

9TH INTERNATIONAL SCIENTIFIC-BUSINESS CONFERENCE
LEADERSHIP, INNOVATION, MANAGEMENT AND ECONOMICS:
INTEGRATED POLITICS OF RESEARCH



LIMEN 2023

Graz University of Technology, Graz, Austria
December 7, 2023 (hybrid)

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NINTH INTERNATIONAL SCIENTIFIC-BUSINESS CONFERENCE
LIMEN 2023

***Leadership, Innovation, Management and Economics:
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December 7, 2023 (hybrid)

Ninth International Scientific-Business Conference LIMEN

Leadership, Innovation, Management and Economics: Integrated Politics of Research

ISSN 2683-6149

Selected Papers (part of LIMEN conference collection)

Editor:

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Published by:

Association of Economists and Managers of the Balkans – **UdekoM Balkan**

Ustanicka 179/2 St. 11000 Belgrade, Serbia

office@udekom.org.rs

+381 62 8125 779

Conference partners:

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LIMEN Conference is co-organized by:

- Institute of Business Economics and Industrial Sociology, Faculty of Mechanical Engineering & Economics Sciences, Graz University of Technology, Graz, Austria
- Association of Economists and Managers of the Balkans - UdekoM Balkan

Technical Editor:

Branimir Trošić

Printed by: SKRIPTA International, Belgrade

Print circulation: 100 copies

Belgrade, 2024

ISBN 978-86-80194-79-0

ISSN 2683-6149

DOI: <https://doi.org/10.31410/LIMEN.S.P.2023>

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CIP - Katalogizacija u publikaciji
Narodna biblioteka Srbije, Beograd

005(082)

336(082)

004:007(082)

330(082)

502.131.1(082)

**INTERNATIONAL Scientific-Business Conference LIMEN
2023 Leadership, Innovation, Management and Economics:
Integrated Politics of Research (9 ; 2023)**

Selected Papers / Ninth International Scientific-Business Conference LIMEN 2023 Leadership, Innovation, Management and Economics: Integrated Politics of Research, Graz University of Technology, Graz, Austria December 7, 2023 (hybrid) ; [organizer Association of Economists and Managers of the Balkans [et al.] ; editor Vuk Bevanda]. - Belgrade : Association of Economists and Managers of the Balkans - UdekoM Balkan, 2024 (Belgrade : Skripta International). - XIX, 203 str. : graf. prikazi, tabele ; 30 cm. - (International Scientific Business Conference LIMEN Leadership, Innovation, Management, Economics: Integrated Politics of Research, ISSN 2683-6149)

Tiraž 100. - Napomene i bibliografske reference uz tekst. - Bibliografija uz svaki rad. - Registri.

ISBN 978-86-80194-79-0

a) Menadžment -- Zbornici b) Finansije -- Zbornici v)

Informaciona tehnologija -- Zbornici g) Ekonomija -- Zbornici

d) Održivi razvoj -- Zbornici

COBISS.SR-ID 151635977

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Contents

Index of Authors	IX
Index	XI
Preface	XIII
LIMEN 2023 Participants' Affiliation	XVII
Evolution of the Concept of Implicit Leadership Theories: A Literature Review	1
Christopher Danis Anna Lašáková	
Artificial Intelligence-Driven HR Practices in SMEs: A Prisma-Compliant Scoping Literature Review	13
Ljupcho Eftimov Bojan Kitanovikj	
Application of LLMs for Solving Algorithm Coding Tests in Recruitment	21
Miloš Živadinović	
An Integrative Model of Crowdsourcing and Intellectual Capital on Effective Enterprise Renewal	29
Matea Zlatković Radaković	
Creating an Effective Working Environment in the Post-pandemic Period	39
Žikica Milošević Ivana Katić Andrea Ivanišević Danijela Čirić Lalić	
How Does Management Style Affect Employee Well-Being within Large Enterprises? The Case of Albania	49
Gentjan Shaqiri	
The Relationship between Innovation and Competitive Advantage: A Literature Review	59
Denada Liça Silvana Gashi	
Eco-Innovation in the Accommodation Sector in Albania	69
Shyqyri Llaci Blanka Xhani	
Strategic Approaches to Enhancing Business Communication Efficiency in the Era of Digital Transformation	79
Mirjana Tankosić Ivana Ercegovac	
The Digital Transformation of the Retail Business: Focusing on the Online Shopping of Clothing by Consumers in the European Union	89
Simeonka Petrova	
The Impact of Augmented Reality (AR), and Virtual Reality (VR) in Marketing Campaigns	101
Anisa Isufi Nerajda Feruni Osman Köroğlu	
Analysis of the Content Marketing to Build a Relationship and Loyalty with Consumers	111
Fani Kerum Dijana Vuković Ivanka Ipša	
Greenwashing Technique – An (Un)Acceptable Tool of Marketing Communication? Experiences and Attitudes of Marketing Experts and Consumers	123
Dijana Vuković Tanja Grmuša Dora Borić Radić	

Sustainability Index and Corporate Performance: A Study of the FTSE4Good IBEX	133
Mónica González Morales José Antonio Cavero Rubio Araceli Martínez Amorós	
Eco-Metals Unveiled: A Deep Dive into Commodity Resilience	141
Mariana Chambino Rui Dias Paulo Alexandre Rosa Galvão	
Mobile Banking Acceptance in Austria and Romania: An Empirical Study.....	151
Ana Diana Domuta Christine Strauss	
The Impact of Standards and Patents on Economic Growth in Western Balkan Countries.....	163
Edmira Cakrani Enriko Ceko	
Engel Expenditure Curves for Households in the Slovak Republic and Income Elasticity of Expenditure	173
Elena Hošková Iveta Zentková	
Income Inequalities during the Post-covid Era in the Greek Tourism Industry	185
Konstantinos Krikonis Ioannis Konstantaras	
Logistics and Supply Chain a Perspective on Unstable Markets.....	193
Rui Mansidão André Alves	



Index of Authors

A

Ana Diana Domuta, 151
Andrea Ivanišević, 39
André Alves, 193
Anisa Isufi, 101
Anna Lašáková, 1
Araceli Martínez Amorós, 133

B

Blanka Xhani, 69
Bojan Kitanovikj, 13

A

Christine Strauss, 151
Christopher Danis, 1

D

Danijela Ćirić Lalić, 39
Denada Liča, 59
Dijana Vuković, 111; 123
Dora Borić Radić, 123

E

Edmira Cakrani, 163
Elena Hošková, 173
Enriko Ceko, 163

F

Fani Kerum, 111

G

Gentjan Shaqiri, 49

I

Ioannis Konstantaras, 185
Ivana Ercegovac, 79
Ivana Katić, 39
Ivanka Ipša, 111
Iveta Zentková, 173

J

José Antonio Cavero Rubio, 133

K

Konstantinos Krikonis, 185

Lj

Ljupcho Eftimov, 13

M

Mariana Chambino, 141
Matea Zlatković Radaković, 29
Miloš Živadinović, 21
Mirjana Tankosić, 79
Mónica González Morales, 133

N

Nerajda Feruni, 101

O

Osman Köroğlu, 101

P

Paulo Alexandre, 141

R

Rosa Galvão, 141
Rui Dias, 141
Rui Mansidão, 193

S

Shyqyri Llaci, 69
Silvana Gashi, 59
Simeonka Petrova, 89

T

Tanja Grmuša, 123

Ž

Žikica Milošević, 39



Index

A

Accommodation sector, 69
Albanian firms, 59
Algorithm coding tests, 21
Arbitrage, 141
Artificial intelligence, 13
Augmented reality, 101

B

Business communication, 79

C

Communication strategies, 79
Competitive advantage, 59
Consumer behavior, 101
Consumers, 123
Content, 111
Crowdsourcing, 29
Culturally endorsed, 1
Customers, 111

D

Digital platforms, 111
Digital transformation, 79; 89
Digitization, 39
Drivers' factors eco-innovation, 69

E

Economic Growth, 163
Efficiency, 39
Electronic Data Interchange (EDI), 79
Energy metals, 141
Engel expenditure curves, 173
Enterprise culture, 49
Enterprise renewal, 29
ESG Practices, 133
European consumers, 89
Events of 2020 and 2022, 141
External and internal barriers, 69

F

Family businesses, 193
Financial performance, 133
Flexible, 39

G

Globe project, 1
Greenwashing, 123

H

Human resource management, 13

I

IEco-Innovation, 69
Impact of income, 173
Implicit, 1
Income elasticity of expenditure, 173
Innovation, 59
Intellectual capital, 29

J

Job location selection, 185

L

Leadership, 1
Leadership, 49
LLM, 21

M

Management style, 49
Marketing, 101; 111
Marketing communication, 123
Marketing experts, 123
Market orientation, 193
Media content, 111
Mobile banking, 151
Motivation, 39

O

Oaxaca decomposition, 185
Online clothing purchases, 89
Online shopping, 89

P

Pandemic, 39
Panel data, 163
Patents, 163
Persistence, 141
Post-pandemic period, 39
PRISMA, 101

R

Recruitment, 21
Remote work, 39
Retail business, 89
Risk, 151

S

Sales, 101
Scoping literature review, 13
Small and medium-sized enterprises, 13
Social networks, 111
Standards, 163
Supply chain, 193
Sustainability index, 133

T

Target audience, 111
Technology, 79
Technology acceptance, 151
Theories, 1
Tourism wage model, 185
Trust, 151

U

Unacceptable practices, 123
UTAUT, 151

V

Virtual reality, 101

W

Work environment, 39



Preface

Organizing is an evolutionary phenomenon, distinctive because of the laws of existence and maintaining all structures in all processes of their functioning. As such, it is a civilizational phenomenon that occurs as a component of human, individual, and social activities and as a factor in the overall development of man and society. On the other hand, as a deliberate human activity, organizing involves seeking solutions to problems that occur on the way to achieving specific goals. No goal can be achieved without appropriate or necessary, or at least minimal organization of conditions, factors, and processes needed for goal achievement. However, the new era requires new types of leaders and managers and new forms of organization; demands those who are willing and able to lead the company/corporation/state, in a distinct competitive environment, with all the good and bad sides brought by the globalization of world economy.

The purpose of the annual LIMEN 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 leadership, innovations, management, and economics, encouraging advancement via excellence, and interaction.

LIMEN 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 LIMEN 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 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, we 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 in cooperation with the Institute of Business Economics and Industrial Sociology of the Faculty of Mechanical Engineering & Economics Sciences at Graz University of Technology headquartered in Graz – Austria; along with the partner institutions, namely the Center for Advanced Studies in Management and Economics (CEFAGE-UE), Institute for Advanced Studies and Research, University of Evora, Portugal; Department of Law, Economics and Sociology, University of Magna Graecia, Catanzaro, Italy; Faculty of Economics, University of South Bohemia, České Budějovice, Czech Republic; Rio de Janeiro Institute College (Faculdade Instituto Rio de Janeiro – FIURJ), Rio de Janeiro, Brazil, and the European Professors of Industrial Engineering and Management (EPIEM) organized 9th International Scientific-Business Conference

titled: Leadership, Innovation, Management, and Economics: Integrated Politics of Research – LIMEN 2023 on December 7, 2023 at the Graz University of Technology, Graz, Austria in a hybrid format (in-person, online and virtually).

LIMEN 2023 conference addresses various contemporary business and economic challenges. The evolution of implicit leadership theories is explored, highlighting shifts in understanding leadership. AI-driven HR practices in SMEs, the application of large language models in recruitment, and the integration of crowdsourcing with intellectual capital for enterprise renewal are examined for their innovative potential. The impact of management styles on employee well-being, the relationship between innovation and competitive advantage, and eco-innovation in Albania's accommodation sector are analyzed for their implications on business strategy and sustainability. The digital transformation of retail, AR/VR in marketing, and content marketing's role in consumer loyalty are also discussed, alongside the ethical concerns of greenwashing in marketing communication. Other studies investigate the sustainability index in corporate performance, the resilience of eco-metals, mobile banking acceptance in Austria and Romania, and the role of standards and patents in Western Balkan economic growth. Income inequalities in Greece's post-COVID tourism industry and logistics in unstable markets are assessed for their broader economic impacts, etc.

The keynote speaker at the LIMEN 2023 conference was Professor Sandra Lovrenčić, Full Professor, Head of the Department of Theoretical and Applied Foundations of Information Sciences, Head of Centre for Volunteering and Humanitarian Work, University of Zagreb Faculty of Organization and Informatics, Varaždin, Croatia with the topic "Artificial Intelligence and (Knowledge) Management".



Within publications from the LIMEN 2023 conference:

- 20 double peer-reviewed papers have been published in the **LIMEN 2023 Selected Papers**,
- 55 double peer-reviewed papers have been published in the **LIMEN 2023 Conference Proceedings**,
- 67 abstracts have been published in the **LIMEN 2023 Book of Abstracts**.

Altogether LIMEN 2023 publications have more than 800 pages. All full papers have DOI numbers and ORCID iD integration.

Participation in the conference took **more than 250 researchers** representing **24 different countries** from different universities, eminent faculties, scientific institutes, colleges, various ministries, local governments, public and private enterprises, multinational companies, associations, etc.



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Evolution of the Concept of Implicit Leadership Theories: A Literature Review

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Received: December 22, 2023
Accepted: March 25, 2024
Published: August 6, 2024

Keywords:

Leadership;
Implicit;
Theories;
Culturally endorsed;
Globe project



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Abstract: *This paper synthesizes existing research on implicit leadership theories (ILTs) — individuals' unconscious cognitive frameworks or mental models that shape their perceptions, expectations, and evaluations of effective leadership. Based on a thorough search and examination of the works on ILTs included in the Scopus database (n = 102), the authors explore the development, evolution, and contextual influences on ILTs, including the culturally endorsed ILTs stream of research (e.g., Globe project), and offer a comprehensive understanding of ILTs and their implications for perceived leadership effectiveness.*

1. INTRODUCTION

Eden and Leviatan (1975) first introduced the concept of implicit leadership theories (ILTs) in 1975, building on Schneider's idea (Schneider, 1973) of implicit personality theories. ILTs can be defined as personal assumptions about the traits and abilities that characterize the ideal leader or as mental images that everyone holds about the traits and behaviors of leaders in general (Epitropaki & Martin, 2004).

These mental images are schemas or prototypes that represent a certain pattern or preimage containing hierarchically ordered features that distinguish leaders from non-leaders. They also define who will be perceived as an effective or ineffective leader and are activated when the individual interacts with someone resembling the concrete category (Epitropaki et al., 2013). Prototypes develop from socialization processes and previous experiences with leaders and followers, which also means that they are culturally conditioned (Epitropaki et al., 2013; House et al., 2002).

In the early days, ILTs were seen as a potential source of bias in measuring the behaviour of leaders (Eden & Leviatan, 1975; Gioia & Sims, 1985; Rush et al., 1977) and the majority of studies on ILTs have been focused mainly on content and measurement issues using samples of university students in laboratory experiments, neglecting studies in organizational contexts (Epitropaki et al., 2013). Nowadays, the number of research studies examining ILTs in organizational settings is larger (e.g. Abdalla & Al-Homoud, 2001; Epitropaki & Martin, 2004, 2005; Holmberg & Åkerblom, 2006; Neal et al., 2005; Sharifirad, 2021; Sy et al., 2010; Tsai & Qiao, 2023).

House et al. (2002) GLOBE study represented a significant effort in exploring ILTs across 62 countries in a comprehensive manner. This study introduced the concept of Culturally Endorsed

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Implicit Leadership Theories (CLTs), with a specific emphasis on the qualities attributed to “effective leaders” across various cultures. Their findings suggested the presence of certain universally recognized traits that are perceived as enhancing effective leadership (positive traits) or hindering it (negative traits) (Epitropaki et al., 2013; Lašáková, 2023).

The primary aim of this review is to synthesize the wide-ranging body of literature concerning ILTs and integrate existing research findings to provide an overview of the current state of knowledge of ILTs. To achieve this goal, we undertook a comprehensive examination of the available C/ILTs-related literature.

This endeavor has the potential to provide researchers and practitioners with a comprehensive grasp of the subject, encompassing its fundamental principles and offering insights into the historical evolution of the C/ILTs field and its potential future trajectories.

2. METHODOLOGY

The search strategy is shown in Figure 1. First, we searched in the Scopus database for all publications that contained a combination of the keywords: „implicit leadership theory“ and „implicit leadership theories“ in the title or abstract. A total of 203 documents were found and manually screened to exclude publications written in languages other than English and publications that did not focus on exploring ILTs in organizational and business settings. We have excluded papers focusing on ILTs in policy settings (e.g. Moss et al., 2022; Powell & Butterfield, 2011), school education institutions (e.g. Ritter et al., 2016; Salinitri, 2020), meta-analyses and reviews of ILTs, and non-open access papers. At the end of this database cleaning process, 102 articles were retained and further analyzed.

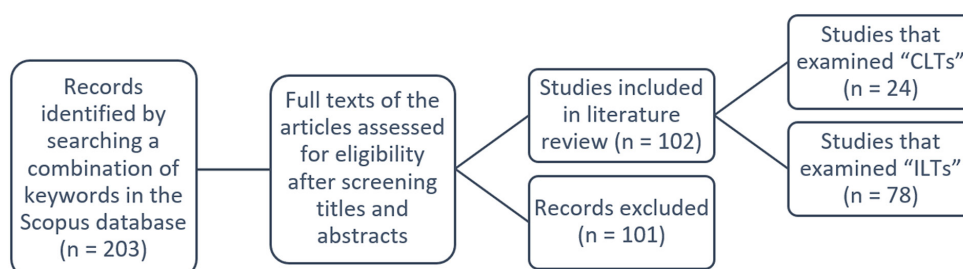


Figure 1. Identification of studies included in the literature review

Source: Own processing

In the next step, we exported the cleaned source list from Scopus to bibliometrix – biblioshiny in order to carry out a basic bibliometric analysis of the given literature corpus. As stated by Aria and Cuccurullo (2017), bibliometrix is a tool for the comprehensive mapping of scientific literature through various types of bibliometric analyses. Biblioshiny is a web application that is part of the bibliometrix package suited for importing bibliographic data from databases such as Scopus and providing a wide range of options for the analysis of scientific production.

After analysing the main features of the literature corpus as a whole via biblioshiny (see the section below for a brief overview), we delved into the content analysis of the respective papers. Based on a standard literature review, we delineated two main time spans in the evolution of the ILTs, namely before and after the turn of the millennium (see the third chapter Results and Discussion).

2.1. A Brief Overview of the Sample of Analyzed Papers

In the final sample of $n = 102$ papers, 100 documents were published in journals, and two papers were recorded as book chapters. The period of publications ranged from 1975 to 2023, with an annual growth rate of 5.31% and with 55.62 average no. of citations per document. The number of studies examining the concept of ILTs was over the first 20 years relatively small. However, in the late 1990s and early 2000s, the number of studies began to increase. Apparently, most studies were published in the *Leadership Quarterly* (14), *Leadership and Organizational Development* (7), *Frontiers in Psychology* and *Journal of Applied Psychology* (5).

The analysis also offers an overview of the most productive countries in the given field based on the authors' affiliation. The US ranked first, followed by China and UK. From the EU, France, Netherlands, and Germany have the highest share of publications. In addition, from the viewpoint of citations, the highest number of citations was noted for papers from the USA (2106), followed by the Dutch and Greek publications (859 and 438, respectively).

Finally, as for the most cited individual works, the most cited paper (972 citations) is the [House et al. \(2002\)](#) study reporting on the six global leadership attributes from the GLOBE project across 61 societies. The second highest number of citations (737) goes on behalf of another GLOBE project study by [Den Hartog et al. \(1999\)](#) that examined specific aspects of charismatic leadership as greatly and generally endorsed across cultures. A study by [Epitropaki and Martin \(2004\)](#) also received quite a lot of attention (438 citations); this paper dealt with the most suitable measurement of ILTs in various organizational settings. Next, in order of the most cited works, a study by [Offermann et al. \(1994\)](#) with 389 citations raised attention to the fact that ILTs vary across leader stimuli and perceived characteristics and therefore, it is advisable to raise the understanding of variations in content and structure of the ways how people view leaders.

3. RESULTS AND DISCUSSION

The earliest study was published in 1975 by Eden and Leviatan, and it was the first introduction to the ILTs concept. They proposed that leadership elements exist within the perceptions of individuals and noted their potential contamination effects in responses to questionnaires ([Eden & Leviatan, 1975](#)). This groundbreaking concept triggered a new way of studying leadership, with a fundamental idea that if leadership is, to some extent, shaped by the thoughts of followers, it is essential to explore what those followers are contemplating.

As noted above, the United States, the United Kingdom, and China have been the most focused countries on ILTs research and only a few countries have focused on exploring ILTs within their country over the period – namely the United States (e.g. [Kono et al., 2012](#)), China (e.g. [Lin & Sun, 2018](#)), Sweden (e.g. [Holmberg & Åkerblom, 2006](#)), Malaysia (e.g. [Subramaniam et al., 2010](#)), Iran (e.g. [Sharifrad, 2021](#)), Brunei (e.g. [Lim et al., 2012](#)) and some Arab countries (e.g. [Abdalla & Al-Homoud, 2001](#); [Neal et al., 2005, 2007](#)).

In the past, leadership research has mainly focused on examining the position of leaders, while relatively little attention has been paid to the role and perspective of their followers ([Junker & van Dick, 2014](#)). Nowadays, it is known that followers do not just passively accept the actions of leaders. Instead, they actively participate in shaping leadership relationships and their impact. Within the context of leadership, followers play a significant role in shaping the nature

of leadership that emerges and in influencing its effectiveness (Lin & Sun, 2018). In this section, we describe the development of ILTs in two periods, namely before and after the turn of the millennium. This differentiation makes sense not only based on the number of papers produced yearly, which indicates a relatively steady growth after 2000. In addition, after analysing the content of the respective papers, it seems that after the millennium turn, the focus moved to the CLTs. This trend is attributed mainly to the GLOBE research project, which was established in the early nineties, while the focus on culturally endorsed ILTs (CLTs) represents a very visible strand of research, especially in the first decade of the current century.

3.1. Implicit Leadership Theory before the Millennium Turn

Eden and Leviatan (1975) found that when respondents are asked to describe their actual supervisors, their responses do not reflect empirical reality but rather their biases, i.e., these responses do not necessarily reflect the objective truth about the real dynamics within the organizational environment, but rather the respondents' pre-existing conceptions.

In the words of Gioia and Sims (1985, p. 218): "The existence of an implicit theory of leadership implies that people have a (perhaps unconscious) theory about how leaders behave in general." This underlying belief, or ILT, significantly shapes how individuals subsequently perceive and express actual leadership behavior (Gioia & Sims, 1985).

Gioia and Sims (1985) also pointed out that when individuals respond, they do not engage in a thorough and exhaustive search of their memory about the leader's behavior. Instead, they rely on cognitive categories to encode, retain, and recall the necessary information. These categories are shaped by prototypes that represent the most typical or characteristic manifestations of leader behavior. When people encounter leader behavior, their perception of that behavior appears to go through a process similar to comparison with established prototypes, which then determines their categorization (e.g. effective or ineffective leader).

Offermann et al. (1994) focused their attention on examining how ILTs differed in content and factor structure for male and female observers, both separately and together. They conducted this analysis using three different types of stimuli: individuals perceived as leaders, individuals perceived as effective leaders, and individuals in supervisory roles. They also referred to the model of Lord and colleagues (e.g. Lord et al., 1984) and reported that leadership is organized in memory into three hierarchical levels (categories). The highest (and most general) is the superordinate level, where individuals simply distinguish between leaders and non-leaders. At the lower level, there are eleven different types of leaders (e.g. business leaders, sports leaders, etc.), based on contextual comparison with category prototypes – these are considered to be the most informative. The lowest (and most specific) is the level of subordinates (e.g. employee's direct supervisor). Categorisation simplifies the complexity of the external environment by organizing data relating to a wide range of stimuli into a more manageable set of categories (Den Hartog et al., 1999).

In their research, Offermann et al. (1994) found that people generally have positive perceptions of leaders, effective leaders, and supervisors, placing high demands on them, but they also admit the possibility that leaders may use their authority "to dominate, control, and manipulate, as well as inspire, motivate, and support" (Offermann et al., 1994, p. 54). Research has also shown that people use similar dimensions for their perceptions of leaders, effective leaders, or

supervisors and that ILT factors are similar for men and women. The authors also pointed out that the ultimate importance of ILTs may lie in the way they structure the interaction between leader and follower because “ILTs are undoubtedly reflected in the expectations that followers bring to the leader-follower relationship” (Offermann et al., 1994, p. 56).

Many research studies suggest (e.g. Lord et al., 1984; Offermann et al., 1994; Schyns & Schilling, 2011) that the following aspects are important for followers in ILTs: a) charisma (charismatic/un-charismatic leader), b) decisiveness/strength (strong/weak), c) devotion (committed/devoted), d) tyranny (tyrannical/participative), e) verbal skills (communicative/non-communicative), f) understanding/sensitivity (sensitive/hard) and g) intelligence (intelligent/stupid). It also seems to be very important to followers that the leader has integrity because then: “followers can feel much more confident that what leader now professes will determine his or her actions and what the leader now believes will inform his or her leadership” (Moorman et al., 2012, p. 14).

In other words, to gain a more complete understanding of leadership, one can consider not only the visible actions and behaviors of leaders but also their underlying character traits such as honesty and integrity, i.e. the overall character of the leader (Zhang et al., 2014). Zhang et al. (2014) found that the integrity of a leader, in the Chinese context, can serve as a signal of leadership effectiveness. This, in turn, has a positive impact on organizational competitiveness by increasing followers’ OCB (Organizational Citizenship Behavior), which means that employees go beyond their formal job duties to support the organization.

Epitropaki and Martin (2004) mentioned a study conducted by Deal and Stevenson in 1998, which found that although men and women had similar perceptions of what makes a typical leader, there were some differences in how they rated certain traits – men tended to rate traits such as aggressiveness, competitiveness, and emotional resilience higher than women, while women rated traits such as empathy, helpfulness, and self-confidence higher than men. These gender differences in trait perception are noteworthy, and there may be other important socio-demographic differences besides gender influencing the perception of leadership traits.

In the late 1990s, it was known that individuals have their ILTs by which they (usually unconsciously) interpret and judge the actions and decisions of leaders. Through ILTs, scientists have sought to explain the attributes and perceptions of leadership. However, to understand the nuances and meaning of leadership more deeply, it was necessary to delve into the psychological aspects of this process, as pointed out by Bresnen (1995).

Keller (1999) stated that people tend to see leaders who resemble them as ideal – they project their own qualities or traits onto idealized leadership figures. There is also a suggestion, that individuals may attempt to elicit behaviors from others in leadership positions that confirm their self-affirmation and that it is possible that individuals in difficult times may seek a strong leader to compensate for their own weaknesses.

Moreover, the characteristics of their parents, both positive and negative, are also associated with idealized leadership figures. This may be due to the fact, that parents are the first leadership figures in a child’s life who play a big role in the formation of ILTs: “They provide children with an initial experience with a leader as well as shape expectations for future interactions with authority figures” (Keller, 1999, p. 590).

3.2. Implicit Leadership Theories in the New Millennium

At the turn of the millennium, there was a growing awareness of the need for a better understanding of how leadership is enacted in different cultures, which also pointed to the importance of developing an empirically grounded theory to explain the different behaviors and effectiveness of leaders in different cultures. There has been an assumption that the most important characteristics of an effective leader may vary across cultures, based on the fact that perceivers' cultural background strongly influences the way they interpret their social environment. Therefore, it was expected that different prototypes of leadership would naturally occur in different societies (Den Hartog et al., 1999).

The project GLOBE draws on culturally endorsed implicit leadership theories (CLTs) and builds on the idea that although some universally valid characteristics are attributed to effective leaders operating in different cultures, there are still some specific traits and characteristics of a leader that are specific to a particular culture and therefore it is important to further examine cross-cultural differences in leadership prototypes (Den Hartog et al., 1999; House et al., 2002).

In another article, Keller (2003) discusses the idea that a person's attachment style can influence their beliefs about how leaders and followers should interact. The author assumes that attachment styles may also influence how open new employees are to messages that suggest leaders behave differently than their existing beliefs about leadership. She also mentions that although there has been interest in ILTs for a while, there has not been much research on how these theories affect organizations (Keller, 2003).

Epitropaki and Martin (2004) found that ILTs are consistent across different employee groups and represent stable trait-based leadership stereotypes. Thus, if the information environment does not change dramatically, ILTs remain stable and are used by employees to evaluate the behavior of their actual managers.

Also, the concept of romance of leadership (RoL) as a specific ILT could have a significant impact on decision-making in management contexts. Participants in the research conducted by Felfe and Petersen (2007) tended to base their decisions more on the perceived quality of the leader than on the situational context. This suggests that the concept of RoL plays a role in how people evaluate and make decisions about leadership in management scenarios. The research also highlighted the importance of the positive evaluation of the leader in favorable situations as a key factor influencing decision outcomes.

Schyns and Schilling (2011) found that people's perceptions of leaders include both effective and ineffective characteristics. Therefore, it is necessary to understand how ineffective ILTs may affect perceptions of leaders differently than effective ones. Leaders may struggle to influence followers with ineffective ILTs, so knowing about these theories can help leaders either change their followers' perceptions or clarify how they differ from these theories.

In the scientific, academic and managerial fields, the differences between managers and leaders have long been debated. Managers are usually appointed by the organization, while leaders are essentially selected or recognized by their followers. In other words, leadership is more about how individuals in an organization perceive and recognize someone as a leader, rather than their formal title or position, which means that not every manager is also a leader. The fact that leadership is not just about formal titles or positions, but is strongly influenced by how individuals in the organization

perceive and interact with their managers is highlighted by the findings of [Chiu et al. \(2017\)](#). They suggest that informal social networks and the degree of influence a manager has within these networks play a significant role in shaping perceptions of his or her leadership qualities. Managers who are central in these networks tend to be perceived as leaders, while those who are excluded from these networks or have low influence in them are less likely to be seen as leaders.

The nature of leadership perception is complex and nuanced. It is not a static, but a dynamic process that is influenced not only by traits and behaviors, but also by the emotions expressed by leaders. Therefore, emotional cues such as happiness and nervousness are important factors in shaping how individuals perceive leaders and form impressions of them ([Trichas et al., 2017](#)). In the words of [Dietl et al. \(2018, p. 476\)](#): “People may use facial appearance as a diagnostic tool to determine the leadership abilities of others”.

Organizations and society are constantly changing. In their 2018 study, [Offermann and Coats](#) wondered if people’s ILTs have changed as well. They suggest that the factors that made up ILTs (in 1994) have remained relatively stable over time (in 2014), but there has been an increased emphasis on creativity as a leadership trait. This shift may be influenced by broader economic forces in the United States that place a strong emphasis on innovation as a solution to economic problems ([Offermann & Coats, 2018](#)).

4. CONCLUSION

The research of ILTs has evolved over the years from focusing on identifying the attributes and characteristics that people associate with effective leadership (e.g. [Lord et al., 1984](#); [Offermann et al., 1994](#)) to examining the practical applications of ILTs, including their impact on leadership perceptions, leader-follower relationships, and decision making (e.g. [Epitropaki & Martin, 2004](#); [Felfe & Petersen, 2007](#); [Keller, 2003](#); [Schyns & Schilling, 2011](#)). Also very important was the recognition that ILTs could vary across different cultures and contexts, which has led to more country-specific research on ILTs (e.g. [Ling et al., 2000](#); [Holmberg & Åkerblom, 2006](#); [Subramaniam et al., 2010](#); [Kono et al., 2012](#); [Sharifrad, 2021](#)) – a topic that is still relevant today. Currently, ILT research is also focusing on different aspects, such as the impact of gender, age, race, etc. on implicit leadership perceptions (e.g. [Adamovic & Leibbrandt, 2023](#); [Merritt & Lynch, 2020](#); [Oliver et al., 2022](#); [Ubaka et al., 2023](#)), while the role of context and situational factors is also at the forefront (e.g. [Boehme et al., 2023](#); [Cloutier & Barling, 2023](#); [Oliver et al., 2022](#); [Schyns, 2021](#); [Stelmokienė & Endriulaitienė, 2020](#)).

