948	0.03923
Skewness	0.0253	-0.4254	-0.3570	7.3748	2.3668
Kurtosis	7.14674	8.4162	7.7073	165.373	36.0939
Jarque-Bera	504.47	881.74	664.96	779759.77	32783.42
Probability	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	704	704	704	704	704

Source: Own elaboration

Validation of the stationarity assumption for the financial markets analysed was fulfilled with the Breitung (2000) panel unit root test. The results show that the time series have unit roots when estimating the original price series. The logarithmic transformation in first differences had to be performed to achieve stationarity, and the null hypothesis was rejected in all the estimated tests.

Table 2. Summary table of Breitung's (2000) panel unit root test for the cryptocurrencies analysed from 24 February 2022 to 28 January 2024

Method			**Statistic**	**Prob.****
Breitung t-stat			-12.9233	0.0000
Intermediate regression results on D(UNTITLED)				
Series	**S.E. of Regression**	**Lag**	**Max Lag**	**Obs**
D(ADA)	0.03412	0	19	702
D(BTC)	1213.0716	0	19	702
D(ETH)	95.0969	0	19	702
D(HGT)	1.44e-05	17	19	685
D(XLM)	0.0075	0	19	702
	Coefficient	**t-Stat**	**SE Reg**	**Obs**
Pooled	-0.113167	-12.9233	0.00875	3488

Source: Own elaboration

The DFA exponent analysis results provide valuable insights for trading strategies in the digital currency markets.

The Islamic digital currency HelloGold (HGT) exhibits short-term memory, which suggests that recent events and short-term trends influence the prices of this cryptocurrency. This could mean profit opportunities for traders by capitalising on these short-term price trends. On the other hand,

the ecological cryptocurrency Cardano (ADA) exhibits long-term memory, indicating that the prices of this digital currency are more affected by long-term events and trends. Investors can use this information to adjust their portfolio management strategies with a broader time horizon.

Regarding the digital currency Stellar (XLM), no clear short-term or long-term memory trend was identified, suggesting that its prices may follow a random walk, making it difficult to predict future movements. Meanwhile, the traditional cryptocurrencies Bitcoin (BTC) and Ethereum (ETH) show long-term memory, meaning that long-term events and trends influence their prices. This could lead investors to adjust their strategies to consider this long-term memory when managing their portfolios.

Table 3 shows the DFA exponents for the Islamic cryptocurrency (HelloGold), the green cryptocurrencies Cardano (ADA) and Stellar (XLM) and the traditional digital currencies Bitcoin (BTC) and Ethereum (ETH), for the period from 24 February 2022 to 28 January 2024. The Detrended Fluctuation Analysis (DFA) exponents show that the digital currency HGT (0.37) has short-term memories. The ecological digital currency ADA (0.53) has long-term memories, while XLM (0.50) does not reject the random walk hypothesis. Regarding traditional cryptocurrencies, we found that BTC (0.52) and ETH (0.56) have long-term memories, i.e. the residuals are not independent and identically distributed (i.i.d) or autocorrelated over time. In pragmatic terms, detecting short-term and long-term memories in the time series of financial digital currencies can have significant implications for investors and traders. For example, if an asset exhibits short-term memory, traders can try to capitalise on short-term price trends. On the other hand, if an asset exhibits long-term memory, investors can use this information to adjust their portfolio management strategies. Several authors corroborate these results: Horta et al. (2022) and Dias et al. (2023), who show the presence of long memories during highly volatile events in the international financial markets.

Table 3. DFA exponent for return. The values of the linear adjustments for αDFA always had $R^2 > 0.99$

Cryptocurrencies (Islamic)	αDFA **(Conflict in 2022)**	**Results**
HGT	0.37** ≅ 0.0022	Short-term memory
Cryptocurrencies (Green)	αDFA **(Conflict in 2022)**	**Results**
ADA	0.53** ≅ 0.0049	Long-term memory
XLM	0.50 ≅ 0.0013	Random Walk
Cryptocurrencies (Traditional)	αDFA **(Conflict in 2022)**	**Results**
BTC	0.52** ≅ 0.0053	Long-term memory
ETH	0.56** ≅ 0.0014	Long-term memory

Note: The hypotheses are H_0: α = 0.5 and H_1: α ≠ 0.5. ** I.C. at 95%.

Source: Own elaboration

5. CONCLUSION

The comparative analysis of efficiency levels between different cryptocurrencies, including Islamic cryptocurrency (HelloGold), green cryptocurrencies (Cardano and Stellar) and traditional digital currencies (Bitcoin and Ethereum), revealed distinct characteristics in their behaviour patterns over time.

The results obtained by analysing the DFA exponents highlight the presence of different types of memory in the time series of these cryptocurrencies. While the Islamic digital currency HelloGold (HGT) shows short-term memory, suggesting profit opportunities based on recent trends, the green cryptocurrency Cardano (ADA) shows long-term memory, indicating the influence of long-term events and trends on prices. On the other hand, the digital currency Stellar (XLM) does not display a clear short-term or long-term memory trend, hindering the prediction of future movements. As for the traditional cryptocurrencies, Bitcoin (BTC) and Ethereum (ETH) both show long-term memory, suggesting that their prices are affected by long-term trends.

In conclusion, the detection of different types of memory in the time series of digital currencies can inform the decisions of investors and traders, allowing them to adjust their trading strategies according to the time horizon and behaviour observed in cryptocurrency prices.

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Tech-Enabled Business Models in Banking for Financial Inclusion: A Systematic Literature Review

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Efficiency;
Accessibility;
Emerging economies;
Digitalization;
Bibliometric analysis;
Inclusive financial systems

Abstract: *Financial inclusion refers to the principle of ensuring universal access to fundamental banking services such as savings accounts, credit, and insurance, irrespective of individuals' economic or social circumstances. In today's context, this equitable access is crucial for fostering active participation in economic activities. This involves breaking down barriers that historically limited access, especially for remote and financially disadvantaged groups, and leveraging technology to create more efficient and accessible financial processes within financial service providers with a specific focus on banks in this case.*

Research on the influence of technology-enabled business models in banks for financial inclusion examines the impact of emerging technologies on transforming traditional banking operations and fostering financial inclusion. Historically, traditional banking systems have been inefficient, time-consuming, and expensive. New technology has transformed these financial processes, making them more efficient and accessible.

This study explores the existing literature published in this domain from 2010 to 2024, aiming to conduct a thorough analysis and to better understand the link between tech-enabled business models, banking and financial inclusion. Through the use of the proper literature review strategy and the collection of the relevant subset, this paper will support research and highlight significant gaps and challenges in understanding and addressing financial inclusion, particularly in the setting of digitalization of banking processes through their business models in developing countries.

1. INTRODUCTION

Financial inclusion is the provision of financial services such as credit, savings, insurance, and money transfers to low-income individuals. While these services have shown positive impacts, particularly for women in terms of savings opportunities, their effects on core economic and social poverty indicators are inconsistent. Information technology, according to Asongu and Nwachukwu (2018), plays a significant role in advancing financial inclusion, particularly in bridging the rural-urban divide, empowering women, and enhancing human capital. However, the specific mechanisms through which these goals are achieved remain unclear.

A business model is a sustainable method of creating value and generating profit defining how an organization creates value for its customers through the strategic use of resources to offer better value than competitors (Nielsen & Lund, 2014).

Currently, the banking industry is undergoing a significant transformation due to the rise of digital technology and financial innovation (Broby, 2021). This transformation has led to the emergence of new business models, such as digital banking and Fin-Tech challenger banks, which are disrupting traditional banking models. These changes are driven by the increasing use of digital platforms and

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the availability of a wide range of digital products and services (Dapp et al., 2015). Consequently, banks are facing new challenges and opportunities, exploring strategies such as customer retention, customer acquisition, and banking as a service to adapt to the changing landscape (Broby, 2021).

Our study researches the transformative impact of technology-enabled business models in banking on financial inclusion. By conducting a systematic literature review, we aim to lighten the critical challenges and opportunities in leveraging technology to enhance financial inclusion and underscore the urgent need for further research in this rapidly evolving domain. Through this exploration, we seek to understand how innovative banking models are reshaping access to financial services and identify both the potential and the pitfalls of these technological advancements.

2. LITERATURE REVIEW

The traditional banking system faces significant challenges, including inefficiencies and limitations in its business model (Mehdiabadi et al., 2020). These challenges have a particularly pronounced impact on remote and financially disadvantaged groups, who often struggle to access banking services (Wonglimpiyarat, 2014). The need for technological improvements is clear, with security concerns being a major barrier to the adoption of mobile banking (Islam, 2014).

The transformation of accounting and financial processes through technology is a key focus in the banking sector, with the adoption of new technologies such as Cloud, AI, Big Data, and Blockchain being a significant driver of change (Yoon, 2020). This digital transformation has led to the development of new business models and products, as well as the need for new competencies in the financial sector (Arefjevs et al., 2020). One example of this is the shift towards omni-channel banking, which is being driven by the need to meet customer expectations and create a new customer experience. The role of technology in making financial processes more efficient and accessible is also highlighted, with a focus on the importance of sustainable development in banking business models (Mohammadkhani et al., 2020).

A range of studies have explored the role of banks in promoting financial inclusion. Kim et al. (2018) and Duvendack and Mader (2019) highlight the potential of mobile financial services in this regard, with Kim emphasizing the need for further research on the impact of these services. Hanafizadeh et al. (2014) underscores the importance of understanding the factors driving the adoption of Internet banking, which can also contribute to financial inclusion.

The role of banks in promoting financial inclusion is crucial, as evidenced by the benefits of financial services for consumers, particularly women and the poor (Demirguc-Kunt et al., 2017). However, there are challenges to achieving greater financial inclusion, such as the need for appropriate financial products and services, and the impact of financial innovation, poverty levels, and regulatory frameworks (Ozili, 2020). In Africa, the majority of adults and small and medium enterprises lack access to formal financial services, highlighting the need for improved financial inclusion (Demirgüç-Kunt & Klapper, 2012). In India, various banks have implemented initiatives to promote financial inclusion, but there is still progress to be made (Garg & Agarwal, 2014).

A review of literature from 2010 to 2024 on the influence of technology-enabled business models in banks for financial inclusion reveals several key trends, gaps, and challenges. Studies have consistently shown that appropriate financial services, including those enabled by technology, can significantly benefit consumers, particularly women and the poor (Demirguc-Kunt et al., 2017). However,

there is a need for further research on the actual supply and demand of mobile financial services, as well as their impact on society (Kim et al., 2018). The relationship between financial inclusion and development is also a key area of study, with factors such as human development, income, literacy, and infrastructure playing important roles (Sarma & Pais, 2010). Despite these findings, there is still a lack of consensus on the optimal level of financial inclusion and its potential to transmit systemic risks (Ozili, 2020). Therefore, future research should focus on addressing these gaps and challenges, particularly in the context of emerging economies and developed countries.

The literature on the influence of technology-enabled business models in banks for financial inclusion has seen significant growth and evolution in recent years. Gomber et al. (2017) and Suryono et al. (2020) both highlight the transformative potential of digital finance and fintech, with Gomber emphasizing the shift towards new business opportunities and models, and Suryono identifying the challenges and trends in this field. Demirguc-Kunt et al. (2017) and Ozili (2020) underscore the importance of financial inclusion in driving inclusive growth and economic development, with Ozili specifically noting the influence of financial innovation, poverty levels, and regulatory frameworks. However, there is a need for further research to address gaps in the literature, particularly in exploring the impact of digital finance and fintech on financial inclusion in both emerging economies and developed countries.

The impact of digitalization on banking practices is a complex and multifaceted issue. Ozili (2019) highlights the potential of digital finance to enhance financial inclusion and stability, particularly in developing and emerging economies. However, Vives (2019) cautions that while digital disruption can increase efficiency and customer welfare, it also poses challenges to traditional banking models. Sardana and Singhania (2018) and Kudryavtseva et al. (2018) both emphasize the transformative power of digital technology in the banking sector, with Sardana focusing on the Indian context and Kudryavtseva on Russia. Despite the potential benefits, both authors also note the need for effective regulation and investment to fully realize the potential of digitalization in banking.

3. MATERIALS AND METHODS

The authors utilized the PRISMA technique and employed articles classified by document type for this review. The analysis only includes publications and reports sourced from the Web of Science database. After the collection of papers, the research was extended and further comprehensive information on the grey literature was incorporated. The search was undertaken by the writers in March - April 2024.

The procedures that were adhered to and the criteria for being included at each stage were documented in Figure 1. Articles about financial inclusion, banking services, and business models, which might be located in the journal's title, abstract, or keywords were incorporated initially. Employing identical search terms, the authors implemented a thorough screening process of all the publications, studies, and reports obtained in the initial stage during a subsequent phase. As a result, the final screening did not contain the entirety of books, book chapters, editorial material, comments, and quick surveys.

During the initial stage, the search terms "financial inclusion" and "banking service" yielded a total of 1,619 items. During the verification step, the authors excluded 636 entries from the dataset because their publication dates did not fall within the range of 2020–2024. In addition, 367 entries that represented document types other than articles and reports were removed. The first

meta-analysis, done using the PRISMA approach, integrated the topics of Financial Inclusion and Banking Service. This analysis focused on the important terms used in the review. An additional examination of the Web of Science was undertaken using the years 2020 through 2024 which yielded a list of 616 publications.

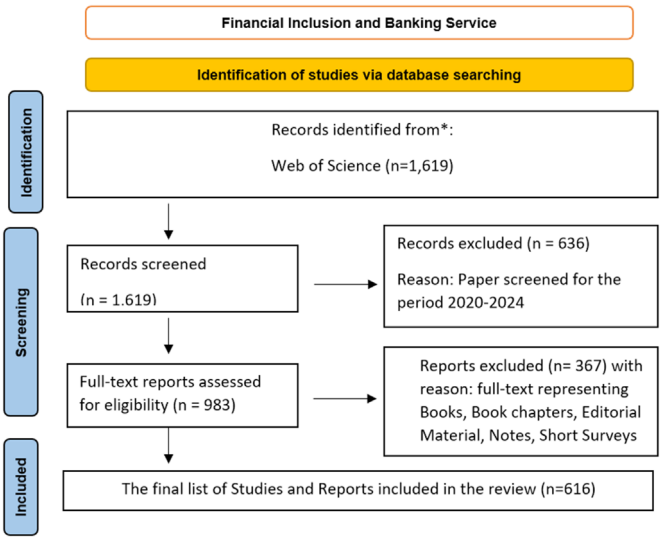

Figure 1. PRISMA flowchart of literature review process based on the combined search of two keywords: *Financial Inclusion* and *Banking Service*. As shown, from a total of 1619 records initially retrieved, only 616 records were included. All these articles were published during 2020-2024

Source: Own research

The following stage of investigation analyzed two more concepts: "financial inclusion" and "business models". A further meta-analysis was undertaken using the same PRISMA approach. Figure 2 shows a schematic illustration of the method used to progress the literature review for this combination of keywords.

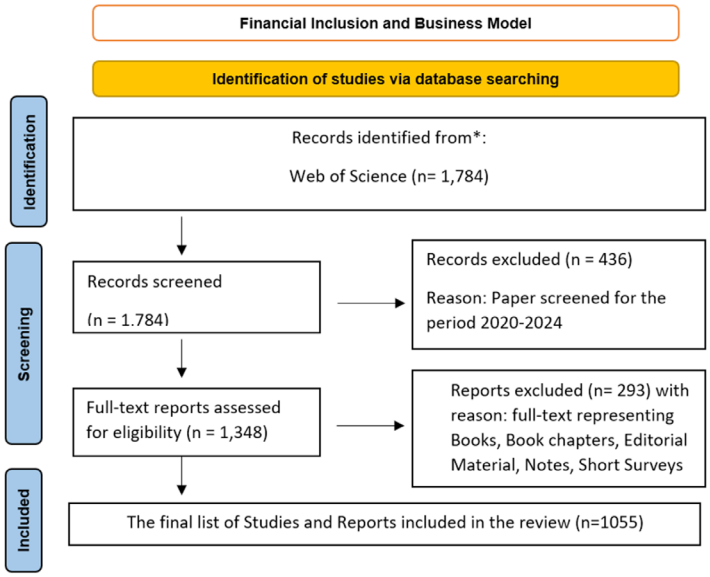

Figure 2. PRISMA flowchart of literature review process based on the combined search of two keywords: *Financial Inclusion and Business Model*. As shown, from a total of 1784 records initially retrieved, only 1055 records were included. All these articles were published during 2020-2024

Source: Own research

During the second phase, a total of 1,784 entries were generated while searching for the terms "financial inclusion" and "business models". During the verification step, the authors excluded 436 entries from the dataset since their publication dates were not within the range of 2020-2024. In addition, 293 entries that represented document types other than articles and reports were removed.

Two methodologies were employed to extract data from the selected articles and conduct research for the "Banking Service-Financial Inclusion" and "Business Model-Financial Inclusion" inquiries:

1. A structured template displayed 10 publications sorted by Web of Science (WoS) categories to summarize the study results.
2. Using the combined data from the research, a TreeMap Chart (shown in the summary below) was produced to represent the main subjects discussed in these publications. Each category's importance was calculated as a percentage of articles.
3. Co-citation analysis and reference inspection were also performed. This approach produced a visual representation of the most frequently cited sources, sorted into clusters and items, identifying the authors, journals, and linked entities.

4. META-SYNTHESIS RESULTS

4.1. Results for the Couple: Financial Inclusion and Banking Service

The discussion that follows will focus on the results of the initial inquiry into financial inclusion and banking services. It is essential to identify the relevant topics and primary issues addressed in the performed research. To demonstrate and understand the current relevance of the research undertaken for Financial Inclusion and Banking Service for the years 2020–2024, these topics were analysed in addition to the top ten record count publications. Consequently, each selected research study was thoroughly reviewed and assessed based on the theoretical interpretations that the authors attributed to the issues and results they presented in their publications.

Table 1. Top 10 record count publications based on WoS Categories, for the couple: financial inclusion and banking service

SELECT ALL	FIELD: WEB OF SCIENCE CATEGORIES	RECORD COUNT	% OF 573
	Economics	186	32.461%
	Business Finance	102	17.801%
	Business	101	17.627%
	Management	44	7.679%
	Development Studies	32	5.585%
	Green Sustainable Science Technology	28	4.887%
	Environmental Studies	27	4.712%
	Social Sciences Interdisciplinary	26	4.538%
	Environmental Sciences	23	4.014%

Source: Own research

Moreover, an examination of the associations linked to the primary entities comprising this complex research subject demonstrates that India, the United Kingdom, and the United States are the most prolific countries.

Figure 3 (Panel a) presents co-citation of authors, which shows the connections between authors in the field. In this context, it highlights the most collaborative authors and influential scholars

working on this topic. By establishing a threshold of a minimum of five citations for an author, the authors derived a total of 951 instances distributed across four main clusters as shown below. The investigation identifies three exemplary figures, each representative of a designated cluster. Specifically, Thorsten Beck from the red cluster, Simplice A. Asongu is highlighted from the green cluster, Viswanath Venkatesh from the purple cluster, Annamaria Lusardi from the yellow cluster.

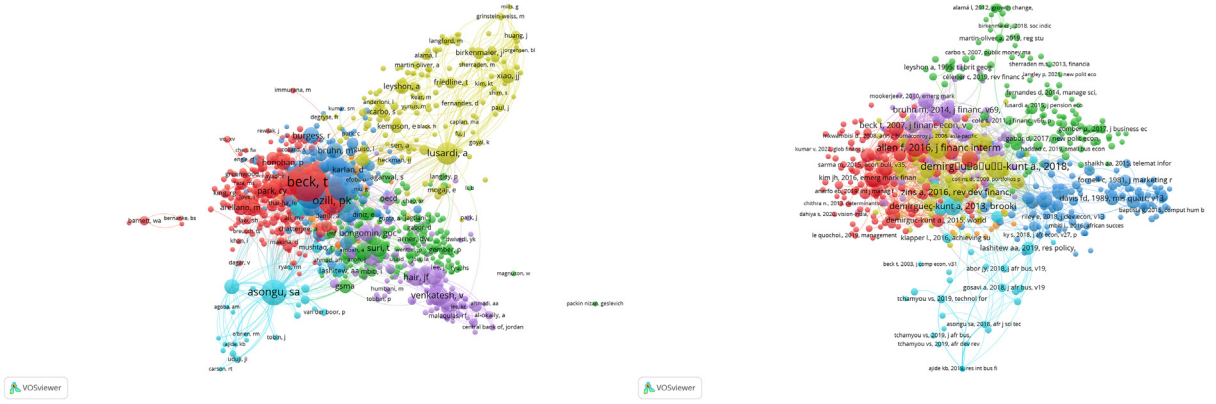

Figure 3. VOSviewer diagram containing the most cited authors (Panel a) and papers (Panel b) with at least 5 citations (top 500), for the couple: financial inclusion and banking service

Source: Own research

Simultaneously, Figure 3 (Panel b) represents the co-citation of references. It shows which references are commonly cited together. This visualization helps in identifying seminal works and the development of research themes. By setting a threshold of five minimum number of cited references, 583 papers were identified which were then classified into six clusters, as illustrated in Figure 3 (Panel b), utilizing VOSviewer.

4.2. Results for the Couple: Financial Inclusion and Business Model

A comprehensive analysis of the findings from the initial inquiry concerning the convergence of business model and financial inclusion will be provided. These focal areas, along with the ten most prolific publications chosen for their record count, help explain the current significance of conducted studies and the future of financial inclusion and business models. From 2020 to 2024, it is important to identify the study subjects and their main problems. Thus, each specified study was carefully examined and explained, comparing the authors' theoretical frameworks to their publications' content and findings.

Table 2. Top 10 record count publications based on WoS Categories, for the couple: financial inclusion and business model

SELECT ALL	FIELD: WEB OF SCIENCE CATEGORIES	RECORD COUNT	% OF 816
	Economics	197	24.142%
	Business	141	17.279%
	Business Finance	125	15.319%
	Management	102	12.500%
	Environmental Sciences	74	9.069%
	Green Sustainable Science Technology	65	7.966%
	Environmental Studies	64	7.843%
	Energy Fuels	24	2.941%
	Multidisciplinary Sciences	24	2.941%

Source: Own research

Figure 4 (Panel a) presents co- citation of the authors. By establishing a threshold of a minimum of five citations for an author, the authors derived a total of 831 instances distributed across four main clusters as shown below. The investigation identifies three exemplary figures, each representative of a designated cluster. Specifically, Hashem Pesaran from the red cluster, Thorsten Beck and World Bank are highlighted from the blue cluster and Viswanath Venkatesh from the purple cluster.

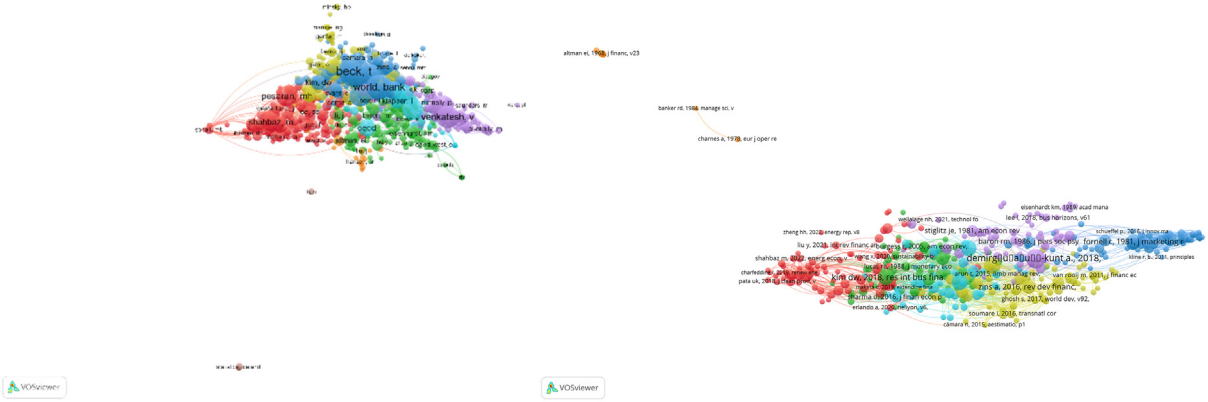

Figure 4. VOSviewer diagram containing the most cited authors (Panel a) and papers (Panel b) with at least 5 citations (top 500), for the couple: financial inclusion and business model.

Source: Own research

Simultaneously, Figure 4 (Panel b) represents the co-citation of references. By setting a threshold of five minimum number of cited references, 390 papers were identified which were then classified into six clusters, as illustrated in Figure 3 (Panel b), utilizing VOSviewer.

5. DISCUSSION

This study systematically examines the impact of technology-enabled business models in banks on financial inclusion, highlighting both the transformative effects and the challenges encountered. Our research reveals that these business models significantly contribute to financial inclusion in developing countries by providing access to essential financial services, such as savings, credit, and insurance, to underserved populations. This transformation is facilitated by the digitalization of banking processes, which reduces costs and improves service delivery, making financial services more accessible and efficient.

However, the adoption of these models also presents significant challenges. The main hurdles include technological barriers, regulatory constraints, and the risk of over-indebtedness among new consumer segments. Additionally, there is a critical need for more inclusive strategies that address the diverse needs of different demographic groups, such as women and rural populations, to fully leverage the potential of technology in promoting financial inclusion.

To further enhance the positive impact of technology-enabled business models on financial inclusion, the following solutions are recommended:

1. **Regulatory Innovation**: Implement regulatory changes that encourage innovation while ensuring consumer protection, such as sandbox approaches that allow for testing new financial services under regulatory supervision.
2. **Technology Adaptation and Training**: Invest in technology infrastructure and training programs to improve digital literacy among the population, thereby increasing the adoption rates of digital financial services.

3. **Inclusive Financial Products**: Develop financial products that specifically target the needs of underserved groups, such as microinsurance and microsavings products that are accessible and affordable.

By addressing these areas, banks can better leverage technology-enabled business models to significantly boost financial inclusion and contribute to economic development in developing countries.

6. CONCLUSION

In conclusion, technology-enabled business models in banks have a profound impact on financial inclusion in developing countries, offering significant opportunities to extend financial services to marginalized groups. However, to maximize these benefits, it is crucial to address the associated challenges through enhanced regulatory frameworks, targeted technological interventions, and inclusive financial products that cater to the needs of diverse populations. Future research should continue to explore innovative solutions and strategic approaches to overcome these barriers and sustain the gains in financial inclusion achieved through technological advancements.

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Navigating the Evolution of Large Language Models in Business Analysis: A Comparative Study of RAG, Prompt Engineering, and Fine-Tuning Techniques

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Abstract: *The rapid advancements in large language models (LLMs) could prove to have significantly impacted the field of business analysis, particularly in the development of domain-specific languages (DSLs) tailored to describe business requirements with precision and flexibility. The study highlights the substantial progress in LLM capabilities, including extended context understanding, enhanced reasoning, and mathematical functionalities, which collectively facilitate deeper integration of domain-specific knowledge into business analysis processes.*

The authors critically assess the relevance of Retrieval Augmented Generative techniques that offer advanced knowledge injection methods, along with prompt engineering reasoning techniques, as opposed to fine-tuning LLMs. Furthermore, the research evaluates the strategic decision-making process for business analysts in adopting these technological advancements. The paper discusses whether business analysts should take a proactive or cautious approach when incorporating these AI-driven methodologies into their analytical frameworks, or just wait for the next turn of LLM's improvements.

By examining various case studies and conducting interviews with experts, this study provides insights into how the deliberate application of advanced LLM techniques can offset the services brought by RAG/Prompt engineering techniques. The text also provides guidance for navigating the technological landscape, indicating that it is important to stay updated with rapid advancements. A strategic combination of RAG, prompt engineering, and fine-tuning can provide a balanced and effective approach to creating intentional frameworks that meet the evolving needs of businesses today.

1. INTRODUCTION

In recent years, the field of artificial intelligence (AI) has witnessed significant advancements, particularly in the development of large language models (LLMs). LLMs are powerful AI systems trained on vast amounts of text data, enabling them to understand, generate, and manipulate human language with remarkable accuracy. These models have demonstrated impressive capabilities in various natural language processing (NLP) tasks, such as text generation, question answering, and sentiment analysis.

LLMs are typically based on deep learning techniques, such as transformers, and have the capability to generate useful language output. As a result, they have been found capable of performing a wide range of language-related tasks, including text generation, answering questions, translation, summarization, and sentiment analysis.

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While LLMs have been widely applied to tasks involving natural languages, their application to software development tasks, involving programming languages, has also gained significant recent attention.

The emergence of LLMs has the potential to revolutionize the field of business analysis, which heavily relies on the effective communication and interpretation of complex business requirements. Business analysts play a crucial role in bridging the gap between stakeholders and technical teams, ensuring that business needs are accurately translated into actionable solutions. The integration of LLMs into business analysis processes could significantly enhance the precision and flexibility of domain-specific languages (DSLs) used to describe business requirements.

DSLs are specialized languages designed to express concepts and relationships within a specific domain, such as finance, healthcare, or e-commerce. By leveraging the advanced capabilities of LLMs, business analysts can develop more sophisticated and adaptable DSLs that capture the nuances and complexities of their respective domains. This integration has the potential to streamline communication, reduce ambiguity, and improve the overall efficiency of the business analysis process.

1.1. Significance of LLMs in Business Analysis

This study aims to explore the frontier of LLMs in order to create a taxonomy of the landscape of possibilities, with a specific focus on the development of business-oriented strategies for companies.

The first research question of the study is to create a framework to understand the different directions of evolution of the tools, with a focus on transferring the internal knowledge of the companies (be it a corpus of internal rules or business requirement gatherings) that are actually an external source to LLMs themselves.

The landscape is very fragmented, the authors want to explore different lines, where single tools, applications, models, and solutions represent them as dots in these lines. The main areas to focus on in injecting knowledge in LLMs are prompt engineering, Retrieval Augmented GenerativeAI and fine-tuning techniques to meet the evolving needs of businesses.

1.2. Objectives and Scope of the Study

Dell'Acqua et al. (2023a) introduced the analysis of the "jagged" LLM frontier in regard to the utilization of generative AI in the workplace. The work introduces some important research on evaluating the impact, bringing in general important positive results. What we want to stress in our present paper is the concept of the frontier itself, like a defensive wall with ramparts, defensive towers and also outposts outside the frontier. To achieve these objectives, the present study examined various case studies and conducted interviews with experts in the field. By synthesizing the findings, this research aims to contribute to the growing body of knowledge on the application of LLMs in business analysis and provide practical insights for business analysts seeking to harness the potential of these advanced AI techniques.

2. LITERARY REVIEW

Large Language Models (LLMs) have emerged as a transformative force in the field of artificial intelligence, revolutionizing the way we approach natural language processing and generation tasks. The authors introduce some cutting-edge research and developments that define the frontier of LLMs, focusing on four key areas: architectures and training, evaluation and benchmarking, applications and use cases, and limitations and challenges.

In LLM architectures and training, researchers are pushing the boundaries to find optimal ways to navigate the complex landscape of pretraining and downstream capabilities. C. J. Yang (2024) tackles this challenge head-on, providing valuable insights into striking the right balance for maximum performance. Meanwhile, Lieber et al. (2024) introduce Jamba, a hybrid architecture that combines the strengths of Transformer and Mamba models, paving the way for more efficient and effective LLMs. Jang et al. (2024) challenge the status quo by demonstrating that fine-tuning a small number of models can achieve impressive results, questioning the need for extensive fine-tuning and offering a more streamlined approach.

As LLMs continue to evolve, so do the methods for evaluating and benchmarking their performance. Fan et al. (2023) uncover the hidden potential of LLMs as powerful text encoders, expanding their applicability beyond traditional language tasks. Wahle et al. (2023) shed light on the intricate web of influence between Natural Language Processing and other academic disciplines, emphasizing the importance of interdisciplinary collaboration in the development and assessment of LLMs. Liu et al. (2023) introduce G-Eval, a cutting-edge evaluation framework that leverages the capabilities of GPT-4 to achieve better human alignment in Natural Language Generation, setting a new standard for LLM evaluation.

The frontier of LLMs is not limited to theoretical advancements; it also encompasses a wide range of applications and use cases. Dell'Acqua et al. (2023a) conduct groundbreaking experiments that reveal the significant impact of LLMs on knowledge worker productivity and quality, highlighting their transformative potential in the workplace in collaboration with BCG. Tao et al. (2024) propose MAGIS, an innovative multi-agent framework powered by LLMs, which tackles complex tasks such as GitHub issue resolution, demonstrating the versatility and practicality of these models. Krishnamurthy et al. (2024) present the concept of in-context learning, exploring the capabilities and limitations of LLMs in this area and providing valuable insights for future research.

By leveraging the advancements in extended context understanding, enhanced reasoning capabilities, mathematical functionalities, and the integration of domain-specific knowledge, LLMs have the potential to significantly enhance the accuracy, efficiency, and value of business analysis processes.

2.1. Integration of Domain-Specific Knowledge: Fine-Tuning Techniques

One of the most promising advancements in LLMs is their ability to integrate domain-specific knowledge. By training LLMs on large corpora of text data from specific domains, such as finance, healthcare, or e-commerce, these models can acquire a deep understanding of the terminology, concepts, and relationships within those domains (Beltagy et al., 2019; Chalkidis et al., 2020). This enables LLMs to generate more accurate and relevant outputs when applied to business analysis tasks. For example, an LLM trained in financial data can assist business analysts in tasks such as market analysis,

risk assessment, and investment decision-making (Chalkidis et al., 2020; Cheng et al., 2024; Zhao et al., 2024). Similarly, an LLM trained on healthcare data can support business analysts in tasks related to patient care, clinical workflows, and regulatory compliance.

At its core, fine-tuning involves training a pre-trained LLM on a smaller, task-specific dataset to adapt its knowledge and capabilities to a particular application. This process allows LLMs to acquire specialized knowledge and skills, enhancing their performance on downstream tasks. Fine-tuning has proven to be a powerful approach, enabling LLMs to achieve state-of-the-art results in various natural language processing tasks, such as question-answering, text classification, and language translation. It encompasses even human task management and execution (Dell'Acqua et al., 2023a).

However, the fine-tuning landscape is not without its challenges. One of the primary difficulties lies in the resource-intensive nature of fine-tuning large models. As LLMs continue to grow in size, with some models reaching billions of parameters, fine-tuning becomes computationally expensive and time-consuming. This poses a significant barrier to entry for researchers and developers with limited computational resources. To address this challenge, researchers have proposed various techniques to optimize the process. C. Yang et al., (2024) introduce a comprehensive study that proposes methods to analyze and optimize the pretraining process, enabling more efficient fine-tuning and improved performance on downstream tasks.

Another approach to mitigate the resource constraints of fine-tuning is the development of parameter-efficient fine-tuning methods. Jang et al. (2024) present Model Stock as an efficient fine-tuning method that achieves superior accuracy using significantly fewer models. This approach, coined as Model Stock, offers a more streamlined and cost-effective solution for fine-tuning large models.

The evaluation and benchmarking of fine-tuned models is another critical aspect of the fine-tuning landscape. Accurate assessment of model performance is essential for understanding the effectiveness of fine-tuning techniques and identifying areas for improvement. Liu et al. (2023) propose G-Eval a framework that utilizes GPT-4 with chain-of-thoughts and a form-filling paradigm to assess the quality of Natural Language Generation (NLG) outputs. By leveraging the capabilities of GPT-4, G-Eval aims to provide a more reliable and human-aligned evaluation metric for fine-tuned models.

However, the application of fine-tuned models also introduces new challenges, particularly in terms of model interpretability and bias.

To further advance the field of fine-tuning, researchers are exploring innovative approaches that push the boundaries of what is possible with LLMs. One such approach is the development of instruction-tuned models, which are fine-tuned on a diverse set of instructions and tasks to acquire a broad range of skills. Yi Tay (2024) introduces a new open-source instruction-tuned model that demonstrates impressive performance across multiple benchmarks, by combining instruction tuning with the UL2 (Mixture of Denoisers) objective, this model achieves state-of-the-art results while being openly accessible to the research community.

Another frontier in fine-tuning is the development of frameworks and tools that streamline the fine-tuning process and make it more accessible to a wider audience. The AI Collective (2024) presents "Axolotl," a tool designed to simplify the fine-tuning of various AI models, supporting multiple configurations and architectures. Axolotl enables users to easily fine-tune models using a simple configuration file.

2.2. Prompt Engineering

Prompt engineering has emerged as a critical skill for unlocking the full potential of large language models (LLMs). It represents in a way the capability to transfer to the model the specific knowledge of the user, or the capability to "program" the model itself.

At its core, prompt engineering involves creating carefully designed prompts that guide LLMs toward generating desired outputs. As Hosni (2024) emphasizes, this is not a one-size-fits-all approach, but rather an iterative process that requires ongoing refinement and optimization. By engaging in a continuous cycle of prompt development, testing, and improvement, developers can create prompts that are tailored to the specific needs and goals of their applications, resulting in more accurate and relevant outputs from the LLMs.

One of the key areas where prompt engineering has shown significant promise is in retrieval-augmented generation (RAG) systems. As Olickel (2024) highlights, effective prompt engineering can play a crucial role in reducing the distance between questions and answers in RAG systems. By carefully designing prompts that guide the model towards relevant information and encourage concise and accurate responses, users can enhance the overall effectiveness and usability of AI applications.

The potential for automating prompt engineering is another interesting development in this field. NousResearch (2024) introduces Genstruct 7B, an instruction-generation model that can automatically create valid instructions from raw text corpora. This opens up new possibilities for streamlining the prompt engineering process, allowing developers to quickly generate suitable prompts for fine-tuning their LLMs.

Prompt engineering is not limited to specific applications or domains but rather has broad implications across various fields. Hong et al. (2024) demonstrate this through their multi-agent framework for data science tasks, which incorporates prompts and LLMs to guide problem-solving. This highlights the versatility of prompt engineering and its potential to enhance the performance and usability of LLMs in diverse contexts, from data analysis to scientific research.

As the field of prompt engineering continues to evolve, frameworks and tools are being developed to support and automate the process. Eladlev (2024) introduces AutoPrompt, a framework for automating prompt tuning using intent-based prompt calibration. By providing a systematic approach to optimize prompts based on the intended use case, AutoPrompt aims to make prompt engineering more accessible and efficient for developers.

In addition to these frameworks, there are also "programming" prompt engineering frameworks that aim to streamline the process of working with LLMs. For instance, GuidanceAI (2024) introduces Guidance, a programming paradigm that offers superior control and efficiency compared to conventional prompting and chaining. It allows users to constrain generation, interleave control structures, and seamlessly integrate with various LLMs.

Huang (2024) presents an approach to prompt engineering using direct preference optimization (DPO) for descriptiveness. This method involves training a model to generate more descriptive prompts by optimizing for human preferences.

Another notable development in prompt engineering is the DSPy framework introduced by a research team at Stanford (Khattab et al., 2023). DSPy is designed to algorithmically optimize LM prompts and weights, especially when LLMs are used multiple times within a pipeline. By separating the program flow from the parameters of each step and introducing new optimizers, DSPy enables the systematic tuning of prompts and weights based on a desired metric. This framework has the potential to make prompt engineering more efficient and effective, allowing developers to focus on building complex systems rather than manually tweaking prompts.

The emergence of "programming" prompt engineering frameworks, such as guidance and DSPy, further empowers developers to build sophisticated LLM-based applications with ease, paving the way for a future where LLMs are seamlessly integrated into a wide range of software systems.

2.3. Retrieval-Augmented Generation - Enhancing LLMs with External Knowledge

Retrieval-Augmented Generation (RAG) has emerged as a new approach in the first months of 2023 in the field of natural language processing, aiming to address the limitations of Large Language Models (LLMs) by integrating external knowledge sources.

Basically, RAG is designed to augment LLMs with the ability to access and incorporate information from vast, dynamic repositories. By enabling LLMs to retrieve relevant knowledge from external sources, RAG enhances the accuracy and credibility of the generated content, particularly in knowledge-intensive tasks (Bansal, 2024; Olickel, n.d.; Sahota, 2023). This symbiotic relationship between LLMs and external knowledge bases allows RAG systems to leverage the best of both worlds - the intrinsic knowledge of LLMs and the vast, up-to-date information available in external databases.

One of the key challenges in developing effective RAG systems is ensuring the quality and factuality of the generated content. To address this, researchers have proposed advanced RAG techniques that incorporate self-reflection and adaptive retrieval mechanisms. For instance, Asai et al. (2023) introduce Self-RAG, a framework that enhances an LLM's quality and factuality through retrieval and self-reflection using special tokens called reflection tokens.

Similarly, Jeong et al. (2024) propose Adaptive-RAG, a novel approach that dynamically selects the most suitable retrieval strategy based on query complexity. By employing a classifier trained to predict the complexity level of incoming queries, Adaptive-RAG offers a balanced strategy that seamlessly adapts between iterative and single-step retrieval-augmented LLMs, as well as no-retrieval methods.

Despite the advancements in RAG techniques, some argue that the increasing capabilities of long-context LLMs may diminish the need for RAG in the future. However, researchers and applicants (Saravia, 2024) point out that long-context LLMs alone may not be sufficient to replace RAG, especially when dealing with complex and dynamic data. The authors suggest that RAG will continue to play a significant role in LLM interactions, particularly in scenarios involving highly evolving information and knowledge.

The effectiveness of RAG systems heavily relies on the retrieval component, which is responsible for selecting the most relevant information from the external knowledge base. To evaluate

and optimize the retrieval process, various metrics and frameworks have been proposed. For instance, an important part of RAG initiatives relies on the evaluation process (Nguyen, 2024) as researchers emphasize the importance of annotated data and discuss commonly used metrics such as precision, recall, and score.

As RAG systems continue to evolve, researchers are exploring advanced techniques to enhance their performance and applicability. C. J. Yang (2024) introduces the concept of recursive retrieval, Page-Based, Information-Centric, and Concept-Centric - and highlights their potential to improve the efficiency and effectiveness of RAG systems by iteratively refining the retrieved information.

Moreover, RAG techniques are being applied to various domains beyond traditional question-answering tasks. Sher (2024) demonstrates the use of LangChain ReAct Agents for answering multi-hop questions in RAG systems, showcasing the potential of RAG in complex reasoning scenarios.

In conclusion, Retrieval-Augmented Generation has emerged as a transformative approach in the field of natural language processing, enabling LLMs to access and incorporate external knowledge for enhanced accuracy and credibility. Through advanced techniques such as self-reflection, adaptive retrieval, and recursive retrieval, RAG systems are pushing the boundaries of what is possible with LLMs.

3. THE ARTIFACT PROPOSAL

In the literary review, we conveyed a sense of the emergence of the technical solutions for our field of study which is the injection of company information (business analysis) in the generative AI tools. On one side RAG combined with fine-tuning seems to be one interesting direction to go, but to date, there is no consensus for an emergent solution when it comes to addressing the mise-en production of an application.

The most promising should be the RAG methodology, but it suffers from the problems of the search: not perfectly finding in a document the correct chunk of information to pass to the Transformer. So we keep over-engineering, reranking, vectorial distance, and ultimately semantic search.

To address this specific challenge, we propose the creation and maintenance of an automated approach for discovering and monitoring those emerging frontiers in LLM research. This approach leverages the power of natural language processing (NLP) techniques and machine learning algorithms to analyze a large corpus of research papers and identify the most salient topics and trends.

The process begins by collecting a comprehensive set of research papers relevant to the LLM domain. In our case study, we assembled a collection of more than 300 papers spanning various aspects of LLMs, such as architectures, training techniques, evaluation methods, and applications. These papers were sourced from leading academic journals, conference proceedings, and preprint repositories to ensure a diverse and representative sample of the current research landscape.

Next, we applied an automated pipeline to extract and process the key information from each paper, focusing on two essential components: the abstract and the keywords. To automate the

extraction and analysis of this information, we employed a prompt engineering technique in order to extract keywords and then using a discovery approach, allowed us to identify and extract relevant entities, phrases, and relationships from the abstracts, creating a structured representation of the key concepts and ideas present in each paper.

Once the information was extracted and processed, we applied a dynamic analysis in order to identify coherent clusters of papers (Figure 1) that share similar topics and concepts, revealing the main areas of focus and emerging trends in LLM research.

The resulting clusters and topics were then visualized providing a clear and intuitive representation of the research landscape in the form of an interactive tag cloud, allowing users to explore the relationships between different topics, identify the most prominent themes, and discover potential gaps or underexplored areas in the current research.

To ensure the relevance of the tag cloud, we propose a continuous monitoring and update process: as new research papers are published, they can be automatically ingested into the pipeline, analyzed, and incorporated into the existing clusters and topics. This dynamic updating mechanism could enable the artifact to evolve and adapt to the latest developments in the field, helping users stay informed about emerging frontiers and potential areas for further investigation.