This study has several limitations. The literature search was carried out only in the Scopus database, and selected publications were only in English. We have also excluded papers focusing on ILTs in policy settings, school education institutions, meta-analyses and reviews of ILTs, and non-open access papers. This may have resulted in the exclusion of other relevant papers from the analysis. On the other hand, Scopus is traditionally considered one of the most reputable databases, which supports the assumption that only high-quality scientific works were included in the respective literature review. Another limitation regards the last phase of cleaning the literature corpus, namely the manual cleaning process based on the content of the papers. We tried to mitigate this limitation by checking the in/exclusion of works in the final sample by two persons independently. Besides, the quantitative bibliometric analysis (section 2.1), which preceded the qualitative analysis of the accumulated knowledge on ILTs, could have been more nuanced. Although this review cannot be considered exhaustive, we have attempted to include key scientific knowledge from the given field.

Acknowledgment

This paper was developed at Comenius University Bratislava, Faculty of Management, within the project VEGA no. 1/0419/22.

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Artificial Intelligence-Driven HR Practices in SMEs: A Prisma-Compliant Scoping Literature Review

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Received: January 30, 2024
Accepted: May 6, 2024
Published: August 6, 2024

Keywords:

Human resource management;
Artificial intelligence;
Small and medium-sized enterprises;
Scoping literature review



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Abstract: Artificial intelligence (AI) is rapidly reshaping human resource management (HRM) practices, extending its reach even to small and medium-sized enterprises (SMEs). Despite the prevalence of AI in HRM, its integration into the practices of SMEs, traditionally characterized by limited HR resources, remains an understudied area in scientific literature. A knowledge gap was identified through a Scopus database search, revealing a lack of comprehensive exploration into emerging trends related to AI's impact on hiring, skill assessment, bias mitigation, and time constraints in SMEs. This study aims to address this gap by conducting a methodical analysis and synthesis of existing scientific contributions on the adoption of AI in SMEs for HR purposes. Employing a rigorous scoping literature review grounded in the PRISMA protocol, the investigation focuses on peer-reviewed publications in English, indexed in the Scopus database. The findings, encompassing emerging publications, authors, key concepts, and avenues for future research, offer valuable insights for HR professionals, entrepreneurs, and the scientific community. This study not only contributes to the understanding of AI's impact on grassroots HR processes in small organizations but also provides practical guidance and recommendations for optimization and enhancement.

1. INTRODUCTION

In the fast-evolving landscape of human resource management (HRM), the ubiquitous presence of artificial intelligence (AI) is significantly altering traditional practices, extending its transformative influence even to micro and small and medium-sized enterprises (SMEs) (Wang et al., 2022). When speaking about HRM and SMEs, researchers are quick to point out that there is not a traditional HR function in these types of organizations due to a lack of resources and the low number of employees where the entrepreneur often holds various job positions including the one of an HR leader (Nolan & Garavan, 2016). In this article, the authors refer to HRM practices in SMEs for recruiting, onboarding, developing, assisting, and managing the members of the core team of these organizations.

The widespread integration of AI in HRM in this context has garnered considerable attention in the literature; however, there exists a conspicuous void in our understanding of its application within the context of SMEs. As this technology continues to be more accessible and reliable, it is worth further exploring as it slowly becomes the new normal in contemporary organizations (Vrontis et al., 2022). This research paper seeks to address this notable gap through a comprehensive exploration of emerging trends related to AI's impact on crucial HRM facets, such as hiring, skill assessment, bias mitigation, and time constraints, specifically within SMEs.

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The investigation commenced with a systematic Scopus database search, revealing a distinct lack of methodical analysis and synthesis in the scientific literature concerning the integration of AI into the HR practices of SMEs. Recognizing this, the study employs a scoping literature review grounded in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol. Focusing on peer-reviewed publications in English, indexed in the Scopus database, the article aims to contribute a nuanced understanding of the current state of AI adoption in SMEs for HR purposes. With that in mind, the article addresses two research questions: 1) What are the main publications detailing the use of AI for HR activities in the context of SMEs?; 2) Which concepts and hotspots have been covered by the literature so far?; 3) What can future researchers explore further in terms of the use of AI for HR activities in the context of SMEs?.

The research not only sheds light on emerging publications and key authors but also seeks to identify fundamental concepts and avenues for future research. Through this thorough examination, the findings aim to provide valuable insights for HR professionals, entrepreneurs, and the broader scientific community. To achieve this, the article first describes the methodology, followed by a presentation and discussion of the results, including the main concepts and hotspots. It will conclude with an overview of pathways for future research.

2. METHODOLOGY

A comprehensive scoping literature review is employed as a research approach for examining the state of the art and the emerging trends. Having in mind the freshness and the low number of studies detailing the use of AI for HR purposes in SMEs, it is encouraged to synthesize the development of the niche field through a scoping review instead of more rigorous review methods like a systematic literature review or a bibliometric analysis (Munn et al., 2018). Still, the reviewing process follows a strict method grounded in the PRISMA protocol, which filters out the publications through the phases of identification, screening, eligibility, and inclusion (Moher et al., 2015). The step-by-step process is outlined in Figure 1.

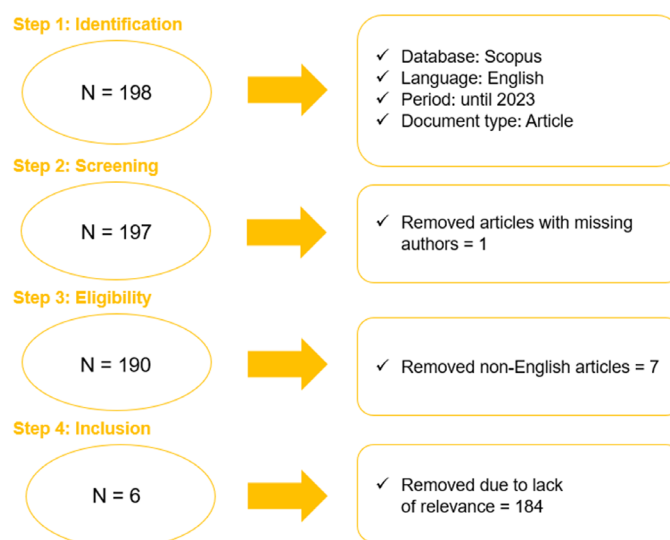


Figure 1. Visualization of the undertaken steps per the PRISMA protocol

Source: Own research

For the purposes of the article, a comprehensive systematic literature search was conducted in December 2023 in the Scopus database, one of the leading global databases for quality research.

The search query was based on a pillar of keywords that included “Human resource*” OR “HR*” OR “SHRM” AND “Artificial intelligence” OR “AI”. The authors believed that a broader search query with these keywords would enable them to gain a bigger, more aerial perspective of the field. Afterward, filters for the organization size were applied to reach the final sample of publications that outline the AI use for HR practices in SMEs. Based on the keywords, it was found that no similar literature review was done regarding the niche use of the technology.

During the search query, the chosen period of publication was until 2023, excluding that year as at the moment of writing, the year is not finished. In this sense, the authors proposed several inclusion criteria so only double-blind peer-reviewed publications written in English were considered. After the publications were identified in the Scopus database, all relevant data related to the publications were retrieved. This included authors, publication title, source title or journal, publication year, number of citations, author affiliations, abstract, keywords, language, publication type, and similar. From the initial 198 publications, the authors performed a manual check of all publications for their relevance and assessment of all publication-related data. As a result, six core publications were identified, which will be further investigated.

3. RESULTS

The administered scoping review based on the keywords ‘human resource management’, ‘artificial intelligence’, and ‘small and medium-sized organizations resulted in six key publications after applying the exclusion and inclusion criteria.

As can be observed, the publications that explored how AI can be used for the core HR practices in SMEs began to be published in 2021, signaling the inception of this niche topic in recent years. This is highly likely since in the past this technology was extremely expensive while recently it became increasingly affordable and almost ubiquitous (Csizmadia et al., 2023). The so-called birth of AI-based ChatGPT as a large-language model broke new ground and welcomed AI into the offices of organizations of all sizes (Ausat et al., 2023). In general, publication trends about the use of AI in HR activities have shown a drastic incline since the start of the 2020s.

Most of the authors come from European countries, including Spain, Germany, Italy, and Ukraine, while one publication is written by authors from India. This leaves more space for researchers in other geographical contexts to join the scientific discourse on the topic. Methodologically, there is a pronounced versatility with both quantitative approaches based on survey data as well as more qualitative methods being actively used.

Moreover, Table 1 presents a tabular presentation of the most relevant and core publications, followed by an in-depth qualitative analysis of the publications and their key findings.

Table 1. Publications detailing AI use in SMEs for HR purposes

Title	Author(s)	Journal/Source
AI-Powered Curricula Selection: A Neural Network Approach Suited for Small and Medium Companies	De Marco et al. (2021)	Lecture Notes in Information Systems and Organisation
Knowledge and Competencies for Human-Centered and Productive AI Work Design	Terstegen et al. (2022)	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)

Artificial Intelligence and Talent Acquisition-Role of HR Leaders in Adoption	Tiwari et al. (2022)	Proceedings of 3 rd International Conference on Intelligent Engineering and Management, ICIEEM 2022
The Transformative Impact of the Development of Artificial Intelligence on Employment and Work Motivation in Business in the Conditions of the Information Economy	Yakovenko et al. (2022)	Proceedings of the 2022 IEEE 4 th International Conference on Modern Electrical and Energy System, MEES 2022
Case Studies of Real AI Applications	Álvarez López (2022)	Artificial Intelligence for Business: Innovation, Tools and Practices
An influence of artificial intelligence on jobs and HRM in small manufacturing units	Sonawane et al. (2022)	Managing Human Resources In SMEs And Start-ups: International Challenges and Solutions

Source: Own research

De Marco et al. (2021) analyzed the role of AI in the last-mile digitalization in SMEs as a process of digitizing field execution or the last segment of the predominantly industrial procedure. Further, they proposed AI and neural network algorithms that can be built into the HR process of resume screening, which was historically done exclusively by the interviewer or the entrepreneur of an SME. It was demonstrated that thanks to the algorithm, SMEs can automate the resume screening process by delegating it to this technology, which analyzes the resume texts and can predict the most adequate job position for the candidate with high levels of accuracy.

The focus of Terstegen et al. (2022) was the knowledge capacities and skillsets of the SME workforce. They argue that founders and the core team of a particular team need to have special AI competencies and know-how to implement this new technology in a way that is humane and fosters higher productivity and well-being for the workforce. This can be achieved through training programs and mentorships.

Tiwari et al. (2022) explored the role of AI in talent acquisition activities of SMEs in Delhi NCR. As AI increasingly affects human capital and intellectual potential, talent acquisition is paramount when putting together the team of an SME. To use this technology, they found that the attitudes of the HR leader in the organization influence the actual AI adoption. In this sense, HR leaders in SMEs who are more innovative and have actively used technology in business operations, tend to significantly use AI to support their talent acquisition actions.

Connected to this, Yakovenko et al. (2022) demonstrated the importance of motivation in using AI in innovative SMEs. When it comes to AI-driven digital transformation of SMEs, self-motivation rather than management reinforcement can be more significant in the long run. This is part of the domain of HRM's activities related to employee management in SMEs. Further, it was found that from direct, indirect, and non-monetary motivators, employees in small and innovative organizations valued the wider opportunities for career development more.

Álvarez López (2022) practically investigated real-world cases of AI use across different operations, including HR. The author described how AI is employed in hiring and recruitment for sourcing suitable candidates, retention management for detecting employees who are more likely to leave the company and the reasoning behind it, performance management for evaluating the workforce fairly and ethically, and HR analytics for analytically studying employee status and subsequent decision-making. The common denominator expressed by the author is that AI and machine learning can be used for analyzing microdata of the knowledge, skills, and capabilities of potential candidates.

Sonawane et al. (2022) examined AI's influence on HRM practices in small manufacturing enterprises, showcasing the highest influence on recruitment, then selection, and employee performance. In this regard, most HR leaders in these organizations stated they use AI for testing specific jobs, planning interviews with candidates, and assessing vacancies. The use of this technology for reducing human error and identifying the right candidate was less pronounced.

4. DISCUSSION

The way HRM is practiced and performed has been drastically changed under the joint influence of technology 4.0, which considers robotics, advanced technologies, big data, the Internet of things, and similar besides AI (Vrontis et al., 2022). On one hand, HR leaders in SMEs can enjoy the benefits of automating repetitive tasks, increased productivity, efficiency maximization, and more opportunities for decision-making (Drydakakis, 2022), while at the same time, they may face higher need for reskilling, algorithmic biases, ethics, and similar (Zhou et al., 2023).

Table 2. Presentation of main concepts and hotspots from surveyed publications regarding the use of AI in SMEs for HR purposes

Authors and publication titles	Main concepts and hotspots
AI-Powered Curricula Selection: A Neural Network Approach Suited for Small and Medium Companies (De Marco et al., 2021)	<ul style="list-style-type: none"> • Use of AI for last-mile digitalization in SMEs • Developed AI algorithm for resume screening with high levels of accuracy • High potential for replication by other SMEs
Knowledge and Competencies for Human-Centered and Productive AI Work Design (Terstegen et al., 2022)	<ul style="list-style-type: none"> • Identified knowledge capacities and needed skills for using AI in SMEs • AI can make the workplace more humane, productive, and wellbeing-focused • Highlighted a need for training programs for entrepreneurs and core staff
Artificial Intelligence and Talent Acquisition-Role of HR Leaders in Adoption (Tiwari et al., 2022)	<ul style="list-style-type: none"> • AI utilization for talent acquisition in SMEs • HR leaders in SMEs with increased innovativeness, habits, and experience with technology are more likely to use AI for talent acquisition • Focus on India
The Transformative Impact of the Development of Artificial Intelligence on Employment and Work Motivation in Business in the Conditions of the Information Economy (Yakovenko et al., 2022)	<ul style="list-style-type: none"> • Highlights employee motivation in using AI in innovative SMEs • Self-motivation is more sustainable than management reinforcement for AI use in HRM
Case Studies of Real AI Applications (Álvarez López, 2022)	<ul style="list-style-type: none"> • Top HRM activities where AI is used include recruitment and staffing, retention and performance management, and HR analytics • Focus on implications and real-world cases • AI and machine learning can analyze employee microdata for better decision-making • Qualitative methodological approach
An influence of artificial intelligence on jobs and HRM in small manufacturing units (Sonawane et al., 2022)	<ul style="list-style-type: none"> • Focus on small manufacturing enterprises • AI can be used for testing jobs, planning interviews, and assessing job vacancies • Quantitative methodological approach

Source: Own research

The synthesis of the findings in this article is in line with other data and input from SMEs that experience internal and external factors in AI-mediated intelligent transformation, where human resources and the involvement of the managers tend to fall under the internal factors (Wang et al., 2022). In this regard, other studies have also singled out HRM as one of the foundational aspects of SMEs where AI can be excessively used (Kumar et al., 2022; Sithambaram & Tajudeen, 2023). The main concepts discussed in the identified publications are provided in Table 2.

This study doesn't come free of a few constraints. To begin with, only publications written in English were considered for analysis, which means that some other studies written in another language were left out without an assessment of their quality and findings. Also, the publication sample can be potentially increased in future studies to include more related fields. These limitations can serve as a proposal and incentive for other researchers to propel the scientific discourse further.

5. FUTURE RESEARCH DIRECTIONS

Considering the scoping literature review analysis, the article proposes some avenues for potential future research. While some areas like recruitment and selection are more researched, there is very little scientific evidence about how AI can be used in other HR functions like job design, compensation and benefits, people analytics, and similar (Eftimov & Kitanovikj, 2023). Furthermore, opportunities or facilitating conditions and challenges faced by micro, small, and medium-sized organizations in implementing AI solutions for HRM can be further investigated. They can be affiliated with the cost structure, infrastructure, skill gaps, organizational resistance to change, and similar (Sithambaram & Tajudeen, 2023). Related to that, the conversation around privacy, bias, and fairness with the utilization of AI in HRM is an evolving topic, that has been less researched in SMEs across the globe (Islam et al., 2022). Additionally, knowledge sharing or hiding within SMEs in the context of AI adoption can be tackled as collaborative models and platforms can help these organizations leverage shared resources and experiences (Kumar et al., 2022). AI's inclusion in HRM activities is bound to have a long-term impact on organizational culture, which is increasingly sensitive in SMEs. The AI integration can result in modifications in communication patterns, decision-making procedures, and relations between employees (Hansen & Bøgh, 2021).

6. CONCLUSION

This article's objective was to fill the gap in the literature for a comprehensive review of the ways AI can be used by HR leaders in SMEs through a methodical analysis and synthesis of existing literature in the field. Subsequently, it provided answers to the three identified research questions, singling out the main publications detailing the use of AI for HR activities in the context of SMEs, the key concepts and hotspots, and five future research pathways. It was shown that machine learning, neural networks, and similar sub-technologies prevail when brought in correlation with AI. The acceptance of AI in SME's HR is largely influenced by the attitude and awareness of the entrepreneur and the core team as well as the external and internal challenges and opportunities. While AI has been mostly used for recruitment, talent acquisition, addressing biases, and similar in this context, the need for upskilling and additional workforce training is underlined. Evidently, AI utilization in SMEs' HR activities is still in an exploratory phase. As a result, this article poses implications for HR professionals, entrepreneurs, and the broader scientific community as one of the first studies in the field.

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Application of LLMs for Solving Algorithm Coding Tests in Recruitment

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Received: December 21, 2023

Accepted: April 22, 2024

Published: August 6, 2024

Keywords:

LLM;
Algorithm coding tests;
Recruitment



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Abstract: Usage of programming interview questions which consist of coding is one of the most common approaches when hiring new candidates. Candidates should possess a variety of skills and knowledge in order to solve these assignments properly within the time and memory constraints in order to pass the examinations. With the advent of LLM (Large Language Models) architectures such as ChatGPT, we are able to prove that the most common interview questions are trivial as a measure of knowledge. By comparing a dataset of common programming interview questions with answers generated by ChatGPT, we have shown significant results in favor of ChatGPT as a solution for solving programming interview questions with an acceptance rate of 96.58% which is 46.45% higher than the average. We conclude from these results that the existing practice of programming interview questions is flawed and that significant changes should be made to render it relevant or to abandon it completely in candidate testing.

1. INTRODUCTION

Rapid advancements in AI and machine learning have reached the point where they aren't strictly academic or specific industry-focused. The newest advancements are being applied to day-to-day problems and activities, such as image recognition applied in traffic sign detection (Kamal et al., 2020) and digital assistants (otherwise called chat-bots) (Adamopoulou & Moussiades, 2020).

One of the key pain points in AI adoption are human-computer interfaces - how can we make the utilization of AI/ML technologies as simple as possible in order to achieve maximum results when applied to our problems. The introduction of text and speech recognition allowed the first steps in making human-computer interaction (HCI) simpler for end users. The creation and proliferation of Large Language Models (LLMs) bridge this gap almost in full, allowing users to communicate with computer systems in natural language, taking account of nuances and different languages. LLMs can be general or specialized. One of the most popular generalized LLMs is ChatGPT (ChatGPT, n.d.) which allows the user to ask both general-purpose and specialized questions and get mostly adequate responses (Dahlkemper et al., 2023).

Computer programming is one of such applications of LLM solutions. Describing the user requirements and expected results, we are now able to generate working computer programs (or programs that require minimal human intervention) (Shone, 2022) with higher efficiency than manually writing computer programs. This is most efficient with common computer programming patterns and snippets that are reused and matched - commonly known as *boilerplate* code.

Considering the technology behind ChatGPT potentially making jobs obsolete (Gilardi et al., 2023) and taking additional input to produce computer code and specialize it per our needs (Brown et al., 2020), we present the following hypothesis - can ChatGPT, as a bespoke LLM

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model, be used to solve algorithmic coding tests better than the average programmer? There is existing research based on LLM-generated code and algorithms (Arefin et al., 2023; Chen et al., 2021; Y. Liu et al., 2023), but they are not focused on the process of software engineer or computer programmer recruitment.

2. LARGE LANGUAGE MODELS (LLM)

Large Language Models (LLMs) represent an improvement in the field of artificial intelligence and natural language processing. These systems have the ability to generate legible and relevant text as answers to received inputs. LLMs gained popularity with the advent of GPT-2 model (Radford et al., n.d.) from OpenAI and GPT-3 (Brown et al., 2020) which proved to be much more suited to the purpose of text generation. There are also LLM models from other companies such as Meta, with their LLaMA LLM model (Touvron et al., n.d.).

The operation of LLMs is based on a deep-learning approach called transformer architecture (Vaswani et al., 2023). This method relies on self-attention mechanisms to process input data in parallel, making it highly efficient for capturing contextual relationships within text. LLM training is performed on large amounts of textual data, allowing it to learn grammar, semantics and basic reasoning due to the data ingested. Transformers have a concept of memory, allowing them to perform statistical predictions based on previous words, thus learning the nuances of communication and text semantics which is characteristic of human writing.

LLMs require fine-tuning and additional checks to prevent the generation of misleading data (Barat et al., 2023; Ling, 2023), as well as parameter optimization to fit the specific niche where they are deployed. The process of providing input to LLMs in order to optimize the required answers is called *prompt engineering* and represents a specialized field of study in computational linguistics (Sorensen et al., 2022; Witteveen & Andrews, 2022).

3. CODING TESTS IN RECRUITMENT

Recruitment for highly specialized roles requires a level of skill checks for the position in question. In the case of software engineering, one of the most common skill checks for new hires is the coding interview which offers high-quality results when testing (K. Liu et al., 2023), besides other abilities such as informed decision-making and constant learning (Li et al., 2015). The organization and structure of the coding interview depend on the recruiter itself, as well as the organization where the recruiter is employed. Most commonly they contain one or more coding assignments which can consist in the form of a take-home (*homework*) assignment or assignments that have to be performed in front of a panel of people. These assignments can vary from simple coding tests to highly advanced architecture design problems. Often you can find a combination of both types of assignments separated through several different interview rounds which increase in complexity.

Coding assignments are popular with FAANG (Facebook/Meta, Apple, Amazon, Netflix and Google/Alphabet) as well as other Big Tech and Fortune 500 companies as a method to perform rapid selection of candidates based on technical skills and merit. Coding tests can be performed in the form of panel assignments, take-home assignments and coding platforms.

In the case of panel assignments, the candidate performs a set of coding tasks in front of a panel of recruiters (in person or online), either on a piece of paper, whiteboard, or a computer

depending on the situation. Most commonly additional questions are asked both from the candidate and the panel in order to clarify the assignment.

Take-home assignments (homework) commonly represent more complex solutions that might require several hours to complete, such as designing a full application or an architecture in order to fit the provided problem. Presentation of the designed solution is often the case, either online or live in front of a panel, or developing a document that describes the thought process and the solution itself.

Computer platforms that provide automated management and execution of programming assignments are defined as coding platforms. The main benefit of usage is the ability to *fire and forget* the coding assignments until they are complete. Candidate is presented with a set of questions with specific difficulty, a text editor and the ability to run their programs. Solutions are then executed inside the coding platform against a suite of automated tests. Most commonly, solutions that pass all tests in a suite are marked as complete, but it is also possible to measure success with runtime and memory criteria, as well as algorithm complexity. Using computer platforms lowers the workload of the recruiter, as well as requirements for domain-specific knowledge, allowing the testing of multiple candidates at the same time. Some of the platforms that offer these abilities are LeetCode ([LeetCode - The World's Leading Online Programming Learning Platform, n.d.](#)) and HackerRank ([HackerRank - Online Coding Tests and Technical Interviews, n.d.](#)).

4. EXPERIMENT SETUP

We used LeetCode as a reference platform for the purpose of experimentation with the [Top Interview Questions \(n.d.\)](#) dataset filtered by questions available to non-premium users. Other platforms, such as HackerRank can be used with different, platform specific datasets, since there isn't a universal shared dataset between platforms.

This gives us 136 algorithmic questions in total, with 37 questions tagged as *Easy*, 80 questions tagged as *Medium* and 19 questions tagged as *Hard*. Every question is given three attempts to get to the correct solution. Each attempt is a clarification of the original question by providing example results.

ChatGPT has had context set beforehand. This step isn't mandatory, but it allows easier formatting of returned answers. The context is the following: "You are a computer programmer. I will give you a set of questions and you should return the answer to the questions in JavaScript. After every question I will tell you how it went."

Each question was copy-pasted directly to the LLM and the response was pasted back to LeetCode. A semi-automatic approach was used in order to evade potential detection from LeetCode: questions and corresponding descriptions were extracted beforehand and responses from the LLM were pasted manually. The whole experiment lasted for two hours and was performed by one person. For a question to be accepted on LeetCode, it had to pass two suites of tests: smoke tests (which are visible to the developer) and acceptance tests which are invisible to the end user. This approach prevents the developer from optimizing code to pass only tests without solving the provided problem. Acceptance is defined as code solutions that pass public and hidden test cases for the defined problem.

No issues were running the experiment on LeetCode regarding the performance of the platform.

5. RESULTS

The following tables represent the experiment findings. The first table shows averaged and aggregated measures across all experiments, while the other tables represent a drill-down into the measures obtained.

Table 1. Averaged and aggregated results across all questions compared to other platform users

Success rate	96.58%
Success on the first attempt	91.32%
Experiment runtime in milliseconds	154.40
Delta runtime in milliseconds compared to platform users	69.92%
Experiment memory used in megabytes	51.57
Delta memory in megabytes compared to platform users	56.75%
Acceptance from platform users	50.13%
Acceptance from our experiment	96.58%
Delta acceptance rate	46.45%

Source: Own research

We can easily see that the average success rate for the question answers is 96.58%, with the platform acceptance rate of 50.13% which is significantly higher than the average acceptance rate of solutions from other users. Our average runtime is also 69.92% faster than solutions from other platform users across all questions, as well as the memory use which is 56.75% better than compared with solutions from platform users.

Table 2. Acceptance rate of questions answered by ChatGPT compared with platform acceptance rate

	Number of questions	Accepted	Rejected	Experiment acceptance rate	Platform acceptance	Delta acceptance
Easy	37	37	0	100%	57.81%	42.19%
Medium	80	76	4	95%	50.48%	44.52%
Hard	19	18	1	95%	42.12%	52.62%

Source: Own research

Presented are metrics regarding the acceptance rate between our experimental solutions and solutions provided by other users of the platform. In the case of questions classified as Easy we had a 100% acceptance rate, while for Medium and Hard questions, the acceptance rate was 95% which is much higher than the platform acceptance rates.

In the case of Medium questions, the first question **Divide Two Integers (n.d.)** was rejected due to the time limit being exceeded even after passing smoke tests, while the time limit was imposed by the free Leetcode plan, the second question **Basic Calculator II (n.d.)** was unsolvable by ChatGPT due to constant bad results, third question **Wiggle Sort II (n.d.)** didn't have enough information in the description to solve it and fourth question **Top K Frequent Elements (n.d.)** had an interesting issue: ChatGPT provided a solution using an external library which encapsulates logic that is key for solving the question; after prompting to solve it without the external library, ChatGPT failed to provide the solution.

There was only one unsolvable Hard question - **The Skyline Problem (n.d.)**. ChatGPT failed to provide any acceptable code even after a few iterations.

Table 3. Number of attempts required to reach the solution. Three is the maximum number of attempts before flagging as rejected

	Number of questions	First attempt	Second attempt	Third attempt	Percentage solved after first attempt
Easy	37	37	0	0	100%
Medium	80	76	2	1	95%
Hard	19	15	3	0	79%

Source: Own research

Easy problems were solved in the first attempt, while both Easy and Hard attempts were solved with a maximum of two attempts. One of the Medium questions - [Top K Frequent Elements \(n.d.\)](#) required three attempts and was rejected in the end.

Table 4. Time and memory usage compared to platform users

	Number of questions	Runtime in milliseconds	Memory in megabytes	Delta platform runtime	Delta platform memory
Easy	37	67.21621622	45.56081081	69.02%	54.53%
Medium	80	177.1579	51.806053	67.80%	55.93%
Hard	19	218.8333333	57.345	72.94%	59.81%

Source: Own research

Delta platform runtime and delta platform memory represent the percentage where average runtime and memory were better than platform solutions.

Considering the performance of ChatGPT-generated solutions, it is visible that there are significant improvements regarding runtime and memory compared to more than 50% of human-generated solutions.

With the statements and research results presented above, we can confirm that the shown hypothesis has been accepted and that ChatGPT, as a bespoke LLM model can solve algorithmic coding tests better than the average programmer.

6. CONCLUSION AND FURTHER DISCUSSION

Considering that we've accepted the presented hypothesis, we can also conclude that the process of providing algorithmic questions as a gauge of candidates' skill in programming is flawed and does not represent the candidates' measure of knowledge. In the case of an algorithmic coding interview in an isolated environment (such as on a piece of paper or a computer isolated from the internet), the process is still flawed due to the possibility of a candidate learning the answers by memory and then reproducing them partially or fully, without understanding the meaning and reasoning behind them.

Usage of ChatGPT for algorithmic assignments outperforms humans in all categories explained, such as acceptance rate, runtime and memory usage, thus providing more efficient solutions than expected. This can potentially skew the performance of hands-on programming interviews if ChatGPT is used as a method for interview preparation, since in the long run it would focus the interview participants to perform micro-optimization of their code in order to beat the new baseline.

Other approaches for technical interviews such as in-person discussion with case studies, real-life problems and previous candidate experiences should be prioritized for selection, albeit being more engaging for the recruiters and technical staff.

Further research can be done on the usage of ChatGPT as a method for self-collaboration (Dong et al., 2023) and as a study aid for the development of necessary technical skills.

It is interesting to note that Leetcode questions classified as Medium difficulty are much harder for ChatGPT to solve than Hard questions. More research is required in this area to determine what are the key factors or areas of computer science (such as dynamic programming) that are difficult for ChatGPT to understand.

Considering that ChatGPT as an example LLM provided good performance against human solutions, research in additional implementation of other LLM models such as LLaMA or GPT-4 (OpenAI, 2023) which has improved logic reasoning and code analysis features integrated. It would be also interesting to compare it with GitHub Copilot Your AI pair programmer (n.d.), a specialized AI tool designed to assist developers in writing code. There is already some research on GitHub Copilot that could classify its output performance as similar to the experiment performed in this paper (Mastrolo et al., 2023; Moradi Dakhel et al., 2023).

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An Integrative Model of Crowdsourcing and Intellectual Capital on Effective Enterprise Renewal

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Received: January 29, 2024

Accepted: June 3, 2024

Published: August 6, 2024

Keywords:

Crowdsourcing;
Intellectual capital;
Enterprise renewal



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Abstract: Faced with a changing business environment and increasing competition, enterprises have started looking for innovative solutions beyond hierarch organizational boundaries. The community of crowds can be employed as a valuable factor in an enterprise's innovation process to create value and upgrade its knowledge base. The present paper seeks to understand the role of the crowdsourcing mechanism through the intellectual capital framework, resulting in a renewed knowledge base. The model was empirically tested using a data set obtained through a questionnaire fulfilled by representatives of enterprises in the Republic of Srpska, Bosnia and Herzegovina, using partial least squares structural equation modelling. The findings reveal that crowdsourcing causes significant linkages between intellectual capital dimensions among which crowdsourcing-human capital and crowdsourcing-structural capital contribute more to enterprise renewal of knowledge base. Research results could assist managers in strategic decisions in resource allocation in promoting and sustaining knowledge dissemination to increase the renewal capability of enterprises.