This provides a comprehensive and up-to-date overview of the research landscape, enabling researchers and practitioners to quickly identify the most relevant and promising areas for their work. It also facilitates the identification of potential collaborators and the formation of interdisciplinary teams to tackle complex challenges at the intersection of different research domains.

Moreover, the tag cloud serves as a valuable tool for decision-makers, such as agencies and industry leaders, to assess the current state of the art and make informed decisions about resource allocation and strategic investments. By highlighting the most active and promising areas of research, the tag cloud can guide the prioritization of research efforts and the development of targeted initiatives to address critical challenges and opportunities in the field.

4. CONCLUSION

The research presented highlights the importance of exploring innovative approaches to address the challenges and limitations faced by current Retrieval-Augmented Generation (RAG) systems in the context of business analysis and generative AI. The automated discovery and monitoring of emerging frontiers in Large Language Model (LLM) research, through the use of a dynamically updated tag cloud, have revealed several promising directions for future research and development.

One of the key findings is the potential of agent-based approaches, such as the Mixture of Experts (MoE) technique employed in models like Mixtral 7bx8, to refine search results and enhance the performance of RAG systems (Cohere, 2024; Drouin et al., 2024; Honchar, 2024). By leveraging the specialized knowledge and skills of multiple agents, these approaches can effectively navigate the complex landscape of unstructured data and identify the most relevant information for a given query even with the correct dubitative approach on real capabilities of LLMs to cover this area (Krishnamurthy et al., 2024).

Figure 1. Mind map of topics and subtopics of the Jagged Frontier
Source: Own research

Another critical insight derived from our analysis is the need for long-context models that can maintain the memory of external information throughout the search process. The MemGPT framework by Packer et al. (2024) has emerged as a promising solution to this challenge, demonstrating the ability to overcome the limitations imposed by the restricted context lengths of traditional LLMs. By enabling long-term memory, consistency, and dynamic evolution in conversational agents, MemGPT sets a new benchmark for LLM performance and applicability in domains such as business analysis and generative AI.

As long as we explore the agentic landscape, we can also leverage the capabilities of LLM to follow a functional calling in the various steps of retrieval. In addition to agent-based approaches and long-context models, another emergent area worth investigating in the direction of Business Analysis is an innovative approach called Rule-Based Conditional Retrieval. This approach could help in exactly mimicking the Domain Specific Language logic, bringing the knowledge inside the rules of retrieval. The Rule-based Retrieval package consists of several key components, including a Client class for managing resources and performing RAG-related tasks, a Rule class for defining custom filtering rules for retrieving documents, and various utility modules such as embedding, processing, and exceptions.

By incorporating Rule-Based Conditional Retrieval into RAG systems, businesses can potentially achieve more accurate and relevant results when querying their knowledge bases. This approach allows for the integration of domain-specific rules and logic directly into the retrieval process, ensuring that the retrieved information is not only relevant to the query but also adheres to the specific requirements and constraints of the business domain.

However, the success of these advanced RAG systems, long-context models, and rule-based retrieval approaches relies on the development of robust evaluation tools and methodologies. Our research highlights especially the need for improved evaluation frameworks that can assess the quality, relevance, and coherence of the generated outputs, as well as the efficiency and effectiveness of the retrieval process. By establishing standardized evaluation metrics and benchmarks, researchers and practitioners can more accurately compare and contrast different approaches, driving further innovation and refinement in the field.

Looking ahead, the integration of agent-based techniques, long-context models, rule-based retrieval, and reinforcement learning with user interaction control presents an exciting frontier for future research. This convergence of technologies could give rise to a new generation of agentic AI systems that exhibit unprecedented levels of understanding, responsiveness, and adaptability. By learning from user feedback and continuously refining their knowledge and strategies, these agentic AI systems have the potential to revolutionize the way businesses analyze data, generate insights, and make decisions.

In conclusion, the automated discovery and monitoring of emerging frontiers in LLM research, coupled with the insights derived from our analysis, indicate the near future development of RAG systems and generative AI in the context of business analysis: agent-based approaches, long-context models, rule-based retrieval, improved evaluation tools, and the principles of agentic AI, researchers and practitioners can unlock the full potential of these technologies, staying afloat on the ever-changing innovations brought in the field.

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Transforming the CRM Diamond Model with Genetic Data Integration

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Abstract: *This paper explores the integration of genetic data into the CRM Diamond model, proposing a new model for CRM-Diamond with the incorporation of customer genetic data. It offers insights into the implications for customer relationship management (CRM), emphasizing enhanced customer segmentation, personalized marketing strategies, and improved engagement. However, this integration presents challenges related to data privacy, ethical considerations, and regulatory compliance. The study examines these challenges and proposes strategies for responsible implementation while ensuring transparency and trust in customer relationships. The proposed integration involves redefining the CRM Vision to prioritize hyper-personalization, adapting core CRM activities to accommodate genetic data, and emphasizing robust data privacy measures. This research aims to inform businesses about the transformative potential of genetic insights in CRM processes and the importance of ethical and compliant practices.*

1. INTRODUCTION

In the dynamic realm of business and technology, customer behavior undergoes continual evolution, shaped by innovations and societal shifts. An emerging transformative force is the integration of genetic data into Customer Relationship Management (CRM) systems, signaling a new era in customer data management and marketing strategies. This paper explores the implications of incorporating genetic insights into the CRM Diamond model, developed by Mack et al. (2005), a framework traditionally used for optimizing customer relationships. The convergence of genetic science and business strategy offers unprecedented opportunities for businesses to gain deeper insights into customer preferences, behaviours, and predispositions (Carey, 2013; Conway & Slavich, 2017; Daviet et al., 2022; Kuechle, 2019). Genetic marketing, driven by advancements in behavioral genetics (Baker, 2004), enables more precise customer segmentation and personalized marketing experiences. However, integrating genetic data into CRM systems raises ethical and regulatory considerations regarding data privacy and consent. This study investigates the integration of genetic data into the CRM Diamond model, aiming to understand its impact on customer segmentation and relationship management. By examining challenges and opportunities, the research proposes strategies for responsible implementation while maintaining ethical standards. Drawing on existing literature and industry insights, this paper aims to inform businesses about the transformative potential of genetic insights in enhancing CRM processes and delivering more tailored customer experiences.

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2. THE EVOLVING LANDSCAPE OF CUSTOMER RELATIONSHIP MANAGEMENT

Customer Relationship Management (CRM) has evolved significantly, transitioning from a technological tool to a strategic approach (Nasir, 2015; Payne, 2006; Sheth & Parvatiyar, 2000; Steinhoff et al., 2022) emphasized sustainable CRM, resonating with the evolving mindset toward positively influencing customer behaviour (Avdagić-Golub et al., 2022). CRM is a holistic strategy integrating customer-centric philosophy, strategic marketing processes, and long-term relationship building (Stanimirov, 2013) to ensure the effective execution of a company's marketing strategy (Georgieva & Kehayova, 2007). Today, CRM encompasses various elements, incorporating sales management, data analysis, and personalized offerings driven by accumulated customer data (Meha, 2021). Marketing reality is seen as a complex web of relationships, its description forms an interconnected array of concepts and models (Kotler et al., 2021; Uzunova et al., 2010) while connectivity stands as the pivotal factor reshaping the marketing landscape, altering market dynamics and the nature of interactions between competitors and customers. Technological advancements provide new avenues for CRM development, enabling the use of innovative solutions like machine learning and artificial intelligence for hyper-personalization or one-to-one marketing (Kotler et al., 2021) reshaping traditional strategic frameworks in marketing (Hoffman et al., 2022). Many companies already engage in direct customer-to-customer (C2C) interactions, leveraging audience engagement with specific brands. Today's customer relationships embody four key features: data-driven, subscription-based, sharing-based, and experience-based (Steinhoff et al., 2022). The growing volume of customer data underscores the need for effective management (via CRM software) and analysis to enhance personalization. However, safeguarding consumer data in large datasets becomes crucial, driven not only by marketing needs but also by legal and regulatory obligations in developed markets. Developed markets transition from an experience economy to a transformation economy (Pine & Gilmore, 2013) with emerging forms of digital reality altering human cognition, necessitating adaptations in marketing strategies based on changed behavioral patterns (Ball et al., 2021). Various models exist in marketing theory and practice to manage customer relationships, guiding organizations in understanding the factors and processes involved in acquiring, converting, and retaining customers. The CRM models serve as a comprehensive workflow, directing all organizational interactions with potential clients.

3. BRIEF OVERVIEW OF THE CRM-DIAMOND MODEL

Mack et al. (2005) introduced the CRM-Diamond model, incorporating key elements of CRM strategy, emphasizing increased customer loyalty, targeted customer control, and improved customer awareness (Mack et al., 2005). The first core element, the CRM-Vision integrates CRM strategy into corporate strategy, where principles, evaluation, and customer segmentation play crucial roles in the organization's overall strategy. The second core element, the CRM activities, encompass a combination of four CRM activity cycles, illustrated by four modules: Customer Information Management (CIM) Module, Customer Transaction Management (CTM) Module, Customer Product/Service Management (CPM) Module, and Customer Lifecycle Management (CLM) Module. The CIM module is the foundation for managing customers as a whole, involving the analysis of existing data systematically, while the CTM module focuses on direct interaction between the company and the customer during each sales transaction. The CPM module encompasses product design oriented toward the customer and continuous improvement of the organization's product portfolio, while the CLM module aims to build, maintain, and extend long-term customer relationships. The third core element, the CRM Base emphasizes three distinctive requirements for successfully implementing CRM activities - an adaptable

organizational structure, effective information technologies and database management, and a customer-oriented organizational culture. In the context of the diagnostic process in CRM, it is essential to investigate and measure the level of integration and implementation of the adopted CRM strategy. This can be addressed by tracking the effectiveness of the CRM strategy and integrating and dynamicizing the descriptive CRM diamond model (Stanimirov, 2017).

4. CUSTOMER GENETIC DATA AND THE BIG DATA PROBLEM

The "big data" poses significant challenges for customer relationship management (CRM) systems due to its vastness, velocity, and variety (Diebold, 2012; Dodge & Kitchin, 2005; Mayer-Schonberger & Cukier, 2013). Traditional CRM systems struggle to handle the real-time generation and diverse formats of big data, leading to delays and reliability issues in customer insights (Mack et al., 2005; Patel et al., 2017). Additionally, the relationality and variability of big data further complicate CRM operations (Boyd & Crawford, 2012). The integration of customer genetic data into business strategies raises ethical and legal concerns, particularly regarding data privacy and security (Briscoe et al., 2020). Legal frameworks, like the EU's GDPR, vary globally, impacting how genetic data is handled (Ivanova-Kadiri, 2023). Genomic data management is viewed as a big data problem, necessitating robust regulatory measures (Reali et al., 2018). Human DNA data presents unique challenges, including immediate identification, potential familial insights, and permanence (Daviet et al., 2022). Such data may be vulnerable to cyberattacks and discriminatory practices (Deliverska, 2013; O'Doherty et al., 2021). Consumers fear repercussions such as denied employment and insurance exploitation (Briscoe et al., 2020). In the context of genomics-as-a-service (Reali et al., 2018), integrating genomic data adds complexity to CRM operations. Addressing these challenges is pivotal for CRM systems to leverage genetic insights effectively (Kitchin & McArdle, 2016). Striking a balance between innovation and ethical use of genetic data is imperative for advancing personalized medicine and maintaining consumer trust.

5. GENETIC MARKETING EFFECT ON CUSTOMER RELATIONSHIP MANAGEMENT

Genetic information is reshaping consumer behavior analysis, integrating biological insights into marketing strategies (Ivanova-Kadiri, 2023). Biomarketing, a nascent field merging biology and marketing, emphasizes the reciprocal determinism between biological and social factors in shaping consumer behavior (Fatoki, 2021). Genetic data provide unparalleled depth in understanding consumers, offering insights into individual identities, familial connections, and predictive behaviors. Within customer relationship management, genetic marketing introduces a new era of hyper-personalization. In the era of "Marketing 5.0," characterized by demand for personalized experiences (Kotler et al., 2021), genetic marketing offers a powerful tool for strengthening customer relationships. However, its implementation requires ethical considerations regarding data privacy and usage (Daviet et al., 2022; Deliverska, 2013; Ivanova-Kadiri, 2023). As technology evolves, genetic marketing may play an increasingly pivotal role in CRM, revolutionizing how businesses interact with and serve their customers. Data-driven marketing enables the construction of a CRM ecosystem for more precise customer targeting. It serves as a springboard for hyper-personalization or targeting individual customers as market segments (Kotler et al., 2021). At the core of DNA-based marketing lies the customer's genetic persona, enabling profiling despite the uniqueness of their genomic signature. Profiling and segmentation can be bidirectional, based on genetic assumptions about specific user behaviors. The accumulated genetic knowledge about the customer can be used to create personalized products or services offered in an individualized manner. Conversely, certain genetic markers may serve

as carriers for specific purchasing behavior (Daviet et al., 2022), which will also be integrated into customer relationship management. This transformation fundamentally reforms customer relationship management. Adaptations are required across the CRM-diamond model, spanning strategic, operational, customer product/service management, and technological aspects.

6. GENETIC DATA INTEGRATION INTO THE CRM-DIAMOND MODEL

Incorporating genetic data into the CRM-Diamond Model signifies a strategic evolution across its facets to harness the transformative potential of genomic insights in customer relationship management. The CRM Vision is redefined to prioritize hyper-personalization through genomic personas, necessitating strategic adaptations to accommodate genetic data. This entails adding core CRM activities, such as customer experience management and customer knowledge management, and adapting them to effectively integrate genetic insights. Foundational to this evolution is ensuring robust data privacy measures, especially concerning sensitive genetic information.

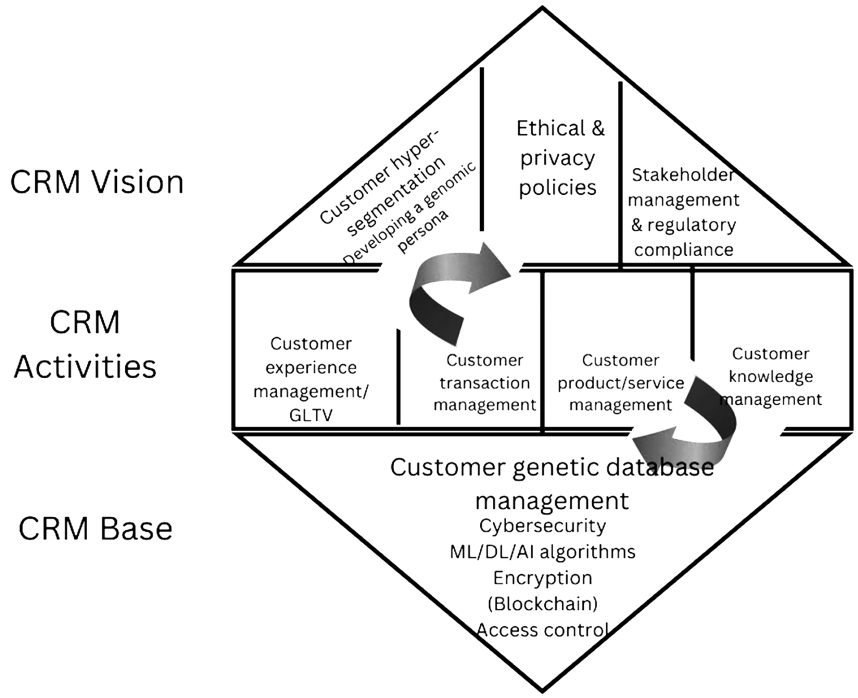

Figure 1. Transformed CRM-diamond model with genetic data integration
Source: Own processing

In the proposed integration of genetic data into the CRM-Diamond Model (Figure 1), the CRM Vision undergoes a substantial shift toward customer hyper-segmentation, achieved through the development of genomic personas. It necessitates the establishment of robust ethical and privacy policies governing genetic data usage, alongside meticulous stakeholder management and regulatory compliance measures. Within CRM activities, alongside customer experience management, transaction management, and product/service management, a key addition is the management of customer genetic lifetime value. This involves the analysis and utilization of genetic data to understand the long-term value of customers based on their genetic profiles, enabling personalized engagement and tailored offerings. In the CRM Base, genetic database management takes precedence, encompassing cybersecurity measures to safeguard sensitive genetic information. Advanced technologies such as machine learning (ML), deep learning (DL), and artificial intelligence (AI) algorithms are utilized to derive insights from genetic data, while

encryption and blockchain technology ensure secure storage and transmission. Access control mechanisms are implemented to restrict unauthorized access to genetic databases, ensuring data integrity and confidentiality.

In terms of implementation strategies, organizations must extend their focus from strategic planning to stakeholder engagement, technology integration, training, and continuous improvement to effectively implement genetic data integration within the CRM framework. Adapting sales channels, particularly through digital marketing tools, becomes imperative to facilitate communication between sellers and buyers in light of the new business models (Vanhala et al., 2013) driven by genetic insights. Compliance with legislation governing genetic data storage and processing is paramount to building and maintaining customer trust.

7. CUSTOMER GENETIC DATA MANAGEMENT

Integration with third-party genetic labs through API communication underscores the importance of safeguarding customer data. The European Genomic Data Infrastructure (GDI) project (n.d.) is dedicated to revolutionizing research, policymaking, and healthcare across Europe through advanced IT solutions and robust data privacy management, including blockchain technology. The project ensures controlled access to human genomic, phenotypic, and clinical data across Europe through establishing a federated, sustainable, and secure IT infrastructure. It integrates blockchain-enabled data privacy management, where approved clinicians, scientists, and healthcare policymakers can securely access insights for improved clinical diagnostics, treatments, and predictive medicine. Integrating genetic algorithms into the incorporation of customer genetic data within CRM holds promise for significantly enhancing CRM strategies. Genetic algorithms offer a robust analytical framework capable of processing extensive datasets (Gen & Lin, 2023) and extracting valuable insights from genetic information. Leveraging genetic algorithms, CRM systems can refine customer segmentation, personalize marketing strategies based on genetic profiles, and enhance fraud detection mechanisms, thereby maximizing the utility of genetic data in CRM applications (Dahab et al., 2023; Garai, 2022a; Xu et al., 2014). Drawing inspiration from natural evolution, genetic algorithms are esteemed for their advanced yet straightforward nature, making them a preferred solution across various domains. Their methodology simplifies problem-solving by identifying recurring patterns, proving instrumental in data mining endeavors such as identifying association rules within business databases and detecting fraud.

8. CONCLUSION

Integrating genetic data into the CRM-Diamond model offers businesses a powerful tool to revolutionize customer relationship management. By prioritizing hyper-personalization and leveraging genetic insights, organizations can enhance customer segmentation, engagement, and satisfaction, driving value creation in the digital age. However, addressing ethical, legal, and technical challenges is crucial for realizing these benefits. Implementing robust data privacy measures, engaging stakeholders effectively, and leveraging advanced technologies such as machine learning and blockchain are essential steps in navigating these challenges. Looking ahead, the integration of genetic data into CRM systems is poised to reshape customer relationship management. The potential applications in personalized medicine, healthcare services, product development, and marketing are vast. However, ethical and regulatory considerations must be carefully managed as the use of genetic data expands. Ensuring data privacy, consent, and protection against discrimination will be paramount. Businesses can stay ahead of the curve and deliver value in an increasingly data-driven world.

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The Influence of Podcast Engagement on Consumer Perception and Purchase Intention: Evidence from Croatia

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Abstract: *Podcast adoption and audience have been growing at a high rate for the last decade since they enable higher levels of availability, intimacy and interactivity than many other media. The attractiveness and advantages of podcast advertising that arise from the characteristics and popularity of podcasts themselves, caused an increase in podcast advertising. In order to gain deeper insight into the influence of podcast advertising on consumer behavior and thus improve our understanding of this area of digital marketing, an investigation on how podcast engagement influences consumer product recommendation perception and purchase intention of the brands and products advertised by their favorite podcast was conducted. In order to achieve the set goal, a questionnaire was administered among a sample of Croatian consumers. The collected data was analyzed and the results were presented and interpreted.*

1. INTRODUCTION

The need to deliver content to the public is an ever-growing one, which can be seen from an increase in both the number and the diversity of new ways of presenting the interested and awaiting masses with topics and subject matter of interest. Among those new ways and modes of connecting and content delivery one can mention newsletters, videos such as YouTube or TikTok videos, e-books, but also audio which are recently predominantly being represented by podcasts.

New communication technologies, arising from the aforementioned need, have contributed to the development and application of new modes of connecting between consumers and companies, that send their advertising messages through personal computing devices, social media platforms, mobile devices and applications. This allowed companies to adapt their offer and messages for consumers more efficiently through the use of digital marketing.

Traditional advertising is decreasing – linear radio and television advertising revenues are giving way to digital marketing advertisement revenues. Nowadays, the most prominent trend in digital marketing is podcast advertising due to the increasing popularity of podcasts in recent decades. The aforementioned popularity of podcasts is evident in the last decade from a growing number of listeners and new episodes running all over the world. Even though podcasts expanded during the 2010s, they became tremendously trendy in the 2020s after the spreading of smartphone use that enabled easier access and subscription to podcast content.

Despite the relevance of podcast advertising for companies and its influence on consumers, relevant literature lacks a clear framework to clarify how podcast engagement influences consumer

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behavior. This paper has aimed to fill this gap in the marketing theory, by exploring our understanding of the relationship between the dimensions comprising listeners' engagement in podcasts and the way their engagement affects their perception of recommendations presented and intention to buy products advertised in the podcast. In the first part of the paper, a review of relevant literature on podcasts and podcast marketing as well as podcast engagement will be presented. Secondly, the conducted research on the aforementioned factors will be described. Finally, a conclusion and recommendation for further research will be provided in this paper.

2. LITERATURE REVIEW

2.1. Podcast

The term podcast, a concoction consisting of parts of the words 'iPod' and broadcasting, was introduced in 2004 by journalist Ben Hammerseley (McGregor, 2022). Since its introduction, there have been several definitions of what is considered to be a podcast. Thus, Olmsted and Wang (2020) defined the term as 'downloadable audio programs that have aired through broadcast radio'. Rohden et al. (2023) defined a podcast as 'a program or an episode which is available for free in digital audio files that can be listened to either online or after download that usually involve one or more hosts discussing a topic or telling stories that are relevant for its audience'. Birch and Weitkamp (2010) described podcasts as audio files that are 'aggregated and downloaded via the Internet and listened to on portable media players'.

According to McGregor (2022), the golden age of podcasting began in 2014, with the emergence of the podcast Serial. This period of podcast market development was characterized by the 'formalization of podcasting into a cultural industry' (McGregor, 2022). Nowadays, thousands of podcast creators and producers broadcast their content focusing on specific topics and concerning particular and diverse groups or communities of listeners in various artistic forms such as documentaries, fiction, mystery, or comedy; in different genres and styles of presentation (McGregor, 2022).

Several characteristics of podcasts make this medium unique. Some of those characteristics are the seriality of podcasts, the variety of podcast shows, active role listeners often play in content creation (Ettmüller, 2021), but also their availability at any time allows listeners to choose the atmosphere and the amount of attention they are willing to invest in podcasts (Rohden et al., 2023). Furthermore, podcasts were considered to be more intimate for audiences since the information was presented via human voices. In addition, there existed a certain interactivity among the podcasts' creators and a link between them and their listeners through common interests and topics they covered and commented on (Rohden et al., 2023). This interactivity resulted in the term 'prosumers', which refers to podcast listeners who are invited into a conversation with podcast creators (Chatterjee et al., 2023) thus having a role of both potential or actual producers and consumers of this media.

All of the aforementioned advantages of podcasts allowed for the increase of both the number and diversity of podcasts and podcast listeners. Even though the largest market for podcasts is the USA, followed by the UK, Canada, Australia, and New Zealand (McGregor, 2022), other markets also exhibit a growing trend and even a tendency to overshadow today's biggest markets. In that effect, the number of listeners in the USA is estimated to be equated with Latin America in 2025 and even surpassed by China in 2027. The number of podcast listeners is also ever-increasing in Western Europe, although at a slower rate, and is estimated to grow to 128,5 million listeners in 2027 (Cramer-Flood, 2023).

The number of podcast listeners has been on the rise in Croatia as well, which can be seen in the example of the growth of podcast listeners from 37% in 2019 to 38,5% in 2020 (Paisana & Crespo, 2022).

2.2. Podcast Advertising

As can be concluded from the aforementioned, podcasts have become an important way of communicating, but they have meanwhile become a popular and effective way of advertising. Although some studies report consumers being overwhelmed by advertising (Nicola, 2022), podcasts have certain advantages over other ways of communication with consumers that allow them to not be as obvious about their commercial messages to consumers. One of the aforementioned advantages is the ability to insert advertisements into regular programs, unlike TV programs that require commercial breaks to display advertising messages (Ettmüller, 2021). Furthermore, advertising messages in podcasts are presented by the host or embedded into a story which makes them seem even more indistinguishable from the rest of the content and thus more acceptable to the consumers. Moreover, podcasts are tailored for specific audiences that share a common belief or interest that enables marketers to reach a target audience and advertise their brands to the ones most interested and invested in the product related to the podcast topic. (Ettmüller, 2021) Finally, podcast advertisements are more effective and received positively, unlike traditional advertising efforts, mostly because podcast listeners trust their podcasters and therefore prefer ads that are delivered by them (Moe, 2023).

Aside from the aforementioned advantages of podcast advertising, an increase in the popularity of podcast advertising and its revenues is also a consequence of a growth in the number of podcast listeners. The increasing number of podcast listeners is what makes the marketing potential of podcasts large, which can be seen from the fact that advertising in the 25 biggest shows reaches nearly half of all weekly podcast listeners in the USA above the age of 13, with a staggering number of 85 millions of listeners in 2023 (Edison Research, 2023). Consequentially, according to Moe (2023), revenues from podcast advertisements increased, which can be seen in the example of the 48% growth during just one year, from 2018 to 2019, when they amounted to 708 million $.

Research on podcast advertising and its influence has been conducted in many markets, such as the USA, Europe and Latin America (Terol-Bolinches et al., 2022), or India (Bezbaruah & Brahmbhatt, 2023), but relevant studies of podcast advertising or consumer behavior regarding podcasts in Croatia have been almost non-existent.

Although various authors have found that podcast advertising can be quite effective, the problem arising with podcast advertising is connected to the fact that it is not known which factors contributed to its effectiveness. One of those factors that some authors proved to be relevant to the effectiveness of podcast advertisements is consumer podcast engagement, a construct that deserves more attention and research, and therefore was the topic of interest of this paper.

2.3. Podcast Engagement

Due to the relevance, it poses to adopting products and brands as well as developing loyalty, consumer engagement has been well-researched in the relevant literature, although academics studying consumer behavior define the construct of consumer engagement differently. According to

Viswanathan et al. (2017), consumer engagement stems from interactive and co-creative experiences with a focal agent or object and it exists in a dynamic and iterative process within relationships between consumers and companies or brands. Van Doorn et al. (2010) define customer engagement behavior as consumer behaviors toward a brand or a company that results in motivation and can be exhibited as word-of-mouth activities, writing reviews, but also other forms of interactive experiences with a product, company, or brand. Hollebeek et al. (2014) consider customer brand engagement to be the level of their cognitive, emotional and behavioral investment in a brand. Nadeem et al. (2021) described consumer engagement as an indicator of commitment to customers, customer trust and the importance of their loyalty toward a company, product, or brand. Additionally, Ben-Eliyahu et al. (2018) defined consumer engagement as the intensity of productive involvement with an activity that includes involvement focus, participation and persistence on a task. Based on relevant definitions of the term consumer or customer engagement, podcast engagement or engagement with podcasts may be defined as the level of commitment and investment with podcasts, that can have a cognitive, affective and behavioral dimension. This research focused on exploring the cognitive and affective dimensions of podcast engagement.

Exploring and analyzing the construct of consumer engagement, different authors found it to be a multidimensional construct. For instance, Vivek et al. (2014) considered engagement to be comprised of conscious attention, enthused participation and social connection, while Hollebeek et al. (2014) as well as Brodie et al. (2013) described it as a construct consisting of affective and cognitive dimensions, as well as a behavioral dimension. The affective dimension refers to positive emotional states or feelings toward a brand or a product, such as enjoyment, enthusiasm, or social connection. According to Ben-Eliyahu et al. (2018), affective engagement expresses a positive effect, ie. positive reactions, and engagement emotions, suggesting that positive emotions can lead to higher levels of behavioral and cognitive engagement. On the other hand, the cognitive dimension is mostly comprised of absorption, attention and cognitive processing (Hollebeek et al., 2014; Vivek et al., 2014). Cognitive engagement refers to the extent of focusing on a task, thinking and paying attention to a focal point of interest (Ben-Eliyahu et al., 2018).

Consumer engagement may result in a long-term relationship and commitment, and even loyalty between a listener and their listened-to podcast. Sprott et al. (2009) even claim that engagement may affect consumers' attitudes and also their loyalty, while Calder et al. (2016) prove that engagement affects consumer attitudes toward advertisements and their purchase intention.

Aldhamiri et al. (2024) claimed that passive engagement in social media implied consumers' interaction with brands on social media without any activity, such as reading comments, watching and listening to videos on social media, etc. They considered passive engagement to be the part of engagement focused on the consumption of the content instead of its creation.

Even though consumer engagement with products and brands has been thoroughly investigated, research on the subject of the relationship between engagement in new technological advances and consumers' purchase behaviors is scarce (Hollebeek et al., 2014; Rohden et al., 2023; Viswanathan et al., 2017). Rohden et al. (2023) investigated the engagement of podcast consumers but focused on the antecedents of the construct, not on the consequences of engagement. Viswanathan et al. (2017) conducted a study researching the relationship between consumers' engagement with mobile apps to their purchase and consumption behaviors, although the investigation of this relationship in the context of podcast engagement has not been found in the relevant literature.

There are a few studies that dealt with the influence of consumer engagement on their behavior. While exploring consumer engagement on social media, Bilal et al. (2024) discovered consumer engagement on social media positively influenced their purchase intention and as well as some other modes of consumer behavior. However, some studies were found that dealt with elements of specific engagement dimensions and their influence on consumer behavior. For instance, Shin and Back (2020) found that cognitive engagement, described as consisting of elements of attention and absorption, had a positive influence on brand love, ie. intimacy, passion and decision or commitment to maintaining a loving relationship. Based on this research, one can conclude that the cognitive engagement of podcast listeners can affect a committed relationship between listeners and their podcast. Furthermore, Rajput and Gandhi (2024) conducted a study in which they concluded that the likeability of podcasters influences listeners' perceptions of both the podcast and the product recommended in the podcast. Consequently, it could be concluded that owing to their' committed relationship based on cognitive engagement, consumers would be more likely to trust podcast recommendations that, in turn, affect their product recommendation perception. Thus, the first hypotheses may be proposed:

H1: Podcast cognitive engagement positively affects product perception.

H1a: Podcast cognitive engagement positively affects product purchase perception.

H1b: Podcast cognitive engagement positively affects product recommendations perception.

Some authors studied the relationship between elements of affective engagement of consumers and their consequential behavior. After conducting their research, Blasco-Arcas et al. (2016) found that positive emotions of pleasure and arousal affect consumers' engagement, and, consequently, their purchase behavior. Similarly, Wang et al. (2020) concluded that consumers that felt an emotional connection to a particular online store were more likely to form a decision or intention to purchase from the same store in the future. Bilal et al. (2024) discovered through their research that consumer engagement on social media positively influenced their purchase intention, moderated by confirming that affective attachment moderates the relationship between consumer satisfaction and purchase intention. Previously described research may lead to the conclusion that effective consumer engagement may affect consumers' purchase intention, so the following hypothesis was set:

H2: Podcast affective engagement positively influences purchase intention/product value perception.

3. RESEARCH DESCRIPTION AND RESULTS

In order to test the hypotheses set, research was conducted via a survey of Croatian consumers.

The research was conducted at the beginning of 2024, and overall, 91 respondents from Croatia participated. The sample consisted of 54% male and 46% female respondents with the following age distribution: 31% of respondents younger than 25 years, 19% between 26 and 35 years, 24% between 26 and 45 years, 16% between 46 and 55 years, 2% between 56 and 65 years and 8% older than 66 years. Education-wise, most of the respondents (43%) have finished high school, followed by masters (26%), bachelors (21%), those who finished elementary education (7%) and PhDs (3%). Respondents mostly (37%) had monthly incomes between 1500 and 2000 euros, followed by an income of more than 2000 euros (27% of respondents), those with monthly incomes between 1000 and 1500 euros (24%), and finally up to 1000 euros (11% of respondents).

The measuring instrument used was a questionnaire consisting of two parts. The first part of the questionnaire was intended to measure podcast engagement, purchase intention and product perception. It was based on measuring instruments used and verified by relevant authors (Khan et al., 2021; Rather et al., 2022; Rohden et al., 2023; Roudposhti et al., 2018). The items were translated and adapted to measuring podcast engagement since they were originally mostly meant to measure engagement in social media or customer engagement behavior. Respondents were supposed to express their thoughts, feelings and behavior concerning their favorite podcast, and the answers were presented by a Likert scale from 1 to 5. The second part of the questionnaire consisted of personal questions, concerning respondents' gender, age, education level and average monthly income.

Collected data were analyzed with SPSS.

Table 1 depicts descriptive statistics of variables observed as independent variables in the analysis.

Table 1. Descriptive statistics of independent variables

Variable name	Variable	Mean	Std. Dev.	Min	Max
PE1	I diligently follow everything connected to the podcast.	3.142857	1.140871	1	5
PE2	I am grateful to the podcast for broadcasting its content.	3.252747	1.278831	1	5
PE3	I feel a deep connection to the podcast.	2.67033	1.256582	1	5
PE4	Listening to the podcast makes me very happy.	2.868132	1.309867	1	5
PE5	I feel proud to listen to the podcast.	3.252747	1.379158	1	5
PE6	Listening to the podcast makes me think about the relevant topics it covers.	3.67033	1.220701	1	5
PE7	I think about the podcast even when I am not listening to it.	2.769231	1.414818	1	5
PE8	Listening to the podcast consumes me so I forget about everything else.	2.516484	1.285497	1	5

Source: Own calculations

Two linear models that tested the influence of cognitive podcast engagement (3 items) on product perception were estimated. Cronbach's Alpha for the cognitive podcast engagement scale (3 items) was 0.8862.

Two linear regression models were estimated and both were statistically significant. Model for product purchase perception was significant ($F(3, 87) = 22.75$, $p = 0.000$) and explained 44% of the variance. The aforementioned model exhibited a positive and statistically significant influence of cognitive podcast engagement (out of the three variables the influence of two was statistically significant) on product purchase perception.

The linear regression model explaining podcast recommendations perception was statistically significant ($F(3, 87) = 24.14$, $p = 0.000$) and explained 45.43% of the variance. The model proved a positive and statistically significant influence of cognitive podcast engagement on product recommendation perception. These results confirmed H1 (H1a and H1b). The aforementioned results are displayed in Table 2.

Using a linear regression model with purchase intention as the dependent variable, the influence of affective podcast engagement as the independent variable (3 items) was tested. Cronbach alpha coefficient for the affective podcast engagement scale was 0.8926. The linear regression

model proved to be statistically significant (F (3, 87) = 35.30, p = 0.000) and explained 54.9% of the variance. The model proved a positive and statistically significant influence (b > 0) of affective podcast engagement on purchase intention thus confirming H2. The results of the estimated linear regression model are shown in Table 3.

Table 2. Results of conducted analysis for models 1 and 2.

Product purchase perception	Coefficient	t
PE6	0.24*	2.07
PE7	-0.18	0.198
PE8	0.67*	2.68
Product recommendations perception		
PE6	0.25*	2.07
PE7	-0.18	-1.30
PE8	0.67*	2.68

* at 0.05 level of significance

Source: Own calculations

Table 3. Results of the conducted linear regression model 3.

Purchase intention	Coefficient	t
PE2	0.36*	2.69
PE3	0.27*	2.14
PE5	0.26*	2.09

* at 0.05 level of significance

Source: Own calculations

Other relationships between podcast engagement variables and consumer behavior were also tested, but they failed to be statistically significant and were therefore not included in the models.

4. FUTURE RESEARCH DIRECTIONS

As with other studies, this research has limitations, such as the sample used. Namely, the results of this paper in future research should be confirmed with a larger sample. Furthermore, the results of the research might also be verified by comparison with results from a sample of respondents from other countries to mitigate the cultural influences on the results.

Further research directions might include the exploration of the impact of other independent variables, such as behavior podcast engagement, identification with the podcaster, or podcast loyalty, as antecedents of product perception and intention to buy.

5. CONCLUSION

According to the conducted analysis on collected data from Croatian consumers, affective and cognitive podcast engagement of consumers positively influences variables of purchase intention and product recommendation perception. In other words, Croatian consumers are more willing to buy products advertised in podcasts if they feel emotionally invested in podcasts. In addition, Croatian consumers are more likely to perceive product purchases and product recommendations positively if they are cognitively more invested in podcasts.

The results have several practical implications for marketing experts and podcast creators since it has proven that podcasts that listeners are more engaged with have a dual function of a trusted product information source and behavior instigator. Namely, building an emotional connection with listeners, especially building on feelings of gratitude, connectedness and pride, would increase the consumers' willingness to buy advertised brands. In addition, creating inviting, interesting, and immersing/capturing content that might attract the attention and spark consumers' imagination, should contain product recommendations of brands and products. On the other hand, podcast host trustworthiness or image did not prove to be an important factor for highly engaged podcast consumers, so the content should be the main focus of podcast creators.

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Examining Consumer Attitudes Towards Online Shopping for Intimate Apparel in North Macedonia: A Study of Customer Expectations & Preferences

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Abstract: *The main aim of this paper focuses on analysing consumer attitudes toward purchasing intimate apparel products online. The necessity for such research arises at a time when online shopping in North Macedonia has become a daily routine, with statistics showing a significant proportion of consumers from the region engaging in online shopping. The apparel was selected for analysis, with a specific emphasis on underwear. Considering the intimate nature of this segment within the apparel industry, a questionnaire consisting of 21 questions was distributed to consumers of the Macedonian underwear brand, Sara Fashion, via social media platforms such as Facebook and Instagram. The research gathered feedback from 80 consumers, from which the research findings showed that online shopping yields a positive experience.*

1. INTRODUCTION

The development of the Internet has profoundly altered the way people live, permeating every facet of daily life, from entertainment to work. It has also revolutionized the process of buying and selling goods and services, making online sales an integral part of everyday life. This shift is driven by numerous advantages, including the ability to shop anytime and from anywhere, effortless price comparison, swift transaction processes, convenient payment methods, home delivery, and more. Undoubtedly, the advancement of the internet and technology has significantly influenced consumer shopping habits. Consequently, numerous studies have been conducted to evaluate and observe the behaviours of online shoppers. Online consumer behavior is the process of how and why consumers make decisions about purchasing products in e-commerce. Consumers and their behavior are always based on identifying a need or deciding to make a purchase (Kesić, 2006). And while the needs look different for every shopper, the new expectations currently driving consumer behavior online are rooted in commonality. Expectations ranging from product availability, product quality, price, and delivery transparency affect how consumers make decisions to purchase items online (and whether they remain loyal customers after purchasing) (Wenzl, 2021). Apparel makes up most of what consumers buy online, but footwear and underwear still represent a significant portion of online fashion market revenue globally (Statista.com., 2022).

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When it comes to online sales of intimate apparel, we are encountering a distinct phenomenon. As Halliwell and Dittmar (2004) emphasize, the underwear segment includes items that are practically worn under outer clothing. This is intimate clothing that changes consumer behavior. That is why the paper aims to explore and understand the attitudes of consumers who purchase underwear online. The research focuses on analysing consumer behaviour in online underwear purchases to emphasize e-commerce within this sector of the clothing industry. The conclusions drawn in this study are based on data extracted from a quantitative analysis of the target group: online consumers of the Macedonian underwear brand, Sara Fashion.

2. LITERATURE REVIEW

2.1. Development of Online Sales

The online store, as an integral part of the electronic business, enables the Internet visitor (client) to order products via the Internet. According to Mandušić et al. (2004), online shopping can be the fastest and often the cheapest way to buy a product. Knowing the details of that type of purchase plays a big role in deciding whether someone will shop online. Ahuja et al. (2003) and Goldsmith and Bridges (2000) define Internet consumption as a passive gathering of information through exposure to advertising, shopping that involves searching and gathering information and, in a sea of offers, choosing specific goods or services to order.

The first electronic sales took place in the city of Columbus, Ohio in 1969, and took place by sending data over telephone lines, which is known as electronic data interchange or EDI (Electronic Data Interchange). An important figure in the development of what would later become online buying and selling is Michael Aldrich. His idea came from the fact that he found it tiring to go to stores for products all the time and came up with the idea that he could develop a system to buy products without going to stores (Faiz et al., 2021). So, in 1979, he invented teleshopping in a way that combined the advantages of telephone and television and allowed people to order products and services advertised on television over the phone. In this way, he invented online buying and selling long before the Internet itself (Greving, 2023). According to Faiz et al., (2021), nowadays online sales are developing at such a speed that websites created a year ago are now outdated and need to be revamped. To be able to achieve a certain level of competition ratio, today's websites are intuitive and integrate various technologies, thus establishing two-way communication between buyers and sellers.

2.2. Consumer Behavior and Online Shopping

Consumer behavior is a wide topic that covers a large segment of the marketing process, one of which is the process of deciding to buy a product. In fact, the decision-making process means deciding between two or more alternatives (Munshi et al., 2020). However, when customers make a decision, they are tempted by different factors such as social, cultural, psychological and personal factors (Gilbert & Jackaria, 2002). For marketers, it is important to understand what influences people's decisions when purchasing a product or a service.

When making a purchase decision in an online environment, customers behave differently, and their behavior depends on different factors. According to Mpinganjira (2015), consumers show different types of behavior when making a purchase decision because the products they buy are not of equal value, so people who buy more expensive and more complex products consider

alternatives and available options longer and involve more participants. The behavior of the buyer during the purchase is determined by the level of involvement of the buyer in the purchase itself, and riskier purchases, that is, the purchase of more expensive products, imply greater involvement of the buyer in the purchase itself (Munshi et al., 2020).

2.3. Consumer Behavior When Purchasing Underwear Online

The term "underwear" is derived from the French word "linge" meaning linen but was first introduced into the English language as a euphemism for underwear (Singh et al., 2022). Throughout history, underwear has constantly changed shapes and appearances, from practical to fashion accessories. As stated by Halliwell and Dittmar (2004) the underwear segment includes items that are practically worn under outer clothing. There are significant differences between purchasing goals at different ages. According to research conducted in Italy by Crisnaro (2013), women over 40 are basically more conservative, prefer white products to colored products, and bras without underwires which implies comfort, and support and they are loyal to a certain brand or model. In contrast, young consumers need to look for products that are used as clothing to "show off". From the above, it can be concluded that market segmentation of buyers is complex and requires adequate research to explain consumer behavior in this area of the textile industry.

Buying underwear presents a challenge for consumers considering that it is an intimate garment that should be comfortable and fit the proportions. Informal factors influence consumers to use online shopping channels (Sanchez Torres & Arroyo-Cañada, 2017). Consumer expectations in a survey conducted in China by Jiang et al., (2013), depend on three strategic factors as presented in Table 1.

Table 1. Consumer expectations

Sanchez Torres and Arroyo-Cañada (2017)	**Jiang et al. (2013)**
Advertising factor	Product: should be innovative, modern, exclusive in terms of fashion content
Brand sensitivity	Online store: its main feature is its diversity and originality
The new concept of underwear, especially among young consumers	Investment: the consumer prefers to spend less on a product with high fashion content and spend more on a classic, sober and durable product.

Source: Ashley Nicole Heller, 2022

However, the biggest influence on the customer's decision to buy a product in a certain online store, especially when it comes to underwear, is his confidence that the product will be of good quality and fulfill all his needs, and expectations and that the online store will do everything right, from ordering to delivery within the stipulated time (Sanchez Torres & Arroyo-Cañada, 2017). The buyer will also be loyal only if the product meets his expectations and if there is trust in the seller.

Websites have been a very important channel to encourage consumers to buy underwear online. Almost all Italian consumers who buy underwear online (94%) check information before buying online, starting with the manufacturer's or brand's official website (67%), then looking for confirmation in expert reviews (57%) and comments from other users (47%) (Crisnaro, 2013). As a result, word of mouth retains all its value, both for those who rely on comments posted online by those who have tried the product before and for those who seek advice directly from

their friends (26%). Social media is also an important driver of the fashion industry nowadays (Mohr, 2013). On the one hand, it refers to the impact on the customer's pre-purchase experience process, which provides consumers with relevant content according to their research (through big data analysis) (Tsaousi & Brewis, 2013).