1. INTRODUCTION

In the current unpredictable and turbulent environment, it is challenging for enterprises to survive and achieve sustainable competitive advantage and high overall performance. Thus, enterprises are forced to find innovative ways to solve organizational problems and acquire resources to produce innovative products and create added value. The ability to access multiple resources is essential for nascent and mature enterprises (Pavlidou et al., 2020) because it enables building resource networks that can accelerate the period between conception and gaining revenue or to sustain or improve organizational performance and market share. Therefore, crowdsourcing practices (CWS) represent an appealing approach as they improve knowledge resources by opening the enterprise boundaries, and acting beyond hierarch organizational structures, to external parties (Pavlidou et al., 2020). The term CWS was first described as a process of pointing out the assignment that traditionally would be assigned to employees in the enterprise to individuals or groups of individuals outside of the enterprise. This process is called outsourcing through open-call invitations to a heterogeneous group of individuals with various expertise and experiences (Devece et al., 2019; Martinez-Corral et al., 2019; Pavlidou et al., 2020). It provides an opportunity to identify current market flows, processes and product innovation, simultaneously collecting feedback, new ideas and conducting tasks (Martinez-Corral et al., 2019). Even though, some researches reveal that SMEs are aware of the benefits of implementing CWS practices, only large enterprises apply CWS using internal IT platforms (Devece et al., 2019). As it can be concluded, SMEs lack knowledge of tools and IT platforms suitable for performing tasks and solving problems so CWS represents an important but undeveloped research area. However, what is still missing in the relationship between enterprise and CWS practices is an analysis of the impact of CWS practices on intangible resources

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and, consequentially, on renewing the capability of enterprises. CWS as emerged digital system affects enterprises in different stages at different levels creating the need to develop an integrated model of CWS and intellectual capital (IC), as novel hidden resources and activities that create sustainable competitiveness and overall high performance of enterprises. Based on the resource-based view (RBV), this research represents an attempt to investigate intangible resources that complement CWS and its effect on enterprises' renewability (Peris-Ortiz et al., 2018).

2. LITERATURE REVIEW

2.1. Intellectual Capital and its Relationship with Enterprise Renewal

There is a broad discussion on IC definitions and classification resulting in the need to adopt the multidimensional view of IC to obtain a comprehensive understanding of this complex phenomenon. Prior literature has determined three main IC components: human, structural and relational capital (Rehman et al., 2021). Human capital (HC) is the core component of IC (Ali et al., 2023; Pasamar et al., 2019) that can produce creative ideas and increase the organization's innovation. Talented employees with excellent educations and high skills possess enhanced cognitive capabilities that can lead to their high productivity and proficiency in enhancing the working performance of an enterprise (Ali et al., 2023; Palazzi et al., 2020). Structural capital (SC) represents individual knowledge retained in the enterprises through the knowledge codification and transfer process (Buenechea-Elberdin et al., 2018). It consists of documents, databases, defined procedures, etc., as an output of knowledge conversion processes. SC reflects the systems and configurations of an enterprise that enable the improvement of the employees' productivity (Ali et al., 2023; Cabrilo & Dahms, 2020). Relational capital (RC) refers mainly to customer relationships which are the essence of this type of capital even though there is an increasing presence of networking such as research and development collaborations and university-business sector cooperations (Kianto et al., 2010). RC refers to diverse ways of interaction, such as horizontal, vertical, downstream, and upstream, thus, reflecting the various types of cooperation and collaboration mechanisms in different settings (Ali et al., 2023). Improvements in the organization's RC represent the capacity of its employees and the depth of communication between them (Bontis et al., 2018). The simultaneous connections between IC components are additive by nature in that the value of one component is increased due to the presence of the other components (Ali et al., 2023). HC is a core component of IC and a driving force for SC and RC (Pasamar et al., 2019). It enables the generation of the relational and SC (McDowell et al., 2018). RC can be considered as a result of HC (Oliveira et al., 2020). HC is required to introduce knowledge databases which are the core of the SC (Rehman et al., 2021). SC gathers knowledge stored in the minds of the employees, thus humans and SC interact to create IC (Sardo et al., 2018). SC includes all non-human knowledge stored in the enterprises used as support for the organizational process and consequently empowers HC. Some authors reveal the positive relationship between relational and SC (Liu et al., 2022). Interaction between employees and stakeholders such as customers promotes generation of the more information and knowledge that leads to the accumulation and update of the SC stocks (Ali et al., 2023). Consequently, enterprises convert SC into added value if good relationships with customers are present (Rehman et al., 2021).

Many researchers have addressed the term enterprise renewal (ERNW) using various terms such as knowledge creation (Nonaka & Takeuchi, 1995), dynamic capabilities (Eisenhardt & Martin, 2000), and ERNW (Kianto et al., 2010). ERNW comprises the resources related to organizational growth and research and development. It represents the ability of enterprises

to respond to unexpected challenges and changes in the market. Some studies revealed that ERNW is a key antecedent of innovation performance (Buenechea-Elberdin et al., 2018; Cabrilo & Dahms, 2020). Likewise, there is also evidence that ERNW has a significant role in the link between IC and enterprise performance outcomes (Ritala et al., 2023). ERNW enables creating a new relationship between learned elements, that have already been known to the enterprise but not connected in a particular way. The renewed knowledge represents the base upon which enterprises can add and rectify their current knowledge as well as generate new connections between the existing knowledge in familiar ways (Ritala et al., 2023). Since enterprises have to survive in turbulent and unpredictable environments, ERNW is a valuable aspect interconnected with IC. Enterprise can not be oriented to learning if individual knowledge is not accumulated in repositories with enabled access only for employees (Patky, 2020). Knowledge is needed to renew knowledge funds, and in a great amount of developed SC is a precondition to upgrade enterprises' knowledge funds. Relationships between enterprises and stakeholders such as customers, business partners and research centres represent the source of new knowledge that enables and nurtures the learning capabilities of enterprises (Patky, 2020). So, renewal capability reflected in learning and renewing knowledge funds of enterprises, depends on existing knowledge (Kianto et al., 2010), especially in the form of tacit cognitive knowledge like beliefs, ideas and mental schemes, and tacit technical knowledge like capabilities and skills (Maharani et al., 2024). In this research, ERNW consists of organizational learning and knowledge base renewal (Kianto et al., 2010; Maharani et al., 2024). It indicates learning ability and capacity to renovate enterprises' knowledge funds that are interrelated with IC components (Kianto et al., 2010).

2.2. Crowdsourcing and Its Relationship with Intellectual Capital and Enterprise Renewal

CWS has the potential to deliver market knowledge to support innovative practices and renew the existing knowledge. It can shift the organizational focus towards the external business environment as a valuable source of knowledge acquisition. Under these circumstances, the creation and acquisition of knowledge prevail under process of the knowledge transfer (Coelho et al., 2018). Thus, the enterprises' renewal capability emerges as essential. Some authors (Coelho et al., 2018) found that depending on the experts included in the CWS practices, acquiring and renewing knowledge funds is one the most highly valued reasons for the development of enterprises' capabilities and it lies in the core of the crowdsourcing mechanism. To exploit all benefits of the CWS, it has to be complemented with other significant enterprise resources such as IC resources and supported by capabilities such as renewal capability (Devece et al., 2019).

Heterogenous tacit knowledge gathered by virtual communities and IT platforms of the CWS process leads to renewing the knowledge funds. Many creative ideas on product and process development and solutions of the business obtained by IT platforms and virtual communities are codified into databases, internal procedures and routine tasks. Thus, this implies that there is a connection between CWS mechanisms and SC. CWS may result in a sustainable competitive advantage when used to exploit differences arising from a variety of strategic resources. However, the process where CWS activities are integrated into organizational activities is not well understood. Customer knowledge captured by CWS can be transformed into innovation competencies thus resulting in higher performance (Lenart-Gansiniec, 2021; Xu et al., 2015). Drawing on RBV theory, it is possible to understand the complementary capabilities that enable the implementation of information systems and the use of IT platforms in enterprises (Devece et al., 2019; Malhotra & Majchrzak, 2019). This theory explains the significance of distinctive capabilities, particularly intangible resources.

However, the ideas generated by crowds are difficult to protect so innovation and knowledge created by accessing the skills and expertise of the crowd through CWS mechanisms cannot be considered as rare, inimitable and valuable as intangible resources. A competitor can easily access or copy obtained ideas and information. Using IT platforms does not guarantee that enterprise can access the collective knowledge and transform it into more valuable products and services. However, if an enterprise uses CWS activities for market purposes, it can help to better comprehend the customer's wants and needs (Stanko et al., 2015), sharpening the enterprises' sensing capabilities to rapidly adapt and change. To fully grasp the benefits of CWS to achieve competitive advantage, CWS must be integrated with other strategic assets (Devece et al., 2019) which makes CWS practices difficult to imitate by competitors. Some researchers revealed that CWS can bridge the gap between acquired knowledge for task fulfillment and existing knowledge funds in enterprises (Malhotra & Majchrzak, 2019). This research suggests the following conceptual model, as presented in Figure 1, based on the above-mentioned theoretical and empirical references.

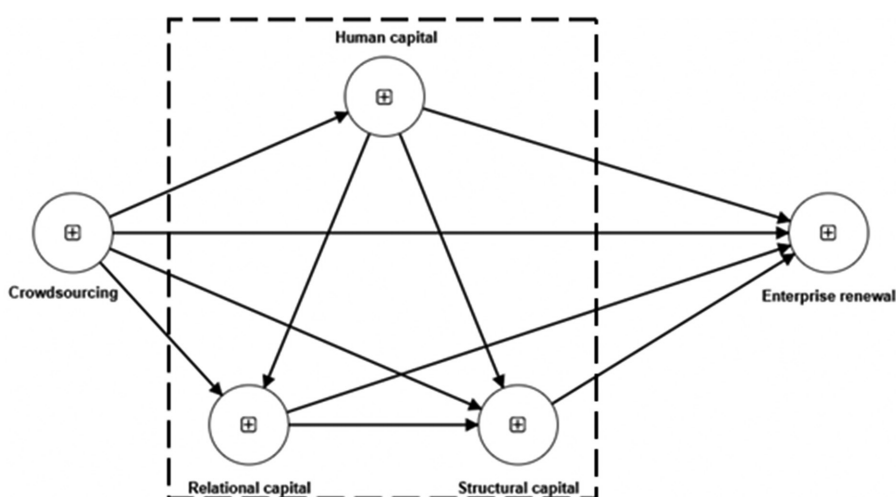


Figure 1. Proposed conceptual model

Source: Own research

3. RESEARCH METHODOLOGY

3.1. Research Method and Measurements

A quantitative approach was used to evaluate the proposed research model. A self-administered questionnaire was used to test the model. All multiple-item scales have items that were measured using five-point Likert scales ranging from 1 representing “strongly disagree” to 5, “strongly agree.” The original English questionnaire was translated into Serbian language using a back-translation procedure, whereas some discrepancies in meaning were detected and the Serbian version of the questionnaire was modified.

A multi-item scale was used in this research to measure the variables as shown in Table 1. To measure latent construct CWS eight items were used developed by authors Xu et al. (2015). This scale is based on a broad conceptualization of CWS activities, including any IT initiative related to accessing collective knowledge in virtual networks. To measure IC components: human, structural and RC, the measurement scale of 53 items, developed by Bontis (1998) was used. A measurement scale of four items is used to evaluate ERNW, as the target endogenous variable (Inkinen et al., 2017; Kianto et al., 2010).

Table 1. Summary of survey items (excerpts from questionnaire)

IC				
HC				
hc1	competence ideal level		hc11	employees perform their best
hc2	succession training program		hc12	recruitment program comprehensive
hc3	planners on schedule		hc13r*	big trouble if individuals left
hc4	employees cooperate in teams		hc14r*	rarely think actions through
hc5r	no internal relationships		hc15r*	do without thinking
hc6	come up with new ideas		hc16	individuals learn from others
hc7	upgrade employees' skills		hc17	employees voice opinions
hc8	employees are bright		hc18	get the most out of employees
hc9	employees are the best in the industry		hc19r*	bring down to others' level
hc10	employees are satisfied		hc20	employees give it their all
RC				
rc1	customers generally satisfied		rc10	meet with customers
rc2	reduce time to resolve the problem		rc11	customer info disseminated
rc3	market share improving		rc12	understand target markets
rc4	market share is the highest		rc13r*	do not care what the customer wants
rc5	longevity of relationships		rc14	capitalize on customers' wants
rc6	value-added service		rc15r*	launch what customers don't want
rc7	customers are loyal		rc16	confident of the future with customer
rc8	customers increasingly select us		rc17	feedback with customer
rc9	firm is market-oriented			
SC				
sc1	the lowest cost per transaction		sc9	develops most ideas in the industry
sc2	improving cost per revenue		sc10	firm is efficient
sc3	increase revenue per employee		sc11	systems allow easy info access
sc4	revenue per employee is best		sc12	procedures support innovation
sc5	transaction time decreasing		sc13r*	firm is a bureaucratic nightmare
sc6	transaction time is best		sc14	not too far removed from each other
sc7	implement new ideas		sc15	atmosphere is supportive
sc8	supports the development of ideas		sc16r	do not share knowledge
ERNW				
ernw1	enterprise acquired new knowledge		ernw3	enterprise as a learning organization
ernw2	employees acquired skills		ernw4	operations are creative and inventive
CWS				
cws1	usage of IT platforms to develop new products or services		cws5	evaluation systems to assess the effectiveness of ideas
cws2	users freely express new innovations in the firm		cws6	there are knowledge transfer systems to disseminate the best ideas
cws3	group of users can develop new ideas about new products or services or improve existing ones		cws7	usage of virtual communities to develop new products or services
cws4	financial and non-financial incentives to develop ideas		cws8	taking into account the enterprises' stakeholders

Note: r* means reversed coded item

Source: Bontis, 1998; Xu et al., 2015; Inken et al., 2017

3.2. Sample and Data Collection Procedures

This research collected data from the population of enterprises in the Republic of Srpska, Bosnia and Herzegovina. The well-structured survey questionnaire was delivered to 500 randomly chosen enterprises from the Chamber of Commerce and Industry of the Republic of Srpska database via Internet survey or in person. Data used in this research were gathered from 232

representatives of the enterprises for period from February to July 2019. After data cleansing to detect outliers, missing values and pattern responses, some of the questionnaires were excluded from further analysis. The remaining 224 questionnaires were used as the final sample. Among these 224 questionnaires 84 (37.5%) of them are gathered from representatives of the manufacturing sector while the remaining 140 (62.5%) questionnaires were collected from the service sector. According to the size and maturity of the enterprises, the majority of the enterprises are SMEs (88.39%) older than 15 years (63.39%).

4. DATA ANALYSIS AND RESULTS

To estimate the research model, partial least squares structural equation modelling (PLS-SEM) is used through the SmartPLS software package, version 4.0.9.9 (Ringle et al., 2022). The PLS-SEM enables the examination of a series of simultaneous relationships between latent constructs and directly observable manifest indicators. In the first stage of the PLS-SEM, fulfilment of the criteria for reflective measurement models is examined (Hair et al., 2022) such convergent validity (items with factor loadings above 0.7 are retained in the model), internal consistency reliability, and constructs' discriminant validity assessed. As shown in Table 2, all criteria for the measurement model are satisfied.

Table 2. Assessment results of the reflective measurement model

Panel a: Convergent validity and reliability				
CWS	HC	RC	SC	ERNW
Cronbach's α				
0.842	0.772	0.718	0.719	0.886
Composite reliability (pc)				
0.882	0.852	0.841	0.841	0.921
AVE				
0.555	0.591	0.64	0.639	0.555
Remaining items with loadings				
crwc1 0.711	hc6 0.815	rc1 0.840	sc7 0.874	ernw1 0.869
crwc 2 0.769	hc9 0.766	rc8 0.736	sc8 0.739	ernw2 0.892
crwc 3 0.718	hc10 0.783	rc10 0.819	sc10 0.778	ernw3 0.877
crwc 4 0.716	hc18 0.706			ernw4 0.813
crwc 5 0.764				
crwc 6 0.788				
Panel b: Discriminant validity - HTMT criterion				
HC	0.562			0.561
RC	0.452	0.674		0.75
SC	0.536	0.631	0.57	0.589
ERNW	0.562			

Source: Own calculations

The next stage of the PLS path modelling includes structural model assessment using the following criteria: multicollinearity issues (all VIF values are below 1.69 – lower than the threshold of 3) (Hair et al., 2022) and predictive relevance analysis. In-sample and out-of-sample prediction approach: PLSpredict algorithm (Shmueli et al., 2016) and cross-validated predictive ability test (CVPAT) (Sharma et al., 2023) are performed. These procedures detected R^2 values in the range from 0.225 to 0.439, as shown in Table 3. The Q^2 values (from 0.106 to 0.213) are above the threshold of zero and PLS-SEM's average loss is significantly lower than the average loss value of prediction using indicator averages or linear model forecast, which suggests that the predictive capability of the model is satisfactory. At the significance levels of 5%, the

direct and total effects are calculated using the bootstrapping technique providing corresponding p-values and appropriate bias-corrected (BCa) 95% confidence intervals. The majority of direct effects are significant, except the effects of HC and CWS on ERNW and the effects of CWS on RC. However, due to the interdependence of human, structural and RC, all total effects are positive and significant.

Table 3. Direct and total effects, bootstrapping BCa confidence intervals and model's predictive accuracy

Panel c ₁ : Direct and total effects and their significance at 5% level								
Path	Direct effects	p values	2.5% (LB)	97.5% (UP)	Total effects	p values	2.5% (LB)	97.5% (UP)
CWS → HC	0.474**	0.000	0.371	0.555	0.474**	0.000	0.371	0.555
CWS → SC	0.257**	0.000	0.113	0.382	0.433**	0.000	0.311	0.533
CWS → RC	0.111 ^{ns}	0.081	-0.017	0.226	0.366**	0.000	0.246	0.469
CWS → ERNW	0.026 ^{ns}	0.684	-0.097	0.147	0.342**	0.000	0.215	0.458
HC → ERNW	0.125 ^{ns}	0.094	-0.005	0.276	0.401**	0.000	0.274	0.518
HC → RC	0.367**	0.000	0.207	0.509	0.438**	0.000	0.304	0.550
HC → SC	0.379**	0.000	0.259	0.498	0.379**	0.000	0.259	0.498
RC → ERNW	0.434**	0.000	0.306	0.555	0.434**	0.000	0.306	0.555
SC → ERNW	0.226**	0.000	0.083	0.357	0.308**	0.000	0.159	0.448
SC → RC	0.189**	0.028	0.024	0.364	0.189**	0.028	0.024	0.364
Panel c ₂ : Predictive relevance of the model - Endogenous constructs								
	ERNW		HC		RC		SC	
R ²	0.439		0.225		0.308		0.299	
R ² adjusted	0.428		0.222		0.299		0.293	

Note: **p<0.05; ns – non significant

Source: Own calculations

5. FUTURE RESEARCH DIRECTIONS

This research, like previous research, has some limitations that determine the direction for future research. Current research used a cross-sectional approach and it is questionable whether or not CWS and IC will continue to enhance ERNW in the long run. CWS practices and their interrelations with intangible resources improve ERNW so researchers could use the same theoretical framework over a long period to see whether the findings change. This research conducted in the context of enterprises in the Republic of Srpska, Bosnia and Herzegovina may be relevant only to specific context, so the same theoretical framework could be used in both developing and developed countries to compare findings. Also, the dissemination of the elements of the CWS mechanism should be examined to obtain deeper insight into significant parts of the CWS that influence IC resources and renewal capabilities. The additional research direction could be to investigate the proposed theoretical framework by adding the enterprise performance outcomes as a target endogenous construct. Also, including the variable that depicts the enterprise's life stage as a mediator or moderator in the theoretical framework could provide more information on the volatile significance of the CWS-IC-ERNW linkage.

6. CONCLUSION

This research, overall, provides deeper insight into the CWS phenomenon by evaluating the relationship between CWS practices, IC and ERNW. Firstly, analysis results provide empirical evidence that enterprises can benefit from implementing CWS practices from an IC perspective to renovate their

knowledge funds. According to the author's knowledge, there is a research gap in identifying and empirically validating the potential linkage between CWS and intangible resources such as IC. Additionally, the research addresses the issues of measuring the CWS practices and evaluating its connection with different enterprises' performance outcomes in different research contexts are underdeveloped. Thus, this research aims to introduce a new integrating model of CWS, IC and ERNW which was empirically validated to reveal the magnitude and significance of the relationships between constructs of interest. Second, research findings enrich existing literature on enterprise capabilities and, overall, enterprise performance outcomes by proposing the theoretical framework and delivering evidence on the presence of the interdependence of CWS and IC. Academics and business practitioners could benefit from research results. Business practitioners should more focus on the magnitude and significance of the linkages between CWS and each IC component, and consequently, its impact on ERNW. When making decisions considering the implementation of IT platforms and virtual communities to gather knowledge and new ideas, it is necessary to evaluate their implications on different aspects of IC and, consequently, on renewing the knowledge funds. The results show that IC significantly strengthens the positive relationships between CWS and ERNW. The results are in line with RBV theory, that CWS should be considered complementary with intangible resources to ensure rare, valuable and inimitable knowledge and information as sources of renewed capabilities and, consequently, sustainable performance and sustained competitive advantage.

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Creating an Effective Working Environment in the Post-pandemic Period

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Received: January 29, 2024

Accepted: May 8, 2024

Published: August 6, 2024

Keywords:

Remote work;
Pandemic;
Efficiency;
Digitization;
Work environment;
Post-pandemic period;
Motivation;
Flexible



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Abstract: *The paper recommends creating a “hybrid” model in which remote workers can come to the office attend meetings or come to the workplace at regular intervals. It is recommended to work in the office on specific days to achieve optimal balance. Finally, the paper argues that the future lies in hybrid and flexible work environments, which in most cases are neither fully remote nor fully “on-site”. However, priority is given to both manual and service work. Nevertheless, when it comes to non-manual jobs and the creative industries, there is no one-size-fits-all solution. The tailor-made approach for each employee can lead to the hoped-for increase in work performance through the formation of teams that would have flexible work routines so that each employee can maximize their results and utilize the best-suited environment, which will ultimately benefit the company and its profit.*

1. INTRODUCTION

Before the pandemic caused by coronavirus, which broke in the first quarter of 2020, and the restrictions on movement that lasted until the first quarter of 2022, the topic of remote work was highly debated, but it never came to fruition en masse – although the prerequisites for teleworking were there: internet connections and apps were already present but underused. Therefore the number of employees working remotely either fully or partially was in the single digits. Everything changed with the advent of lockdowns, and the number of remote workers, some of them involuntary, increased sharply. It has led to the “normalization” of remote work. It was, in a way, “a global experiment with remote working”, happening in real-time, starting immediately (Kniffin et al., 2021).

The paper analyzed parameters like commuting time, distractions, self-control, concentration, the effective length of the working day, motivation or isolation, psychological effects on creativity, and even physical environment. This all gave us a more complete picture of how to organize a balanced work environment, combining work in situ, and remote work, according to the specificities of each employee, their work performance, preferences, and psychological state.

The recent events, as shown in this paper, resulted in the mass adoption of technologies to support virtual collaboration, communication and remote work (Hermann & Paris, 2020). This, by

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all means, does not imply that the traditional work practices will be supplanted by teleworking – on the contrary, traditional work practices will remain and the office will not completely disappear, but employers' interest in WLB employees is growing and new goals are to increase motivation, achieve better WLB, and therefore obtain better corporate results.

2. REMOTE WORK AND FLEXIBLE WORKING ENVIRONMENT

Non-service industries, especially the creative industries were less sensitive to the lack of presence of workers in the workplace since there was a rapid advancement in technology that made communication easier and the in-situ presence redundant. Therefore remote work was a logical step forward in non-service industries even during the coronavirus pandemic, especially because there were prerequisites present even before the coronavirus pandemic (Allen et al., 2015).

Remote working was defined far before the current events in technology and global epidemical situation, namely, (Di Martino & Wirth, 1990) defined it as „a flexible work arrangement whereby workers work in locations, remote from their central offices or production facilities, the worker has no personal contact with co-workers there, but is able to communicate with them using technology”.

However, it was only after the pandemic kicked in that teleworking (remote working) was seriously applied, so the so-called “new normal” normalized remote work (Ng et al., 2022). Unfortunately, many did not dare to apply such practices before the pandemic started.

The creative industries are particularly insensitive to the “on-spot” presence in the workplace, and when it is said “creative industries”, the primary reference is programming, IT industries, design, music production, architecture, video-effects and editing, copywriting, journalism and content creation in any form or shape, including content creation for the social media by so-called influencers, which can and must be done in any place available and technically equipped. The rise of remote work appears to be the change in work practices most likely to persist in the long term, and the long-term growth of hybrid work also appears to be inevitable (Gifford, 2022). In creative industries, it is most likely here to stay, but in other areas, the situation is not that clear, so hybrid work is a probable future.

At the onset of the pandemic, everything changed so rapidly and the whole life of the planet virtually became online overnight, so there was quite a lot of discussion about this disruption. The common conclusion was that remote work has to be introduced quickly, that it is here to stay and the companies had to equip the workers with adequate software and hardware (Song et al., 2020). The companies rapidly digitized their work (Wang et al., 2021), although it was not such a wide practice before the pandemic (Kossek & Lautsch, 2018).

The development of new communication technologies led to the development of the virtual workplace (Dropbox etc.) and remote work, which were used to a great extent during the coronavirus pandemic from February-March 2020 until today, although before the pandemic there was not a large number of workers who could perform their tasks fulfill satisfactorily through telecommuting (Olson & Olson, 2000). Nowadays, it is widely accepted that remote work can be implemented successfully and there are numerous analyses of how exactly to implement the transition to remote working as a standard working modality after the pandemic (De Valdenbro Campo et al., 2021). Although the advantages of such a model have grown immensely and

rapidly (Saura et al., 2022), it is visible that some managers do not see it as an efficient model, i.e. the managers' perspective of connection between the remote work and productiveness is somehow blurry and they show a certain level of distrust that predates the pandemic (Martínez-Sánchez et al., 2007).

It is however, quite evident, watching the newest trends, that teleworking will be normalized widely and combined with physical presence from time to time to create a flexible, mixed-way "middle ground" working environment to maximize the results and performances of the employees. Tailored-up workspaces and flexible environments are more popular with younger generations, especially Generation Z.

3. METHODS AND PROBLEMS

The purpose of this study is to find out the creative workforce's work values and, based on them, to examine the work environment thus creating a possible flexible work environment and maximizing the outcome. The paper uses literature research and desk research methods, combined with the analysis and synthesis, deduction and induction methods. It also researches psychological and physical parameters in remote work. Physical parameters are usually better at home but it depends on the material situation. There are different and divergent conclusions about remote work and the success of mastering tasks and employee performance.

The paper presents a work value theory for current generations, which will eventually be replaced by Generation Y and Z gradually, and the results reflect the expectations of creative workers in the IT industry and elsewhere to tailor up the physical work environment and the flexible work arrangements since they are presented among the work values of the majority of the studies that were examined. In the post-COVID-19 era, this paper suggests organizations apply hybrid and flexible working models. The paper calls attention to the critical management issues concerning the creation of flexible and hybrid work environments, which is confirmed by the works by Pataki-Bittó and Kapusy (2021), which pays more attention to Generation Z. This study is however, wider since it is taking all generations in account.

In this aspect, the following hypotheses were constructed:

Hypothesis 1:

The flexible working environment, i.e. the combination of remote work and physical presence in the company elevates productivity.

Hypothesis 2:

Tailored-up workspaces and flexible environments will lead the the increased work-life balance of the employees, thus helping the company they work for.

4. RESULTS AND DISCUSSION

There were many types of research and some 30 parameters were analysed in literature. The transition from office work to remote work was not voluntary and Franken et al. (2021) call it "forced flexibility", which has led to different reactions from employees. The biggest challenges

are those related to corporate culture and the culture of certain societies. Workers working from home felt “cut off from the group” and showed worse work parameters. i.e. some people feel “isolated” when working at home and cannot fully concentrate on work, which is especially evident in so-called „collective societies“ like the ones in Asia (Chen, 2021). It was noticed decades ago (Rook, 1985). Counterintuitively it was shown that it is the major cause of depression in Finland (Van Zoonen et al., 2021) and Australia (Wang et al., 2021).

For some, teleworking increases productivity because interruptions and distractions from co-workers are avoided (Thulin et al., 2019). Saura et al. (2022) found that even Twitter (now X) content creators experienced reduced stress and increased creativity due to reduced distractions from others in the office. On the other hand, some banal things have been a distressing factor in people who have no personal space, or good internet connection (Allen et al., 2021). Some people had a chance to take care of their children, while some were distracted by their families, as shown by a Colombian study (De Valdenebro Campo et al., 2021). Once again it seemed to be a crucial problem in China (Shao et al., 2021), and some workers personally preferred separate time and space for work and family gatherings (Sarbu, 2018).

Some estimates say that up to 25% of workers could work from home without a drop in productivity, and also estimates that that number will never drop below 20% (Barrero et al., 2021). The change that was anticipated to happen in 25 years was achieved in only 2 years under the pandemic pressure (Gifford, 2022). 40% of employers predict more than half of their workforce will regularly work from home, compared to just 15% before the pandemic (the UK) (Brinkley et al., 2020). According to research by WFH Research, a group of academics, part-time workers with at least a high school education in the US, Britain and Canada work an average of one and a half days a week from home, and, on average, they want to double the time they spend doing so - employers, however, have different ideas – they want to diminish the remote work to a maximum one day a week (Shanbhogue, 2023). The resulting compromise will likely be somewhere in between these two figures, between one and three days of remote work a week, perhaps two or two and a half day, arguably more in Asia (Shanbhogue, 2023).

The main obstacle to the wider adoption of remote work is the cognitive dissonance and the discrepancy in viewing the efficiency of remote work by the managers (Wang et al., 2021). It is not a new phenomenon, since it was noticed in the very beginnings of remote work (Golden et al., 2008). Therefore, the managers often insist on a harsher grip over employees, especially the lower-level managers who have more interactions with the employees, which was shown in the research in Poland during the Covid-19 pandemic among 141 managers of different levels, including 18.7% middle management and 81.3% lower management, and the results show that middle-lever managers feel more relaxed about the positive outcome and benefit for the company and the employees (Kowalski & Ślebarska, 2022).

Orzeł and Wolniak (2022) in Poland conclude that 40 out of 50 surveyed architects-designers stated that they would choose to work remotely, as better and more comfortable, due to a multitude of factors. The research in India has proven that among 128 IT experts, all the parameters were better, including two of the most important ones, encouraging work-life balance (EWB), and maintaining interest and productivity (MIP) (Raj et al., 2023). Similar findings were observed in Sri Lanka, where there is evidence for better concentration and motivation, as well as commitment to work, among the employees, while their WLB (work/life balance) has improved (Iddagoda & Opatha, 2020).

Commuting time disappeared, so a new amount of time appeared which brought surplus working time and time for rest to employees (Eldér, 2020), and relieved a certain amount of stress from the employees who did not have to worry if they would be in office in time (Yang et al., 2023).

The problem of self-organization of working time is crucial for some workers. It depends on self-discipline and self-control some workers do not possess. The working time from home can be either extremely shortened or extremely extended - it happens because the employee tailors it themselves, which can sometimes lead to burnout syndrome (Vayre, 2019). It is especially noticed in Japan, which has been facing that problem (so-called „karoshi“ or „death by overworking and exhaustion“ for decades (Kazekami, 2020).

But it can go the other way since they can also set it in the way to achieve a balance between work and the private sphere. If employees conclude and perceive that remote work is good for them, they feel grateful to the company that provided them with such work (option), so that it increases their commitment and performance (Golden & Gajendran, 2019). The psychological factors within the person (employee) were also observed by Vega et al. (2015), concluding that everything is in the mind: employees believe that they can have better results and work performance if they work from home, because it allows them freedom and flexibility (they can stop work, look TV shows, go to the beach or exercise, eat healthier, etc.) and automatically achieve better results, partly due to autosuggestion. All in all, the effective working day, if remote work is applied, is said to be increased by 48 minutes and 30 seconds, so the conclusion is that the working day performance automatically increases and is beneficial for the company itself (DeFilippis et al., 2020).

5. FUTURE RESEARCH DIRECTIONS

There is still room for improvement within the existing working hours by removing disincentives and adding motivational factors by determining which workers belong to which group. It is not possible to “force” everyone to behave effectively in the same way. The universal availability of everyone everywhere, via smartphones that have applications for e-mail and all kinds of messages, does not contribute to the relief of employees if they do not agree with their superiors or if the legal area does not regulate itself, as in Portugal. Creating an effective digital work environment must take into account all these divergent parameters and monitor how “involuntary” remote work will turn into “voluntary” remote work in the years after the pandemic.