Thus, consumers have the chance to always be updated on the latest trends and the opportunity to receive quick and easy feedback/reviews from around the world at any time (Wolny & Mueller, 2013). But as stated by Garimella et al. (2015), recently social media has changed its shape, and today it is not only a channel through which consumers can search for suitable products, reviews, and opinions during their pre-purchase phase, but recently it has become another sales channel called Social Commerce or S-Commerce. When it comes to the underwear industry and the pandemic with coronavirus COVID-19, every online store is already directly connected to a social network and allows purchases to be made directly from this social store (Garimella et al., 2015).

3. METHODOLOGY

The research was conducted on the consumers of the Sara Fashion brand through a structured questionnaire containing two parts: demographic and purpose analysis. The demographic analysis examined gender, marital status, educational level, and frequency of online shopping. In the second part, the questionnaire is divided into five sections in which the respondents responded to the statements offered in each section separately through the Likert scale. These sections were selected as the most suitable for this study by analyzing a large amount of available research on this topic. The survey questionnaire was distributed to Facebook and Instagram followers in order to maximize the number of potential respondents.

3.1. Research Approach and Sample

The concept of customer purchasing behavior and the elements that influence it is difficult to grasp. The positivist approach is related to a quantitative research method based on a statistical examination of quantitative (numerical data) research data because social processes may be measured. The data analysis focuses on discovering connections between variables and causation (one variable influences the other). The research was conducted in June 2023. The questionnaire was distributed among one hundred consumers, and 80 responded.

Regarding the gender of the respondents, 25 men, or 32% of the respondents against 68% or 55 women participated in the research. The next demographic characteristic refers to the age of the respondents. The largest percentage of respondents (35%) are between the ages of 26 and 32, then those between the ages of 33 and 42 are represented by 27% of the respondents, while the youngest and the oldest respondents are with 15% each. When it comes to marital status the largest percentage of respondents are married (47%), followed by unmarried with 25%. The remaining respondents are proportionally divided as follows: extramarital union 14%, divorced 8% and widowed 6% or 5 of the respondents. Regarding the level of education 44% of the respondents have bachelor's degree, then 31% have a master's degree, and 19% or 15 of the respondents have a secondary education, against 6% who have a doctorate. The last question concerns how often respondents shop online. It can be noted that the respondents equally agree that they shop once a week and once a month. Thus, 37% declared that they shop online once a week, 38% that they shop once a month, and 25% of respondents stated that they do so once a year.

3.2. Data Collection Instrument

Quantitative, descriptive research was conducted using a survey questionnaire as a research instrument, which the authors shared on the social networks Facebook and Instagram and used the Messinger application to directly send individual respondents a request to complete the survey, which means that the research sample is a deliberate convenience sample with certain restrictions such as the age limit of the participants who should have been at least 18 years old. Statistical data processing was done with the SPSS software package. Based on the research of Kim and Lee (2016) an empirical study has been designed to discover the benefits sought by the underwear online buying consumer and the elements imparting favorable brand experience on the following conceptual framework.

On a 5-point Likert scale, the section on the utilization of digital marketing channels has 5 factors relating to customer behaviour. A Likert scale contains units of measurement ranging from 1 to 5, with 1 indicating Strongly Disagree, 2 indicating Disagree, 3 indicating Uncertain/Neutral, 4 indicating Agree, and 5 indicating Strongly Agree.

4. RESEARCH RESULTS

A questionnaire was used in the research because it is possible to obtain specific answers relatively quickly from a large number of people. The LimeSurvey tool was used to create the questionnaire, which is used to create different types of questionnaires with different types of questions depending on the needs of the research. In the questionnaire, respondents were guaranteed complete anonymity. In this dedicated part of the research, five aspects related to buying underwear online were analyzed: Reasons for purchasing lingerie online, consumer's expectations from brand, lingerie purchasing occasions, consumer's outlook on lingerie fashion and factors of importance.

Fisher's exact test was used, which is a statistical test used to determine whether there are non-random associations between two categorical variables (Fisher, 1954). The first analysis of the determinants that are examined is presented in the following table. From the information in Table 2, it can be seen that the largest number of respondents, 25%, pay attention to what the underwear brand can offer them. But the determined consumer's outlook on lingerie fashion is not lagging behind those who buy underwear because of the price, comfort and the need for quality underwear (20%). Determinants such as Reasons for purchasing lingerie online and Lingerie purchasing occasions are represented by 17.5% and Factors of importance by 17.5%.

Table 2. Analysis of determinants of consumer behavior patterns for buying underwear online

Determinant	Respondents	%
Reasons for purchasing lingerie online	15	18.75
Consumer's expectations from Brands	20	25
Lingerie purchasing occasions	15	18.75
Consumer's outlook on lingerie fashion	16	20
Factors of importance	14	17.5
Total		100

Source: Own processing

The following Table 3 contains the information about correlation made between the determinants that are related to buying underwear online and the attitudes of consumers in relation to

the gender of the respondents. From what can be observed, both men and women are most affected by what an underwear brand can offer them. Thus, 8 (32%), of the male respondents and 12 (21.82%) of the female believe that it most affects their decision to buy online, while the biggest difference in terms of gender is the determinant Lingerie purchasing occasions, where only 4 (16%) of the male respondents are affected by the opportunity to order underwear, against 12 (21.82%), female respondents who have different attitudes towards the opportunity to buy underwear. As stated by Santhi and Sunil (2022) in their research on this topic, women buy underwear for self-indulgence, special occasions, or for a size change. Regarding Fisher's exact test, the following results were obtained: the chi-square statistic is 2.0807. The p-value is .72092. The result is not significant at $p < .05$. This means that gender and the listed determinants are not decisive in terms of gender for consumers' choice in online underwear shopping. In a survey conducted by Statista.com (2022), 62 percent of female respondents in the U.S. purchased individual items of underwear products.

Table 3. Analysis of determinants of consumer behavior patterns for buying underwear online based on gender[5]

	Male	%	Female	%
Reasons for purchasing lingerie online	3 (4.69) [0.61]	12	12 (10.31) [0.28]	21.82
Consumer's expectations from Brands	8 (6.25) [0.49]	32	12 (13.75) [0.22]	21.82
Lingerie purchasing occasions	4 (4.69) [0.10]	16	11 (10.31) [0.05]	20
Consumer's outlook on lingerie fashion	6 (5.00) [0.20]	24	10(11.00) [0.09]	10.182
Factors of importance	4 (4.38) [0.03]	16	10 (9.62) [0.01]	18.182

Source: Own calculations

The next correlation that is examined is the relationship between the investigated determinants and the age of the respondents. According to the information presented in Table 4, it refers to the relationship between the age of the respondents and the five determinants of consumer behavior when buying underwear online. The results obtained are: the chi-square statistic is 2.7349. The p-value is .997144. Since the result is greater than .05, the result is not significant at $p < .05$, which indicates that there is no significant relationship between the two groups that were examined. In research done by Singh et al., (2022) age and online shopping habits, especially when it comes to underwear, are mostly related to online shopping habits rather than age.

Table 4. Relation between age and determinates of underwear online shopping[6]

	19-25	26-32	33-42	43+
Reasons for purchasing lingerie online	3 (2.81) [0.01]	6 (5.25) [0.11]	5 (4.12) [0.19]	1 (2.81) [1.17]
Consumer's expectations from Brands	4 (4.12) [0.00]	7 (7.70) [0.06]	6 (6.05) [0.00]	5 (4.12) [0.19]
Lingerie purchasing occasions	4 (3.75) [0.02]	7 (7.00) [0.00]	5 (5.50) [0.05]	4 (3.75) [0.02]
Consumer's outlook on lingerie fashion	3 (2.44) [0.13]	4 (4.55) [0.07]	3 (3.58) [0.09]	3 (2.44) [0.13]
Factors of importance	1 (1.88) [0.41]	4 (3.50) [0.07]	3 (2.75) [0.02]	2 (1.88) [0.01]

Source: Own calculations

The following analysis is related to the marital status of the respondents. From the analysis of the received information, table 5 shows the relationship between the marital status and the experience of the respondents in online shopping. Accordingly, the following results were obtained: the chi-square statistic is 3.4094. The p-value is .999605. The result is not significant at $p < .05$. In other words, it means that marital status does not depend on the determinants that describe the experience of online shopping for underwear among direct consumers. However, in

[5] The results in the first bracket are the expected count, the results in the second bracket are residuals.

[6] The results in the first bracket are the expected count, the results in the second bracket are residuals.

the research of Santhi and Sunil (2022, p. 18), one of his respondents made the following statement: "My lingerie closet is no longer the same as it was before I married. Now I mostly use basic items. I used to wear thongs and anything nice before becoming a mother.".

Table 5. Relation between marital status and determinates of underwear online shopping[7]

	Unmarried	Married	Divorced	Widowers	Extramarital union
Reasons for purchasing lingerie online	4(3.25)[0.17]	5(6.18) [0.22]	1(0.98)[0.00]	1(0.81)[0.04]	2(1.79)[0.03]
Consumer's expectations from Brands	5(5.50)[0.05]	10(10.45)[0.02]	2(1.65)[0.07]	1(1.38)[0.10]	4(3.02)[0.31]
Lingerie purchasing occasions	5(4.50)[0.06]	8 (8.55) [0.04]	1(1.35)[0.09]	1(1.12)[0.01]	3(2.48)[0.11]
Consumer's outlook on lingerie fashion	34.00) [0.25]	10 (7.60) [0.76]	1(1.20)[0.03]	1(1.00)[0.00]	1(2.20)[0.65]
Factors of importance	3(2.75)[0.02]	5 (5.22) [0.01]	1(0.82)[0.04]	1(0.69)[0.14]	1(1.51)[0.17]

Source: Own calculations

The next step in the research is the relationship between the educational level and the behavior of consumers in the online purchase of underwear. Table 6 presents the information obtained from the respondents on how much the educational status is related to the behavior during the online purchase of underwear. The results obtained are that the chi-square statistic is 2.9724. The p-value is .995736. The result is not significant at $p < .05$. It shows that there is no significant relationship between educational level and how they perceive the online underwear shopping experience.

According to Rose et al. (2016), education as a factor in the online shopping experience does not have a mediating role, however, observing the obtained results, it can be concluded that more educated consumers are more inclined to online shopping and to create positive attitudes about it, since online purchasing among such consumers increases with positive attitudes.

Table 6. Relation between level of education and determinates of underwear online shopping[8]

	Secondary education	Bachelor's degree	Master's degree	Doctorate
Reasons for purchasing lingerie online	2 (2.62) [0.15]	6 (6.12) [0.00]	5 (4.38) [0.09]	1 (0.88) [0.02]
Consumer's expectations from Brands	4 (4.69) [0.10]	12 (10.94) [0.10]	8 (7.81) [0.00]	1 (1.56) [0.20]
Lingerie purchasing occasions	4 (3.00) [0.33]	8 (7.00) [0.14]	3 (5.00) [0.80]	1 (1.00) [0.00]
Consumer's outlook on lingerie fashion	3 (2.81) [0.01]	5 (6.56) [0.37]	6 (4.69) [0.37]	1 (0.94) [0.00]
Factors of importance	3(2.75) [0.02]	1 (1.00) [0.00]	5 (4.38) [0.09]	1 (1.00) [0.00]

Source: Own calculations

The last part of the analysis is the connection between the frequency of online shopping and the determinants related to the experience of the respondents. The following can be concluded from Table 7: The chi-square statistic is 2.4685. The p-value is .963184. The result is not significant at $p < .05$. From this it can be concluded that the relationship between how often the respondents buy underwear online and the determinants that describe the online shopping experience is insignificant among the respondents involved in this research. As expected, trendy underwear is more significant for persons who go shopping frequently and spend more money (Tiron & Elsharabasy, 2022).

[7] The results in the first bracket are the expected count, the results in the second bracket are residuals.

[8] The results in the first bracket are the expected count, the results in the second bracket are residuals.

Table 7. Relation between how often respondents shop online and determinates of underwear online shopping[9]

	Once a week	Once a month	Once a year
Reasons for purchasing lingerie online	5 (4.12) [0.19]	4 (4.12) [0.00]	2 (2.75) [0.20]
Consumer's expectations from Brands	10 (10.50) [0.02]	12 (10.50) [0.21]	6 (7.00) [0.14]
Lingerie purchasing occasions	8 (6.75) [0.23]	6 (6.75) [0.08]	4 (4.50) [0.06]
Consumer's outlook on lingerie fashion	4 (4.50) [0.06]	4 (4.50) [0.06]	4 (3.00) [0.33]
Factors of importance	3 (4.12) [0.31]	4 (4.12) [0.00]	4 (2.75) [0.57]

Source: Own calculations

By examining this correlation, the research concerning the topic of this study was completed and the next step is a discussion related to the obtained results.

5. DISCUSSION OF RESEARCH FINDINGS

According to the analysis, the respondents were in the majority of the female gender, 65 against 25 male respondents. The majority of the respondents are highly educated, of which the largest number are married and shop online, usually once a week or once a month. These obtained results show that this target group is a good example in terms of the attitudes that consumers have towards online shopping. According to the results, it can be concluded that the influence of all the examined factors (gender, education, marital status and the frequency of online shopping) is not significant towards the attitude in the online shopping of underwear. Based on the results obtained and a thorough literature review, consumers frequently take advantage of online shopping, benefiting from the opportunity to acquire quality items at lower prices, the convenience of shopping from their own homes, and the ability to stay up-to-date on trends and styles. Although Fisher's test does not indicate significance, factors such as price, contact with sellers through social networks, chatbots, etc. are still very important, if not decisive, in how consumers feel about shopping online.

6. CONCLUSION

In this research paper, the target group comprised consumers of Macedonian underwear brand Sara Fashion to assess their behavior and experiences when purchasing underwear online. Based on their feedback, it was determined that consumers exhibit a high level of proficiency in online shopping, particularly in the context of purchasing underwear. Respondents demonstrated positive attitudes regarding their expectations and experiences with online shopping, particularly when interacting with a brand like Sara Fashion. Ultimately, it can be inferred that online shopping fosters positive consumer attitudes. Therefore, it is crucial for companies to prioritize understanding and accommodating consumer opinions and needs to ensure business success. The paper may serve as an initial step towards comprehending the behaviors of online intimate apparel consumers.

[9] The results in the first bracket are the expected count, the results in the second bracket are residuals.

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Customer Satisfaction and the Use of Beacon Technology in the Hotel Industry

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Abstract: *The hotel industry is undergoing profound change, driven by digitalisation and technology. Mobile apps and beacon app technologies have proven to be powerful tools to enhance the guest experience, streamline operations and drive guest loyalty. These technologies allow guests to manage reservations, access information and easily search for services via their smartphones. Beacon technology, which uses Bluetooth Low Energy (BLE), allows hotels to provide targeted notifications and personalised content based on guests' location and proximity. The topic of this article is the investigation of personalised content through beacons and BLE mobile technology on user satisfaction and the impact on the hotel company's revenue. The article aims to investigate the impact of personalised content on user satisfaction, their attitude towards the introduction of new technologies and the sensitivity of data sharing. To this end, an empirical study was conducted using the survey method. The study found that a personalised service that uses as little private data as possible has a positive impact on user satisfaction. It was also found that a personalised service helps with product selection and encourages the customer to make a purchase.*

1. INTRODUCTION

Innovative technologies, especially mobile technologies, have revolutionised the hotel industry by offering convenience, personalisation and a better guest experience. Convenience means that guests have the ability to control their journey by making their reservations, accessing information, and using services according to their preferences. With the advent of smartphones and mobile technology, hotels have harnessed the power of mobile applications to improve communication with their guests and simplify their operations (Elziny & Mohamed, 2021). Smart hotels are therefore integrating modern information technologies such as the Internet of Things (IoT), cloud computing, mobile internet, smart devices and big data to provide customers with a better service experience and a much higher level of personalisation (Gala et al., 2023; İştin et al., 2022; Kansakar et al., 2019; Mercan et al., 2021; Pelet et al., 2021; Yang et al., 2021). They also endeavour to use innovative technologies as much as possible in order to remain competitive and better meet the needs of their guests.

An exceptional customer experience is critical to attracting and retaining guests and gaining a competitive advantage. Through the use of cutting-edge technologies, the guest experience in hotels is changing, offering customised and wearable technological applications to reduce waiting times for guests, monitor their location and activities in real-time, provide personalised services and increase overall guest satisfaction (İştin et al., 2022). Among these innovations, beacon technology has emerged as a powerful tool that provides location-based personalised services (Thakur, 2022) and has the potential to increase customer satisfaction and loyalty. Beacon

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technology, a subset of Bluetooth Low Energy (BLE) technology, enables hotels to send contextual and location-based information to guests' mobile devices, providing them with a personalised and seamless experience during their stay at the hotel or destination. In addition, beacon technology has the potential to improve the guest experience by providing real-time data, guiding guests to specific locations, people, or products, sending personalised advertising, targeting users through proximity marketing, helping them save time and much more (Alringer, 2024; Alzoubi et al., 2022; Gala et al., 2023; Pangriya & Pandey, 2021).

In recent years, interest in the use of beacon technology has increased in the hotel industry as it has the potential to increase user satisfaction by enabling seamless and personalised interactions throughout the guest's stay. The purpose of this study is to investigate the impact of personalised content through beacons and BLE mobile technology on user satisfaction and its impact on hotel companies' revenues. The objective of the study is therefore to investigate the impact of personalised content on user satisfaction, their attitude towards the introduction of new technologies and their sensitivity towards data sharing. Based on the research purpose and the underlying research objective, the following research questions were posed:

RQ1. Are today's users ready to utilise the new information technologies (such as beacon)?

RQ2. To what extent are today's users willing to share private data in order to receive a personalised service?

RQ3. Does the use of a hotel's mobile application affect guest satisfaction and access to information and services during their stay?

RQ4. Does the personalised advertising of hotel offer through mobile technologies have an impact on increasing hotel revenue?

To answer the research questions, an empirical study was conducted to find out how open hotel guests and tourists, in general, are to newer technologies, to what extent they are willing to share private information and to what extent personalised content would help them during their stay in a hotel or destination. Following the introduction, the "Related work" section presents current research activities related to beacon technology and other similar technologies that have an impact on providing personalised services and increasing guest satisfaction. The "Methodology" section describes the research process and provides insight into the constructs used in the questionnaire. In the "Results and discussion" section, all results are presented and discussed. Finally, the most important results and answers to the research questions are presented in the "Conclusion", together with an overview of the research limitations and possible avenues for further investigation.

2. LITERATURE REVIEW

Customer satisfaction is crucial in the hotel sector and influences brand image, competitiveness and long-term development (J. Wang et al., 2021). The service quality of hotels has a great impact on user satisfaction (Qasem Saeed et al., 2021; Y. Wang, 2022) and remains an important source of competitive advantage for tourism and hospitality companies (P.J et al., 2023).

Smart technology and robotics have the ability to increase customer satisfaction and loyalty in hotels (Elziny & Mohamed, 2021; Yang et al., 2021; Zhong et al., 2020). In addition, the use of

technologies such as beacon technology and artificial intelligence can increase service quality in hotels and customer satisfaction (Nam et al., 2021; Nicholas & Shapiro, 2021). Beacon technology, along with other technologies such as mobile applications (Dou et al., 2020; Huang et al., 2019), virtual reality (Bilgihan & Ricci, 2024), IOT (Car et al., 2022; Mercan et al., 2021), NFC (Vitezić et al., 2015), big data, automated check-ins and robots are changing the guest experience in hotels. They can help hotels to better serve their guests by providing them with personalised, location-based information about special offers, services and other points of interest in the hotel (Alringer, 2024; Pangriya & Pandey, 2021).

Yang et al. (2021) highlight the growing importance of smart hotel technologies such as AI, IoT, cloud computing and mobile internet in enhancing the guest experience and suggest that hospitality practitioners need to consider these insights for effective technology-related marketing strategies. In addition, Gala et al. (2023) explored how the Internet of Things technologies, specifically Bluetooth Low Energy beacons, can improve the tourism experience by providing personalised, contextual information to travellers. These beacons interact with tourists' smartphones and provide location-based services (Alzoubi et al., 2022; Kansakar et al., 2019; Qamaz et al., 2022; Spachos & Plataniotis, 2020; Stringam & Gerdes, 2021) and messages tailored to their needs and location, e.g. historical information when they are near an attraction.

"*A beacon is a small device with a Bluetooth radio transmitter that repeatedly sends a single signal that other devices can see. Inside the beacon is a CPU, a Bluetooth radio, a module for Bluetooth Smart connectivity and batteries*" (Salame, 2019). They can be powered by small lithium-ion chip batteries or connected to the mains. Beacon devices use a new technology called Bluetooth Low Energy (Alzoubi et al., 2022). A beacon is therefore a small proximity detection device that sends certain information via a display at predefined intervals. Beacons are used in a variety of applications, including tracking, navigation, security, interaction and analysis (Qamaz et al., 2022). Similarly, Technology 4 Hotels (n.d.) explains how beacon technology can be used to understand and anticipate guests' needs to provide more personalised service. Figure 1 shows how the beacon technology works using the example of retail.

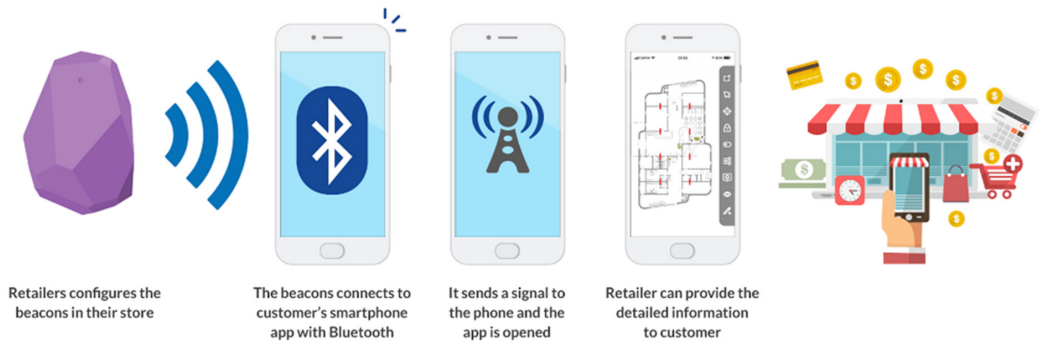


Figure 1. How Beacon Technology Works

Source: Salame, 2019

However, beacon technology has the potential to take the user experience to a new level by providing real-time data, guiding guests to specific locations, people or products, sending personalised advertising, targeting users through proximity marketing and helping them save time. Beacon technology is a significant innovation in the hospitality industry that improves personalised customer experiences and digital services as well as customer satisfaction and loyalty (Alzoubi et al., 2022; Thakur, 2022).