A good and efficient team is formed by a mixture of employees in the company, at physical locations, and those who work remotely. Globally, remote workers have been observed to be less stressed. Individual creative jobs such as IT workers, media workers, designers and architects/planners find it much easier to create high-quality digital work environments than those working in traditional service industries. Since electronic and video communications cannot be an absolute substitute for live conferencing, we recommend creating a “hybrid” model. Remote workers who can come to the office attend meetings or come to the workplace at regular intervals. It is recommended to work in the office on specific days to achieve optimal balance since there is no one-size-fits-all solution, and these are the guidelines for future research.

6. CONCLUSION

One of the essences is in the employee’s mind, i.e. perception. If employees conclude and perceive that remote work is good for them, they feel grateful to the company that provided them

with such work (option). It increases their commitment and performance. The Internet makes it possible to work virtually from anywhere in the world. Increased digitization during this period was noted by many authors (among them [Vyas, 2022](#)) and this transition during the pandemic was so sudden that it is equivalent to disruptive technology, with Saura and colleagues arguing that the transition to digital communications with colleagues and the personal reconciliation of private and business is such a demanding change that it still needs to be studied in order to obtain, in the years after the pandemic, quality response ([Saura et al., 2022](#)).

The transition to digital communications with colleagues and the personal reconciliation of private and business is such a demanding change. The managers and especially HR managers play the key role in all of this. It “requires the selection of workers who are more suitable for working from home, the training of such workers on more efficient remote work methods and greater monitoring of the quality and productivity of those assigned to work from home” ([Kramer & Kramer, 2020](#)), which is the guideline for this process.

This is a strong momentum in the direction of encouraging those employees who are willing and ready to work remotely, to do so. Let’s note that there are also included those who reluctantly went to work from home and have reduced work performance and those who are happy about going to work from home. This cumulative result shows that, nevertheless, work efficiency has been improved - and that by creating such a digital work environment in which those who feel good when working from home would and should work from home, and in which those who feel better when they work in the office, worked in the office, got an even greater extension of the working day in minutes, and thus greater global productivity. The employee must design their own tasks and solve them step by step, at their own pace, which must be balanced with the pace set by the company ([Troll et al., 2022](#)). If this is not possible, the employee is not suitable for remote work. HR teams in companies must deal with how to determine which employee is for which role.

A good and efficient team is formed by a mixture of employees in the company, at physical locations, and those who work remotely. Of course, working from home if you choose to work from home is not the same as if your company forces you to work from home against your will, so you should be careful to avoid involuntary actions. Globally, remote workers have been observed to be less stressed, but only when the post-pandemic era is in full swing and the further development of telecommunications technologies will make this fully clear. Individual creative jobs such as IT workers, media workers, designers and architects/planners find it much easier to create high-quality digital work environments than those working in traditional service industries. It’s been proven. Since electronic and video communications cannot be an absolute substitute for live conferencing, we recommend creating a “hybrid” model in which remote workers can come to the office attend meetings, or come to the workplace at regular intervals. It is recommended to work in the office on specific days to achieve optimal balance.

Finally, the paper argues that the future lies in hybrid and flexible work environments, which in most cases are neither fully remote nor fully “on-site”. However, priority is given to both manual and service work. Nonetheless, when it comes to non-manual jobs and the creative industries, there is no one-size-fits-all solution. As [Vyas \(2022\)](#) concludes, traditional work practices will remain and the office will not completely disappear, but employers’ interest in WLB employees is growing and new goals are to increase motivation, achieve better WLB, and therefore obtain better corporate results. In that aspect, it is evident that the hypotheses are proven.

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How Does Management Style Affect Employee Well-Being within Large Enterprises? The Case of Albania

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Received: January 30, 2024

Accepted: May 28, 2024

Published: August 6, 2024

Keywords:

Management style;
Leadership;
Enterprise culture



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Abstract: *Employee well-being and a positive workplace culture consist of employees who enjoy and are passionate about their work. It includes employees who show interpersonal and professional pride in the services they provide to their customers and clients, who interact with co-workers collaboratively and collegially, and who enthusiastically engage in healthy workplace relationships. This highly desirable employee behavior within enterprises is not easily attainable. As a result, this paper investigates and investigates how management style impacts employee well-being in the Albanian business environment. Based on semi-structured interviews with high and middle management of large enterprises in Albania, this paper examines how adherence to international standards to tackle workplace stress affects employee well-being and the degree of nurturing enterprise culture. A comparison is made between locally-owned and foreign-owned enterprises. This paper concludes that managers who can distinguish between a certain healthy amount of employee competition and more destructive ones that affect both a single employee, the department, and ultimately the enterprise are the ones possessing more leadership qualities and capable of continuously cultivating the highest degree of employee well-being in their enterprises.*

1. INTRODUCTION

Enterprises are increasingly cognizant of the significance of safeguarding and encouraging staff health to attain and maintain a competitive edge. The frantic pace and the ever-increasing complexity of the environments where enterprises operate call for constant creativity and excellence. Since teams are increasingly combining different skills and expertise to tackle new and diverse tasks, teamwork and collaborative learning are becoming increasingly important. Furthermore, encouraging cooperation within enterprises is often associated with attaining organizational objectives with higher levels of well-being and lower stress, which explains why working together is also associated with a higher degree of employee well-being (Bartels et al., 2019).

Over the past few years, employees have been exposed to high pressure within the work environment. The COVID-19 pandemic that hit the world has thrown a wrench into how and where people work, and now there are mass layoffs, longer working hours, and wages that aren't keeping up with inflation, making employees feel overwhelmed, stressed, and burned out (Kaluza et al., 2020). The employees' mental health and overall well-being are feeble. In both the public and private sectors, ensuring employees feel good at work is important. As such, every day, it is becoming imperative to develop resources and employee well-being programs to better support their workforce to dedicate a variety of resources and to meet the psychological needs of employees at all levels of the organization. Social relations at work and leadership, such as social capital or social support from colleagues and supervisors, are some factors (Sejera, 2018). Managers are important in a fair workplace because they help employees blend, give feedback on work, make decisions about the enterprise, and give employees chances to participate in the decision-making process. make things easier or worse (Tariq et al., 2023).

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2. MANAGEMENT STYLE FOR EMPLOYEE WELL-BEING

In the literature when considering employee well-being management and leadership are often used interchangeably. This is deemed normal, as these concepts are intricately linked and challenging to grasp and assimilate in practice. In many ways, leadership is similar to management. Being a leader requires influence, as does being a manager. Leadership involves working with people, which is also the case with management (Kaluza et al., 2020). Leadership is concerned with effective goal accomplishment, and so is management. In general, a multitude of the responsibilities of management are characterized by activities that align with the concept of leadership. However, it can be helpful to know the difference between managing and leading (Fu et al., 2020). The manager position entails being accountable for the entire or a specific segment. Leadership is one of the roles or functions that management performs, but leadership is always included with the other roles. As a leader, your job is to make sure your workers do their jobs well. This means motivating them, encouraging them, and helping them improve their skills. A manager can prioritize tasks that are typically associated with management while utilizing leadership only in a limited manner (Al-Malki & Juan, 2018). On the contrary, an individual may possess a significant inclination towards leadership duties while simultaneously highlighting the importance of management. It is also feasible to assume leadership roles without formal managerial positions. Another difference is that leadership can happen either directly or indirectly. The term “direct leadership” refers to the conduct and responsibilities that managers employ when dealing with the employees they are guiding (Liao et al., 2017). Indirect leadership means leading by preparing guidelines, rules, and protocols that affect employee interaction within the enterprise or organization. For example, rules or guidelines can change how employees think, act, and do things. Direct and indirect methods of leadership are not mutually exclusive. When paired up, each one strengthens the other. For this paper, management style refers mainly to the leadership qualities managers display when guiding and advising their employees. This paper introduces two management styles, one based on transformational leadership and the other based on destructive leadership (Sianoja et al., 2020).

To continue, one of the most widely used leadership theories is transformational leadership, which is based on the full-range leadership model. It helps employees grow by giving them individual consideration, intellectual stimulation, and motivational messages. It is associated with numerous favorable outcomes both on an individual and team level and is regarded as a leadership approach that prioritizes change within enterprises. This leadership style has been recognized as a positive influence on employee well-being, such as decreased risk of sick absence and reduced stress (Marin-Garcia & Bonavia, 2021). This has been proven in both for-profit and non-profit organizations, as well as in studies that look at a group of employees over a long period. Within this theory, leaders provide customized assistance to employees through individualized consideration or reduce delivery requirements if the employee is unable to complete the assigned tasks adequately. This way they encourage healthy habits within the enterprise by stimulating employees to utilize their resources effectively. As a result, they support employees' health by stimulating beneficial interactions among employees and promoting the importance of healthy employee relationships (Barnes et al., 2020).

Several studies on transformational leadership indicate that a balance between rational performance demands and the degree of available resources to perform these demands are at the core of this leadership style. However, less research has been done on how leaders can make their followers feel good about their jobs and what they need to do simultaneously. For instance, the literature on transformational leadership indicates that initiatives within organizations that reduce

the number of working hours yield higher levels of self-confidence and allow them to engage personal resources in other recreational activities and family (Ma & Jiang, 2018). This helps reduce stress and irritation while promoting productivity and healthy relationships. Given the difficulties of the contemporary workplace, the rapid evolution resulting from accelerating digitization, and unanticipated occurrences like the COVID-19 pandemic and the war in Ukraine, the importance of transformational leadership in psychological employee well-being is getting much more attention in running enterprises (Slemp et al., 2018). Research shows that implementation of transformational leadership mitigated employee burnout during organizational transformation while a transparent promotion policy and guidelines resulted in a reduction in stress levels among full-time employees. Most studies on transformative leadership and psychological well-being target the implementation of transformational leadership from a leader-focused perspective that examines how it affects employees' psychological and physical well-being. Numerous studies have established a strong connection between transformational leadership and full-time employees in various settings across industries, countries, and social-cultural values (Eva et al., 2019).

Management based on transformational leadership indicates that they are open and welcome ongoing contributions from employees. In this management culture employee contribution is incorporated into the decision-making. They consider their employees' wants and needs when making decisions (van Tuin et al., 2020). The management culture based on transformational management ensures that employees feel safe talking their minds without worrying about the consequences of their employment or relations with co-workers. Psychological safety helps create a culture where employees feel supported, treated fairly, and trust each other. Inclusiveness can also boost commitment, contentment, resolution of disputes, participation, performance, creativity, and resilience (Parker et al., 2019).

On the other hand, a management culture that is based on destructive leadership is characterized by a hostile and potentially harmful approach towards co-workers, as well as a tendency to encourage them to oppose the guidelines, rules, and protocols on which an enterprise operates (Tripathi & Bharadwaja, 2020). These conducts are likely to be perceived as threatening and stressful for full-time employees. These behaviors frequently encompass mockery, abusive language, persistent criticism, blame-shifting, and unfriendly and impolite demeanor, leading to higher stress levels and unstable emotional states both in the working environment and also the social surroundings of employees (Berger et al., 2019). Research indicates that too much stress or periods of prolonged stress are detrimental to physical and psychological well-being. The detrimental effects of destructive leadership might be exacerbated by passing on their negative experiences to their workmates or private acquaintances. Unlike other leadership styles, destructive leadership is most harmful to employees because it makes them more likely to encounter dangerous or stressful situations (Su & Swanson, 2019). A recent meta-analysis shows that leadership and negative mental health outcomes have one of the biggest adjusted correlations, which shows how harmful it can be for enterprises, employees, and society due to its spillover effects (Gjerde & Alvesson, 2020).

3. RESEARCH METHODOLOGY

Management cultures based on leadership that promote employee health and well-being may take different forms. Leaders can help employees feel healthy and happy by acting and leading. Different kinds of health-promoting activities may be coordinated and encouraged, such as

participation in wellness events. Also, a healthy environment can be created by changing how work is organized (Sanchez-Manzanares et al., 2020). The previous section described direct and indirect leadership, with the first being more direct and the other being more indirect. The first approach to leadership for health and well-being tends to be more direct, whereas the other two are more indirect. A relatively new research field has been described for the importance of leadership (Inceoglu et al., 2018). Occasionally, outcomes such as the impact of the management culture evaluating meeting employment requirements have been studied for several decades. Nevertheless, the more explicit connection between the conceptualization of health and a health-centered perspective is relatively new, and additional research is still needed to fill several existing gaps (Rahmadani et al., 2020).

Adding to the existing literature, this paper tries to identify how a management culture employee based on different leadership styles affects employee well-being in enterprises operating in Albania. The research is based on semi-structured interviews with high and middle management in Albanian enterprises. In total 57 interviews were conducted over six months, out of which 31 were with high management and 26 with middle management. In this paper, a distinction is made between foreign-owned enterprises and locally-owned ones. This way, it is possible to test the main hypothesis of the paper that in Albania, it is possible to test the main hypothesis in Albania: employees working in foreign-owned enterprises have a better well-being than employees working for locally-owned enterprises. The main characteristics of the sample are presented in Table 1. The main criteria for the selection of enterprises are (i) number of employees, (ii) annual turnover, (iii) years of operations in the market, (iv) type of industry, (v) the origin of the foreign investment in the country, (vi) number of years management had in the enterprise. The research was conducted in three stages. The first research stage was between January and March 2023, during which the enterprises were identified, screened, and selected according to the predetermined criteria. The second stage consisted of fieldwork with selected enterprises between April and June 2023. In the third stage between September and October 2023, the data was carefully analyzed, and the most meaningful information was selected to be included in the paper.

Table 1. Main characteristics of the research sample

No.	Category	Characteristics
1.	Foreign-owned enterprises	<ul style="list-style-type: none"> • 13 enterprises, out of which 5 Italian, 4 German, 3 Greek, 2 Spanish. • Over 10 years of experience in the Albanian market, with at least one additional branch in another country in the Western Balkan. • 8 enterprises operate in the service industry, while 5 of them operate in the manufacturing industry. • 17 high-level managers and 14 middle managers. • All enterprises have over 100 employees. • All enterprises have a turnover of over 5 million euros. • Middle management had worked for the enterprise for at least 7 years. • High-level management for at least 10 years.
2.	Locally-owned enterprises	<ul style="list-style-type: none"> • 13 enterprises that are owned entirely by Albanian entrepreneurs • Over 10 years of experience in the Albanian market, with at least one additional branch in another country in the Western Balkan. • 7 enterprises operate in the service industry, while 6 of them operate in the manufacturing industry. • 14 high-level managers and 12 middle managers. • All enterprises have over 100 employees. • All enterprises have a turnover of over 5 million euros. • Middle management had worked for the enterprise for at least 5 years. • High-level management for at least 8 years.

Source: Own research

The interviews address several areas closely connected to the management culture and employee well-being, both psychological and physical. The main areas of investigation are presented in Figure 1. During the interviews, these areas were addressed both with a set of fixed questions and open questions. Interviews were analyzed through QDA software with the ultimate objective of identifying commonality patterns among managers’ responses and generating significant results about how the four previously introduced leadership styles affect the well-being of employees (Tariq et al., 2023). Separate analyses were performed for foreign-owned and locally-owned enterprises to investigate whether, in a developing country like Albania, employee well-being is affected by the nationality of the management.

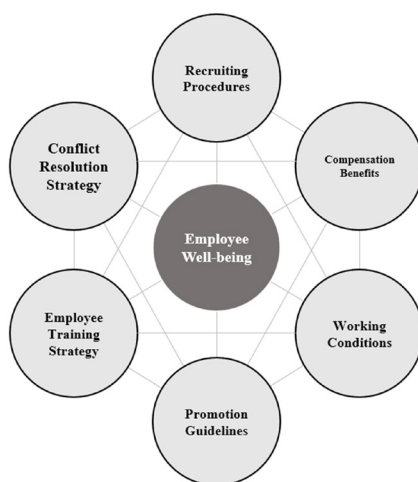


Figure 1. Main areas to investigate the impact of management style on employee well-being in Albanian enterprises

Source: Own processing

4. MAIN RESEARCH RESULTS

This section presents the main results of the research after analyzing the responses received from interviews with high and middle management of both Albanian and foreign-owned enterprises operating in Albania. These results are summarized in Table 2.

Table 2. The main results based on research interviews

No.	Area of research	Albanian owned enterprises	Foreign-owned enterprises
1.	Recruiting procedures	Recruiting procedures are not always clear and publicly available. Candidates are not informed if they are not called for an interview or that their application has not been successful. Usually, recruitment occurs through internal recommendations, as management considers this a more reliable path.	Recruiting procedures are well-written and documented. For all vacancy announcements, the requirements, the job description, and the steps in the recruitment process are made public to all potential candidates.
2.	Compensation benefits	All wages are above the minimum wage. However, bonuses are not consistent for employees and depend entirely on the owner's decision. In-kind benefits are almost absent, with few exceptions that offer additional benefits, like gym membership or subsidized lunch.	Wages are well above the minimum wage. In addition, several in-kind benefits are provided to employees, such as membership to the gym, lunch sponsored by employees, additional health insurance, discounts or vouchers in several shops, and leisure activities organized periodically in the form of staff retreats. Few exceptions to this trend exist when the enterprise is foreign-owned but has hired local managers to run the enterprise.

3.	Working conditions	Working conditions are adequate, mostly with open space offices. In the majority of enterprises, common leisure areas are missing, while the kitchen is small. Lighting, heating, or cooling is inconsistent as these enterprises are located in relatively old buildings.	Working conditions are well organized with personal dedicated space. Ventilation, lighting, and health safety are according to international standards. In addition, filtered water, coffee, and tea are offered during working hours. The kitchen and employee leisure areas are present and well-furnished.
4.	Promotion guidelines	Promotion guidelines are not clear, and with few exceptions, they have not been updated for at least five years. Promotions are mostly made based on the direct decision of managers or the enterprise owner. Few promotions are based on following the enterprise guidelines.	Promotion guidelines are written and updated at least every two years. The code of conduct and the career path are distributed to all enterprise employees, and all employees are informed of any changes or amendments to them.
5.	Employee training strategy	Enterprises provide initial training for first-time employees, that are on a trial period for three months before they are offered a permanent contract. A properly written employee training strategy is missing. Occasional trainings are offered on which participation is directly decided by the manager or supervisor. Individual training is sometimes encouraged but not financially supported by the enterprise.	Enterprises have a clear strategy of training employees. An initial introductory training is performed for all new employees. Moreover, at least training is delivered to all employees twice a year. Additional training is delivered to employees according to the enterprise's specific needs. Employees who are promoted are trained for the new placement before starting to perform their duties. Recommendations and suggestions of employees are considered training.
6.	Conflict resolution strategy	There is no conflict resolution strategy or guidelines for management. On-the-job conflicts are addressed directly by the manager based on his/her resolution and the opinion of the employees involved. In case the conflict escalates, the owner is the one to make the final decision.	The enterprise's code of ethics clearly describes a conflict resolution strategy. All employees are informed in advance of the steps to resolve conflicts. In addition, management is open to receiving and considering different opinions of involved employees in the decision-making process.

Source: Own processing

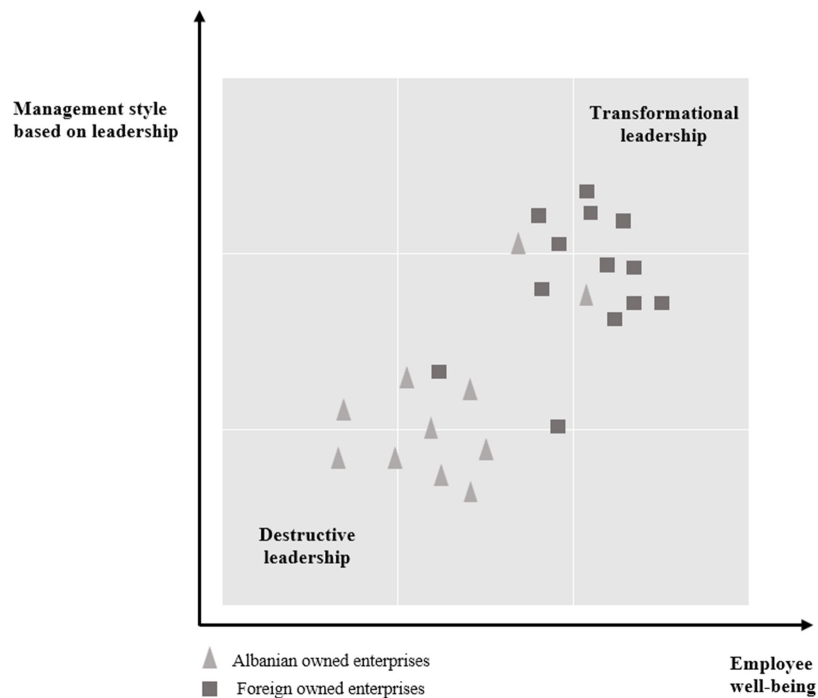


Figure 2. Enterprises are categorized according to the leadership style followed by the management

Source: Own processing

Regarding the analysis of results presented in Table 2 and the information received during the interviews, enterprises are categorized according to Figure 2. The results indicate that foreign-owned enterprises are more oriented toward transformational leadership, which benefits from higher employee well-being. On the other hand, Albanian-owned enterprises are more clustered around destructive leadership. Few exceptions are observed on both sides. Foreign-owned enterprises are run by employing local managers who exhibit more destructive features rather than transformational ones. Furthermore, Albanian-owned enterprises are managed by foreign managers and are oriented more toward transformational leadership.

5. FUTURE RESEARCH DIRECTIONS

This research has several limitations that can be addressed in future studies. For example, a large-scale survey can be undertaken in the country to include hundreds of enterprises and evaluate which leadership style dominates the management culture in Albanian enterprises (van Tuin et al., 2020). As this research targets only the management in enterprises, an additional study can specifically target employees and how they perceive well-being in the workplace and how they are affected by the different management cultures and the leadership styles they decide to follow.

6. CONCLUSION

This study concludes that both high- and middle-level management must understand and prioritize well-being in the workplace while fostering an enterprise culture that offers guidance to employees on physical and mental well-being. When managers follow transformational leadership, they possess a more profound comprehension of what well-being signifies in their personal lives; they can gain a greater comprehension of the necessary steps required for employees to assume responsibility for their well-being, thereby serving as significant role models for their respective groups (Barnes et al., 2020). This helps the management and employees establish a culture based on trust in the workplace. In the absence of trust, individuals may be apprehensive about being punished for expressing their hardships, or they may be apprehensive that their concerns will not be considered. Trust helps to establish strong relationships by regularly communicating with employees. This facilitates enhancing the perception of fairness within your team, which is frequently a crucial factor in fostering well-being. Also, trust helps to ensure that your decisions are equitable by dedicating adequate time to thoroughly scrutinize and contemplate all alternatives, involving others in the decision process whenever feasible, and elucidating your decision to others (Gjerde & Alvesson, 2020). When you know how to care for yourself and trust others, you can create and keep a positive team culture. This will help your workers feel better and enjoy a better well-being. The paper identified that such culture is observed more in foreign-owned enterprises rather than Albanian-owned ones. This paper concludes that Albanian-owned enterprises need to switch from a management culture based on destructive leadership and build a new one oriented toward transformational leadership, resulting in better well-being for employees, benefiting both the enterprise and the workplace.

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The Relationship between Innovation and Competitive Advantage: A Literature Review

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Received: January 12, 2024
Accepted: April 15, 2024
Published: August 6, 2024

Keywords:

Innovation;
Competitive advantage;
Albanian firms



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Abstract: *Innovation has been considered by many scholars a crucial factor in driving firms to achieve competitive advantage. Moreover, many firms decide to reconfigure their business operation to be more innovative and competitive. This paper aims to analyze the drivers and challenges firms deal with to be more innovative and to achieve competitive advantage. Albanian firms are investigated through a literature review to offer some insights regarding the relationship between innovation and competitive advantage, and to understand the drivers and challenges of being innovative firms. Results indicate that innovative Albanian firms are more likely to achieve competitive advantage than others that do not engage in innovation. This study contributes considerably to enlarging the literature on innovation and competitive advantage.*

1. INTRODUCTION

In the contemporary field of global business, characterized by relentless technological advancements, dynamic market shifts, and ever-changing consumer preferences, innovation has emerged as a linkage for firms seeking not only survival but a sustained competitive advantage (Annalah et al., 2022; Srisathan et al., 2022; Wijesinghe et al., 2021). As industries worldwide undergo rapid transformations, the ability to innovate becomes a defining factor in a firm's adaptability, resilience, and ability to stay ahead of the curve (Calvo et al., 2018; Laursen & Salter, 2006; Srisathan et al., 2022; Webb et al., 2019). This research aims to explore the nuanced relationship between innovation and competitive advantage, focusing specifically on the context of Albanian firms.

The importance of innovation has never been more pronounced than in an era where borders blur, markets transcend geographical constraints, and digital disruption reshapes traditional business models. As firms face a complex web of challenges and opportunities, innovation becomes the catalyst for not only meeting market demands but also anticipating and shaping them (Natário et al., 2012; Vissak & Zhang, 2014; Volberda et al., 2014). The competitive landscape demands a proactive approach, and the strategic deployment of innovation emerges as a key differentiator.

Within this global panorama, this study focuses on Albanian firms, recognizing the distinctive features of their business environment. Albania, situated at the crossroads of Eastern and Western Europe, carries a rich historical and cultural backdrop that influences its economic landscape (Blau & Janssen, 2020; Republic of Albania, Council of Ministers, 2022). The business context in Albania is characterized by a unique blend of market dynamics, regulatory frameworks, and cultural nuances (Blau & Janssen, 2020; Countries & Taxation, 2018; Icka et al., 2021). By focusing

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on this specific context, the research aims to unravel the complexities of innovation in a setting where global trends intersect with local intricacies. The reason for focusing on the innovation dynamics of Albanian firms lies in the dual recognition of their inherent potential and the challenges they face (Blau & Janssen, 2020; Boeckhout & McClements, 2010). While global connectivity offers opportunities for these firms to participate in the broader economic landscape, the uniqueness of the Albanian context necessitates a tailored examination of the drivers and obstacles to innovation (Republic of Albania, Council of Ministers, 2022; World Bank, 2021). Understanding how Albanian firms leverage innovation to gain a competitive edge provides not only localized insights but also contributes to the broader discourse on innovation strategies in diverse global settings.

Against this backdrop, the primary objectives of this research emerge. Firstly, this study aims to analyze the key drivers influencing Albanian firms towards innovation. This involves a thorough exploration of internal factors, such as organizational culture and leadership, as well as external factors, including market dynamics and technological advancements. Secondly, this study aims to identify and analyze the challenges faced by these firms in their pursuit of innovation, considering factors such as resource constraints, regulatory landscapes, and cultural resistance to change.

The significance of this study lies in its potential to contribute important insights to both academic and practical realms. By shedding light on the intricacies of innovation in Albanian firms, the research aims to enrich the theoretical foundations of innovation studies. Simultaneously, the findings hold practical implications for Albanian businesses seeking to navigate the path of innovation strategically. Furthermore, the study contributes to the broader literature on innovation by offering a case study of innovation dynamics within a unique cultural and economic context.

As this study focuses on the exploration of innovation in Albanian firms, the multifaceted nature of the global business landscape and the specific nuances of the Albanian context form the backdrop against which this study aims to unravel the drivers, challenges, and implications of innovation in the pursuit of competitive advantage. This research aims to understand how businesses in Albania, and potentially in analogous settings, can harness innovation as a transformative force in an ever-evolving global economy.

2. LITERATURE REVIEW

Many studies have been conducted on innovation analyzing its multifaceted nature and recognizing various types that contribute to organizational growth and competitiveness (Amendolagine et al., 2014; Annamalah et al., 2022; Cainelli et al., 2012; Denicolai et al., 2015; Ervits, 2018; Foster, 2016; Ghauri & Rosendo-Rios, 2016). Product innovation, involving the development of new or enhanced products and services, stands out as a well-explored dimension (Hartono & Singapurwoko, 2021; Maggioni, 2013; Wernerheim, 2012). Process innovation, focusing on optimizing internal operations and production processes, represents another critical facet (Coluccio et al., 2012; Pinto et al., 2019; Sobrero, 2000; Volberda et al., 2014). Additionally, organizational innovation, encompassing changes in structure, culture, and management practices, underscores the broader scope of innovation within firms (Agostini & Filippini, 2019; Baier et al., 2015; Ghauri & Rosendo-Rios, 2016; Noruzy et al., 2013; Sekli & De La Vega, 2021).

Research by many scholars has laid the groundwork for understanding innovation typologies, emphasizing the role of technological advancements, diffusion processes, and the cyclical

nature of innovation within industries. As the landscape of innovation evolves, recent literature extends beyond traditional categories, delving into concepts like open innovation, collaborative innovation, and disruptive innovation, offering a more contemporary lens through which to analyze the innovation spectrum (Annamalah et al., 2022; Asim & Sorooshian, 2019; Bertello et al., 2022; Boermans & Roelfsema, 2015; Gilani & Faccia, 2022; Isiordia-Lachica et al., 2020; Laursen & Salter, 2006; Mubarak & Petraite, 2020; Srisathan et al., 2022; Vega et al., 2012; Wyrnarczyk, 2013). A comprehensive exploration of innovation necessitates an understanding of the processes that underpin its conception, development, and implementation. The innovation funnel, often depicted as a sequential process involving idea generation, screening, development, testing, and commercialization, serves as a foundational model (Ikram et al., 2021; Isiordia-Lachica et al., 2020; Liu et al., 2019). However, more recent contributions highlight the iterative and dynamic nature of innovation processes, emphasizing the importance of continuous feedback loops and adaptability (Bertello et al., 2022; Srisathan et al., 2022).

Noteworthy research on open innovation emphasizes the significance of leveraging external sources of knowledge and collaboration throughout the innovation lifecycle (Annamalah et al., 2022; Gilani & Faccia, 2022; Srisathan et al., 2022). The concept of the “innovation ecosystem,” expands the traditional view of innovation processes by considering the interconnected networks of stakeholders, both internal and external, that influence and contribute to innovation within and beyond organizational boundaries (Bărbulescu et al., 2021; Lee et al., 2021). In the pursuit of a competitive advantage, firms strategically deploy innovation to differentiate themselves in the marketplace. The Resource-Based View (RBV) of the firm, as proposed by Barney (1991), posits that sustained competitive advantage arises from the possession of unique, valuable, and difficult-to-replicate resources. From this perspective, innovation emerges as a crucial resource that can confer a sustainable competitive edge. Firms may leverage innovation to achieve cost efficiencies through process improvements or differentiate their products and services, creating a unique value proposition for customers. This strategic perspective on innovation aligns with the broader discourse on business strategy, emphasizing the dynamic interplay between external environmental forces, internal capabilities, and strategic choices (Di Maria et al., 2022; Gashi & Liça, 2023; Liça & Gashi, 2023; Luu et al., 2023; Srisathan et al., 2022).

3. DRIVERS OF INNOVATION IN ALBANIAN FIRMS

In the specific context of Albanian firms, understanding the drivers that propel innovation is crucial for unraveling the dynamics that contribute to a competitive advantage. The drivers of innovation within Albanian firms are multifaceted, encompassing both internal and external factors that shape the innovative landscape. Organizational culture plays a pivotal role in fostering or hindering innovation (Filipi & Balla, 2011; Icka et al., 2021; Republic of Albania - Institute of Statistics (INSTAT), 2011; Republic of Albania, Council of Ministers, 2022; World Bank, 2021). The unique cultural fabric of Albania, with its rich history and traditions, influences how firms approach and embrace innovation. A culture that values creativity, experimentation, and continuous improvement tends to stimulate innovative thinking within organizations (Filipi & Balla, 2011; World Bank, 2021). In the Albanian context, understanding how cultural nuances influence the innovation climate provides insights into the cultural drivers of innovation.