3. METHODOLOGY

The research methodology was based on a quantitative research design to analyse the impact of the use of modern technology on customer satisfaction in the hotel industry. A structured questionnaire was developed based on an extensive literature review and validated constructs from previous studies. The data collection was carried out in two periods: in June 2023 and from January to February 2024. The survey instrument comprised five-level scale to measure the following four key constructs (Table 1): C1) Perception towards the technology (Agarwal & Karahanna, 2000), C2) Usage of private data (Kozyreva et al., 2021), C3) The influence of personalised content on customer satisfaction (Fang, 2019) and C4) The influence of personalised content on purchase behaviour (Dou et al., 2020). The questionnaire also collected relevant demographic information about the respondents. Respondents were informed in the introduction of the questionnaire about what modern technologies (such as Beacon, IoT, NFC, VR, AR, and others) include.

Table 1. Research constructs and questions

Construct	Questions
C1. Perception towards technology	Q1. If I heard about a new information technology, I would look for opportunities to experiment with it.
	Q2. Among my colleagues, I am usually the first to try out new information technologies.
	Q3. I like to experiment with new information technologies when I have the opportunity.
	Q4. Generally, I hesitate to try out new information technologies.
C2. Usage of private data	Q5. I am concerned about my private data when using the internet.
	Q6. I have no problem with social media and other websites collecting and using data about my previous online activities to personalise various internet services, e.g., search results or offers.
	Q7. I consent to internet platforms and applications using any of the following information to create personalised advertising, e.g. gender, age, political views, sexual orientation.
	Q8. I consent to web services and applications recording and using the following types of information they collect on their platform, e.g. browsing and search history, location history, email content and online messages.
C3. The influence of personalised content on customer satisfaction	Q9. If a mobile application could deliver personalised content during my stay at the hotel, I would be satisfied.
	Q10. Being informed about current offers and information at the hotel would improve my overall stay at the hotel.
	Q11. Providing personalised content during the stay would increase loyalty and interest in the hotel company.
C4. The influence of personalised content on the purchasing behaviour of customers	Q12. Receiving timely personalised notifications about hotel offers in the mobile application would encourage me to make a purchase.
	Q13. Receiving location-based notifications about hotel offers in the mobile application would tempt me to make a purchase.
	Q14. Receiving personalised notifications about hotel offers in the mobile application would reduce my effort when searching for specific products.
	Q15. Receiving personalised notifications about hotel offers in the mobile application would help me save time when selecting products.

Source: Kliman (2023) adapted from (Agarwal & Karahanna, 2000; Dou et al., 2020; Fang, 2019; Kozyreva et al., 2021)

4. RESULTS AND DISCUSSION

The main constructs of the survey were described in the methodology section, and the results are presented here in tabular, graphic, and text form. The questionnaire was completed by 217 respondents, of whom 106 (49%) were male and 111 (51%) were female. The other relevant demographic results are shown in Figures 2 and 3.

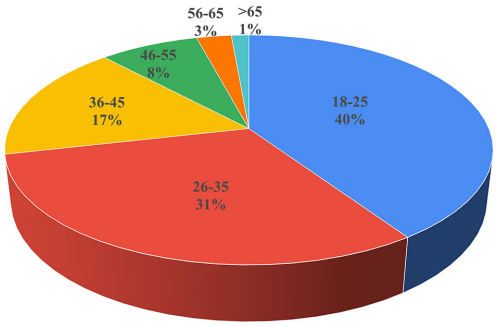


Figure 2.
Respondents' age distribution
Source: Own research

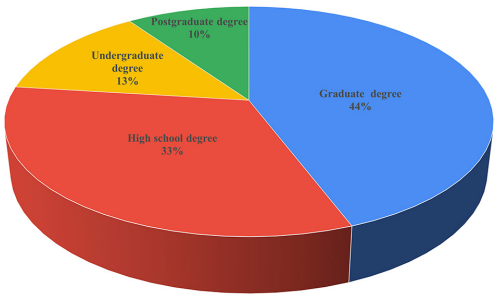


Figure 3.
Distribution of respondents' level of education
Source: Own research

Respondents' most common reasons for using mobile technology when travelling (multiple answers possible, Table 2)

Table 2. Frequency of reasons why mobile technology is used during travel

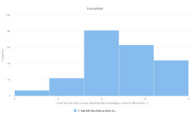
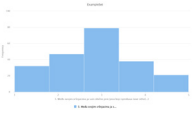
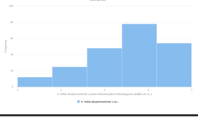
Reasons for using mobile technology	**N**
Destination information	173
Social media	153
Flight booking and purchase	127
Accommodation booking	88
Accommodation reservation	83
Finding activities at the destination	30

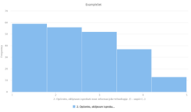
Source: Own research

All answers were given on a 5-point scale, where 1 - strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, and 5 - strongly agree. The average result of the questions and constructs higher than 3.0 represents acceptance and a positive attitude towards the question/construct and less than or equal to 3.0 is considered a negative attitude towards the question/construct. The results are given in Tables 3, 4, 5, 6 and 7.

The first construct, C1 - Perception towards technology, comprised 4 questions, where Q1, Q2 and Q3 were designed to capture openness to new technologies, and Q4 examined the opposite: whether they were reluctant to use new technologies.

Table 3. The results for C1 construct (Q1-Q4) -Perception towards technology

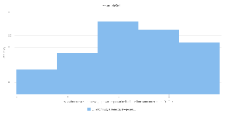
Question	Answers' distribution (5 level scale)	Mean	SD
Q1. If I heard about a new information technology, I would look for opportunities to experiment with it.		3.53	1.03
Q2. Among my colleagues, I am usually the first to try out new information technologies.		2.86	1.16
Q3. I like to experiment with new information technologies when I have the opportunity.		3.63	1.14

Question	Answers' distribution (5 level scale)	Mean	SD
Q4. Generally, I hesitate to try out new information technologies.		2.49	1.22

Source: Own research

The answers to questions Q1 and Q3 show a general openness towards the use of new technologies (mean values above 3), with most answers in the 3-5 range. As for Q2, it is almost perfectly bell-shaped (Gaussian distribution), suggesting that respondents are divided when it comes to being the first to try out new technologies. Q4 is formulated in such a way that the semantics of the answers should be reversed, which turns out to be correct (distribution curve and average score of only 2.49).

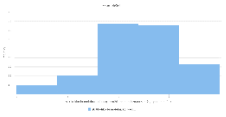
Table 4. The results for C2 construct (Q5-Q8) - Usage of private data

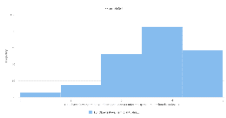
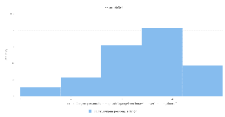
Question	Answers' distribution (5 level scale)	Mean	SD
Q5. I am concerned about my private data when using the internet.		3.3	1.24
Q6. I have no problem with social media and other websites collecting and using data about my previous online activities to personalise various internet services, e.g., search results or offers.		2.46	1.13
Q7. I consent to internet platforms and applications using any of the following information to create personalised advertising, e.g., gender, age, political views, sexual orientation.		2.65	1.21
Q8. I consent to web services and applications recording and using the following types of information they collect on their platform, e.g., browsing and search history, location history, email content and online messages.		2.25	1.13

Source: Own research

Construct C2 analyses the extent to which respondents are willing to share their private data and browsing data. The results of Q6-Q8 indicate that respondents are not willing (all means are lower than 3.0, Q6 and Q8 are lower than 2.5, Q7 is equal to 2.65) to share their private and browsing data, even for the personalising benefits of various mobile services. Question 5 was designed to find out opinions about the security of private data on the Internet. The majority of respondents agree or strongly agree that they are concerned about the security of their data when using various mobile services.

Table 5. The results for C3 construct (Q9-Q11) - The influence of personalised content on customer satisfaction

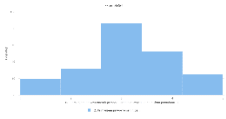
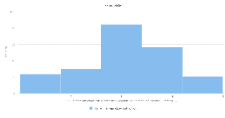
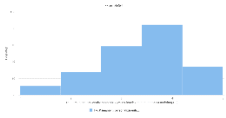
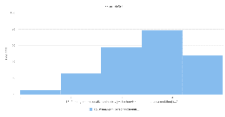
Question	Answers' distribution (5 level scale)	Mean	SD
Q9. If a mobile application could deliver personalised content during my stay at the hotel, I would be satisfied.		3.47	1.01

Question	Answers' distribution (5 level scale)	Mean	SD
Q10. Being informed about current offers and information at the hotel would improve my overall stay at the hotel.		3.80	0.99
Q11. Providing personalised content during the stay would increase loyalty and interest in the hotel company.		3.53	1.06

Source: Own research

The C3 construct shows that respondents highly value the opportunity to receive personalised content and timely information, which has a positive impact on their loyalty, interest, and overall stay with the hotel company. Q10 received the highest score of 3.8 among all the questions in the questionnaire.

Table 6. The results for C4 construct (Q12-Q15) - The influence of personalised content on the purchasing behaviour of customers

Question	Answers' distribution (5 level scale)	Mean	SD
Q12.Receiving timely personalised notifications about hotel offers in the mobile application would encourage me to make a purchase.		3.14	1.1
Q13.Receiving location-based notifications about hotel offers in the mobile application would tempt me to make a purchase.		3.10	1.11
Q14. Receiving personalised notifications about hotel offers in the mobile application would reduce my effort when searching for specific products.		3.48	1.06
Q15. Receiving personalised notifications about hotel offers in the mobile application would help me save time when selecting products.		3.63	1.04

Source: Own research

The C4 construct was used to investigate how respondents perceive the benefits of personalised content and its influence on purchase intent. While the answers were all above 3.0 on average and showed a positive influence on the search and selection of purchase items (Q14 and Q15, 3.48 and 3.63), the values for purchase intention were slightly lower (Q12 and Q13, 3.14 and 3.10, respectively).

Table 7. Overall means by constructs

Construct	Overall Mean	Overall SD Mean
Perception towards technology (Q1-Q3), *excluded Q4*	3.34	1.11
Usage of private data (Q6-Q8), *excluded Q5*	2.45	1.16
The influence of personalised content on customer satisfaction (Q9-Q11)	3.60	1.04
The influence of personalised content on the purchasing behaviour of customers (Q12-Q15)	3.34	1.06

Source: Own research

The overall mean values of the C1-C4 constructs are all above 3.0, which shows the positive influence of personalised content on customer satisfaction (highest mean value of 3.6) and purchase intention, as well as openness to embrace new technologies. However, respondents still do not feel comfortable and are very cautious when it comes to sharing their private data and browsing behaviour, and they are rather concerned about their privacy online. Q4 and Q5 were excluded as the semantics of their assessment is the reverse of the other questions.

5. CONCLUSION

The main objective of this study was to investigate the perception of technology, the use of private data and the influence of personalised content on customer satisfaction and purchase intent in the hotel industry. The results obtained were used to answer four research questions (A1-A4) as follows:

RQ1: Are today's users ready to utilise the new information technologies (such as beacon)?
A1. Construct C1 answers (mean of 3.34) show a general openness and willingness to use and try out new information technologies (Q1-Q3 are above 3.0 and Q4 on hesitation is below 2.5)

RQ2: To what extent are today's users willing to share private data in order to receive a personalised service?
A2. The answers to the questions of construct C2 suggest that users are still very cautious and sceptical when it comes to sharing their private data (overall score of 2.45) and that they feel insecure when it comes to sharing data (mean score of 3.3 for question 5).

RQ3: Does the use of a hotel's mobile application affect guest satisfaction and access to information and services during their stay?
A3. With an overall mean value of 3.6 for construct C3 and high mean values for the individual Q9–Q11, it can be concluded that personalised information during the hotel stay has a positive influence on guest satisfaction.

RQ4: Does the personalised advertising of hotel offers through mobile technologies have an impact on increasing hotel revenue?
A4. With an overall mean score of 3.34 for construct C4 and high mean scores for Q14 and Q15 (3.48 and 3.63, respectively) and slightly lower mean scores for Q12 and Q13 (3.14 and 3.1, respectively), it can be concluded that personalised advertising during the hotel stay has a positive influence on the purchase process (searching and selecting items) and purchase intention of guests.

The limitation of the research is mainly reflected in the size and structure of the respondents. In the future, it is planned to further explore the introduction of modern technologies in the hospitality industry and investigate their influence on customer satisfaction and purchase intention for hotel products.

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Digital Nomadism in a Contemporary Business Environment

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Abstract: *During the COVID-19 pandemic, it was essential to ensure the environment and the techniques for remote work, which was strongly advised for health reasons. After the pandemic was officially over, the companies understood that many workers were better off in that working mode, while some of them enjoyed coming back to the offices - it was connected to many personal factors, among which motivation was one of the crucial ones for employees, and the trust and control was crucial for employers. Some employees felt cut off from the corporate culture, thus feeling like "gig-workers" and craved to come back to their offices, while some of them felt uncomfortable coming back from the serenity of their homes and "digital nomadism". In fact, digitisation of the world hand in hand with globalisation has led to new opportunities in reshaping the workplaces, such as remote work and so-called digital nomadism. Digital nomadism refers to the work practices far from the office, usually from another town, country or continent, and it has brought many benefits like increased productivity and cash influx in less developed areas of the world, together with a sense of freedom, but they have also brought the sense of loneliness, uncertainty, financial difficulties, increased risk, and transnational gentrification. Many countries around the world, especially during and after the COVID-19 pandemic, stepped out with measures aimed at enabling the digital nomads with adequate visas. Serbia is one of the countries with a high influx of digital nomads, that have changed its economy and culture.*

1. INTRODUCTION

The advancement of technology has not only transformed the way tasks are performed technically but has also significantly impacted the economic outcomes associated with these technical tasks. A notable change is the ability to work without being physically present at the workplace. With the realisation that presence at the workplace (company premises) is not mandatory, the question then becomes, *"How far can one be from the company premises and still effectively work?"*

The natural conclusion is that the distance from the traditional workplace has become arbitrary. This realisation leads us to the concept of "*digital nomadism*" and "*digital nomads*," who are defined as individuals who travel and work freely around the world, leveraging internet technology (Schlagwein, 2018). Most digital nomads are professionals in fields such as IT, development, programming, or design, including content creators ranging from social media influencers to journalists, writers, photographers, music producers, and web designers (Nash et al., 2018). Essentially, they predominantly or exclusively work within the *creative industries*.

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Steven K. Roberts is widely regarded as the first digital nomad, who from 1983 to 1991, travelled on a "recumbent bicycle" equipped with a laptop and early versions of a mobile phone, managing work tasks throughout his journey (Roberts, 1984). Although not always under such extreme conditions, digital nomadism began to gain traction during the 2010s, propelled by technological advancements (Cook, 2023). The past four years have seen significant changes, including the COVID-19 pandemic, conflicts in the Middle East and Ukraine, political instability in various regions, the "culture wars" in the US, and rising living costs in Western countries, all of which have contributed to the acceptance of a "new normal" (Hermann & Paris, 2020). Before these developments, the typical image of a "digital nomad" was of a millennial working on a laptop from a remote, exotic beach (Hart, 2015).

Although the roots of digital nomadism lay in the youthful culture of travel ("*I travel, but I don't want it to be a vacation; I want it to be work that enables further trips*") (Richards, 2015), it later evolved, by the end of the 2010s, into a rejection of the routine of daily work, traditional working hours, the office environment, and commuting. This transformation took the form of a countercultural "hipster" rebellion, often manifesting as working from a nearby coffee shop within the same city (Reichenberger, 2018). The digital economy is seen as the future of economic growth worldwide (Bolesnikov et al., 2019), and young people have embraced and reshaped the digital economy through digital nomadism. The so-called *"nomad objects"* that they own and use are "*compact and practical; they are always within the nomad's personal belongings and are used at any time, rendering everyday life devoid of permanence. This allows the digital nomad to avoid direct participation in its creation*" (Dobrinskaja, 2020).

During the COVID-19 pandemic, it became clear that employees do not necessarily need to be tied to their offices, prompting the question of whether it was possible not only to work from home but also from exotic locations (such as Bali, Colombia, Morocco, etc.), where the cost of living is significantly lower, thereby potentially increasing the profits of digital nomads (Hermann & Paris, 2020). This realisation led to the emergence of numerous digital nomad initiatives, including special visa programmes. The period from 2020 to 2022 saw a large influx of immigrants from Russia, Belarus, and Ukraine, along with individuals seeking more liberal COVID-19 regulations, bringing many from these and other countries to places like Serbia, which has undergone significant changes compared to the period before the Russian-Ukrainian war. Digital nomadism is not solely a response to emergency events like wars and sanctions; it also thrives in the USA, where an estimated 17.3 million Americans worked as digital nomads in 2023, marking a 131% increase from pre-pandemic levels in 2019 (MBO Partners, 2024).

This paper aims to explore the psychological, social, and economic consequences of digital nomadism, and how it transforms the societies and economies of both the countries digital nomads leave (*"digital emigrant"* countries) and those they move to (*"digital immigrant"* countries).

2. LITERATURE OVERVIEW

Digital nomadism is a relatively new concept and phenomenon that has yet to be extensively researched. More than 40 years ago, it was predicted that the future would belong to *"knowledge workers"* and that they would be the driving force behind a new Industrial Revolution (Toffler, 1981). With the advent of increasingly powerful IT tools and global connectivity—initially through telephones and faxes, and later via mobile phones and the Internet—"knowledge workers" have emerged as a dominant and mobile force. The availability of virtual meetings and

conversations from anywhere with communication tools has led to a flexible work environment (Aroles et al., 2019), and logically, to the emergence of digital nomadism.

In his vision of the future, *"The World of Tomorrow"* the French journalist Jacques Attali distinguished between three future classes in 1997: he identified the elite *"hypernomads" "virtual nomads"* and the disadvantaged *"infranomads"* (Attali, 2008). The digital nomad community encompasses a wide variety of profiles, some of which overlap with other types of remote or location-independent workers (Bonneau et al., 2023). However, digital nomads uniquely combine work and leisure with travel (Urry, 2007).

Before the pandemic, the image of the digital nomad was somewhat idealised. They were often depicted—and they often depicted themselves—as individuals keen on highlighting their distance from the companies for which they worked and the aesthetics of their living environments (Müller, 2016), with little emphasis on the financial aspect. However, more rigorous analyses later identified that the primary factors influencing a digital nomad's choice of location are financial considerations (moving to a place with lower living costs), climate, and available leisure activities (Ehn et al., 2022), among others.

Digital nomads encounter several challenges, including the regulation of tax payments and financial contributions (such as retirement/pension fund contributions) in either their home country or the country where they are currently located, managing their pension status, as well as the legality of their work arrangements in countries where they often stay as tourists—a situation that can be legally ambiguous or even prohibited (Hall et al., 2019).

Countries have varied responses to these challenges, most commonly implementing visa programs with very specific criteria. Additionally, digital nomadism has sparked controversy over a form of *"transnational gentrification"* at a global level. This occurs because digital nomads, who often originate from the Global North, move to more exotic or affordable destinations in the Global South, inadvertently driving up the cost of living and rent in their destination locales and in countries of digital immigration (Holleran, 2022). This phenomenon was particularly pronounced in Serbia at the start of and during 2022, with the influx of digital nomads from Russia and, to a lesser extent, Belarus and Ukraine, leading to a sharp increase in rental prices, initially in Serbia's largest cities (Belgrade and Novi Sad) and subsequently in other cities (N1 Beograd, 2022).

Not everyone is cut out to be a successful digital nomad. Key to working remotely, especially across different time zones, are self-organisation, self-discipline, and concentration (Cook, 2023), as well as the ability to find free time and secure an adequate internet connection that aligns with the business hours of the destination company (Nash et al., 2018). When remote workers are left to their own devices, dictating their own work and behaviour patterns, they often encounter a psychological challenge: they either struggle to motivate themselves to work as effectively as they would under workplace supervision, or they find it difficult to disconnect and rest without a clear separation from work (Milošević, 2023).

Geographical independence introduces several new challenges for digital nomads, such as blurring the lines between work and leisure time, difficulties in maintaining relationships with family and friends, and securing a steady income—often, their earnings are unstable and sporadic, typifying the *"gig economy"*, posing a risk of financial instability, and even leaving them without

means to return home (Thompson, 2018). Hermann and Paris (2020) highlight issues like insecurity, high risks, loneliness, and uncertainty among digital nomads. More recently Cook, in his four-year study of 16 digital nomads worldwide, concluded that the idealised image of stress-free work is largely a fantasy. Although some traditional office work challenges are mitigated, new ones emerge (Cook, 2023). The romanticisation of digital nomadism is also scrutinised by Bonneau et al. (2023) who compare it to the glorification of other professions in earlier periods through mass media, just as the legal profession was glorified in the 1980s (Friedman, 1989).

Digital nomads often form informal "clusters" or communities based on word-of-mouth, living and interacting together, or simply residing close to each other in a "familiar environment" rather than integrating with the local population. This phenomenon is particularly notable among Russians in Novi Sad, Belgrade, Sremska Mitrovica, Pančevo, and globally in places like Chiang Mai, Phuket, Medellín, Ubud (Hermann & Paris, 2020), as well as destinations like Santa Marta (Colombia) and Bali. Another trend among expats, including digital nomads, is clustering into communities abroad that mimic their homeland's culture, often resulting in cultural isolation from the local lifestyle (Thompson, 2019), reminiscent of Western "concessions" in China until World War II.

A distinctive aspect of digital nomadism related to travel and economy is the redefinition of "home" (Bonneau et al., 2023), as digital nomads often adopt a *"minimalist lifestyle"* (Aroles et al., 2019), with many not maintaining a "home base" at all (Nash et al., 2021). These factors, combined with limited access to healthcare and social security, detract from the initially idealised appeal of digital nomadism. On a positive note, digital nomads contribute to both their employers and local economies, spending 35% of their income in local communities (Angiello, 2022) and recording a 4.4% increase in productivity when other job factors are controlled (Choudhury et al., 2021).

3. DIGITAL NOMADISM BY COUNTRY AND IN SERBIA

Different countries have launched various initiatives to attract digital nomads, a trend that gained momentum following the onset of the COVID-19 pandemic and the implementation of lockdowns (Westenberg, 2020). Among the first programmes to draw in digital nomads were introduced by Estonia, Georgia, Bermuda, and Barbados in early 2020 (Hermann & Paris, 2020). Currently, many countries have set conditions for digital nomads and offer specific visas. According to recent data, 41 countries globally provide some form of visa for digital nomads, including Germany, Anguilla, Antigua and Barbuda, Aruba, Barbados, Bermuda, Brazil, Cape Verde, Costa Rica, Croatia, Curaçao, Cyprus, Dominica, Ecuador, Spain, UAE, Estonia, Georgia, Grenada, Greece, Hungary, Indonesia, Iceland, Cayman Islands, Seychelles, Italy, Latvia, Malaysia, Malta, Mauritius, Mexico, Montenegro, Montserrat, Norway, Panama, Portugal, Czechia, Romania, Saint Lucia, Thailand, and Sri Lanka (Planet Nomad, 2024).

Planet Nomad notes that these programs typically require standard documents such as a criminal record certificate (either lifelong or, as in Brazil, for the last five years), health insurance, and a medical record confirming that the digital nomad does not pose a health risk. Additionally, there is considerable variation in the average required income. Spain, for example, requires an average income of €2,151 per month, or, for irregular income, an annual income of €25,816, along with standard health insurance, a clean criminal record, and a medical certificate. Brazil asks for $1,500 per month or $18,000 per year, while Portugal only requires €600 per month. Mexico sets

the bar at $1,620 per month, Estonia at €3,504, Costa Rica at an average of $2,500 per month over two years or $60,000 in bank deposits if income stability is uncertain. Iceland demands as much as €6,993 per month, Malta €2,700, Romania €3,330, Czechia €5,000, Georgia $2,000, Croatia €2,232, Antigua and Barbuda, and Barbados $50,000 per year, while the Cayman Islands, asking for up to $150,000 of annual earnings, are less popular (Planet Nomad, 2024). Bermuda does not specify an income requirement but requires consistency, making it a popular choice (Government of Bermuda, n.d.), as is Germany. Norway requires €35,719 per year, and Serbia, still in discussions about its program despite hosting many digital nomads, is considering a mandatory salary of €3,500 per month (Lawyers Serbia, n.d.), a relatively high sum.

In Serbia, citizens of Russia, Belarus, Ukraine, or Moldova do not need visas, allowing for an "undefined" form of digital nomadism. People can work through permanent residence, refugee status, or by renewing their visa through monthly exits from the country, often to Bosnia and Herzegovina (the so-called visa-run) (srb.guide., n.d.). Oxford Analytica notes that the Serbian economy benefits from the influx of immigrants from these countries, who are mostly highly-skilled, often IT experts or digital nomads from creative industries. The arrival of these individuals and their families has significantly boosted Serbia's demography and real estate market (Oxford Analytica, 2023). As of November 2023, 2,129 companies founded by citizens of Russia and Ukraine, mostly in non-specialised wholesale trade, computer programming, consulting, business management, and other management activities, were registered in Serbia, with many of their workers relocated there. This indicates that many immigrants from the former USSR are not digital nomads, but there is a significant number who work for Russian companies and receive payment from home. Additionally, the cultural life and local tourism in Serbia have been invigorated by immigrants from Russia, Belarus, and Ukraine, including increased visits to cultural institutions.

4. CONCLUSION

Digital nomadism is a logical evolution stemming from generational shifts, the intensification of globalization, the emergence of new connectivity options through information technologies, and the changes brought about during and after the COVID-19 pandemic from 2020 to 2022 (Graić et al., 2023). It reflects the response of knowledge workers, particularly in creative industries, to movement restrictions (lockdowns) and the reduced necessity—or outright redundancy—of reporting to a traditional workplace. The primary benefits of digital nomadism include an average productivity increase of 4.4%, which benefits employers, and investment in local economies, with digital nomads spending an average of 35% of their earnings in their host communities.

However, despite research and analyses conducted from 2000 to 2019, perceptions of digital nomadism haven't significantly moved beyond the romanticised vision of individuals working from exotic beach locations, defying conventional employment norms. Although digital nomads can reduce living expenses by moving from expensive to more affordable locations (even within the same country), avoiding commuting costs, and potentially working fewer hours due to increased productivity, they face challenges. These include blurring the lines between work and leisure, difficulties in maintaining relationships, unstable income, insecurity, uncertainty, logistical issues like internet connectivity across different time zones, loneliness, and high risks, such as disruptions in payment transactions (e.g., the recent suspension of Western card services in Russia).

Like other forms of remote work, but more acutely, self-organisation and self-discipline are crucial. Host countries may experience "transnational gentrification" where price increases driven by digital nomads can lower living standards for local residents. Digital nomads often embrace a minimalist lifestyle and face cultural barriers, leading them to cluster with like-minded individuals, sometimes isolating themselves from the local culture.

The post-pandemic world and relaxation of travel bans prompted numerous countries to initiate visa programmes for digital nomads, reflecting a broader movement towards digitalisation as strategies for staying competitive. Currently, Planet Nomad identifies 41 countries offering such programmes, highlighting the progressive stance of nations like Croatia, Montenegro, and Hungary. Serbia, too, has emerged as an informal beacon for digital nomadism, illustrating how countries are adapting to changing market dynamics (Ribeiro et al., 2023). Serbia has become an informal hub for digital nomadism, despite the lack of formal legality, as digital nomads from Russia, Belarus, and Ukraine do not require visas for Serbia and mostly work there on tourist visas. Nonetheless, the economic and cultural impact of digital nomads in Serbia has been significantly positive, offering a boost to a country grappling with demographic and brain drain challenges. The arrival of highly skilled workers and their families revitalises both the economy and culture.

While many countries set minimum income requirements for digital nomads, the suggested income of €3,500 per month for Serbia, like that of many Eastern European countries, seems overly ambitious and may push digital nomads into a "grey economy" of clandestinely working tourists. We recommend that the Government of the Republic of Serbia consider adopting more realistic policies, akin to those of Portugal (€600), Germany (no requirement), or Georgia ($2,000), instead of demanding higher incomes from digital nomads than countries like Spain.

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Can Hypnosis Develop Emotional Intelligence and Employees' Skills?

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Abstract: *Emotional intelligence (EI) refers to qualities and skills beyond traditional intellectual and technical competencies. EI proved to be an essential skill that goes alongside leadership skills, positively impacting organizational behaviors and business outcomes and influencing overall work performance. EI is important in organizational settings in three ways: the leader's EI, the employee's EI, and the emotional climate of groups and teams. Few studies showed that happier people produce more GDP, so the positive effects are countable in business. People have different levels of EI, but nowadays, workplaces do not focus on developing such soft skills yet. However, we can see that the development of EI could be beneficial. One possible way to develop EI is using coaching hypnosis, which has been used in the workplace to improve organizational skills.*

This paper examines hypnosis professionals' feedback on hypnosis use for the development of emotional intelligence and employees' skills. The study follows a qualitative methodology with a questionnaire built to investigate the opinions of professionals. The primary results show that hypnosis can be used to develop emotional intelligence and employee skills in general.

The study aims to underline the effectiveness of hypnosis at workplaces and, based on this, to offer a potential development strategy for emotional intelligence to enhance company success based on employee success. In this paper, we'll present concrete techniques based on professionals' answers to improve leaders' skills to be transformative and resonant leaders.

1. INTRODUCTION AND LITERATURE REVIEW

There exists an ongoing evolution that reflects the dynamic nature of organizations and their management.

Management theories field, for example, goes back thousands of years, followed by leadership theories and, more recently, emotional intelligence (EI). and in some way, they are all interconnected. Developing emotional intelligence contributes to developing leadership skills, which help in fostering a positive, successful management environment in organizations. Studies on different ways to develop EI are still understudied and ongoing. Neuro-linguistic programming (NLP) used in training is one of the possible ways to develop EI that is still under study. NLP is a psychological intervention mostly used in coaching and training to develop different soft skills. Hypnosis is another psychological intervention used in the past to develop different skills. For example, research showed it could be used for problem-solving skills (Sanders, 1976). Despite the lack of research on both psychological interventions for developing EI and leadership, there is still more research using NLP for this purpose compared to studies using hypnosis, while NLP has its roots in hypnosis (Bandler & Grinder, 1979). This might be due to the stigmatization that the hypnosis concept has. Hypnosis might be a great tool to use to develop employees' skills and EI. This research investigates the opinion of hypnosis professionals on this possibility.

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The field of management theories has a rich and extensive history that dates back thousands of years. From the ancient civilizations of Iraq and Egypt to the classical management theories and behavioral theories developed in the 20th century to leadership theories and contemporary management approaches, the study of management has evolved and grown over time. Leadership theories, in particular, have been explored and analyzed throughout history, with different perspectives and ideas developed to understand leadership dynamics in various contexts and industries (Dinh et al., 2014).

While the leadership concept was already mentioned in the past with Attila the Hun (Roberts, 1987), scientific theories and studies started gaining in popularity in the 19th century. It followed the same path as management theories in that both have been going through changes over time, and both are linked to organizational management. Over the years, leadership theories have been studied, and several theories have emerged. In 1985, Bass worked on developing the initial work of Burns (1978) and introduced transformational leadership theory.

Transformational leadership is one of the most prominent and widely studied theories in leadership (Yusuf & Kurniady, 2020). It focuses on the ability of leaders to inspire and motivate their followers, creating a sense of shared vision and purpose. This approach emphasizes the importance of leaders creating meaningful connections with their followers, promoting individual growth and development, and fostering a positive organizational culture.

It is about leaders who encourage, inspire, and motivate their followers while developing themselves to be ready to adapt to changes when they occur. It is mainly used when an organization is going through a change or needs revitalization. But in today's world, we witness discoveries and inventions daily. According to this theory, leaders would stimulate logical thinking, questioning the basic assumptions of employees to encourage creativity and innovation (Bass & Riggio, 2006). The emergence of transformational leadership theory further contributed to our understanding of effective leadership by emphasizing the importance of inspiring and motivating followers to achieve shared goals. Transformational leadership aims to enhance team performance through idealistic influence, motivational inspiration, intellectual stimulation, and personalized attention. Leaders can be considered hypnotists, and the crowd/followers are the ones being hypnotized. It is interesting to note that hypnosis is linked to leadership skills. Hypnosis is, after all, a power of persuasion that several political leaders used unconsciously or might have also used consciously to lead their followers/the crowd in a certain direction. Donald Trump is an example of a powerful leader who was a big influencer, leading the crowd in the direction he looked for (Koritar, 2022). Studies also showed that throughout history, several leaders might have used hypnosis to manipulate in a way the crowd toward their common goal, such as is seen in most revolutions where we witness few people leading the whole movement (Graumann, 1986). Aside from being used by leaders, hypnosis is also used to develop EI.

Emotional intelligence can facilitate reaching transformational leadership goals, which brings in the capacity to recognize, process, comprehend, and control emotions (Ireland, 2008).

Studies showed that EI can predict the effectiveness of transformational leadership (Pandey & Rathore, 2015) and that those with a higher level of emotional intelligence tend to exhibit more transformational leadership qualities (Allameh et al., 2015; Mathew & Gupta, 2015). The definition for this leadership style, according to Bass (1985), is that leadership is "the principal dynamic force that motivates and coordinates the organization in the accomplishment of its objectives".

On the other hand, emotional intelligence is the ability to recognize, understand, and manage one's emotions and those of others effectively. Research shows that by doing so, we influence other's motivation and behavior, ultimately leading to better interpersonal relationships and overall success in various areas of life.

Leadership based on emotional intelligence brings in a positive and motivating environment in the workplace. Employees' performance is positively affected by their well-being, enhancing decision-making and problem-solving skills (Palmer et al., 2001). Together, there is a higher effect on organizational success.

Wellbeing incorporates different factors, including happiness (Seligman, 2011). In a variety of settings, there is a strong correlation between happiness and emotional intelligence (EI). Research indicates that people with elevated emotional intelligence (EI) typically report greater enjoyment and overall happiness (Elayan et al., 2023). A low level of EI in engineering students, for example, is linked to a low level of happiness (Khefacha & Sellei, 2023), which emphasizes furthermore the importance of developing EI levels for success and well-being.

Since its emergence, different methods have been pointed out and experimented with to develop emotional intelligence. This includes different training and techniques such as teamwork, self-reflection, and empathy-building exercises within emotional intelligence training (Groves et al., 2008; Nelis et al., 2009; Pat McEnrue et al., 2009; Tucker et al., 2000). Different ways of coaching can be used for this purpose. For example, over time, Daniel Goleman and Cary Cherniss noticed that a promising approach to use to do EI training is using the Intentional Change Theory (ICT) of Richard Boyatzis's work (Goleman & Cherniss, 2024). On the other hand, some studies showed the effectiveness of using psychological coaching to develop EI. Neurolinguistic programming is still a new approach under study but has proven its effectiveness (Ahmad, 2017; Zhang et al., 2023). In addition, it can also enhance knowledge, self-management, and mental health while minimizing work stress (Nompo et al., 2021). It is interesting to point out that NLP is derived from hypnosis. Hypnosis, which is used in the workplace to develop employees' skills, is also understudied. A recent study focusing on developing self-motivation from the emotional intelligence framework on 10 employees in an international corporation showed its effectiveness (Khefacha & Sellei, 2023). Another study on self-hypnosis used to develop EI also proved its effectiveness with young officers at a bank in India (Umashankar & Varma, 2017).

Hypnosis is also an effective tool for increasing happiness. It is a facilitative approach to increase happiness by working on variables such as executive attention, positive imagery, and emotions about the past, present, and future (Ruysschaert, 2014). While hypnosis is mainly known for being used for therapeutical practices, it can also be used for coaching. "The term 'coaching hypnosis' is proposed when referring to using hypnosis in coaching" (Armatas, 2009).

This brings us to the central question of this research. There is a lack of studies on the possibility of hypnosis usage to develop EI and employee skills despite its use in reality, and few studies show its effectiveness in developing EI, leadership, and happiness.

- Does the years of experience of hypnosis professionals impact their belief in the possibility of using hypnosis to develop employees' skills?
- Does the years of experience impact hypnosis professionals' usage and the possibility of usage of hypnosis to develop EI?
- Do hypnosis professionals trained in NLP believe that NLP is a form of hypnosis?

2. METHODOLOGY

The focus of this research is to determine the possibility of using hypnosis to develop employees' skills and EI in an attempt to alleviate the stigma and fear that exists in the hypnosis field. We aimed to have the opinions and feedback of experienced hypnosis professionals on the possibility of using it for employees' benefits.

We received the collaboration of the National Syndicate of Hypnotherapists in France (SNH). They agreed to share on their online platforms our questionnaire built for this research. The questionnaire was made in French language and English in an attempt to share the English version with the broader international community in the future. Answers were confirmed to be anonymous, and they targeted hypnosis professionals from all levels.

It required approximately 5 to 10 minutes maximum to complete and contained 4 sections: general questions, hypnosis and employee relationship, hypnosis and NLP, and EI and hypnosis. A few questions were made using 5-point Likert scale to determine their degree of belief in the possibility of using hypnosis for employees' skills and increasing EI levels, for example.

The questionnaire was shared between March 1, and March 12, 2024 by the SNH on their official Facebook page and website.

3. RESULTS

The demographic part of the questionnaire was focused on gathering general data such as the gender of participants, their level of hypnosis certificate if they were members of the SNH, the number of years using hypnosis, and if they used coaching hypnosis and frequency of use.

We received 200 answers, of which we excluded 10 with several empty answers. Only 7 participants were technicians in Hypnosis, and the remaining had a practitioner or higher level of certification in hypnosis. The technician level is an introductory training towards becoming a hypnotherapist. With further training and certification, one can become a practitioner and attain higher levels. Due to the low number of differences, we decided not to use this variable in our deeper analysis. All participants in the survey were members of the SNH. This question was important as the social media channels, such as the Facebook page, of the syndicate are accessible to everyone, not only their members.

The participants were composed of 126 females and 64 males. 54%, thus, 103 of the respondents had between 6 and 30 years of experience using hypnosis. 40%, thus, 76 of the participants have between 1 to 5 years of experience.

49% thus 94 hypnosis professionals confirmed using hypnosis to develop employees' skills. Only 17 of them reported being recruited by companies to use hypnosis to develop employees' skills. There are only 19 of 94 professionals who have started using it for employees' benefit in the last year, and Figure 1 shows that there is an increase of experienced hypnosis professionals using it to develop employees' skills despite the existing stigmatization. This might be explained by the efforts several professionals, associations, and syndicates are putting into supporting research and providing further proof of the benefits of using hypnosis.

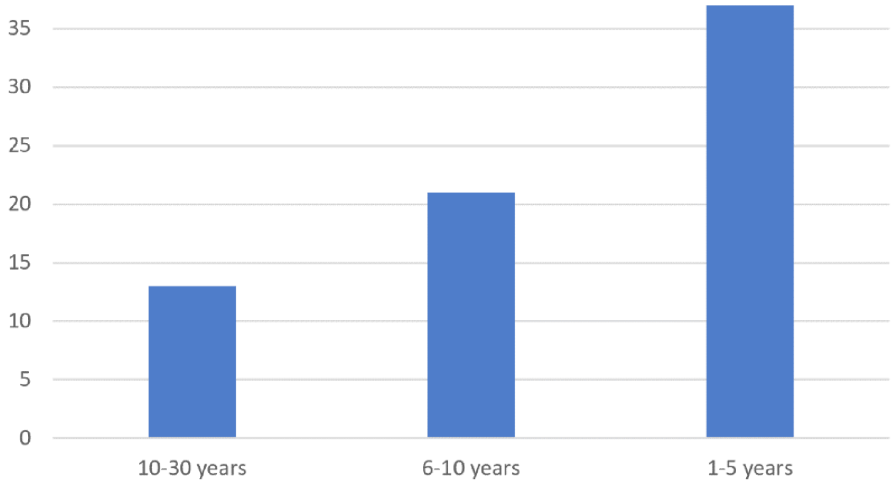

Figure 1. Increase of hypnosis professionals using hypnosis to develop employees' skills over time

Source: Own research

To answer our paper's questions, we used quantitative analysis with Excel with ANOVA analysis. Table 1 shows the mean and standard deviation of the relationship between years of experience with hypnosis professionals and their belief in using hypnosis to develop EI and employees' skills.

Table 1. Relationship between years of experience of hypnosis professionals and their belief in using it for employees' skills development and EI

Question 1	**Count**	**Mean**	**SD**
>1 year	11	4.54	0.65
1-5 years	76	4.46	0.86
6-10 years	64	4.42	0.99
10-30 years	39	4.38	1.03
Question 2	**Count**	**Mean**	**SD**
>1 year	11	3.86	0.56
1-5 years	76	3.95	0.64
6-10 years	64	3.79	0.93
10-30 years	39	3.92	0.68

Source: Own calculations

For Question 1, we found a p-value of 0.977>0.05. We accept the null hypothesis, which encompasses that the years of experience do not affect their belief in the possibility of using hypnosis to develop employee skills. This confirms further the descriptive analysis where we see that the number of professionals using hypnosis for employees (19) is higher than the total number of professionals who have less than a year from the time they started using hypnosis in general.

Question 2 was analyzed by using 6 sub-questions using 5 points Likert-scale to investigate to which extent they use or would they use hypnosis to develop EI, with the different sub-scales of EI; Self-awareness, self-regulation, empathy, self-motivation, stress management, and social skills. All 6 variables were proven to be correlated. We thus combined them in one variable "Possibility of using hypnosis to develop EI". The ANOVA analysis showed a p-value of 0.650>0.05. This result means that the difference in their years of experience is that experienced hypnosis professionals do and would use hypnosis to develop emotional intelligence. A deeper analysis of the variables that

might have an impact on their possibility of using hypnosis for EI showed that using coaching hypnosis does have an effect with p=0.001. This might be explained by the fact that 62% confirmed using coaching hypnosis in their practice. 47% of those using coaching hypnosis do use it daily while the rest use it sometimes. Emotional intelligence is an umbrella of a set of soft skills, and the definition of coaching hypnosis is the use of hypnosis to develop different skills, including soft skills. The significance of this result might be because over 50% of participants already use coaching hypnosis.

On the other hand, using hypnosis to develop employees' skills ($p=0.653>0.05$) and being trained in NLP or not ($p=0.07>0.05$) do not have an impact on the possibility of using hypnosis to develop emotional intelligence skills.

An ANOVA test of the third question also showed significance with $p=0.01<0.05$. This confirms that hypnosis professionals trained in NLP do believe that NLP is a form of hypnosis.

4. DISCUSSION AND CONCLUSION

One of the most known leadership theories is transformational leadership, which emphasizes the ability of leaders to inspire, motivate, keep self-developing, and develop others while enacting meaningful change within an organization. This theory posits that transformational leaders can positively influence their followers to exceed expectations and achieve remarkable results while driving positive changes (Yusuf & Kurniady, 2020). Emotional Intelligence is a crucial component that supports the transformational leadership theory, allowing leaders to understand and empathize with their followers, effectively build trust, and communicate their vision. Developing emotional intelligence skills is thus crucial for leaders to effectively implement transformational leadership practices, create a positive work environment, and bring happiness and well-being feelings to employees. One of the possible methods to do this is through psychological ways such as neurolinguistic programming and hypnosis. Despite the lack of research on such techniques, coaches use them and implement them in their training and coaching. Hypnosis is known mostly for its use in the medical field. However, coaching hypnosis is a concept that confirms the possibility of using it to develop different skills instead of resolving therapeutic mental issues.

This paper looked into decreasing the stigmatization of hypnosis used for developing soft skills and emotional intelligence with an analysis focused on French hypnosis professionals. NLP is accepted as a method for use for such a goal, but hypnosis is still feared. Our study confirmed further that NLP is derived from hypnosis and is, in a way, a form of use of hypnosis. This result is consistent with the authors' original description and explanations of the NLP method when they presented it as derived and inspired by hypnosis (Bandler & Grinder, 1979).

The findings indicate that the number of years of experience had no bearing on the respondents' conviction that hypnosis can be utilized to improve workers' skills. The rise in hypnosis practitioners utilizing it more and more for the benefit of workers and the workplace is an encouraging sign for the future of hypnosis outside the medical field.

Results also confirmed the possibility of using it for EI development. With its development comes transformative leadership practice and the success of employees and organizations. Based on these results, we propose using hypnosis for coaching as a tool to develop emotional intelligence and empower leaders.

The limitations of this study include the timeframe of the questionnaire, which is 12 days, and the questionnaire is shared only with French hypnosis professionals. We look into keeping the survey open to gather further data from worldwide.