Leadership styles have a significant influence on an organization’s innovation orientation (Noruzzy et al., 2013; Yidong & Xinxin, 2013). Effective leaders inspire and empower their teams, creating an environment that encourages risk-taking and experimentation. The leadership landscape

in Albanian firms, influenced by cultural and historical factors, may exhibit distinct leadership styles (Filipi & Balla, 2011; Republic of Albania - Institute of Statistics (INSTAT), 2011; Republic of Albania, Council of Ministers, 2022). Exploring whether transformational leadership, known for fostering innovation, is prevalent within Albanian firms, or whether other leadership models are more prominent, contributes to understanding how leadership acts as a catalyst for innovation (Blau & Janssen, 2020; Icka et al., 2021; World Bank, 2021). External factors, particularly market dynamics, shape the innovation strategies of Albanian firms. An in-depth analysis of market trends, customer needs, and competitive forces provides a comprehensive understanding of the external drivers of innovation. A market-driven approach, focusing on customer insights and feedback, enables firms to align their innovation efforts with market demands. Exploring how Albanian firms navigate market dynamics and leverage customer insights to drive innovation sheds light on the external forces influencing their innovation agenda (Blau & Janssen, 2020; Hashi, 2001; Icka et al., 2021; World Bank, 2021).

Investment in research and development is a critical driver of innovation, providing firms with the resources and capabilities to explore new ideas and technologies (Gashi & Liça, 2023; Lica et al., 2021; Liça & Gashi, 2023). Within the Albanian business landscape, examining the extent to which firms allocate resources to R&D initiatives offers insights into their commitment to innovation. Understanding the relationship between R&D investments, innovation outputs, and competitive advantage provides a quantitative dimension to the exploration of innovation drivers (Brossard & Moussa, 2016; Goñi & Maloney, 2017; Lica et al., 2021). Collaboration, both within and beyond organizational boundaries, is increasingly recognized as a potent driver of innovation. Albanian firms that engage in collaborative efforts, whether through partnerships with other businesses, academia, or research institutions, may benefit from a diverse pool of ideas and expertise (Republic of Albania, Council of Ministers, 2022). Investigating the collaborative practices of Albanian firms and the impact on their innovation outcomes elucidates the role of networking in driving innovation within the local business ecosystem. The embrace of technological advancements and the integration of digital tools and processes can significantly influence a firm's capacity for innovation (Gashi & Liça, 2023; International Labour Organization, 2023). Albanian firms navigating the digital landscape may find new opportunities for innovation, ranging from the adoption of advanced manufacturing technologies to the implementation of digital platforms for product/service delivery. Examining the role of technology and digitalization as drivers of innovation provides a forward-looking perspective on the evolving nature of innovation within Albanian firms (International Labour Organization, 2023; Liça & Gashi, 2023; Rama et al., 2018).

4. CHALLENGES IN PURSUING INNOVATION

As Albanian firms strive to innovate and secure a competitive advantage, they confront a range of challenges that can impede their progress (Filipi & Balla, 2011; Government of Albania and United Nations, 2017; Republic of Albania - Institute of Statistics (INSTAT), 2011; Republic of Albania, Council of Ministers, 2022). Recognizing and addressing these challenges is imperative for devising effective strategies to foster a culture of innovation and navigate the intricate landscape of the global business environment.

One of the predominant challenges faced by Albanian firms in their pursuit of innovation is resource constraints. Limited financial resources, coupled with a scarcity of skilled personnel, can hinder investment in research and development initiatives and the adoption of cutting-edge

technologies (Republic of Albania, Council of Ministers, 2022; World Bank, 2021). Understanding how resource limitations impact the innovation capacity of Albanian firms is critical for devising pragmatic solutions and identifying alternative pathways for innovation that align with the available resources. Navigating regulatory frameworks and overcoming bureaucratic hurdles pose significant challenges to innovation in Albania. Ambiguous or restrictive regulations may create barriers to experimentation and the implementation of novel ideas. An in-depth examination of the regulatory landscape allows for the identification of specific regulatory challenges and the exploration of how firms navigate and, if possible, influence these regulations to facilitate innovation. Cultural factors, deeply ingrained in the fabric of Albanian society, can foster resistance to change within organizations. Traditional norms and resistance to deviation from established practices may impede the adoption of innovative ideas. Investigating the cultural dimensions that contribute to resistance and understanding how firms manage and overcome cultural barriers is crucial for fostering a culture that embraces change and innovation (Blau & Janssen, 2020; Icka et al., 2021).

Access to funding and capital is a critical factor in the innovation journey (Annalah et al., 2022; Mubarak & Petraite, 2020). Albanian firms, particularly startups and small enterprises, may face challenges in securing the necessary financial support for innovative projects (Hashi, 2001; World Bank, 2021). Exploring the avenues and mechanisms for funding innovation, including government initiatives, venture capital, and banking partnerships, sheds light on the financial constraints that firms encounter. Attracting and retaining skilled talent is a perpetual challenge for firms globally. Albanian firms may face difficulties in retaining innovative and skilled employees due to various factors, including emigration trends and talent competition (Countries & Taxation, 2018; International Labour Organization, 2023). Examining the talent retention landscape and identifying strategies to bridge skill gaps contribute to an understanding of how firms can nurture and retain a workforce conducive to innovation. Established organizational structures and processes can become entrenched barriers to innovation. Resistance from employees who are accustomed to traditional practices and fear the uncertainty associated with change poses a substantial challenge. Investigating how firms manage the tension between existing practices and the need for innovation provides insights into organizational dynamics and strategies for fostering a culture of adaptability. Limited opportunities for collaboration and networking within the business ecosystem can hinder the flow of ideas and knowledge exchange. Albanian firms may face challenges in establishing partnerships, both domestically and internationally. Exploring how firms overcome these challenges or leverage existing networks provides insights into the importance of collaboration for innovation (Government of Albania and United Nations, 2017; International Labour Organization, 2023; Rama et al., 2018; Republic of Albania - Institute of Statistics (INSTAT), 2016, 2017).

The absence of adequate infrastructure support, including technological infrastructure and innovation-friendly workspaces, can impede the implementation of innovative ideas. Understanding the infrastructure gaps and exploring how firms navigate these challenges offers valuable insights into the broader ecosystem within which innovation unfolds. The global economic landscape, characterized by volatility and uncertainty, can impact the ability of Albanian firms to innovate (International Labour Organization, 2023; Rama et al., 2018). Economic fluctuations, geopolitical events, and global market dynamics may introduce additional challenges that firms need to navigate. Analyzing how firms respond to and mitigate the impact of global economic volatility on their innovation strategies enhances the understanding of the broader macroeconomic context.

5. CONCLUSION

In conclusion, this study has undertaken a comprehensive exploration of innovation and its impact on competitive advantage within the specific context of Albanian firms. By combining theoretical insights, empirical investigations, and practical recommendations, the research provides a nuanced understanding of the drivers, challenges, and outcomes of innovation in a dynamic and evolving business environment. This study identified several key findings that contribute to the existing knowledge of innovation and competitive advantage. Notably, organizational culture and leadership styles were identified as critical drivers of innovation within Albanian firms. The research highlighted the importance of market dynamics, strategic investments in research and development, collaboration, and technological advancements in influencing innovation outcomes. Concurrently, challenges such as resource constraints, regulatory hurdles, and cultural resistance emerged as significant barriers that firms must navigate to foster a culture of innovation. For Albanian firms, the implications of this study are far-reaching. The identification of drivers provides a roadmap for firms to strategically align their organizational culture, leadership practices, and investments to foster innovation. Simultaneously, the exploration of challenges offers insights into areas that require targeted interventions for building a more resilient and innovation-driven business environment. The study underscores the importance of creating a conducive ecosystem that supports innovation, emphasizing collaboration, talent development, and strategic investments. Policymakers in Albania can leverage the study's findings to formulate policies that foster innovation and support the growth of local businesses. Recommendations include streamlining regulatory processes, facilitating access to funding, and promoting collaborative initiatives. Policymakers play a pivotal role in creating an enabling environment that encourages experimentation, risk-taking, and knowledge exchange, thereby nurturing a thriving culture of innovation.

This study contributes significantly to the academic literature on innovation and competitive advantage. The research enriches existing typologies of innovation, integrating cultural and global perspectives to provide a more comprehensive understanding. By bridging the gap between theory and practice, contextualizing drivers and challenges, and adopting a mixed-methods approach, the study contributes methodologically as well. The exploration of sustainability in innovation-driven competitive advantage and the recognition of cultural resistance as a dimension of innovation studies add novel dimensions to the literature. The practical recommendations emerging from this study offer actionable insights for Albanian firms and businesses in similar global contexts. Strategies for building a strong intellectual property portfolio, encouraging a culture of open innovation, and continuously monitoring and adapting innovation strategies provide firms with a roadmap for sustained competitiveness. The study's emphasis on talent development, education, and industry collaboration further reinforces the practical applicability of its recommendations. While this study provides a robust foundation for understanding innovation within Albanian firms, avenues for future research remain open. Future studies could delve deeper into specific industries, examining how innovation varies across sectors. Additionally, longitudinal studies could track the evolution of innovation practices and their impact over time. Exploring the role of government policies and international collaborations in shaping innovation outcomes presents another avenue for future research.

In conclusion, this study advances our understanding of innovation and competitive advantage by unraveling the unique dynamics within Albanian firms. The synthesis of theoretical insights, empirical findings, and practical recommendations contributes not only to the scholarly discourse but also offers actionable strategies for firms and policymakers. As Albania positions itself in the global business landscape, fostering a culture of innovation emerges as a strategic imperative for sustainable growth and competitiveness.

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Eco-Innovation in the Accommodation Sector in Albania

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Received: January 30, 2024

Accepted: May 20, 2024

Published: August 6, 2024

Keywords:

Eco-Innovation;
Accommodation sector;
External and internal barriers;
Drivers' factors eco-innovation

Abstract: *Limited research examines eco-innovation in developing nations, especially when it comes to a country like Albania. Therefore, in order to close this gap, the purpose of this paper is to analyze the barriers and driver factors to eco-innovation in the accommodation sector in Albania.*

It was conducting a qualitative-method approach, with a multiple-case study of six big hotels in Albania. The authors for data collection in this study used an in-depth interview with the managers, and the main research question was "What are the drivers' factors and barriers of eco-innovation in the accommodation sector in Albania? The interview includes both closed- and open-ended questions: the interview begins with closed-ended questions, which were used to give an overall orientation to the respondents, and after open-ended questions to offer them an opportunity to elaborate on their response and to see things from their perspective of view.

Despite the eco-innovation advantages, the Albanian hospitality industry has not yet adopted them widely due to several internal and external barriers. The internal barriers are identified as lack of awareness and education for the potential benefits of eco-innovation, cost constraints because implementing eco-friendly practices and technologies often requires an initial investment that some businesses may find challenging, limited technical expertise as hotels may need the technical expertise to implement eco-innovations effectively.

Regulatory challenges in Albania as a candidate country for the European Union can be seen as an external barrier because the legal system exists, but the executive system doesn't work properly in the actions of environmental laws. But also, it can be seen as an incentive to shorten the time of adaptation of environmental laws because the influence of EU regulations might result in strengthened environmental protection measures in Albania. This could include improvements in waste management, energy efficiency, and other eco-friendly practices. Another external barrier is infrastructure limitations, and access to financing as many accommodation providers, especially smaller ones, may struggle to secure financing for eco-innovation projects. Access to loans or grants for sustainable initiatives can be limited or the a lack of incentives from the Albanian government to be green, such as fiscal incentives for companies that have a higher approach to eco-innovation.

As a result, by highlighting the impact of eco-innovation practices on the relationship between the drivers of eco-innovation and the performance of hospitality companies, this research contributes to the repository of knowledge related to hospitality management and eco-innovation. Additionally, the authors have identified the main barriers to greater adoption of eco-innovation techniques in products and processes and addressed the primary concerns with the relevant stakeholders.



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1. INTRODUCTION

In recent years, the most growing and developing sector in Albania is the accommodation sector. In Albania, hotels are the most popular type of accommodation, as reported by 44% of respondents, who declare that have spent vacations in Albania (UNDP, 2022), for this reason, the sector that the authors choose in the research is the accommodation sector, especially hotels. Also let's not forget hotels are one of the biggest polluters of land, water, air, and in general big hotels have restaurants. Showering is the largest water user in houses, hotels, and apartments, accounting for about 25% of monthly water use, also laundries use enormous amounts of water, which makes up around 35% of their overall energy use, according to De Freitas Melo et al. (2017). Hotels are adopting cutting-edge water-saving technologies that enable rainwater collection and utilization, "grey" water separation, and water recycling, and hotel guests should be encouraged to reuse towels for water-saving consumption Walmsley (2011). To consume less energy, many hotels are implementing smart lighting, temperature control systems, and gadgets like LED (Kansakar et al., 2019). Temperature affects how heating and cooling systems are used; warmer weather necessitates the usage of air conditioners and the adoption of the most efficient cooling and heating systems in hotels is being demanded to be more and more energy-efficient models (Auffhammer et al., 2017).

Based on previous research by Lenzen et al. (2018) it was noticed that hotels are one of the biggest polluters Juvan et al. (2023) and for this reason, many of them are trying to use innovative eco techniques to reduce the level of pollution in the environment Tan et al. (2017). Therefore, in this study, interviews were conducted with 6 large hotels in Albania, to see what eco-innovative techniques they adopt in the process and in the product, to reduce the level of pollution and which are the main barriers and driving factors for implementing eco-innovative technologies.

2. LITERATURE REVIEW

Given the link and relationship between environmental quality, economic development, and commercial performance, eco-innovation presents a challenge to the accommodation sector. There are many ways to define eco-innovation, but two are the most comprehensive: a new list of products and processes that can boost the value for businesses and customers and support a significant reduction in negative environmental externalities and the introduction of any innovation or enhancement to goods or procedures, organizational reorganization, or new marketing opportunities that, taken together or separately, have the potential to maximize the utilization of natural resources (Alonso-Almeida et al., 2016).

Scholars frequently refer to environmental innovation, sustainable innovation, green innovation, and eco-innovation interchangeably (Rennings, 2000). Several methods are being used to investigate the emerging research themes as eco-innovation and green practices research develops. These have included, for example, implementing sustainable practices to achieve financial benefits and reducing environmental costs (Singal, 2014; Tzschentke et al., 2004). Organizations are becoming more concerned with conserving resources and cutting down on all types of hazardous emissions into the environment, according to Soewarno et al. (2019). Furthermore, to lessen and prevent environmental damage, governmental organizations are attempting to create stronger laws and regulations (Soewarno et al., 2019). By the end, many businesses have shifted their focus from "How do we produce products efficiently?" to "How do we develop more eco-friendly materials or reduce the generation of pollutants in the production process?" as a result of the concept of "green innovation" (Ma et al., 2018).

3. METHODOLOGY

3.1. Research Setting and Participant Sampling

The sample sizes for qualitative investigations are often modest, and participants are chosen with a purpose in mind. The choice of sample size in qualitative research depends in part on the scientific paradigm in which the study is being conducted. To obtain a representative image of the entire population under review, positivist-oriented qualitative research, for instance, will need larger samples than in-depth qualitative research. However, the report also adds that, as management research, examples show, sample sizes including a single case might be highly informative and relevant (Boddy, 2016). Owners, general managers, and operations managers made up the sample in this research. Just six of the big twenty hotels that were contacted consented to participate in the interviews.

3.2. Data Collection

The main research question was “What are the drivers’ factors and barriers to eco-innovation in the accommodation sector in Albania? The interview includes both closed- and open-ended questions. Individual interviews, lasting about an hour each, were conducted with an interview guide consisting of 23 questions. The interview begins with a structured 12 closed-ended questions, which was used to give an overall orientation to the respondents, and after 11 open-ended questions to offer them an opportunity to elaborate on their response, and to see things from their perspective of view. The purpose of the questions was to learn about the hotel managers’ experiences implementing eco-innovation in process and product, their perspectives on the value of what eco-innovations brought to their companies, barriers to implementing eco-innovative new technologies within the hotels, and driving factors to the implementation of the new environmentally friendly technologies. Each of the six interview subjects provided their informed consent to take part in the research. The interviews were conducted from October to November of 2023.

3.3. Data Analysis

In the conclusion of all interviews, the data was subjected to a categorization to interpret the findings and generate pertinent conclusions and suggestions. Due to the minimal number of interviews, manual coding was used to complete the data analysis. The main subjects of analysis were economic dimensions, (what is the impact on the operational cost by increasing or decreasing the cost of implementing these eco-technologies, or impact on the intangible assets such as reputation, etc), environmental dimensions, (impact on energy saving, air pollution, waste management) (Cántaro Márquez et al., 2023; Ekinil et al., 2020), social dimensions in terms of management skills to adapt new technologies, awareness, capability, training within the employees and management (Ahmed et al., 2023) and in the end all the barriers and driven factor (Menezes & Cunha, 2016) that impact in the implementation of eco-innovation in hotels (Luo et al., 2021).

4. RESULTS

In the table below, the authors present a summary table of the hotels that have been studied. It is worth noting that these hotels are coded and do not have their real names.

Table 1. The six hotels interviewed

	Number of years of experience in the sector of accommodation	No of hotels room	Number of employees (full-time)	International Brand	Bar & Restaurant	Wellness Spa, Indoor swimming pool, congress centre
Hotel 1	20	151	154	Yes	Yes	Yes
Hotel 2	17	23	8	No	Yes	No
Hotel 3	28	178	139	Yes	Yes	Yes
Hotel 4	8	188	170	Yes	Yes	Yes
Hotel 5	8	85	62	No	Yes	No
Hotel 6	7	17	6	No	Yes	No

Source: Own research

Below is a brief overview of the programs conducted by hotels in Albania. In total, only one hotel has a publication of a mission statement in support of environmental goals. Two of the biggest hotels are certified with environmental audits (ISO 14000, BS7750, BMAS). In total, four hotels conduct every year environmental training programs for staff. Three of the hotels have designated management teams responsible for environmental issues. One of the hotels adopted the system to regularly monitor changes in the environmental regulation. Also, one of the hotels has implemented a product design program incorporating environmental goals. Hotel 4, one of the biggest hotels in Tirana, from 2018 has green certification for recycling used cooking oil from the restaurant, because oil is one of the biggest polluters in the environment.

Eco-Innovation in Process. Most of the investments in eco-innovation in the accommodation sector in Albania are in eco-innovation in process and the investments start from 70,000 euro up to 100,000 euro. Excluded from those amounts of investment are smart lighting and digital menu because they are cheaper investments, both implemented in three hotels as green practices. In general, more expensive investments are in solar panels, (three hotels), and one of the hotels has implemented also photovoltaic panels for the conversion of thermal energy into electricity, while solar panels convert solar radiation into heat.

One of the biggest hotels has implemented BMS (Building Management System) for air conditioning and water management, EMS for electricity management, and, has implemented electric car charging stations. Other investments are in terms of waste management (2 hotels), water management (one hotel), green building in the outdoor areas, use of electrical equipment with energy-saving options, and smart elevators (only at one hotel). In general, they all have invested in LED lighting, lighting with motion sensors, use of smart (magnetic) keys, heating with gas exchange systems, sensors in taps, and use of electrical and electronic devices with saving options of energy.

Eco-Innovation Products in Hotels. Product innovations are essential for enhancing and perfecting an already-existing good or service to raise its quality and meet the demands of the intended market audience (Sok & O’Cass, 2015).

The managers interviewed in this research have mentioned that in general, the eco-innovation products used in the hotels are the use of biodegradable soaps, shampoos, detergents, and disinfectants. The use of organic waste for fertilizer in gardens, waste management and separation, recycling of paper, cardboard, aluminum, glass, and reuse of soaps not used by customers. Using the well for garden irrigation (Alonso-Almeida et al., 2017) and investment in water filtration plants, rainwater harvesting, and efficient use in showers and taps.

Effects on cost from the investments. From the conducted interviews, it was found that investment in eco-innovation especially in the process has an impact on reduction in cost in the level of 10-15%, and the implementation of solar panels has reduced the cost of electricity by a maximum of 40%. It has made it possible to save lighting and thus reduce costs and the implementation of this technology has influenced the reduction of the cost of energy relatively 9-10%.

Based on previous research by [Arundel and Kemp \(2009\)](#), process innovations and recycling were frequently implemented in response to regulatory requirements, but many of them were also implemented to achieve cost savings unrelated to the environment or to enhance the company's reputation in the environmental domain. A constant and dependable supply of energy can be obtained from renewable energy sources like sun, wind, and geothermal energy. Furthermore, establishing renewable energy systems may have higher initial costs than traditional energy sources, but over time, there may be significant cost savings ([Endrikat et al., 2014](#); [Rodríguez-Antón & Alonso-Almeida, 2019](#)).

The benefits from the adaptation of Eco-Innovation. In terms of benefits, our managers declare that eco-innovation increases financial profitability and productivity, potential cost savings in the future, reducing operating costs, in terms of waste of water, energy etc. The implementation of eco-innovation in product and process improves and increases the image of the hotel, increases the competitive advantage, the quality of service, employee motivation to work in a hotel that applies environmental practices, and probably increases the number of customers as per the god will of the hotel. This is consistent with the focus being more on environmental issues than on factors of social and economic sustainability ([Lima et al., 2023](#)). None of the interviewed hotels had gained any form of government assistance to implement the different forms of eco-friendly technology.

Internal and external barriers. Among the most important barriers ([Ahmed et al., 2023](#)) are public policies, which can be a driver or blocker of this type of innovation and related to environmental policies, many regulations will be implemented in terms of being part of the EU in the future but uncertainty about this led to a weakness in legislation and clarity about environmental legislation.

The final consumer who lacks information about the benefits that come from eco-innovation can create an obstacle to this type of innovation. Financial institutions, (Banks, microcredits, EBRD, etc.) that invest in the practice of this type of innovation, do not always offer loan products that finance an eco-innovative initiative, and when it happens is not in the preferential interest rate among the other products or not a declared interest rate on the financial side of banks ([ProCredit Bank Albania, n.d.](#)). Such weakness in information often makes businesses unable to make such decisions on investment in eco-innovation. Lack of research centers, that can contribute to the development and dissemination of these innovations and to testing the benefits of eco-innovation in increasing the profitability of businesses in the approach of these practices, a lack of green experts, employees to train on environmental management, lack of knowledge and skills. Finally, high implementation and maintenance costs, and uncertainty about the effects of environmental management on the company's financial results.

Drivers of eco-innovation. The first mention of drivers from the interviews was encouragement by competitors, being adopted by the competition of an eco-innovative process or product makes the company copy such behavior as soon as possible because it perceives it as a competitive

advantage that contributes to the hotel image, also the second one was the investors' vision about the business, and the way how they design in the future regarding the three main pillars of environmental, social and governance. This is particularly important for the hospitality sector since affects the sociocultural, economic, and environmental aspects of travel destinations while also being the target and object of sustainable development, understanding that the activities of an ESG lead to business profitability and stability (Beliak, 2023). Driver can be also, grants from the EU or other organizations for financing environmental innovations, local legislation supporting Eco-Innovation practices in terms of financial support for subjects, and incentives for the companies that gain green certificates. Cooperation with the government to increase public awareness on waste management and recycling, as well as in the drafting of policies to promote plastic recycling.

5. DISCUSSION AND CONCLUSION

This study looked at the value of eco-innovation in hotels in Albania. The findings show that hotel managers view eco-innovations as crucial instruments for their operations due to the numerous advantages they provide, particularly in terms of reduction in costs in lightening about 10-15 % and from solar panels by 40% in terms of energy saving, in improving and increasing the image of the hotels' (Kemp & Andersen, 2004).

An independent investigation of both environmental processes and product developments was provided in this study. In line with earlier research, it was discovered that hotels mostly utilized advancements in environmental processes connected to water and energy services (Chan et al., 2017) than in product eco-innovation practices.

The most common challenge that hotels face in adopting green innovation in Albania is the lack of any financial grants or schemes specifically aimed at green investments. There are loan products for financing green practices, but they do not provide in terms of cost lower interest rates than the other products.

The universities have identified zero financial support or schemes for scientific research in testing eco-innovation in products and processes in the accommodation sector. The hotels do not have proper information about the reduction in cost in the short term or long term. From the government, they benefit from zero fiscal schemes (tax breaks) or financial support for being a green and sustainable company, also they refuse law-enforcing government agencies to enforce the existing laws for waste management. Moreover, absence of legislation to promote the carbon exchange market in the accommodation sector and the other sectors. The previous researchers demonstrate that carbon trading in hotels has a spillover effect on CO₂ emission reduction, meaning that it can reduce emissions both locally and regionally (Wang, 2023; Yang et al., 2021).

Legislation is absent for the energy green certificate (Enti Rregullator i Energjisë. (n.d.) – EU-backed legislation to reward green companies that utilize biofuels as a source of electrical energy.

Furthermore, the government applies a 3% infrastructure tax when you install solar panels –the same tax a builder pays to construct a residential building. In addition to the above, there are also some types of restrictions as construction permits, environmental permits, and all other permits – the same procedure as every other company, or even the ones that harm the environment. And in the end, there is the absence of projects that would benefit all actors.

6. RECOMMENDATIONS

Addressing the primary concerns related to eco-innovation in the accommodation sector in Albania involves engaging with various stakeholders to ensure a comprehensive and collaborative approach.

Government Authorities should implement regulatory frameworks, incentives for eco-friendly practices, and waste management policies. Advocate for the development and enforcement of eco-friendly regulations. They should propose incentives such as tax breaks or subsidies for businesses adopting sustainable practices. As well, the government should collaborate with local authorities on effective waste management strategies.

Accommodation businesses in general have a lack of awareness about the cost of eco-friendly technologies and their potential impact on profitability. Profitability is not always in financial terms but also non-financial assets such as goodwill, reputation, etc. They should provide information on cost-effective, eco-friendly solutions with long-term benefits and continuously offer training programs to staff on sustainable practices to raise awareness not only among the management staff but among all employees. Among businesses in the accommodation sector, they should highlight success stories of businesses that have successfully adopted eco-innovations.

Association of Hospitality – Tourism in Albania, should encourage the adoption of eco-friendly practices as a way to attract environmentally conscious tourists. They should create such a platform, to promote sustainable tourism and develop guidelines for sustainable practices within the accommodation sector.

Environmental NGOs, they necessary need to monitor, advocate for environmental protection, promote sustainable tourism, and report the environmental impact of accommodation facilities. Seek support for sustainable initiatives through joint campaigns and advocacy. Provide expertise and resources for implementing eco-friendly practices.

Tourists, in general, have limited information on eco-friendly options, but they should increase their willingness to pay for sustainable services. All the above stakeholders should create awareness campaigns targeting tourists on the importance of choosing eco-friendly accommodations and providing information on sustainable options through tourist information centers and online platforms.

Educational institutions and researchers in Albania should collaborate on educational programs for hospitality students emphasizing eco-friendly practices, also conducting training programs for hotel managers by offering workshops and seminars to industry professionals on the benefits of eco-innovation. The universities should continuously research innovative and sustainable solutions applicable to the accommodation sector.

7. LIMITATIONS

There were some limitations in this study. Despite the small number of the interviewed hotels, even with the efforts done by the authors, some of the managers refused to give answers to the conducted interviews. In the future, the authors are willing to increase the number of interviews for more information.

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Strategic Approaches to Enhancing Business Communication Efficiency in the Era of Digital Transformation

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Received: January 30, 2024

Accepted: May 15, 2024

Published: August 6, 2024

Keywords:

Business communication;
Digital transformation;
Communication strategies;
Technology;
Electronic Data Interchange (EDI)



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Abstract: *This paper presents a thorough analysis of strategic approaches designed to enhance business communication efficiency in the modern digital business landscape. Focused on tools like Electronic Data Interchange (EDI), the study aims to identify successful communication strategies adaptable to evolving technology, client needs, and market expectations. The research delves into practical approaches and innovations, offering diligent exploration to guide organizations in optimizing communication processes amid current challenges. Also, the paper highlights the significance of feedback in achieving communication efficiency and conducts an additional analysis of the ethical implications of employing new technologies in business communication. Concrete guidelines are provided for organizations to integrate effective communication strategies, explore opportunities to enhance efficiency, customer satisfaction, and achieve business goals. This comprehensive analysis aims to deepen understanding of contemporary challenges in business communication and provide guidance for successful management in a dynamic business environment.*

1. INTRODUCTION

In the contemporary landscape of business operations, the integration of digital technologies has become a ubiquitous force, reshaping industries, and demanding a nuanced understanding of strategic approaches. This paper ventures into the field of business communication efficiency, specifically addressing the challenges and opportunities presented in the era of digital transformation. As communication stands as the basis of organizational success (Men et al., 2020), the impact of technological advancements, including tools such as Electronic Data Interchange (EDI), warrants careful consideration (Ali & Govindan, 2023). The motivation for this research comes from the imperative to not only adapt to technological changes but to strategically leverage them for optimal communication outcomes. In positioning the approach, it becomes most important to recognize the dynamic nature of technology, client expectations, and market dynamics (Addo, 2022). The study aims to move away from a mere identification of tools and practices; rather, it seeks to provide a nuanced analysis of successful communication strategies adaptable to the evolving technological landscape. Navigating the complexities of the digital era requires organizations to not only be technologically savvy but also ethically conscious (Sahraoui et al., 2023).

The specific research problem at the core of this exploration is the identification of practical strategies that optimize communication processes amidst the challenges posed by the digital aspect. The research problem statement underscores the need for a strategic understanding that goes beyond technological implementation, focusing on achieving tangible efficiency gains.

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To guide organizations through the complexity of this transformative context, the paper articulates concrete guidelines for the integration of effective communication strategies. These guidelines aim to offer a practical roadmap for organizations looking to enhance efficiency, elevate customer satisfaction, and align communication practices with overarching business goals. The subsequent sections of the paper will delve deeper into strategic analyses and practical guidelines, offering valuable insights for effective management in a digitally-driven business environment.

2. LITERATURE REVIEW

Communication is integral to human life and essential for business expansion (Topić, 2023). Within the business sector, diverse methods are employed to promote products, services, and organizations, facilitating the exchange of information within supply chains. The term “communication”, rooted in the Latin word “communis” (common) (Mălureanu, 2019), encompasses a broad spectrum within the context of business, ranging from marketing and branding to customer relations, advertising, and corporate communication. In the digital era, digital transformation involves the comprehensive integration of digital technologies into various aspects of business operations, revolutionizing communication channels and strategies. EDI, as a subset of digital transformation, entails the electronic exchange of structured business documents between organizations, enhancing the efficiency and accuracy of information interchange (Kamasak et al., 2023).

A critical examination of past research endeavors provides valuable insights into strategies aimed at improving business communication within the digital context (Lacarcel & Huete, 2023). Literature showcases diverse definitions of communication, emphasizing its role as a mutual exchange of understanding. Definitions from the American Management Association define communication as any behavior leading to an exchange of meaning, highlighting its broad scope (Richards & Curran, 2002). One perspective views communication as a dynamic process involving the transmission of information and eliciting understanding responses (Shi et al., 2023). Another defines it as the exchange of facts, ideas, opinions, or emotions among individuals (Van der Bles et al., 2019). A third perspective sees communication as the conveyance of information and understanding, functioning as a bridge between people to ensure a safe passage across the river of misunderstanding (Waisbord, 2020). Business communication, as highlighted in previous studies, is inherently goal-oriented. The effective dissemination of a company’s rules, regulations, and policies to both internal and external stakeholders is important for organizational success (García-Sánchez et al., 2019). Traditional forms of communication, such as paper-based correspondence and telephone calls, have evolved with technological advancements, embracing tools like cell phones, video conferencing, emails, satellite communication, and EDI (Ali & Govindan, 2023).