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Generation Z Students` Preferences Toward Future Professional Engagement

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Abstract: *Over the last few years, many authors have examined Generation Z – its characteristics, habits, values, attitudes and behaviors, interests, learning style, as well as job preferences. It is not surprising, because this generation is significantly different from its predecessors in many aspects. Moreover, this generation has entered to labor market for the first time. A new generation of workforce means new challenges for employers. In this sense, the purpose of this study is to explore the characteristics of Generation Z students and their preferences toward future professional engagement. The survey is based on a questionnaire addressed to students of professional studies at The Academy of Applied Technical Studies Belgrade. The data is processed in the SPSS software package and the research strategy includes descriptive statistics. Despite some limitations, the results of the study may be useful for employers, higher education institutions and teaching staff, as well as for present and future research.*

1. INTRODUCTION

The 'generational differences' are not a new phenomenon, it has always existed. Historically, people were affected by different living conditions and specific events that shaped their lifestyle, and the way they think and behave. These differences made the basis for sociologists to classify people into age groups – named 'generation'. Many theorists suggest explanations for this term, but for this paper, the authors use the definition by McCrindle (2014) – a generation is a cohort of people born in a certain period, 'united by age and life stage, conditions and technology, events and experiences' (p. 1). The contemporary literature identifies six different generations: Silent or Greatest Generation (born between 1928 and 1944); The Baby Boomers (1945 – 1965); Generation X (1965 – 1979); Generation Y (1980 – 1995); Generation Z (1995 – 2010) and Generation Alfa (2010 – 2024) (Bencsik et al., 2016; Dolot, 2018; McCrindle & Fell, 2019). Each generation has unique characteristics that differentiate it from its predecessors. In the case of Generation Z, the differences are more pronounced, as this generation has grown 'in completely different circumstances' (Dolot, 2018, p. 44). Digitalization and virtualization, 'recession and economic uncertainty' (Dwidienawati & Gandasari, 2018), the development of social media, pandemic lockdown and climate changes (McKinsey & Company, 2023) are the main forces that shape values, attitudes and behaviors, expectations and preferences of Generation Z. Since 2017, graduates of this generation have joined the labor market and new issues have arisen. Understanding their characteristics, job-related preferences and career aspirations is crucial for employers to attract and retain them. In Serbia, there is an insufficient number of studies in this field. This paper aims to verify the results of previous research with a sample group of Generation Z students from The Academy of Applied Technical Studies Belgrade.

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The paper addresses the following research questions:

Research Question One: What are the characteristics of Generation Z students from their point of view?

Research Question Two: What are the preferences of Generation Z students toward professional engagement?

Research Question Three: How do Generation Z students evaluate the needed skills and abilities for successful professional development?

The results of this study confirm some conclusions from previous research and refer to some new information about Generation Z.

2. GENERATION Z: CHARACTERISTICS AND WORK PREFERENCES

The different terms that are used for Generation Z - 'net generation', 'iGeneration', 'digital natives' (Tari, 2011, as cited in Bencsik et al., 2016, p. 93; Dolot, 2018; Hernandez-de-Menendez et al., 2020) and 'digital integrators' refer that technology is highly integrated into their lives (McCrindle & Fell, 2019). It is not surprising, since they were born when the Internet and World Wide Web already existed (Cilliers, 2017; Gomez et al., 2022), i.e. they were growing at the time of the digital revolution. Digital surroundings have caused Generation Z has 'never used phone with a cord, floppy disk, paper map or cassette player for listening a music' (Gomez et al., 2022, p. 4). Instead, they have always had 'smart' phones; stored data on a 'cloud'; found locations by e-map; and listened to music through digital platforms. Mobile internet enables them to be online 24/7 (Cowan, 2014, as cited in Jaleniauskiene & Juceviciene, 2015, p. 41) and to reach information by 'one click'. They learn from e-sources rather than printed materials (Madden, 2019; McCrindle, 2014). Members of this generation 'do not spend so considerable time outside' with their peers (Çora, 2019, p. 911); they use social media to share ideas, and interests and to express themselves (Hernandez-de-Menendez et al., 2020), to chat with people around the world; they are members of virtual communities (Madden, 2019). According to McKinsey and Company (2023), Generation Z spends six or more hours a day on their phones; they cannot imagine life without the internet and smart technology (Çora, 2019; Gabrielova & Buchko, 2021). It is 'the first generation of globalization […] characterized by a high degree of mobility, universal values, and virtualization' (Arar & Yuksel, 2015, p. 4). This generation simultaneously lives in physical and virtual realities (Dolot, 2018; Lazanyi & Bilan, 2017, and Żarczyńska-Dobiesz & Chomątowska, 2014, as cited in Bieleń & Kubiczek, 2020, p. 89).

It is not just digital technology that influences young people during the processes of socialization and identification. Also, political, economic and social circumstances at global and national levels shape their personalities (Çora & Aydin, 2016, as cited in Çora, 2019, p. 913). Besides digitalization and other global forces (e.g., the growth of China`s economy, the Great Recession, and COVID-19), people in Serbia have been exposed to turbulent living conditions over the last 30 years. Today higher education students – members of Generation Z, were growing in the time of recovery from Yugoslav wars and bombing, transition from socialism to capitalism, political unrest, economic uncertainty, and radical changes in social norms and values.

Respecting individuality, many authors agree about some common characteristics of Generation Z. Deep familiarity with digital technology makes Generation Z tech-savvy (bin Othman

et al., 2019; Devan, 2024; Hernandez-de-Menendez et al., 2020; Jaleniauskiene & Juceviciene, 2015). They are capable of finding, exchanging, and processing information fast and they are skillful in multitasking (Arar & Yuksel, 2015; Çora, 2019; Jaleniauskiene & Juceviciene, 2015). As most of the time, they spend online and in virtual communication, they are fluent in the digital language (Lev, 2021) and they use foreign words, slang (Bencsik et al., 2016), emoticons, gifs and images in mutual communication (Half, 2015b, as cited in Racolţa-Paina & Irini, 2021, p. 79). On the other hand, their written, oral, and listening (Half, 2015, as cited in Racolţa-Paina & Irini, 2021, p. 79), as well as interpersonal skills (Bieleń & Kubiczek, 2020; Richmond, 2024), are insufficiently developed. Through social media, they are connected with people from different cultures (McCrindle, 2014), which enhances their flexibility, and openness to diversity (Choughari, 2024; Kapil & Roy, 2014, as cited in Racolţa-Paina & Irini, 2021, p. 79) and 'ability to adapt to the global world' (Wood, 2013, as cited in Iorgulescu, 2016, p. 48). Excessive use of internet and social media cause their span of attention is limited (Çora, 2019; Bejtkovsky, 2016, as cited in Demir & Sönmez, 2021, p. 685), difficulties in long-term memorizing contents (Tari, 2011 & Csobanka, 2016, as cited in Dolot, 2018, p. 45) and tendency to individualism (Igel & Urquart, 2012 and Törocsik, et al., 2014, as cited in Demir & Sönmez, 2021, p. 685). However, Generation Z is always up to date with changes, especially with technological innovations (Richmond, 2024). Consequently, they are innovative and adaptable to (rapid) changes, and they know that better opportunities always exist (Devan, 2024).

Although many authors agree about the common characteristics of Generation Z, the findings related to its work preferences are slightly opposite. Some recent studies point out that Generation Z is not opposed to working in a midsize or large company (Bloomgarden, 2022; Desjardins, 2019; Iorgulescu, 2016; Mărginean, 2021) especially in 'technologically innovative environment' (Lev, 2021); but they prefer autonomy, individual work and own workspace (Bloomgarden, 2022; Çora, 2019; Desjardins, 2019; Mărginean, 2021). On the contrary, some authors indicate that Generation Z favors working in a group (Hysa, 2016, as cited in Bieleń & Kubiczek, 2020, p. 90) or in a large team (Iorgulescu, 2016). Considering that Generation Z gives priority to flexible working hours and locations (Choughari, 2024; Half, 2023; Racolţa-Paina & Irini, 2021; Richmond, 2024) it is not surprising that some authors find Generation Z is more entrepreneurial and/or self-employment oriented than to work in a company (Peterson, 2014, as cited in Arar & Yuksel, 2015, p. 4; Bloomgarden, 2022; Çora, 2019; Beal, 2019, as cited in bin Othman et al., 2019, p. 48). Additionally, they prioritize a friendly working environment (Half, 2023; Mărginean, 2021); competitive salary, job security, mentorship and good relationship with the manager (Half, 2023; Iorgulescu, 2016;); face-to-face (Desjardins, 2019), 'open, transparent and frequent' communication (Richmond, 2024). On opposite, Dolot (2018), by literature review, notices that Generation Z does not pay too much attention to job security even more, they are willing to change a job if it does not meet their expectations. Generation Z expects and appreciates developmental opportunities (Choughari, 2024), promotion and career growth (Desjardins, 2019; Half, 2023; Iorgulescu, 2016); equality at work (Choughari, 2024; Desjardins, 2019); possibility to express opinions and ideas; collaboration with people from different cultures (Mărginean, 2021); work-life balance (Bloomgarden, 2022; Choughari, 2024; Richmond, 2024). They are aware that success in a career means hard work and lifelong learning (Desjardins, 2019; Iorgulescu, 2016; Mărginean, 2021).

Each new generation of workforce has initiated new issues and challenges for employers and policymakers, but it seems that Generation Z has caused 'the greatest generational shift the workplace that has ever seen before' (Tulgan, 2013, as cited in Iorgulescu, 2016, p. 48).

3. RESEARCH METHOD

According to the aim of this study – the exploration of Generation Z students` preferences toward future professional engagement, the quantitative research method was applied. The results of previous research in this field were the basis for empirical analysis. The study used a survey that was carried out by online questionnaire. The questionnaire consisted of three demographic questions, one related to students` characteristics and seven questions regarding students` job-related preferences. The types of questions were single-selection and rating the statements by a five-point scale (1=the lowest grade and 5=the highest grade). A convenience sampling technique was applied, due to this technique enabled the data from respondents who were available to the authors. In total, 250 questionnaires were distributed to the second- and third-years students of The Academy of Applied Technical Studies Belgrade (Department of Belgrade Polytechnic). Only 96 students filled out the questionnaire, of whom 86 belonged to Generation Z, and their responses were considered in the results analysis. The research was conducted in December 2023 and January 2024. Descriptive statistics was used to summarize and describe the data. Data was processed using SPSS.

Some limitations occupied this study. Firstly, as the sample was determined by availability, the authors are aware the results are not representative, but it is interesting to gain insight into Generation Z students` characteristics and preferences. A significant number of students did not want to participate in the survey. Additionally, very often students are not willing to respond honestly.

4. RESULTS AND DISCUSSION

The first part of the questionnaire included demographic questions and in this sense over two-thirds of respondents were females (76.9%), 77.9% were third-year students and the span of the birth years was from 1995 to 2004.

By the first research question, the authors want to examine students` perceptions about their work-related characteristics. The obtained results are presented in Table 1.

Table 1. Students' perceptions about their work-related characteristics

	Mean	5	%	4	%	3	%	2	%	1	%
I easily accept changes	3.74	24	27.9	25	29.1	29	33.7	7	8.1	1	1.2
I am good at multitasking	3.72	19	22.1	36	41.9	19	22.1	12	14.0	-	-
I need a lot of time to build trust with other people	3.65	24	27.9	21	24.4	31	36.0	7	8.1	3	3.5
I enjoy being a leader	3.33	14	16.3	26	30.2	26	30.2	14	16.3	6	7.0
I am patient	3.93	31	36.0	30	34.4	15	17.4	8	9.3	2	2.3
I enjoy daydreaming more than making realistic plans	2.51	6	7.0	11	12.8	22	25.6	29	33.7	18	20.9
I tend to take risks	3.34	11	12.8	32	37.2	25	29.1	11	12.8	7	8.1
I am a team worker more than an individualist	3.15	14	16.3	17	19.8	32	37.2	14	16.3	9	10.5

Source: Own calculations

The results show that more than two-thirds of respondents consider that they are patient (70.4% - very agree and completely agree), which is opposite to many previous research. The majority of students (64%) see themselves as good at multitasking. Similar findings are obtained by

Arar and Yuksel (2015), Çora (2019), and Jaleniauskiene and Juceviciene (2015). 57% of students think that they easily accept changes, which is in line with the assertion by Devan (2024). They need a lot of time to build trust with other people and they are not afraid to take risks (50%). Just 36.1% believe they are team workers, 10.5% are true individualists, and they are not dreamers, but rather make realistic plans. These results confirm some findings of the previous studies mentioned in the theoretical background.

The second research question considers the preferences of Generation Z toward professional engagement. It is analyzed through a set of items related to the type of work engagement, work-related priorities, expected salary and workload. The findings indicate that almost one-third of respondents want their first job to be in a medium-sized organization (30.2%); one-fifth (19.8%) see themselves in a start-up or entrepreneurial organization; 18.6% prefer freelance jobs; 14% are oriented to a large international company and same proportion to the public sector; while few of them are interested to work in NGO and in 'other options'. These results point out that the majority of students prefer their first job to be in an organization, which confirms the statements by (Desjardins, 2019; Iorgulescu, 2016; Mărginean, 2021). Interestingly, 39.6% want to work in a team (large or small-sized) which is consistent with the percentage of them who perceived themselves as team workers. Likewise, the true individualists (10.5%) confirm that they prefer individual work (8.1%). One-half of the respondents (51.2%) would like to try each of the previous options. An insignificant percentage of students (1.1%) chose 'other options'.

The next item analyses the students` priorities toward future work engagement. The results are presented in Table 2.

Table 2. Students' priorities toward future work engagement

	Mean	5	%	4	%	3	%	2	%	1	%
Interesting/challenging job	4.17	34	39.5	35	40.7	15	17.4	2	2.3	-	-
A job that implies innovation	3.91	25	29.1	38	44.2	16	18.6	4	4.7	3	3.5
A job that implies creativity	4.36	49	57.0	25	29.1	7	8.1	4	4.7	1	1.2
Continual improvement of knowledge, skills and abilities	4.55	56	65.1	23	26.7	5	5.8	2	2.3	-	-
Possibility to express ideas and opinions	4.70	64	74.6	20	23.3	1	1.2	-	-	1	1.2
Career advancement	4.83	72	83.7	13	15.1	1	1.2	-	-	-	-
Job security	4.53	60	69.8	14	16.3	11	12.8	-	-	1	1.2
Work-life balance	4.80	72	83.7	11	12.8	3	3.5	-	-	-	-
Friendly work environment	4.69	68	79.1	11	12.8	6	7.0	-	-	1	1.2
Good employer reputation	4.42	45	52.3	32	37.2	9	10.5	-	-	-	-
Diversity and inclusion	4.35	50	58.1	22	25.6	10	11.6	2	2.3	2	2.3
An autocratic manager (clear instructions and direct control)	2.78	1	1.2	20	23.3	33	38.4	23	26.7	9	10.5
A job that enables a high level of responsibility	3.34	8	9.3	32	37.2	32	37.2	9	10.5	5	5.8
Possibility of business traveling	3.70	26	30.2	25	29.1	24	27.9	5	5.8	6	7
Flexible working hours and/or remote work	4.26	47	54.7	22	25.6	11	12.8	4	4.7	2	2.3
Possibility of achieving status and prestige	3.74	26	30.2	27	31.4	22	25.6	7	8.1	4	4.7
Small distance between work and home	3.83	26	30.2	30	34.9	26	30.2	2	2.3	2	2.3
Independence in performing tasks	4.03	26	30.2	41	47.7	15	17.4	4	4.7	-	-
Recognition for the achieved results	4.28	39	45.3	36	41.9	7	8.1	4	4.7	-	-
High starting salary	4.06	29	33.7	34	39.5	22	25.6	1	1.2	-	-
Numerous paid vacation days	3.94	32	37.2	21	24.4	29	33.7	4	4.7	-	-

Source: Own calculations

Table 2 shows that students believe that most of the above statements are (very) significant, except 'manager`s autocratic approach' (M=2.78) and 'high level of personal responsibility' (M=3.34). Considering mean values and distribution of the highest grades (4 and 5), almost all students recognize career advancement, work-life balance and the possibility to express ideas and opinions as the most important priorities (M = 4.83, 98.8%; M=4.80, 96.5%; M=4.70, 97.9%, respectively). Additionally, students value a friendly work environment (M=4.69; 89.4%), the possibility of improving knowledge, skills and abilities (M=4.55; 91.8%), and job security (M=4.55; 86.1%). The findings are similar to those obtained by Iorgulescu (2016), Desjardins (2019), Mărginean (2021), Bloomgarden (2022), Choughari (2024) and Richmond (2024). The mean values of other statements are in the range of 3.70 to 4.42. It is surprising that, although they are young and have no personal and professional experiences, only 59.3% of them appreciate the possibility of business traveling.

Concerning the starting salary at the first job, students` expectations are varied. Nearly one-half of them (47.7%) expect a starting salary of 600-800 euros per month. This group of students is realistic and well-informed, considering that the average monthly salary was 818.3 euros at the national level in January 2024 (Statistical Office of the Republic of Serbia, 2024). One-fifth of respondents (20.9%) expect the first salary in the range of 800-1000 euros; 5.8% are more modest expecting a salary below the national average; while 7% are very confident and expect over 1500 euros per month. The results confirm that a high amount of starting salary is not a students` priority.

When asked about expected daily working hours in relation to mentioned starting salary, 74.4% of respondents think that they should work 8 hours; 7% of students believe that they should work between 10 and 12 hours; 15.1% expect to work less than 8 hours; and three students chose 'other options'. The findings confirm that most students indeed appreciate work-life balance.

By the third research question, the study aims to identify students` opinions on the needed skills and abilities for successful professional growth. Table 3 presents the ratings.

Table 3. The importance of needed skills/abilities for successful professional growth

	Mean	5	%	4	%	3	%	2	%	1	%
Ability to work in a diverse cultural environment	3.81	21	24.4	39	45.3	19	22.1	3	3.5	4	4.7
Ability to work individually	4.33	40	46.5	36	41.9	9	10.5	-	-	1	1.2
Proficiency in foreign languages	3.94	28	32.8	33	39.4	17	19.8	8	9.3	-	-
Listening skills and ability to forward effective feedback	5.00	86	100	-	-	-	-	-	-	-	-
Creativity	4.45	52	60.5	25	29.1	6	7.0	2	2.3	1	1.2
Ability for team work	4.67	79	91.9	-	-	-	-	-	-	7	8.1
The ability for problem-solving	4.62	57	66.3	25	29.1	4	4.7	-	-	-	-
Written and oral communication skills in a diverse professional environment	4.34	41	47.7	35	40.2	8	9.3	2	2.3	-	-
The ability for lifelong learning	4.57	56	65.1	23	26.7	7	8.1	-	-	-	-
Taking the initiative	4.02	28	32.6	35	40.7	20	23.3	3	3.5	-	-
Attention to detail	4.34	44	51.2	30	34.9	9	10.5	3	3.5	-	-
Organizational skills	4.35	42	48.8	34	39.5	8	9.3	2	2.3		-
Leadership skills	3.83	27	31.4	27	31.4	26	30.2	2	2.3	4	4.7
Data/information skills	4.08	30	34.9	40	46.5	10	11.6	5	5.8	1	1.2
Innovativeness	4.37	40	46.5	35	40.7	7	8.1	2	2/3	2	2.3
Entrepreneurial skills	3.83	20	23.3	40	46.5	18	20.9	7	8.1	1	1.2

Source: Own calculations

The results show that all respondents believe that 'listening skill and ability to forward effective feedback' is the most important soft skill (M=5.00; 100%). In the literature, many authors suggest that effective and prompt feedback is very important for Generation Z. The abilities of team work, problem-solving and lifelong learning are also highly rated (M=4.67, 91.9%; M=4.62, 95.4% and M=4.57, 91.8%, respectively). Interestingly, the percentages of students who prefer individual work (8.1%) and students who assess their 'ability for team work' by the lowest grade (8.1%) are the same. Compared to their priorities, once more students confirm the importance of continual improvement of knowledge, skills and abilities. The 'ability to work in a diverse cultural environment', 'leadership skills' and 'entrepreneurial skills' are rated poorly (M=3.81; M=3.83 and M=3.83, respectively).

Finally, the study considers Generation Z`s expectations about their professional development in 5 years after graduating. The largest percentage (36%) strive for academic progress by completing a master's degree. Approximately one-third (34.9%) expect advancement in a chosen organization; 17.4% expect to gain professional experience by working for different employers and 8.1% want to start their own business. For the third time, 8.1% confirm they are real individualists. Only 3.5% of the respondents expect a managerial position in a chosen organization.

5. FUTURE RESEARCH DIRECTIONS

Based on the main limitation of this study, it would be interesting to extend this study to a larger sample of Generation Z students in Serbia. The obtained results refer to some divergences among respondents and the issue of intra-generational differences has arisen. Moreover, the research could be applied to members of Generation Z who already work and compare with this study. Finally, it would be interesting to examine Serbian employers` opinions about Generation Z.

6. CONCLUSION

Global and national occasions affect people and shape their characteristics, lifestyles and behaviors. Generation Z was born when the internet already existed and grew in the time of digital technology expansion, political unrest, economic uncertainty, dramatic climate changes and struggles for equal rights and social justice. Consequently, they developed unique characteristics and preferences that distinguish them from their predecessors. This paper aimed to verify the results of previous studies related to Generation Z`s characteristics and preferences toward professional engagement. The sample consisted of the second- and third-years students – members of Generation Z. Due to the convenience sampling technique used, the findings cannot be applied to the generational cohort, but some useful conclusions emerged.

In line with the findings of previous research, these representatives of Generation Z think that they are good at multitasking; easily accept changes; and see themselves as team workers rather than individualists. They prefer their first job to be in an organization. In this study, two groups of students are clearly distinguished. The first includes students who perceive themselves as team workers and want to work in a large or small-sized team. The second (smaller) group represents true individualists. These students prefer individual work, consider that their ability for team work is not significant and want to have their own businesses.

As the top work-related priorities, students identify career advancement, work-life balance, the possibility to express ideas and opinions, a friendly work environment, the possibility of improvement in knowledge, skills and abilities, and job security, respectively. The same priorities

are determined by other studies but in different order. They do not have high expectations about starting salaries, and a large percentage of students do not expect they should work over 8 hours per day. Students recognize the importance of soft skills in the contemporary environment, and all respondents agree that 'listening skill and ability to forward effective feedback' is the most important skill. Additionally, the majority of them consider that team work, problem-solving and lifelong learning are very significant abilities. Finally, most of them would like to finish their master's studies or advance in a chosen organization 5 years after graduating.

On opposite to some previous research, these members of Generation Z believe that they are patient; do not consider a high starting salary among their top priorities; and the majority of them do not see themselves working for different employers.

Despite some limitations, the findings of this research may be useful for employers, higher education institutions and teaching staff, as well as for present and future research.

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