Prevailing methods include web-based communication, reports, presentations, telephonic meetings, forum boards, and face-to-face meetings. Advanced trends encompass electronic devices (mobiles, pagers, fax machines), email, internet, intranet, extranet, SMS, video conferencing, and social media/networks, including the integration of EDI (Kamasak et al., 2023) as a key component. An exploration of contemporary communication methods reveals advantages such as efficiency, economy, quick feedback, flexibility, and environmental benefits (Yu et al., 2019). However, these methods also come with limitations like reduced opportunities for deep thinking, absence of human touch, and negative impacts on language use. As business communication continues to transform, the integration of EDI aligns with the broader

shift towards digitalization and enhanced efficiency in information interchange (Andiyappilai, 2020). The transformative impact of ICT on education, politics, and the economy is evident, widening the horizon of communication. As technology transcends geographical, cultural, and traditional boundaries, the 21st century witnesses a transformative journey from a traditional age to a digital era.

3. STRATEGIC APPROACHES TO BUSINESS COMMUNICATION EFFICIENCY

The optimization of business communication efficiency in the digital age necessitates a proactive stance from organizations, urging them to adopt strategic approaches that seamlessly synchronize with the dynamic characteristics of technology and the constantly evolving expectations within the market (Hofmann et al., 2019). Organizations are encouraged to transcend a passive adaptation to technological changes and instead embrace a strategic mindset. The dynamic nature of technology implies that it is not merely a tool for operational enhancement but a driving force that continuously shapes the business perspective. Therefore, organizations must strategically align their communication practices with these technological shifts to harness their full potential (Allioui & Mourdi, 2023). As market expectations undergo a continuous transformation, organizations must exhibit an acute awareness of these shifts and strategically position their communication initiatives accordingly. This involves not only recognizing current market demands but also anticipating future trends. By doing so, organizations can stay ahead of the curve, ensuring that their communication strategies remain relevant and effective in meeting the evolving needs of their target audience. The term “strategic approaches” underscores the need for a purposeful and intentional methodology in dealing with business communication optimization (Kalogiannidis et al., 2022). Rather than employing ad hoc solutions, organizations are encouraged to formulate a comprehensive strategy that considers the cooperation between technology, market dynamics, and the specific goals of the business. This strategic approach involves a proactive assessment of the organization’s current communication infrastructure (Gavrikova et al., 2020), identifying areas for improvement, and aligning these enhancements with the technological advancements in the broader industry. It requires a forward-thinking mindset that not only addresses immediate challenges but also lays the groundwork for future scalability and adaptability. Expressing the strategic approach mathematically,

The formulation of Business Communication Efficiency (BCE) as a function (f) of Evolving Technology (T), Market Demands (M), and Organizational Goals (O) has been crafted by the authors:

$$BCE=f(T,M,O) \tag{1}$$

Where:

BCE : Business Communication Efficiency,

f : Function representing the strategic approaches,

T : Evolving Technology,

M : Market Demands,

O : Organizational Goals.

This formula encapsulates the complex interaction of technology, market dynamics, and organizational goals providing a mathematical representation of the strategic approach to optimizing business communication efficiency.

4. LEVERAGING ELECTRONIC DATA INTERCHANGE (EDI)

In the area of enhancing business communication efficiency, Electronic Data Interchange (EDI) emerges as a starting point, playing a transformative role in the digital evolution of organizational communication (Sun, 2023). EDI facilitates the electronic exchange of structured business documents, transcending traditional paper-based methods. By seamlessly integrating EDI into their communication infrastructure, organizations can revolutionize the flow of information (Andiyappillai, 2020). This strategic integration eliminates the constraints of manual processes, allowing for a more fluid and rapid exchange of critical business data. One of the compelling advantages of EDI lies in its ability to significantly reduce errors inherent in manual data entry. The structured format of electronic documents minimizes the likelihood of transcription errors, ensuring the accuracy and integrity of exchanged information (Awan et al., 2021). This aspect not only enhances operational efficiency but also contributes to the reliability of communication, fostering a foundation of trust among stakeholders.

The swift nature of transactional processes is a hallmark benefit of EDI implementation. By automating the exchange of business documents, EDI accelerates the pace at which transactions are initiated, processed, and concluded (Sun, 2023). This acceleration not only saves valuable time but also enhances overall operational effectiveness. In this paper, Panteon Plus Ltd Belgrade is utilized as a case study to exemplify how organizations can achieve a competitive advantage in the digital business landscape by responding more promptly to market dynamics and customer needs, thanks to the operational efficiencies and time savings afforded by EDI implementation.

Panteon Plus Ltd Belgrade's approach to business communication efficiency through EDI can be expressed by the following equation:

$$\begin{aligned} BCE_{PanteonPlus} = f(\textit{Optimization of Supply Chain Processes in various industries,} \\ \textit{Specialization in Electronic Business,} \\ \textit{Archiving of Electronic Documents,} \\ \textit{Monitoring Business Processes among Organizations,} \\ \textit{Security, Reliability, Traceability}) \end{aligned} \quad (2)$$

Where:

- **BCE_{Panteon Plus}**: Represents the Business Communication Efficiency of Panteon Plus Ltd Belgrade.
- **f**: Represents a function that captures Panteon Plus Ltd Belgrade's overall strategy for business communication efficiency.
- **Optimization of Supply Chain Processes in various industries**: This represents the focus of Panteon Plus on improving and streamlining supply chain processes across different sectors, such as FMCG, logistics, HORECA, pharmaceuticals, manufacturing, banking, and other applicable segments.
- **Specialization in Electronic Business**: Panteon Plus specializes in electronic business solutions, emphasizing expertise in the electronic exchange of business documents and processes.
- **Archiving of Electronic Documents**: Panteon Plus offers services related to the storage and management of electronic documents, ensuring efficient archiving for easy retrieval and compliance purposes.

- **Monitoring Business Processes among Organizations:** Panteon Plus provides tools and services for overseeing and optimizing business processes among different organizations, contributing to a more synchronized and efficient operation.
- **Security:** Panteon Plus guarantees the security of information exchange, emphasizing the importance of secure and protected communication channels to prevent unauthorized access and ensure data integrity.
- **Reliability:** Panteon Plus prides itself on its exceptional reliability, boasting a service availability of 99.4%. This reliability is crucial for maintaining uninterrupted business operations.
- **Traceability:** Panteon Plus ensures that information exchanged between companies is not only secure and reliable but also traceable. This means that the flow of data can be monitored, tracked, and audited for accountability and compliance purposes.

5. ADAPTING COMMUNICATION STRATEGIES TO TECHNOLOGICAL EVOLUTION

In navigating the swiftly changing digital landscape, the imperative for organizations is to cultivate communication strategies that embody profound adaptability to the emergence of new technologies (Niemimaa et al., 2019). A fundamental facet of adapting communication strategies to technological evolution is the evaluation of existing communication protocols. Organizations functioning as dynamic entities within the digital ecosystem (Barykin et al., 2020), should subject their communication methodologies to systematic examination. This involves a thorough assessment of the effectiveness of current protocols and their resonance with the ever-shifting field of technology. The heart of adaptability lies in the proactive incorporation of emerging tools and platforms into the communication arsenal (Mizrak, 2023). Organizations are tasked with not merely acknowledging technological shifts but actively seeking and integrating innovative solutions that can augment their communication efficacy. This forward-thinking approach positions communication as a dynamic function, capable of leveraging the full spectrum of technological advancements. Proactivity forms the basis of adapting communication strategies to technological evolution (Mizrak, 2023). Rather than responding reactively to technological changes, organizations should instigate a culture of foresight and anticipation. This involves staying alongside emerging technologies, seeing their potential impact on communication dynamics, and pre-emptively adjusting strategies to ensure seamless integration with the evolving technological paradigm (Niemimaa et al., 2019).

The overarching goal of adapting communication strategies is to sustain both relevance and efficiency. By embracing a forward-looking mindset, organizations can avoid the risk of communication strategies becoming outdated or ineffective. This continuous adaptation ensures that communication remains a potent tool for organizational success, resonating with contemporary technological norms and meeting the expectations of a digitally savvy audience.

6. CUSTOMER-CENTRIC COMMUNICATION

Central to the concept of customer-centric communication is a deep understanding of client needs and preferences. Organizations should conduct comprehensive research and analysis to discern the unique requirements and preferences of their clientele. This nuanced understanding serves as the foundation for tailoring communication strategies that resonate with clients on a personal level (Sheth et al., 2023). The essence of a customer-centric approach lies in the customization of communication strategies to align with the specific needs and preferences

of individual clients. This involves the segmentation of client demographics, preferences, and communication channels (Chaillet & Bastard, 2023). By tailoring messages, content, and interactions to suit the distinct characteristics of different client segments, organizations can establish a more meaningful and resonant connection. Personalization is a driver of customer satisfaction (Rane et al., 2023). By infusing communication strategies with a personalized touch, organizations demonstrate a genuine commitment to meeting the unique needs of their clients. This not only enhances satisfaction but also cultivates a sense of value and appreciation, laying the foundation for enduring and positive client relationships. Customer-centric communication is inherently geared toward fostering long-term relationships (Al-Shammari, 2023). By consistently addressing client needs, adapting communication based on feedback, and demonstrating a commitment to their well-being, organizations can build trust and loyalty. Long-term relationships not only contribute to customer retention but also serve as a source of valuable referrals and positive word-of-mouth marketing (Haryono et al., 2023).

The outcome of customer-centric communication is the cultivation of loyalty and positive brand perception. When clients perceive that an organization genuinely cares about their needs and consistently delivers personalized communication experiences, it creates a sense of trust and loyalty (Sheth et al., 2023). This positive sentiment extends to the overall brand perception, influencing how the organization is perceived in the broader market.

7. CONTINUOUS FEEDBACK MECHANISMS

The foundation of continuous improvement in communication lies in the establishment of robust feedback systems. Organizations are encouraged to design and implement structured mechanisms for soliciting feedback from various stakeholders, including employees, customers, and partners (Zowghi & da Rimini, 2023). These systems should encompass multiple channels, ensuring a comprehensive and diverse range of perspectives. The scope of feedback should extend beyond internal processes to encompass the experiences and perceptions of external stakeholders. Feedback from employees provides insights into the effectiveness of internal communication practices (Jiang et al., 2023). Customer feedback offers a valuable perspective on how communication strategies resonate with the target audience. Collecting feedback from both areas allows for a holistic evaluation of communication effectiveness.

Collecting feedback is only the first step. The subsequent analysis is equally crucial. Organizations should invest in tools and processes that allow for the systematic analysis of feedback, identifying patterns, trends, and areas for improvement (Lee, 2023). This analysis yields actionable insights that inform strategic decision-making, guiding adjustments and enhancements to communication strategies. The essence of continuous feedback mechanisms lies in their frequent nature. Organizations should view feedback not as a one-time assessment but as an ongoing process of improvement (Rane et al., 2023). By incorporating feedback into regular review cycles, organizations can adapt their communication strategies dynamically, ensuring they remain aligned with evolving requirements and responsive to emerging challenges (Mizrak, 2023).

Feedback, when acted upon effectively, becomes a catalyst for improvement. Organizations should establish a culture that values and prioritizes the implementation of changes based on feedback received (Sheth et al., 2023). This proactive approach not only demonstrates a commitment to continuous improvement but also fosters a culture of responsiveness and adaptability within the organization.

8. CONCLUSION

This study has explored key strategic approaches to enhance business communication efficiency in the context of contemporary digital transformation (Sahraoui et al., 2023). By focusing on the implementation of Electronic Data Interchange (EDI) and adapting communication strategies to rapid technological changes, the paper underscores the necessity for organizational adaptability to meet the demands of the modern business environment (Awan et al., 2021). The literature review provides a contextual framework for understanding the evolution of communication methods and highlights the pivotal role of digital technologies, particularly EDI, in transforming communication processes. The conclusion underlines important strategic aspects, including EDI implementation, adaptability of communication strategies to technological advancements, customer-centricity, and the establishment of continuous feedback systems. This integrative approach lays the foundation for improving communication efficiency, enhancing customer satisfaction, and achieving organizational goals.

The transformative potential of digital technologies extends beyond pure operational enhancements, offering a new paradigm for strategic engagement and communication excellence. In an era marked by rapid technological advancements, organizations like Panteon Plus Ltd Belgrade exemplify the integration of digital tools such as EDI not just for efficiency, but as a foundation for innovative business models and customer engagement strategies. The case study underscores the significance of forward-thinking in harnessing digital capabilities to craft a competitive edge and foster sustainable growth. By exploring such practical applications, this research contributes to a deeper understanding of the strategic imperatives for digital excellence in business communication. As demonstrated through this paper, the adaptability and proactive approach of organizations in integrating new technologies are critical to navigating the complexities of the digital age.

Through the recommended guidelines, organizations can build resilient and efficient communication practices suited to the dynamic business environment. Future research directions could explore ethical considerations in the integration of digital technologies, offering insights into how organizations can maintain ethical standards while leveraging innovations in business communication.

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The Digital Transformation of the Retail Business: Focusing on the Online Shopping of Clothing by Consumers in the European Union

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Received: January 9, 2024

Accepted: April 1, 2024

Published: August 6, 2024

Keywords:

Online shopping;
Digital transformation;
Retail business;
European consumers;
Online clothing purchases



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Abstract: *This study presents conceptual ideas and propositions for the digital transformation of the apparel retail business and its evolutionary transformation and modeling. Empirical aspects of the development of online clothing shopping by European consumers are highlighted. The main objective of the present study is to outline more significant manifestations of the impact of digital transformation on the clothing retail business and on this basis to analyze and evaluate the change in online clothing purchases made by European consumers, taking into account the dependencies of certain economic and demographic variables such as disposable income, gender, age, education and employment status. Respondents to the study are individuals from the 27 member states of the European Union. Data on their budgets, demographic profiles and online clothing purchases are for the period 2012-2022. The measurement of the emerging dependencies between the main variable – online clothing purchases, and the selected variables is carried out with the help of computer processing software – IBM SPSS Statistics and the Excel program. The research methodology includes the application of the single linear regression and correlation method. The results obtained from the research carried out are useful for characterizing the changes occurring in the online shopping of clothing by consumers in Europe.*

1. INTRODUCTION

Rising consumer expectations, huge advances in digital technology and the rise of e-commerce are significant parts of the trends changing today's retail business, including apparel. The pace of change in online shopping is accelerating significantly during the COVID-19 pandemic. The existing studies in the specialized literature carried out by Bradley et al. (2021), highlight the economic significance of digital technology adoption leading to an increase in the market value of retailers' companies, highlighting the widening gap between leaders and laggards. Retailers are generating economic benefits from digitization in their business models. The movement of commodity flows is rationalized, which is of particular importance for market competitiveness. In his development, dedicated to innovation in the retail business, theorists, led by Mostaghel et al. (2022), confirm that digitization provides data with high volume, high speed, variety and credibility. The resulting attitudes are fully manifested in the clothing retail business. According to Parida et al. (2019), digitization is defined as the use of digital technologies to innovate business models in the retail business and to provide new sales revenue streams and value creation opportunities.

The application of digital technologies in the clothing retail business leads to improved interaction with consumers, matching the offered assortments with consumer preferences, increasing online shopping, and the realization of higher sales volumes and revenue profitability. Digitalization is changing the behavior of apparel consumers by revolutionizing the purchase

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decision-making process, expanding the volume of online shopping, leveraging mobile payment capabilities, and personalizing the consumer experience. As an example of improving the user experience, the use of virtual reality (VR) (Battisti & Brem, 2021) stands out.

Digital technologies are likely to have a significant impact on the future of the apparel retail business, providing opportunities to create value with various socio-economic dimensions and satisfy consumer demands, a significant part of which will be met through online shopping. The main objective of the present study is to outline more significant manifestations of the impact of digital transformation on the clothing retail business and on this basis to analyze and evaluate the change in online clothing purchases made by European consumers, taking into account the dependencies of certain economic and demographic variables such as disposable income, gender, age, education and employment status. To achieve the goal, research tasks are set, finding expression in outlining conceptual ideas and aspects of the digital transformation of the clothing retail business; highlighting empirical aspects of the development of online clothing purchases made by European consumers, taking into account dependencies on selected economic and demographic variables; formulation of more important conclusions from the theoretical and empirical research. The obtained research results refer to the period 2012-2022 and represent a reflection of the capabilities of individual countries in achieving Europe's goals regarding the digitization process and digital technologies for 2030.

Analyzing and evaluating the online purchases of clothing carried out at the European level require certain limitations to be introduced within the framework of the present study: clarifying the research process of online purchases through the prism of the concept of the digital transformation of the clothing retail business; the dominance of selected variables measuring the development process of online clothing purchases in Europe.

The presented work is structured in a total of seven sections, as follows: introduction; literature review on the digital transformation of the apparel retail business; the third part presents the research methodology, which is adopted while observing the specificity of application of the method of linear regression and correlation; the following fourth section presents an empirical study focusing on the variation of online clothing shopping carried out by European consumers. Within this part, measurement is done using certain variables that account for relevant economic and demographic characteristics of the respondents. The geographical focus of the present study is on individuals from the 27 member states of the European Union. The fifth part presents a discussion that contains an interpretation and comparison of the results with other researchers published in the context of problem studies. The sixth part outlines future research directions. The last seventh part presents conclusions aimed at the theoretical-practical significance of the conducted research.

2. LITERATURE REVIEW

The process of carrying out online shopping, including clothing, is developing with increasing potential and economic significance in the context of the digital transformation of the retail business. A part of the existing studies in the specialized literature, disclosed by Spahiu et al. (2021), focuses primarily on the technological advancements in which virtual and physical apparel production and sales systems connect and function together, and which is needed to attract consumer attention to enable flexibility and omnichannel shopping.

Another part of the studies is aimed at systematizing the transformations occurring in goods, processes and innovations due to the digitalization of the apparel business along the entire value chain.

A special focus is placed on three-dimensional 3-D digital technology with prospect identification in the apparel sales process (Arribas & Alfaro, 2018). The digitalization of the clothing retail business involves structuring, shaping and influencing its transformation along various dimensions – economic, social and cultural. As confirmed by a group of theorists including Riedelsheimer et al. (2020), optimizing the socio-economic and environmental impact of goods is becoming increasingly important for consumers, with new digital technologies stimulating their sustainable behavior.

In the apparel business, digitization facilitates integrated processes of pattern design, visualization of aesthetic features such as colors, patterns and materials, as well as production specifications (Papachristou & Bilalis, 2015). According to Demarco et al. (2020), in this way, the digital approach optimizes the consumption of material resources for physical sampling, shortens the time of the production process, promotes design creativity, and reduces the total amount of costs, including for sales.

In previous studies conducted by a group of authors including Volino et al. (2005), it is argued that digital technologies enable the algorithmic and computational design of clothing ordering. Focusing on consumer behavior, theorists including Carulli et al. (2017), adhere to the claim that digitization improves the way clothes can be personalized as well as adapted to consumer requirements. Paritala et al. (2017) also emphasize the customization of goods such as clothing. The cited authors put the research focus on the digitization of the production process, the use of production machines that can perform digital pattern reading, streamlining operations, improving precision, efficiency and time of production and market realization. As assessed by Robertson et al. (2020), digital technologies are widely used in the final stages of the supply chain as well as in the retail sales stage, providing virtual opportunities for assembly and reducing returns of items purchased online.

Among the existing publications in the specialized literature that examine the effects of digitization on consumer behavior, Colombi et al. (2018) highlight the opportunities related to the use of digital interactive technologies in communication with consumers and adopting marketing solutions leading to better and effective satisfaction. According to Rangaswamy et al. (2022), under the influence of digital technologies, consumer behavior is changing, with consumer satisfaction influencing online shopping initiatives and online purchase decision-making.

A substantial part of the studies has a context that focuses on measuring the dependencies between economic and demographic variables, on the one hand, and, on the other hand, the change in online shopping for goods, including clothing. In this direction, a research group that includes Serenko et al. (2006), engages in interpreting determinants such as economic characteristics and consumer demographics. Earlier studies by Bigne et al. (2005) put the research focus on socio-economic and demographic consumer characteristics such as age, gender, income, level of education, and place of residence. According to the cited authors, the determinants identified in this way have a modeling role and can encourage or limit online clothing purchases by consumers. Other studies performed by Al-Somali et al. (2009), focus research attention primarily on the amount of disposable income of households and individuals as an explanatory cause of consumer behavior in online shopping. Higher incomes predetermine the perception by consumers of a relatively more active behavior when making online purchases and thus resonate with the demand for online goods, including clothing.

In specialized theory, a large group of researchers emphasize the experiences, psychographics, and interests of consumers. Thus, the distinguished theorists put psychographic characteristics and their correlation with the search and purchase of goods within the framework of classical and digital marketing into precise consideration. Authors such as Wardana et al. (2023), explore

the potential of social networks, defined as one of the main channels for obtaining data sought by Internet users. In the outlined area, there is research aimed at determining the factors that influence the propensity of users towards mobile technology services. Some studies focus on studying both the demographics and psychographics of consumers in parallel, to delineate their unique segments and profiles (Koziel & Shen, 2023).

The present study assumes that economic and demographic determinants such as disposable income, gender, age, education and employment status presuppose and determine the behavior of consumers from the 27 member states of the European Union when making online purchases of clothing in matching sizes. Therefore, the variables thus determined have a modeling effect on the magnitude of online clothing purchases, with causal relationships between them.

The theoretical statements presented so far support the understanding that the clothing retail business uses digital progress to attract the attention of consumers with high-tech developments and strategies, to improve sales organization, and to facilitate consumer access, which affects management efficiency of the amount of realized income.

3. METHODS AND METHODOLOGY

This research is based on data published by the European Statistical Office – Eurostat, which was obtained and summarized to monitor the level of achievement of the European Union’s digital goals for 2030. In analyzing and measuring the dependence of online clothing purchases made by natural persons at the level of the 27 member states of the European Union, the following variables are used: disposable income, gender, age, education and employment status. The set of variables thus determined helps to provide a relevant account of the economic and demographic characteristics of the survey respondents.

Through the capabilities of the IBM SPSS Statistics software product and the Excel program, it is sought to describe the dynamics and development trends of online clothing purchases by European consumers. The methodological framework of the study includes the application of the single linear regression and correlation method. The choice of this method is presupposed by the existence of significant differences regarding the development of the variables by which the online purchases of the observed respondents are measured. The given method helps to examine the strength of the relationship between “online clothing purchases made by individuals from the 27 member states of the European Union” and “disposable income”. The analysis and assessment of the dependence of the main variable - online purchases of clothing by European consumers, on other selected variables of an economic and demographic nature, refer to the time interval 2012-2022.

The research results measure the variation of online clothing purchases taking into account variations in the income of individuals from European Union Member States; skirt; age; education and employment status. The formulated conclusions are of practical utility in characterizing the determinants of the changing online clothing shopping behavior of consumers in Europe.

4. RESULTS

Within the framework of the current development, the research emphasis is placed on the characteristics of the selected economic and demographic variables determining the behavior of consumers from the 27 member states of the European Union when shopping for clothing online. As

a result of the analysis, the manifested variations in the power of influence of the deterministic variables are determined. Analyzing and evaluating the data on the dynamics and trends of online shopping for clothing by European consumers is a basis for formulating the opinion that there is a growing trend of online purchases during the period 2012-2022, as illustrated by Figure 1.

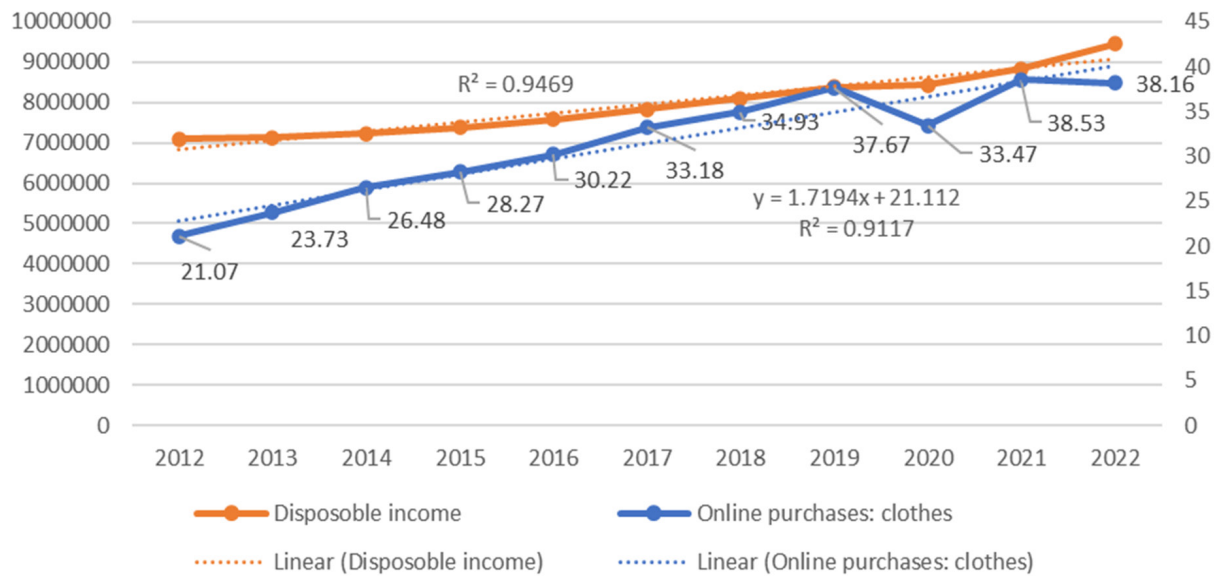


Figure 1. Dynamics and changing trends of online purchases of clothing and household income from the 27-member states of the European Union in the period 2012-2022

Source: Eurostat, 2023a, 2023b, 2023c

Figure 1 presents data describing the dynamics and trends of disposable income and online clothing purchases by European consumers. The presented figure contains two axes, the left axis shows the amount of income, and the right axis shows the change in the studied online purchases. The dynamics of online clothing purchases made in the period 2012-2022 can be described by a relatively increasing trend, with the coefficient of determination amounting to 0.9117. Thus, the highlighted coefficient of determination expresses the strength of the dependence in percentages and shows what percentage of the variation of the dependent variable – the magnitude of online purchases by consumers from the 27 member states of the European Union, can be explained by the variation of the independent variable – disposable income, i.e. this is the so-called explained variance.

Therefore, the regression analysis performed aims to illustrate the presence of the emerging trend. The section of the regression line starts from 26.48% in 2014, and the increase for each past year of the analyzed period is 1.7194%. During the studied ten-year period, according to the regression model, the magnitude of online clothing purchases increased by nearly 17.05% and at the end of the period, in 2022, it reached 38.16%. The analysis of the amount of disposable income of European consumers shows that its change during the studied period follows an increasing trend, with the coefficient of determination taking the value of 0.9469. The reported value of determination expresses a high proportion of the variation of the dependent variable that is determined by the independent variable.

The study of online purchases of clothing according to the variables – gender, age, education and employment status, is a reason to present their values in the last year of the analyzed period: see Figure 2.

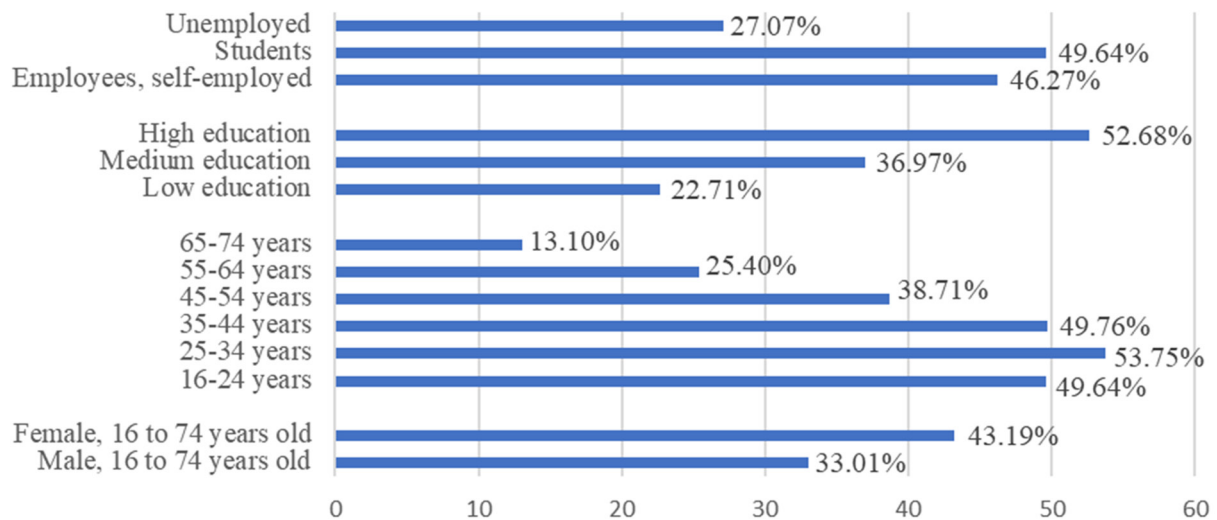


Figure 2. Internet users in the 27-member states of the European Union who bought or ordered clothes in the previous 12 months, 2022
 (% of individuals who used the Internet in the previous 12 months)

Source: Eurostat, 2023a, 2023b

From the data in Figure 2, it is clear that according to the employment status of the surveyed European users, the relative share of employed and self-employed persons represents 46.27% of Internet users who purchase clothing. Prominent consumers as well as students, comprising 49.64% of the respondents, shop for clothing through the online method much more than the unemployed, whose relative share stands at 27.07%. According to the other determinant - education, the relative weight of the respondents with a higher level of education who shop online for the desired clothing is 52.68% and exceeds 1.42 times the share of the surveyed online users with secondary education. Consequently, more than 5 out of every 10 highly educated consumers order and buy clothing online. The relative weight of individuals with low education who buy clothing via the Internet is lower and amounts to 22.71%. According to the age determinant, individuals aged 25 to 34, along with individuals aged 35 to 44 and those aged 16 to 24, are much more active in online clothing shopping than respondents, from all other age groups that are singled out. According to the data shown in the table, the relative share of women making online purchases of clothing is 10.18% higher than that of men.

Analyzing online clothing purchases by survey respondents can be done by applying a linear relationship model, helping to explore the relationship between «online clothing purchases made by individuals from consumers from the 27 member states of the European Union» and «amount of disposable income». The obtained research results are visualized with the help of the following three consecutive tables and one figure as follows Table 1, Table 2, Table 3 and Figure 3. The analyzed data refer to the time interval 2012-2022 as disclosed by the European Statistical Office – Eurostat. Using Table 1, the values of the correlation and determination coefficients are visualized.

Table 1. Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.904	0.816	0.796	2.697

Note: The independent variable is disposable income.

Source: Eurostat, 2023a, 2023b, 2023c

Table 2 presents data that help analyze and estimate the variance.

Table 2. Anova

	Sum of Squares	df	Mean Square	F	Sig.
Regression	291.217	1	291.217	40.033	0.000
Residual	65.469	9	7.274		
Total	356.686	10			

Note: The independent variable is Disposable income.

Source: Eurostat, 2023a, 2023b, 2023c

Through the data from the following Table 3, data is visualized that presupposes the analysis of the coefficients that are measured by the applied method of single linear regression and correlation.

Table 3. Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Disposable income	7.041	0.000	0.904	6.327	0.000
(Constant)	24.558	8.886		2.764	0.022

Source: Eurostat, 2023a, 2023b, 2023c

With the help of the following Figure 3, a visualization of the relationship between the magnitude of online clothing purchases, on the one hand, and, on the other hand, the disposable income of the surveyed respondents from Europe is achieved.

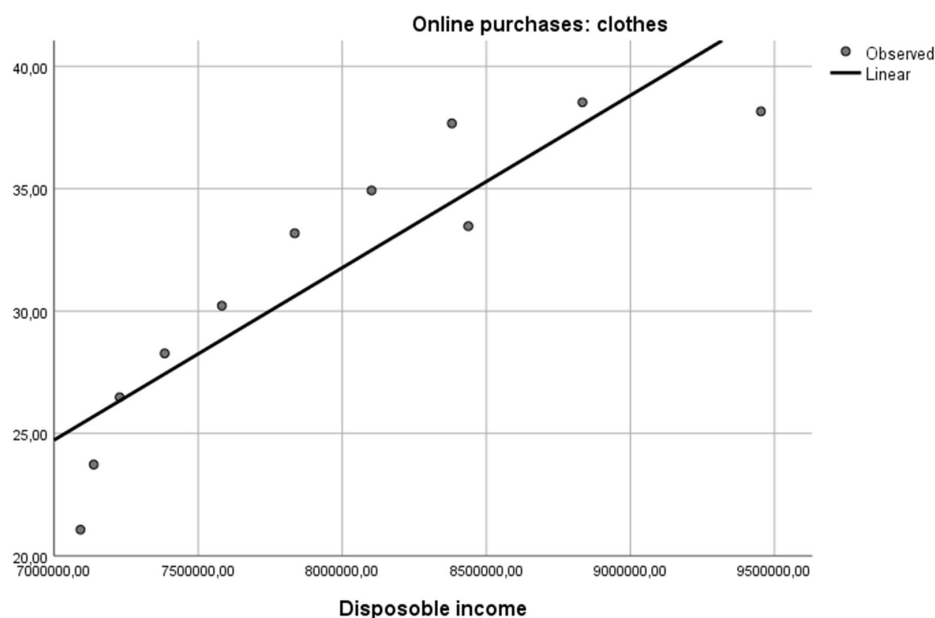


Figure 3. Relationship between online clothing purchases and disposable income of EU-27 consumers, 2012-2022.

Source: Eurostat, 2023a, 2023b, 2023c

In an analytical aspect, cognitive significance has the basic measures of the assessed dependence, such as the regression coefficient; the correlation coefficient as well as the coefficient of

determination. On the other hand, the regression coefficient shows the average change in the outcome variable – the number of online orders of consumers from the 27 member states of the European Union, with a unit increase in the factor variable – the amount of disposable income of the respondents. According to the data from Table 3, the analyzed regression coefficient takes the value of 7.041. The reported value is a reason to accept the assumption that when the respondents' disposable income increases by 1 euro, an average increase in the value of online clothing purchases by about 7.041 euros is established. According to the data in Table 1, it is evident that the value of the correlation coefficient is as follows: $R = 0.904$. Thus, the reduced coefficient measures the narrowness of a single linear correlation between the two evaluated variables. Since $0.7 < R = 0.904 < 1$ indicates a strong single linear correlation or a “high degree of dependence” of the number of online clothing purchases on the respondents' disposable income.

The other coefficient of analytical significance is that of determination. The considered coefficient is a basic measure of the explanatory power of the selected regression model. In the specific case, the differences between the units of online clothing purchases are explained, related to the corresponding differences in the size of the disposable income of European consumers. According to the postulates of economic science, the main determinant in the consumer function is disposable income. According to data from Table 1, the relative share of the explained variation exceeds half of the total variation of the magnitude of online clothing purchases of European consumers, with $R^2 = 0.816$, the model explains more than three-quarters of the variation of the measured online purchases. This gives reason to formulate the categorical conclusion that nearly 82% of the differences between consumers from the 27 member states of the European Union in terms of their amounts of online clothing purchases are associated with the differences between them in terms of disposable income. From what is shown in Figure 1, it is clear that along the abscissa axis are presented the values of the online purchases of clothing made by the respondents, and along the ordinate axis – the amount of disposable income. The existence of a high degree of dependence between the two variables allows the conclusion that the actual values of online clothing purchases by European consumers tend to be distributed around or close to the regression line.

5. DISCUSSION

The results, which were obtained in the context of the conducted research, allow us to interpret the digital changes occurring in the clothing retail business - application of innovative interactive technologies, streamlining of business processes, and personalization of the online offer of clothing. A special focus is placed on measuring the impact that certain economic and demographic variables have on European consumers when shopping for clothing online. In the research direction outlined in this way, there is an opportunity for discussion and comparison of the results obtained by other researchers. In a scientific work published in the specialized literature, the determinants of the use of online shopping in the countries of the European Union are examined and highlighted (Huterska & Huterski, 2022). In the cited study, the authors adhere to the statement of the presence of statistical significance of dependent variables of an economic and demographic nature that affect the propensity to shop online in the European Union countries during the period 2010-2021. Similar studies influence the direction of research interest in the issue under consideration. In this field, econometric models are applied that take into account economic, demographic and other determinants that presuppose the change in online shopping and take into account the effects of the impact of digitalization - in studies by Petrova et al. (2023), Ilieva et al. (2021), Blazheva and Karataeva (2022), Nikolova (2023). In the course of the present development, considerations are also brought forward, seeking a better

clarification of the dependence of consumer behavior on certain variables. In this sense, the basic research position is the opinion that the behavior of European consumers when shopping for clothes online is determined by the influence of many determinants, among which a significant place is occupied by those of an economic and demographic nature.

6. FUTURE DIRECTIONS OF RESEARCH

Examining the digital transformation of the clothing retail business and charting the dynamics and trends of online clothing purchases made by consumers in the 27 member states of the European Union during the period 2012-2022, is a challenge to understand the main directions of their future development. Thus, for further research, the cluster analysis method can be adopted. So, for example, by means of the given method, striking similarities, as well as differences, can be established between the individual member states of the European Union regarding the ongoing changes in online clothing shopping. The cluster type of analysis helps to form relatively homogeneous clusters of countries that are based on the determined determinants of observation. The choice of such a method can also be justified by the possibility of measuring different aspects of the digitization of the individual sectors of the economies included in the Community. These results can be useful in determining the necessary transformations in promoting the digitalization of societies and economies in Europe.

7. CONCLUSION

The present study, presenting a theoretical framework of the economic benefits of digitization of the clothing retail business, as well as practical aspects of the change in online shopping of consumers from the 27 member states of the European Union, allows the formulation of corresponding conclusions and generalizations. The degree of digital transformation of the clothing retail business determines the change in the online shopping of European consumers and outlines the prospects for the sales process. Within the framework of the development, the predominant role of variables such as disposable income, age, gender, education, and employment status, which promote or limit the online purchases of European consumers, is considered. Empirical validity is the consideration of the research result that a very significant part of the differences between consumers from the 27 member states of the European Union in terms of online clothing purchases is associated with existing differences between them in terms of disposable income. From this point of view, future strategic and other decisions for the development of the European economy must observe and take into account the impact assessment of a wide range of determinants of an economic and demographic nature, determining the change in consumer behavior in the context of digital transformation.

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The Impact of Augmented Reality (AR), and Virtual Reality (VR) in Marketing Campaigns

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Received: January 30, 2024
Accepted: May 7, 2024
Published: August 6, 2024

Keywords:

Augmented reality;
Virtual reality;
Sales;
Marketing;
PRISMA;
Consumer behavior



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Abstract: *Augmented Reality (AR) and Virtual Reality (VR) technologies have revolutionized marketing by seamlessly merging physical and digital experiences. However, the conceptual development of this field within academic literature has been somewhat limited. To address this gap, our systematic literature review, following the PRISMA methodology, thoroughly examines existing research and industry insights while emphasizing the importance of a well-defined conceptual framework. By introducing the PRISMA technique, our study aims to investigate the current and anticipated technological advancements in terms of consumer engagement, brand loyalty, and sales conversion. Our framework encompasses technological affordances, consumer engagement, and persuasive content creation, exploring how AR and VR applications impact consumer perception, brand awareness, and purchase behavior within this framework. While some studies highlight positive impacts on consumer engagement, brand loyalty, and sales conversion, we also identify critical research gaps. These gaps primarily center around the need for empirical research and a deeper understanding of consumer behavior when interacting with AR and VR in marketing campaigns. Additionally, technological challenges, privacy concerns, and content creation hurdles remain significant obstacles to success in this domain. Our study's key contributions include the classification of five cluster themes for the two meta-synthesis analyses, pointing to potential future directions for businesses and academics. This underscores the continued integration of AR and VR technologies into marketing practices, providing a compelling opportunity to address these research gaps. Ultimately, our review offers a roadmap for further inquiry, providing valuable insights for both marketers and the academic community in this dynamically evolving field.*

1. INTRODUCTION

Augmented reality (AR) is an innovative technology that enhances users' perception and interaction with the physical world by overlaying virtual content (Masneri et al., 2022). On the other hand, virtual reality (VR) allows users to explore and interact with computer-generated environments (Asad et al., 2021; Durukan et al., 2020; Fabris et al., 2019). While VR provides a fully immersive digital experience, AR combines real and virtual elements. Both AR and VR rely on specialized hardware, like headsets or smartphones, to deliver their content in real time.

In the field of modern marketing, which is shaped by the merging of digital technologies, scholars such as Kannan and Li (2017), Mitrović et al. (2020), and Yung et al. (2019) have laid the foundation for understanding shifts in marketing strategies. Building upon this academic discourse, this study aims to contribute to the field by examining the impact of Augmented Reality (AR) and Virtual Reality (VR) technologies on marketing campaigns.

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The study has two objectives. The first objective is to examine Extended Reality (XR) user experiences. This requires thoroughly studying how AR and VR technology improve marketing consumer experiences. User interactions, attitudes, and engagements will be examined in this study to understand how consumer-brand relationships are changing online. Second, the study compares XR's influence on consumers' purchasing intentions and decision-making to traditional marketing tactics. A complete meta-analysis will add to the academic literature on extended reality and marketing studies. The meta-analysis will identify crucial patterns, trends, and anomalies among existing research to improve our knowledge of the complicated interaction between XR technology and consumer behavior.

This study combines technology, marketing, and consumer psychology. It seeks to humanize the digital revolution in marketing campaigns. As businesses implement XR technology, this research seeks to understand human experiences and digital decision-making beyond technological trends. The study joins the scholarly effort to understand modern marketing landscapes and contribute to the conversation about how XR technology can change consumer-brand interactions.

The paper is organized as follows. Initially, the upcoming section provides an overview of the evolution of augmented reality (AR) and virtual reality (VR) within the business domain, laying the groundwork for a comprehensive knowledge of its current significance. Subsequently, an in-depth literature review is presented to substantiate our argument. The third section delves into the methodology and materials employed in the study. Sections four and five encompass a meticulous examination and discourse on the study's findings. Finally, the last section wraps up the paper, offering conclusions and proposing recommendations for future directions.

2. LITERATURE REVIEW

A comprehensive meta-analysis of various research studies exploring the transformative effects of Augmented Reality (AR) and Virtual Reality (VR) in marketing campaigns sheds light on a range of significant and enlightening trends. The global academic realm has witnessed a notable increase in investigations focusing on the implementation and implications of AR and VR in the marketing field, with particular attention given to the ever-evolving sectors of retail, tourism, and advertising (Du et al., 2022; Mitrović et al., 2020; Yung & Khoo-Lattimore, 2019).

Kong et al. (2020) emphasize the direct impact factors of VR on strategic marketing models, including immersion, conception, and customer buying behavior. They note that product-added value and brand design are indirect impact factors. Sung (2021) add that VR leads to a higher experience of immersion, learning attitude, and enjoyment. On the other hand, Davis and Aslam (2024) contribute to this discussion by highlighting that consumers appreciate AR apps for providing a unique, immersive shopping experience akin to in-store shopping, with advanced features such as 3D visualization. Javornik et al. (2022) caution about the democratization of AR, especially through filters on apps like Instagram, raising ethical questions and potentially impacting consumers' well-being.

Furthermore, Ferreira and Qureshi (2020) and Ekmeil et al. (2021) delve into the uncharted territory of the customer journey, unearthing the transformative power of VR and AR in revolutionizing every step of this intricate process. Ferreira's extensive research illuminates the myriad ways in which VR and AR can reshape and redefine the path consumers embark on when

interacting with brands, while Ekmeil emphasizes the indispensable need for all-encompassing models that can propel the advancements of these extraordinary technologies forward, ensuring a future where consumer experiences are enriched, elevated, and utterly unforgettable. As for XR, research shows that it is more likely to attract a younger audience because of its technological and playful aspects (Nechita & Rezeanu, 2019; Paliokas et al., 2020; Scarles et al., 2020). It may also be perceived as a hedonic but not a utilitarian tool by older users, which may hinder its use in certain contexts (Penco et al., 2021).

3. METHODOLOGY

The authors of this study adopted the PRISMA methodology, opting for articles categorized by document type. Specifically, the study confined its scope to papers and reports exclusively drawn from the Web of Science and Scopus databases. Furthermore, the research scope expanded to delve into nuanced insights from the gray literature, a process initiated in December 2023.

To illustrate the methodological journey, Figure 1 consolidates the procedural steps and inclusion criteria for each phase. Commencing with the initial stage, the authors selectively incorporated publications that explored the intersection of sales and artificial intelligence, discernible through journal titles, abstracts, or keywords. Following this, employing the same search keywords, the authors undertook a thorough screening of entire articles, research papers, and reports identified in the first phase during a subsequent stage. This comprehensive approach led to the exclusion of materials like complete texts of books, book chapters, editorial content, notes, and concise surveys from the final screening process.

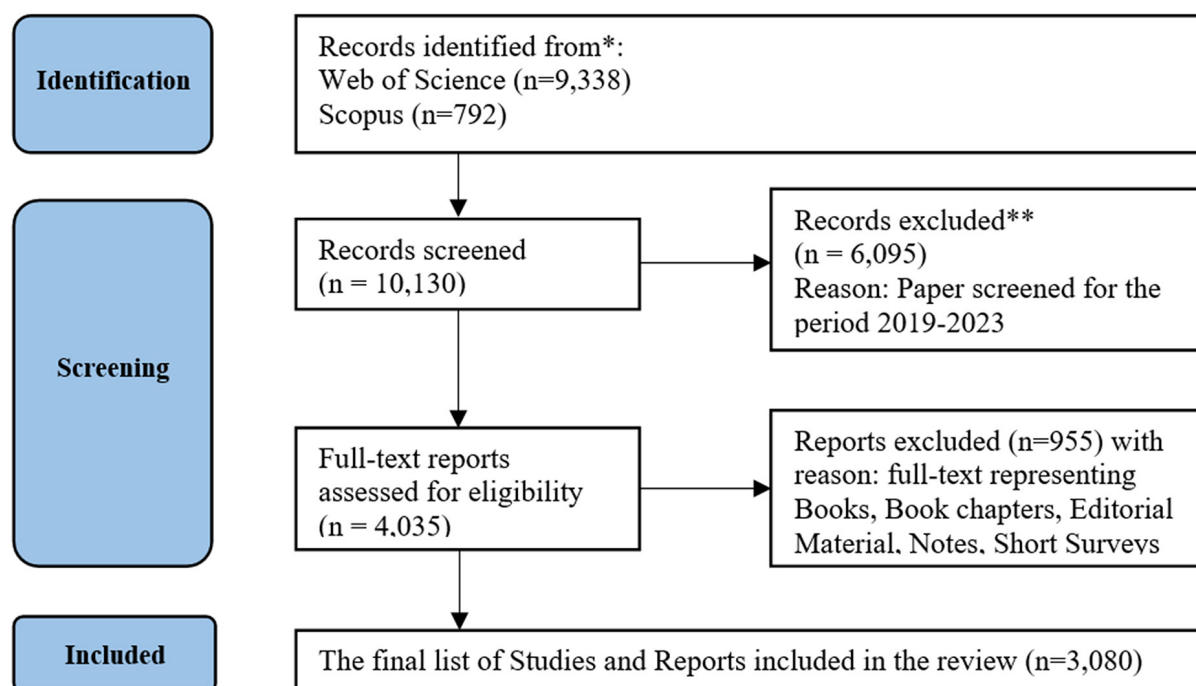


Figure 1. A visual representation of the literature review process, utilizing the PRISMA flowchart, is constructed based on a dual keyword search for “Marketing” and “Augmented Reality Intelligence.” As depicted, out of the initial 10,130 records obtained, only 3,080 records met the inclusion criteria. Notably, all the included articles were published between 2019 and 2023.

Source: Own research

In the initial phase, the search terms “marketing” and “augmented reality” yielded a total of 10,130 records. During the screening process, the authors excluded 6,095 items from the dataset due to their publication dates falling outside the range of 2019–2023. Additionally, 955 items, which represented document categories other than articles and reports, were eliminated. A meta-analysis was then performed, combining the themes of marketing and augmented reality using the PRISMA technique, aligning with the first set of key terms employed in this review. Given the significant number of citations (constituting more than 80% of the total citations) found in the Web of Science, an analysis was conducted specifically for those two terms, spanning the years 2019 through 2023, resulting in a list of 3,080 papers.

The subsequent phase of investigations focused on another pair of concepts: marketing and virtual reality. Employing the same PRISMA methodology, a subsequent meta-analysis was conducted. Figure 2 visually represents the sequential progression of the literature review methodology concerning the amalgamation of these keywords.

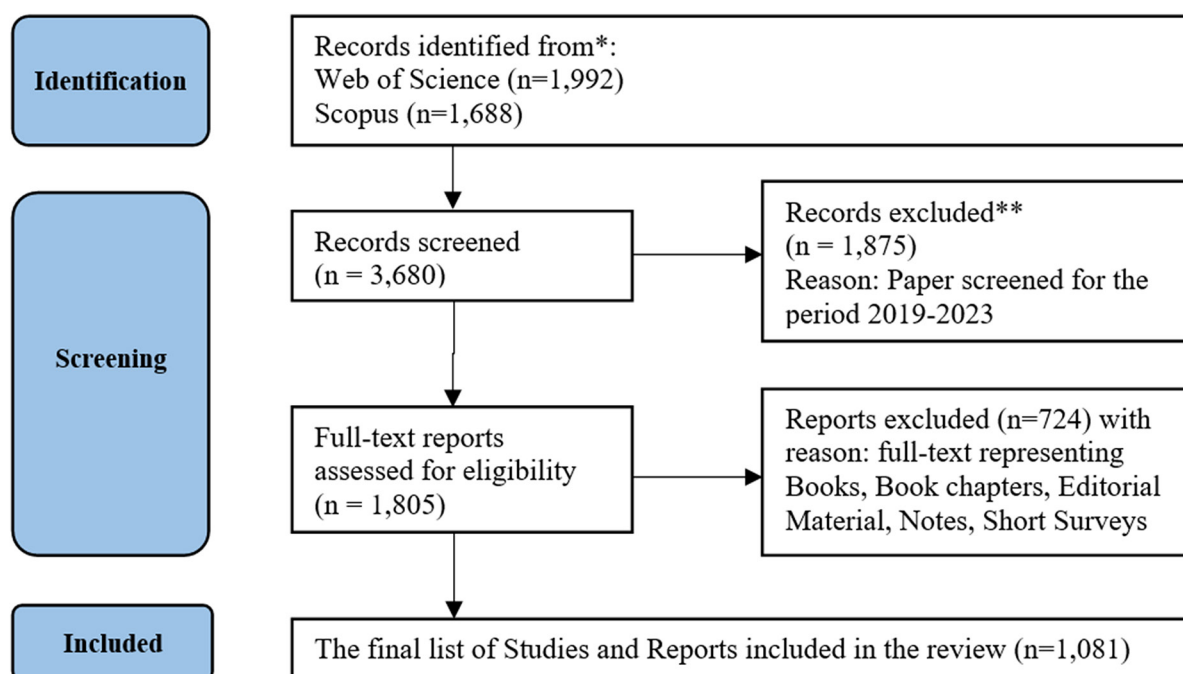


Figure 2. A visual representation of the literature review process, utilizing the PRISMA flow-chart, is constructed based on a dual keyword search for “Marketing” and “Virtual Reality”. As depicted, out of the initial 3,680 records obtained, only 1,081 records met the inclusion criteria. Notably, all the included articles were published between 2019 and 2023.

Source: Own research

During the second phase, the search terms “marketing” and “virtual reality” generated a total of 3,680 records. In the screening process, the authors excluded 1,875 items from the dataset because their publication dates fell outside the range of 2019–2023. Additionally, 724 items, categorized as document types other than articles and reports, were removed. Subsequently, a meta-analysis was conducted, amalgamating the themes of marketing and virtual reality through the application of the PRISMA technique, consistent with the initial set of key terms utilized in this review. Due to a substantial number of citations found in the Web of Science, a focused analysis was carried out specifically for these two terms, covering the years 2019 through 2023, resulting in a compilation of 1,081 papers.

4. META-SYNTHESIS RESULTS

4.1. Results for the Couple: Marketing and Augmented Reality

This section will focus on the outcomes derived from the initial exploration of the intersection between augmented reality and marketing. It is imperative to identify subjects closely related to the conducted studies and address the primary concerns highlighted by these investigations. The selection of these areas should complement the inclusion of the top ten publications with the highest record counts. This approach aims to present and comprehend the contemporary significance of the studies conducted, as well as to offer insights into the future trajectory of augmented reality and marketing for the period spanning 2019–2023. Consequently, each selected research study underwent thorough examination and evaluation through the lens of the theoretical frameworks employed by the authors in articulating the issues and conclusions discussed in their publications.

Table 1. Top 10 record count publications based on WoS Categories, for the couple: augmented reality and marketing.

Field: Web of Science Categories	Record Count	% from 3,080 Articles
Business	500	14.264%
Economics	400	9.922%
Engineering Electrical Electronic	350	7.132%
Business Finance	300	6.822%
Computer Science Information Systems	250	6.667%
Management	200	5.271%
Materials Science Multidisciplinary	180	4.496%
Physics Applied	150	4.341%
Environmental Sciences	90	4.186%
Environmental Studies	90	4.186%

Source: Own research

Moreover, delving into the affiliations linked with the key entities within this complex research topic discloses the United Kingdom, China, and Australia as the most prolific nations. Through co-citation analysis and a thorough examination of cited references, focusing on the top 3000 most cited papers and setting a minimum citation threshold of 5 for references, resulted in a total of 755 items meeting the designated criteria. These items are then classified into four clusters, as illustrated in Figure 3a, utilizing VOSviewer.

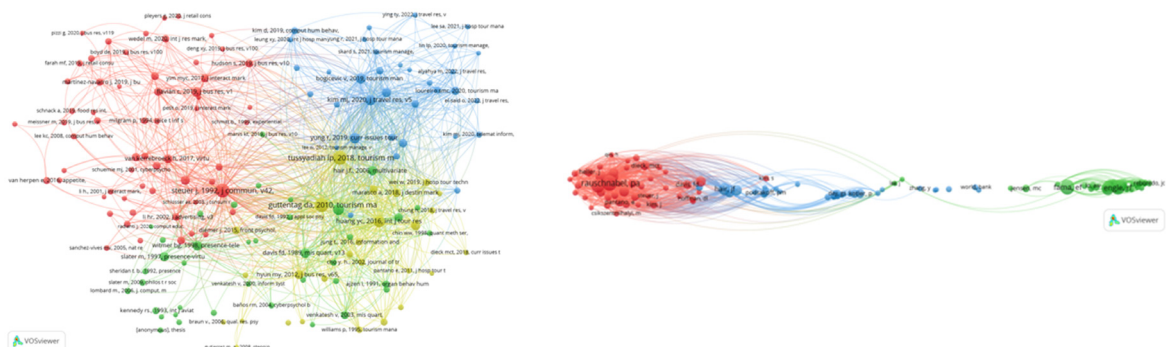


Figure 3. VOSviewer diagram containing the most cited papers (Panel a) and authors (Panel b) with at least 5 citations (top 500), for the couple: marketing and AR

Source: Own research

At the same time, utilizing the same co-citation methodology but adjusting the unit of analysis to cited authors. By setting a threshold of at least five citations for an author, the researchers identified a total of 2099 instances distributed among five distinct clusters, as illustrated in Figure 3b.

4.2. Results for the Couple: Marketing and Virtual Reality

This discussion aims to elaborate on the findings from an initial exploration of the intersection of marketing and VR. In addition to analyzing the ten most prolific publications selected based on their record count, these focused areas are chosen to clarify and comprehend the contemporary significance of conducted studies and the potential trajectory of the relationship between marketing and VR. Covering the period from 2019 to 2023, it is crucial not only to outline the related subjects to the undertaken research but also to illuminate the primary concerns arising from these investigations. Consequently, each designated study underwent meticulous examination and interpretation, wherein the theoretical frameworks proposed by the authors were scrutinized concerning the content and findings presented in their respective articles.

Table 2. Top 10 record count publications based on WoS Categories, for the couple: marketing and virtual reality.

Field: Web of Science Categories	Record Count	% from 1.081 Articles
Business	190	15.860%
Hospitality Leisure Sport Tourism	164	13.172%
Engineering Electrical Electronic	157	10.484%
Computer Science Information Systems	137	9.677%
Telecommunications	131	5.914%
Computer Science Interdisciplinary Applications	79	5.376%
Computer Science Software Engineering	70	5.376%
Environmental Studies	53	5.376%
Environmental Sciences	50	5.108%
Green Sustainable Science Technology	50	5.108%

Source: Own research

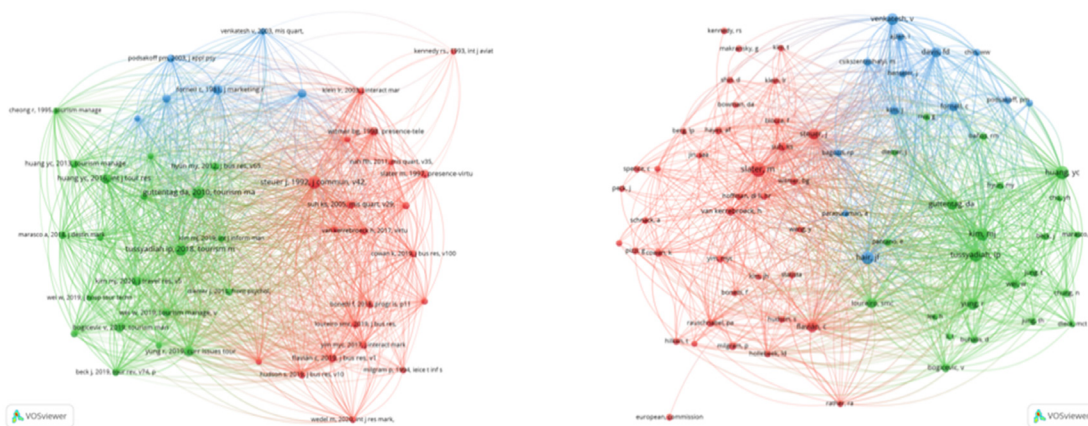


Figure 4. VOSviewer diagram containing the most cited papers (Panel a) and authors (Panel b) with at least 20 citations (top 1000), for the couple: marketing and virtual reality.

Source: Own research

Moreover, when delving into the affiliations connected to the key entities within this complex research domain, it becomes apparent that the United Kingdom, Australia and China stand out

as the most prolific nations. Through the application of co-citation analysis and a careful examination of cited references, and by focusing on the top 500 most cited papers with a minimum citation threshold of 20 for references, a total of 47 items were identified, meeting the stipulated criterion and organized into four distinct clusters. The visual representation of this analysis is crafted using VOSviewer, as depicted in Figure 4a.

At the same time, utilizing the same co-citation methodology but changing the analytical unit to cited authors. Establishing a minimum citation threshold of 20 for authors, we pinpointed 101 instances distributed across four distinct clusters, as illustrated in Figure 4b.

5. DISCUSSION

AR, VR, and marketing campaigns are where technology meets consumer and brand engagement. This debate summarizes the literature on AR and VR's revolutionary marketing effects, highlighting significant trends, problems, possibilities, and sector-specific insights.

AR and VR contribute to better customer experiences in retail, tourism, and advertising. Many agree that these innovative technologies improve consumer experience and facilitate contact with a wide range of products and services (Ekmeil et al., 2021; Mitrović et al., 2020). However, AR and VR have significant consumer adoption challenges despite their potential. These issues include widespread knowledge, complex usability, and the perceived time commitment of developing technologies (Yung et al., 2019). AR and VR marketing strategies must overcome these challenges to reach their full potential. Since widespread acceptance of these technologies depends on technological innovation, efficient communication, and user-friendly interfaces.

AR and VR have a tremendous value proposition, especially in their capacity to influence client experiences throughout the customer journey. These disruptive technologies strongly influence consumers' purchasing intentions, enhancing marketing efforts and changing customer behavior (Ferreira & Qureshi, 2020). AR and VR's ability to immerse customers in engaging and realistic virtual settings improves their decision-making, increasing buy intentions and marketing campaign efficacy. As marketing evolves, AR and VR offer many opportunities to engage consumers and build brand loyalty. Successfully integrating these technologies can transform product and service presentation and experience, immersing consumers.

Academics have examined sector-specific projects and campaign kinds to determine how AR and VR improve customer interactions and brand experiences. VR advertising and AR online buying can increase product engagement, according to research. Numerous studies have examined the immense impact and transformative potential of sector-specific initiatives, diverse promotional campaign types, and seamless technological integration on the efficacy and overall outcomes of augmented reality (AR) and virtual reality (VR) in improving consumer interactions, engagement, and brand experiences. Cowan et al. (2021) emphasize the importance of deep-rooted product involvement, while Atanasova Paneva and Sidorenko (2019) eloquently focus on the revolutionary use of AR in online shopping. Du et al. (2022) also highlighted the limitless potential and remarkable opportunities of these cutting-edge technologies, underlining the need for comprehensive and forward-thinking research in this ever-changing field.

When studying AR and VR acceptance and challenges, retail is the focus. AR has great potential to provide value and improve retail customer pleasure, but the study notes implementation

issues. Marketers may maximize engagement and effectiveness by tailoring AR and VR experiences to their target customers' requirements and preferences by investigating sector-specific solutions. Mitrović et al. (2020) and Lavoye et al. (2021) focus on the retail business, examining the challenges and acceptability of VR and AR in marketing. Mitrović's rigorous analysis illuminates the obstacles and elements that impact the effective adoption and integration of immersive technologies. However, Lavoye's research shows that AR has nearly endless potential to provide value and improve user pleasure.

AR and VR revolutionize the client journey, according to studies. Scholars note that comprehensive models are needed to advance these technologies and improve user experiences. Technology and playfulness make XR technologies more appealing to younger people, according to demographics. They may be seen as hedonic rather than utilitarian by older users, which may hamper their adoption. To adapt marketing strategies and create experiences that appeal to a wide range of consumer groups, demographic preferences and AR/VR attitudes must be understood. The technological and playful components of XR make it more appealing to younger audiences (Nechita & Rezeanu, 2019; Paliokas et al., 2020; Scarles et al., 2020). Older users may view it as a hedonic rather than utilitarian tool, which may limit its utilization (Penco et al., 2021).

6. CONCLUSION

In conclusion, the comprehensive meta-analysis employing the PRISMA technique provides insight into the significance of Augmented Reality and Virtual Reality on marketing initiatives. The study's thorough analysis has revealed significant discoveries, namely in the areas of improving user experience, influencing buying decisions, and considering demographic factors. The AR application that replicates in-store interactions and provides immersive shopping experiences has become a crucial element in consumer engagement (Davis & Aslam, 2024). Furthermore, the significant impact of virtual reality (VR) on strategic marketing models is evident in its influence on elements such as immersion, perception, and purchasing behavior. This highlights the crucial role of VR in molding customer decisions (Kong et al., 2020).

Demographic factors indicate that younger audiences are particularly interested in Extended Reality (XR) because of its technological and playful features. This emphasizes the importance for marketers to customize their campaigns for different age groups (Nechita & Rezeanu, 2019; Paliokas et al., 2020). The meta-analysis is a significant addition to the XR and marketing literature.

The integration of current information has contributed to a thorough comprehension of the influence of AR and VR in these fields, facilitating continuous progress and enhancements in the quest for excellence.

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Analysis of the Content Marketing to Build a Relationship and Loyalty with Consumers

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Received: December 26, 2023

Accepted: May 30, 2024

Published: August 6, 2024

Keywords:

Social networks;
Media content;
Digital platforms;
Target audience;
Customers;
Marketing;
Content



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Abstract: Social networks as new mass communication media enable the consumer to actively use, socialize, follow, interpret, and share media content and forms for the purposes of information, shopping, entertainment, and education, so companies that do not brand themselves and do not communicate with their users via social networks in the right way or at all inevitably lose the battle with their competition. Under the pressure of drastic market changes, numerous companies are entering this market, and social networks are flooded with branded content of all kinds of goods and services. It is therefore more important than ever to create a personalized offer and the closest possible relationship with the customer and thus gain a competitive advantage. However, in order to do this, it is extremely important to know the customer well; it is important to understand his problems, desires, passions, doubts, interests, habits, strengths, and weaknesses. Digital platforms offer extremely functional sales tools with which brands can effectively reach their target audience on social networks, but sales that rely exclusively on dry ad formats are not enough today by themselves for the reasons mentioned. It is necessary to offer the audience relevant content with values that they can identify with; it is necessary to offer content that solves some of their potential problems. This paper aims to point out the basic characteristics of the marketing content concept in the phase of building relationships and in the phase of maintaining consumer loyalty. In addition, the article aims to respond to the current limitations associated with the measurement and use of marketing content as a concept, as well as the importance of professional and academic research on this form of marketing communication.

1. INTRODUCTION

The model of today's Internet is based on decentralized, distributed and direct control over "when", "what", "why" and "with whom" users exchange information, and as such encourages critical thinking, activism, democracy and quality of communication. It is obvious that in the era of digital communications, where the concept of reality becomes debatable, marketing communications, whether it is mass or customized forms of communication, create most of their activities in virtual reality. In such an environment, which would be impossible without the high availability of the Internet, a change in the marketing paradigm and the dominant role of consumers, the conditions were created for the emergence and development of a new form of communication with consumers: content marketing. Organizations that implement content marketing strategies must ensure that their content is about their prospects and customers, not about themselves **Rahim and Clemens (2012)**. Understanding the customer and the related cultural influences, and being conscious of their pain points is paramount to delivering compelling content that offers solutions to the customers' day-to-day problems. Instead of focusing on creating a demand for products and

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services, organizations should focus on delivering content that provides information that can help consumers make well-informed buying decisions (Rahim & Clemens, 2012). Bearing in mind that it is a marketing concept, it is not surprising that the characteristics of content marketing in the marketing literature are defined by the 3E model (Educate, Engage and Entertain) (Pulizzi & Barrett, 2009). In creating marketing content, it is necessary to have a combination of excellent organizational skills, the ability to notice details, creativity and analytical insight, the goal is to continuously question how the marketing plan will support marketing and business goals.

2. LITERATURE REVIEW

With the development of media and new technologies, modern consumers are less responsive to traditional advertising (Touchette et al., 2015). Today, consumers mostly look for information about products and services via smartphones, search engines, and social networks. They don't buy newspapers because they read them online, and they don't watch TV because they have Netflix. Companies have realized that digital communication channels have taken over the role of traditional mass media. However, as digital media and their communication channels developed, so did the digital media audience. Consumers today are educated; they know their rights (Kaspar et al., 2019). Real-time feedback significantly increases consumer trust in the brand. Consumers who receive quick and relevant answers to their questions and comments have a more positive perception of the brand (Ho et al., 2020). Competition is high, and brands need to think seriously about how to create a competitive advantage. For this reason, the role and importance of content marketing are huge today. Hollebeek and Macky (2019) believe that digital marketing content describes content that is "based on the premise of a genuine, sincere desire to add value to the consumer's life in some relevant way, thereby facilitating customer acquisition or retention" via the Internet or social media. The importance of content marketing also lies in the fact that the era of advertising and communication of companies via advertising web banners is far behind us. This is confirmed by the fact that 20 million people use ad blockers. Statistics are largely on the side of content marketing, so content marketing research confirms that leaders in content marketing have 7-8 times more traffic to websites than those who do not; content marketing increases traffic on websites by 8 times; 56% of sellers believe that personalized content drives higher engagement rates, IBM says, and most (88%) B2B marketers use content marketing in their marketing strategies. Quality content becomes the standard of every company that nurtures a relationship with its customer or user at the center of its business and nurtures and develops the quality of content in all its segments. The content marketing strategy was defined and developed before the social network strategy.

The main purpose of content marketing is to create relevant and useful content that will help solve the problems of target groups of consumers. Content marketing does not create new needs but serves to build trust and a deeper relationship with the audience. Concerning other forms of marketing, content marketing is concerned with meeting existing customer needs by providing consumers with information that is relevant and valuable to them. From the perspective of the consumer, however, "[c]ontent marketing is about delivering the content [they are] seeking" Pulizzi (2013) lists three components of any successful marketing venture: (1) basic target audience: the type of person you can most help with your content, (2) what will be delivered to the audience: the types of information you will provide through your content; (3) desired audience outcome: things the audience will be able to do after consuming the content. The only way to actively maintain a long-term engaged relationship with customers is to constantly encourage them to engage in some specific way: comment, like, share, download, bookmark, read a blog,

view video content, buy, etc. Robert Rose believes that the best is to direct the goals to the subscribers. Consumer satisfaction is “a cognitive-affective state of the individual derived from the experience of consumption”. It is the result of the quality and image of the product, as well as the motivation and perceived value of the experience resulting from consumption. The evaluation of satisfaction with the used product is the last stage of the process of planning and purchasing the product. After consumption, consumers make judgments about a certain product or service (Gundersen et al., 1996), that is, they assess whether the products or services have met their needs and expectations (Bitner et al., 2010). The satisfaction rating is of great importance for all future purchases, considering that the experience is recorded in the consumer’s memory and becomes a reliable source of information in future product purchase planning processes.

Customer satisfaction is an essential element of customer loyalty (Yoon & Uysal, 2005). It is considered to influence the intentions of their consumer behavior (Perez-Aranda et al., 2018). Tourists who are satisfied with the product they have consumed express the intention to repeat purchases (Sreejesh & Abhilash, 2017). Also, when consumers are satisfied with a certain product, they will convey positive impressions (Hutchinson et al., 2009; Wang et al., 2017), and will share the experience through social networks (Sreejesh & Abhilash, 2017). Furthermore, consumers who are satisfied with the destination are more likely to decide to spend more money with the same manufacturer, that is, with the same product brand, buying other products as opposed to those products with which they are less satisfied. In their model which used both, satisfaction and performance quality for revisit intentions measurement, they, however, hypothesized that performance quality has a direct influence on behavioral intentions which are in the model represented by (1) loyalty to the event (2) and willingness to pay more, while it has an indirect influence on them through satisfaction (Baker & Crompton, 2000).

Companies that have implemented relationship marketing strategies in their marketing plans have at least some kind of interaction with almost every customer, even if they serve mass markets, so they can track customer satisfaction directly. In addition to statistics or market share, the company is interested in the reactions and opinions of its customers, users, and partners. Feedback is important to them. In combination with classic measuring instruments, an approach focused on customer satisfaction, needs, and wishes represents a valuable source of information for making relevant business decisions. In order to achieve maximum efficiency, it is necessary to implement a digitalized information (CRM) system that manages the databases of its customers and users, and measurements of the degree of satisfaction or dissatisfaction among customers are enabled. Therefore, such a system serves as a powerful management instrument. CRM systems are excellent tools for collecting, analyzing, and segmenting customers and users, and with this data, a company can develop customized marketing strategies for each segment. Customers are loyal for different reasons and require customized relationship marketing strategies. Once a marketing strategy is implemented, ongoing evaluation is needed to determine its success. Social networks are a valuable tool for building relationships with customers. Facebook and Instagram enable companies to communicate quickly, easily, and two-way with their customers, so companies get feedback from the market in real-time. In addition, digital marketing technology enables the use of software to monitor customer behavior, which enables companies to adapt better. In order to incorporate feedback into the company’s business practices, social networks are used to conduct surveys. Surveys are a very effective tool for understanding the wishes and needs of customers. All these tools are used to implement clear policies that determine how company employees will interact with customers in both positive and negative situations. Having a comprehensive customer relationship management strategy means

maintaining a high rate of customer satisfaction in all areas of the company (Ming-Sung Cheng et al., 2009). To address the lack of systematic research on the process through which e-service-escape creates e-loyalty in an online travel and tourism context, a conceptual model is proposed that examines the potential influence of the e-servicescape of travel and tourism websites (Pee et al., 2019; Sreejesh & Abhilash, 2017), how processing information about the product to be purchased is closely related to the consumer's experience; Pee et al. (2019) claim that customer loyalty gradually increases; evaluation based on information processing (versus experiential evaluation) may have a stronger effect on loyalty in the initial phase (first purchase), while experiential evaluation grows faster and becomes a driving force for increasing long-term loyalty.

3. MARKETING COMMUNICATION ADAPTED TO THE TARGET AUDIENCE

Communication is the process of transmitting information, which may or may not be comprehended. According to Bevanda et al. (2019), effective communication requires both the sender and receiver to have a shared foundation and a mutual comprehension of the signs used to convey information. Schiffman and Kanuk (2004) concur with those who assert that providers must employ suitable symbols to convey the intended images or attributes of products and services and successfully interact with their audience. According to Bevanda et al. (2019), Bacile et al. (2014) believe that marketing communication involves transmitting information, ideas, and emotions using shared signs from the sender to the recipient, to achieve specific outcomes. According to Kotler and Keller (2008), marketing communications is the method by which organizations aim to directly or indirectly inform, convince, and attract potential consumers to their products or services. Marketing communications serve as a tool to convey the brand's worth and facilitate interaction, enabling the company to connect with the intended audience and cultivate lasting relationships with users. Meler (1992) maintains that marketing communication can be divided into two groups (according to Kesić (1997):

- Symbolic marketing communication - refers to the recognized and acknowledged methods of communication used in promotion.
- Functional communication is a part of the marketing mix.

Disseminating marketing communication may be challenging as it encompasses not just promoting a certain product or service, but also representing the entire organization. An efficient marketing message, regardless of its form, delivers the appropriate information to the intended audience at the optimal moment. Marketing specialists may facilitate the creation of a brand image, promote products and services, minimize advertising expenses, and establish connections with the intended consumer base. These professionals should contribute to the organization's goals through (Kotler et al., 2010):

- *Building recognition* - The marketing department is responsible for utilizing its skill and expertise to promote "news" that will attract attention to a product, service, person, organization, or concept.
- *Enhancing credibility* - The marketing department should augment the credibility of the message being sent to clients.
- *Stimulation of the sales force and intermediaries in the channel* - The marketing department is responsible for consistently motivating the sales team and generating enthusiasm among franchisees by regularly sharing positive news about new company developments.
- *Maximizing advertising efficiency* - Enhancing the marketing department's ability to enhance the brand, resulting in increased customer focus on the brand rather than sponsored advertisements.

To capture the attention of online audiences, one may utilize captivating material disseminated through social media platforms, websites, paid advertisements, and other means. This content can include several forms such as corporate information, intriguing statistics, surveys, quizzes, reward games, recipes, and more. To engage and captivate the intended audience, websites or social networks must include the following elements (Cox & Koelzer, 2005):

- The material should effectively communicate and showcase the brand identity or demonstrate the market standing of the firm, product, or service.
- The information must be relevant, practical, and engaging for the intended audience.
- The material should be written in a clear and accessible language that can be easily comprehended by the intended audience.
- The material should be aligned with the company's communication objectives about visitors.
- Facilitating seamless communication between visitors and representatives from other departments, such as marketing, sales, or customer support, is crucial.
- It is important to enable visitors to easily use the site and establish dialogue through questions, then various possibilities such as "start booking," "click and learn," "send us your comments," and other ways of asking questions and encouraging visitors to take action, show interest, or get in touch with the sales staff.
- To encourage repeat visits, it is important to offer plenty of valuable and engaging material. However, it is crucial to avoid overwhelming visitors with excessive information and content, since this may make the website appear cluttered and difficult to read. An impeccable organization of the site is crucial to enhance its appeal to visitors.
- Consistently update the content to ensure that outdated material is modified and amended, while fresh material is incorporated.
- It is necessary to avoid long articles, detailed descriptions, and exhaustive reports. Such data is best offered in the form of reformable files. Most visitors absorb small "bites" from titles, images, graphics, or videos.
- Accurate spelling, proper grammar, and correct punctuation have significant importance. Inadequately composed content will give the impression to the visitor that the firm is negligent, trivial, and lacking in professionalism.

A relevant message that is sent to the target audience with the help of an appropriate means, according to Kotler et al. (2010) is a key component for the success of any marketing department of a certain organization. Marketing experts carefully identify the audience they want to reach, so they study it and find the media that will most easily deliver the desired information and messages. They shape the messages they send so that they look natural, logical and interesting to the target audience.

4. RESEARCH METHODOLOGY

The scientific method used to collect the primary data of this research was a survey, and the respondents approached it anonymously. The sample of respondents is random. The research was conducted in June 2023. The survey questionnaire is divided into five parts of the work. The first part of the survey, consisting of 8 closed questions, refers to the collection of demographic information, general characteristics and preferences of respondents when consuming Internet content. The second part of the research refers to the attempt to prove H1, how and in what way digital content has value for customers, clients, partners and the company and its brands. This part of the survey has 8 closed questions. The third part of the research refers to issues related

to building and maintaining relationships with clients, and are related to proving H2. This part of the survey had 6 closed questions. The fourth part of the research was related to H3 and the attempt to determine the lifestyles and values and motivational goals of the respondents. This part of the survey had 6 closed questions. The fifth part of the research connects content marketing and product brand loyalty and consists of 8 questions (Likert scale).

The research problem relates to the underutilization of the potential of the marketing content of the selected example on social networks, and which techniques are best to use in order to maximize the potential. The main goal and purpose of the research is to determine the impact of the marketing content itself on the selected example through the use of social networks and a local portal by obtaining and processing primary and secondary data.

Other objectives of the research are:

- determine/define forms of content marketing;
- determine content strategies and content marketing advertising strategies.

Following the defined research problem and general and specific goals, the hypotheses of the work were defined:

Hypothesis H1: Marketing of digital content is an activity related to the creation, communication, distribution and exchange of digital content that has value for customers, clients, partners and the company and its brands.

Hypothesis H2: Content publication on the portal affects building and maintaining relationships with clients.

Hypothesis H3: In building relationships with consumers, it is necessary to create content that matches the clients' lifestyles and values.

Hypothesis H4: Lifestyle content marketing creates consumer loyalty.

After the analysis, the results of the survey showed that the profile of the respondents who joined the survey questionnaire is mostly made up of women aged 30–50 and older, mostly with high school education, then a college diploma, and a master's degree. Most of the professional activities from which respondents come are related to administrative, social services, production, educational institutions, business and finance, art, sports, entertainment, and the media. Almost half of the respondents have incomes between 690 Euro and 800 Euro, while the other half share an income of 800 – 1.000 Euro and 1.000 – 1.500 Euro. 67.4% of respondents are married. As part of the Demographic analysis examined the respondents' personal preferences for using Internet content through lifestyle categories. The research showed that they are most interested in travel, nature and recreation, family and relationships, cooking and recipes, health and wellness, caring for the environment and sustainability, home and garden, and community issues. The majority of respondents, 74.7% of them, take into account the quality of the content they follow or read on Facebook; 17.7% of respondents do not think about it; and 7.5% do not take into account the quality of the content.

The lowest score with which the respondents could confirm the hypotheses was 1, while the highest possible score was 5. The Mean column represents the arithmetic mean of the stated

statements. The results show that for respondents, interesting and useful content means content that entertains and relaxes them (3.92), educates and informs them (4.32), content that solves some of their problems (4.17), content that inspires and motivates them (4.02).

Table 1. Kolgomorov- Smirnov test

Descriptive Statistics							The -Smirnov „normality“	Kolmogorov test for
Results	N	Min.	Max.	Average	Standard deviation	Coefficient of variation	Statistics	P value
Content that entertains and relaxes time	368	1.00	5.00	3.925	0.861	26.432	0.250	0.000
Content that educates and informs me	368	1.00	5.00	4.327	0.793	27.138	0.299	0.000
Content that solves a problem of mine	368	1.00	5.00	4.172	0.995	29.147	0.200	0.000
Content that inspires and motivates me	368	1.00	5.00	4.025	0.828	25.041	0.299	0.000
Valid N (listwise)	368							

Source: Own research

Table 2. The importance of content marketing in building loyalty

Do you believe that posting content on the portal and associated social networks affects building and maintaining relationships with clients?	Number of the respondents	Ranking the importance of marketing content for building loyalty					
		Arithmetic middle (standard dev.)	Difference	95% range reliability		t (df)	P*
				From	To		
Inspirational and motivational content							
No	73	4,15 (1,0)	-0,519	-0,7	-0,3	-4,4 (250)	<0,001
Yes	295	4,77 (0,6)					
Interesting informative articles							
No	73	3,74 (1,2)	-0,438	-0,7	-0,2	-3,2 (239)	0,001
Yes	295	4,17 (0,9)					
I consider a realistic presentation of products/services an important characteristic of online communication							
No	73	3,72 (1,1)	-0,447	-0,7	-0,2	-3,3 (251)	0,001
Yes	295	4,16 (1,0)					
Content marketing needs to keep the attention							
No	73	3,06 (1,3)	-0,452	-0,8	-0,1	-2,7 (251)	0,008
Yes	295	3,91 (1,3)					

Source: Own research

According to the results of the research on the impact of content marketing on building loyalty shown in Table 2, it can be concluded that content marketing has several functions. Namely, since his role is to educate, the respondents answered that it is very important that the content be direct and informative, and that it be the way he needs it most. What makes marketing content of this type valuable is the direct transfer of knowledge, which provides the user with information about what he did not know before. Furthermore, in order to build user loyalty, it is extremely important to provide content that confirms the knowledge and beliefs of consumers and creates a positive sense of satisfaction and pride. The modern and contemporary consumer needs marketing content with which the consumer can identify, which will confirm his previous knowledge, preferences, and content that justifies and shares his opinion. Regardless of whether respondents agree or not that content marketing has a significant role in building loyalty, content marketing must be inspiring and motivating (the arithmetic mean of those respondents who agree with the role and importance of content marketing is 4.77, while for those respondents

who do not agree with the role and importance of marketing content in building loyalty is 4.15). For content marketing to attract and retain the attention of modern consumers, it must have informative articles, which are agreed upon by 295 respondents who rated the above statement with an average score of 4.17. Realistic presentation of products and services is extremely important in the concept of building loyalty, as evidenced by the average arithmetic mean of 4.16.

Hypothesis H1: The marketing of digital content is an activity related to the creation, by communicating, distributing and exchanging digital content that has value for customers, clients, partners and the company and its brands. Research hypotheses were tried to be proven through questions in a Likert scale for measurement of attitudes. Through questions related to proving H1 that digital content marketing has value for customers, the majority of respondents confirmed the stated hypothesis. Selected content serves multiple purposes: it is useful for searching for information, education, socializing, networking, maintaining relationships with people who share similar interests, entertainment, shopping, expressing opinions, and commenting on articles across various platforms. In order to solve a certain problem to the greatest extent, they will search online articles, they will browse videos and will read user experiences. Specifically, the respondents do not decide to access information on the blog, download e-books, subscribe to the newsletter, and do not use hashtags for content search. However, despite this, a high percentage confirmed that it was the value of digital content is greater compared to “old media”, 67.4% of respondents think that digital content offers greater value to users than traditional media. Values that they also see in the use of digital content the possibility of sharing content with others because they want to share something that they consider valuable (76.8%), respondents want to provide others with fun content (44.9%), they want to spread the word about the things they care about (37.85%), they want to define themselves through the content they share (15.74%) Hypothesis H2: Content publication on the portal and associated social networks have an impact on building and maintaining relationships with clients. To try to confirm hypothesis H2, we measured which values and to what extent at consumption of marketing content is represented by respondents and what are their views on the key elements of communication (content and visual), but also the technical characteristics of portals, pages, and web stores. Conditions acceptable to respondents in order to agree to follow certain content on social networks are inspiring, useful, interesting and motivating content, interesting informative articles, positive communication and atmosphere, friendly atmosphere and respect for interlocutors, high-quality visual presentation of products and services, fast answers to questions and inquiries in the inbox, non-censoring of comments, and video content. Again reports the same pattern according to which respondents do not choose a blog among the offered content formats, iconography, loyalty programs and e-books. However, despite this, all other elements are exceptionally important in building and maintaining relationships with clients, and the statistical rank of mean values, small deviations of the standard deviation from the arithmetic mean, tells us in support of the confirmation of H2.

Regarding the analysis of the respondents' opinions and attitudes related to the use of web stores, they consider logically developed categorization to be the most important characteristic of web store products and services (I reach the final destination in 3 clicks), realistic display of products and services, they think that the marketing content offers enough information about the offers of web stores, fun it is for them to follow the web content that interests them, and if they trust the source of the web content, they will do it shopping. The results also show that respondents value all additional technical or service elements of the web store, which refers to additional information about size, quantity, dimensions, or the duration of the product or service, information on delivery and the possibility of return, i.e. cancellation of the product or service, the possibility to compare

information about the product or service, suggestions of similar ones products in the same product category, proposals of products/services that complement the basic one the product they want to order, video presentation of the desired product/service, live chat with employees companies. When the question about the loyalty program was asked separately, the majority of respondents, 82.5% know and 47.5% participate in and use brand loyalty programs. As another specificity, it is valid to highlight the large percentage of respondents who do not use hashtags. The majority of respondents, 69.9% of them, do not use the ability to search for content via hashtags. With these research results, Hypothesis H2: "Content publication on the portal and related the influence of social networks on building and maintaining relationships with clients" has been proven because the respondents showed with their answers that they think to a great extent about the elements that are necessary to build and maintain relationships with customers. In H2, the statistical ranking of the mean values is positive, the deviations of the standard deviation from the arithmetic mean are small, and our data speak in support of the confirmation of H2.

As specifics from this part of the research, the results that indicate how the design can be singled out web stores do not significantly influence the attitude about the same, respondents believe that their marketing content doesn't hold attention, and they do not consider influential persons/influencers to be an extremely important source information. Hypothesis H3: "In building relationships with consumers, it is necessary to create content that is compatible with lifestyles and values of clients". In order to try to confirm H3, it was necessary to define the value systems of the respondents. For that, the research used Schwartz's 10 motivational types of values. Research showed what values the respondents represent. Values represented by respondents in order from largest to smallest are benevolence, independence, universalism, achievement, conformity, hedonism, incentive, and security. Tradition and power are the values that the respondents of this research do not represent. Also, a very high percentage of respondents state how it is for them useful and interesting content is important, and it is extremely important for them that the content is of high quality and relevant, in a very high percentage they take care of the quality of the content they follow on Facebook, and in a large for the percentage of 85.5%, it is important for them that this content is positive. It shows again how they are doing less relevant content created by influencers, i.e. famous people. The statistical rank mean values on questions to confirm H3 was also high and affirmative, and the deviations from the arithmetic mean are also small, so the data speak in favor of confirming H2. In today's digital age, where information is readily available, content marketing has become. In today's digital age, where information is readily available, content marketing has become a key tool for attracting and retaining consumers. Consumer loyalty is not only a matter of repeat purchases but deeply related to the emotional and intellectual relationship between the brand and the consumer. Thus, when asked questions about marketing content, consumers recognized the importance of different and defined a crucial role in creating and maintaining this loyalty. As part of the aforementioned research, they analyzed how different dimensions of content quality (relevance, consistency and informativeness) affect consumer loyalty and proved that quality content marketing is a prerequisite for achieving personalized content and creating an emotional connection. The results showed that personalized content significantly improves the user experience and strengthens the emotional connection between the consumer and the brand. This research highlights the importance of understanding consumer preferences and behavior in order to create content that is relevant and tailored to individual needs. They confirmed the hypothesis H4. From the overall analysis, we could conclude that the respondents of this research are somewhat conservative users of digital content. Quality and relevance are very important to them, and they are looking for it through useful, interesting, educational and socially engaged content, but they choose from the format of classic online articles, mostly pretending to be videos, and avoiding the

formats of blogs, e-books, newsletters and iconography. Recommendations from others are very important to them in nurturing relationships users, supporting loyalty programs, and additional valorization of products and services by brands. Lifestyle content marketing can play a key role in creating consumer loyalty. This approach to marketing focuses on creating content that reflects a certain lifestyle or values that are close to the brand's target audience. Lifestyle content marketing connects the product brand with the consumer on an emotional level, given that consumers recognize their values or interests in the content that the product brand shares on social networks. It is the content itself that provides the target consumer with useful information and thus increases the consumer's perception of the product brand itself.

5. CONCLUSION

The conclusion of the paper emphasizes the key aspects of digital content marketing and its importance in today's business. Activities related to the creation, communication, distribution, and exchange of digital content have intrinsic value for all stakeholders, including customers, clients, partners, and the company and its brands. Publishing content on digital platforms, especially on portals, has a strong impact on building and maintaining relationships with clients. This interaction contributes to creating a connection between the company and the audience, which is crucial for long-term success. Through proper management of digital content, a company can shape its image, improve brand recognition, and create a positive experience for users. Special emphasis is placed on the importance of adapting digital content to the lifestyles and values of the target audience. Creating content that matches consumer preferences is key to building relationships of trust and loyalty. The importance of lifestyle content marketing as a strategy that directly affects the formation of consumer loyalty is highlighted here. In conclusion, it is emphasized that digital content marketing is a dynamic process that requires continuous monitoring of trends, analysis of feedback and adaptation of strategies to meet the changing needs of the target audience. Through proper management of digital content marketing, companies can achieve competitive advantages, improve their position in the market, and achieve long-term success in the digital environment.




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Greenwashing Technique – An (Un)Acceptable Tool of Marketing Communication? Experiences and Attitudes of Marketing Experts and Consumers

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Received: January 12, 2024

Accepted: May 22, 2024

Published: August 6, 2024

Keywords:

Greenwashing;
Unacceptable practices;
Marketing communication;
Marketing experts;
Consumers



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Abstract: *The term greenwashing is inspired by numerous immoral and unacceptable practices in the creation of marketing content as a response to consumers' desire for green and sustainable practices. Given that real change and rationalization of business generally require numerous investments, many corporations decide to use greenwashing as a communication tool with the aim of falsely or incompletely presenting their business. This paper brings the results of qualitative research conducted using focus group methods and in-depth interviews with a sample of consumers and marketing experts, its goal was to investigate the awareness of consumers, as well as representatives of the profession, and the general attitudes and actions that are applied when making decisions about purchasing or acting within the profession.*

1. INTRODUCTION

We are witnessing the growth of green messages in marketing communication, regardless of the type of product and the audience. This way of communication did not develop by accident, on the contrary, it is very intentional. Public interest is now, more than ever before, focused on sustainability topics. Faced with the consequences of mass production and the late stage of consumerism, many are turning to changes in lifestyle and habits with the desire to change global consciousness. At the global level, there is a recognizable trend of boycotting companies and corporations that put profit above sustainability, which has a clear negative impact on such brands. Sometimes it is easier to invest great efforts in an apparent change than to implement the change. As a consequence of this way of approaching the problem of sustainability and ecology, the term greenwashing appears. Greenwashing is an extremely harmful marketing practice that tries in numerous ways to convince end consumers to give their money for a sustainable product from a sustainable business (Braga Junior et al., 2019, p. 228), although this is not necessarily the case. According to the results of recent research (Doshi & Noble, 2023; McKinsey & Company, 2023; Tighe, 2023), consumers are willing to pay more for environmentally friendly products. A common form of greenwashing is the use of “green” or “eco-friendly” labels or branding, which can give consumers the impression that a product is environmentally friendly, even if it is not. Other examples include making claims about the recycled content of a product without disclosing the full extent of its environmental impact, or claiming that a product is biodegradable without providing any evidence to support the claim (Jakubczak & Gotowska, 2020).

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2. MANIPULATION IN MARKETING COMMUNICATION

In order for communication between people to be as efficient and appropriate as possible, society and laws impose communication rules that direct and adapt modern communication. Given that communication is a key component of many businesses, good business communication can open many doors and opportunities, while bad communication can truly have harmful consequences (Sewar Alkhatib et al., 2023; Schmuck et al., 2018), so many organizations have appropriated words such as eco, sustainable, green, clean, CO₂ neutral and the like into their communication vocabulary in order to gain sympathy from the ecologically conscious mass of consumers. Manipulation refers to the act of influencing or controlling someone or something unfairly or deceptively. In the context of marketing, manipulation can take many forms (Ljubičić & Vukasović, 2023): using persuasive language or tactics to influence a person's decision to buy a product or service (Braca & Dondio, 2023), and using false or wrong information to create a positive impression about the product or company. Companies that use manipulative techniques in their business can damage their reputation and potentially face legal consequences, as well as loss of credibility and respect from consumers and competitors. Manipulation is a frequent occurrence in everyday communication, but also in marketing communication. Some of the most common manipulation techniques in the media are „1. Fake news, 2. Disinformation, 3. Manipulation of facts, 4. Spin, 5. Biased reporting, 6. Covert advertising, 7. Clickbait, 8. Unverified information, 9. Censorship, 10. Conspiracy theory, 11. Pseudoscience, 12. Satire“ (Ras-krinkavanje.ba, s.a.). Of course, there are many other techniques that we as consumers have to consider when consuming media or marketing content. What all these techniques have in common is the desire to influence the consumer's decision in an immoral way.

3. GREENWASHING CONCEPT AND GREEN TRANSFORMATION - CAN THEY WORK TOGETHER?

3.1. How Can Consumers Recognize Greenwashing?

By increasing the trend of sustainable consumerism, other actors are encouraged to act with a common goal - conservation of resources and rationalization of consumption. However, under consumerism, there is still one supreme rule, and that is profit. Green marketing, as well as numerous other phenomena in society, have the same trajectory under consumerism: from an initiative aimed at improving conditions and ways of dealing with production and waste disposal to practices that are in the gray zone. By finding vague definitions and open interpretations in marketing communication, the damage is done not only to the consumer but also to society, the market, the level of trust and the state of consciousness of the masses. The question arises: if green marketing raises profits and the image of the business, why use greenwashing methods instead of turning processes and businesses towards a more sustainable path? Emotional appeals have been proven to be powerful tools in marketing communication (Bové & Thill, 2012; Vrtana & Krizanova, 2023) and it is generally accepted that they should agree with the moral principles of the community within which they operate. Today, more than ever, it is essential to develop a critical thinking approach to products and services with caution and do your research. Terms like “eco-friendly,” “natural,” or “green” are imprecise claims for which corporations cannot legally be held accountable. A warning sign is often the lack of solid evidence and sources of information. Through the use of PR and marketing tools, corporations are presented in the minds of consumers as conscious and responsible corporations, while less acceptable practices are concealed and covered up.

„2008, and in 2009, researchers from TerraChoice visited retailers in the United States, Canada, Australia, and Great Britain and recorded products that made green claims. In the United States and Canada alone, 2,229 products filed 4,996 green claims. Of the 2,219 products that submitted a claim, over 98% committed at least one of what TerraChoice Marketing for the Environment called “The Seven Sins of Greenwashing”“ (Pharoskc.com, 2023) The seven sins of greenwashing, according to TerraChoice (Pharoskc.com, 2023), are as follows: „sin of hidden trade, the sin of no evidence, the sin of vagueness, the sin of worshipping false labels, the sin of irrelevance, the sin of the lesser of two evils and the sin of fibbing“. Taking these data into account, it is visible that this topic is legally insufficiently defined, and that consumers are the target of misleading information. The seven sins of greenwashing serve as a guide not only for consumers but also for experts in marketing, public relations, communication specialists and everyone else who is part of the creation of the offer.

3.2. Green Fatigue – The Biggest Challenge for Green Transformation

This phenomenon is increasingly noticeable in modern society. Through constant calls for green action and respect for sustainable practices, it is easy to feel overwhelmed by information (Strother & Fazal, 2011). For this reason, it is essential to control the quality and frequency of green messages to avoid collective green fatigue. If worst-case scenarios, negative examples, frightening information and other communication shock factors are emphasized, the possibility of green fatigue and resistance increases (Tarabieh, 2021). Messages should be empowering and motivating to create a sense of excitement and involvement in addressing environmental crises. Taking into account the extremely fast-paced lifestyle, the great global economic and health uncertainty after the COVID-19 virus pandemic, the military uncertainty and the fear of nuclear conflicts caused by current wars and conflicts around the world, and other threats that directly affect the state of consciousness of consumers, as well as producers, it is easy to see that the pursuit of ecological improvement becomes a luxury of time and emotional capacity for many. According to Maslow’s hierarchy of needs, it is evident that solving the problems of the higher sphere can only take place if numerous other needs are satisfied.

4. RESEARCH METHODOLOGY

For the purposes of this research, focus groups and in-depth interviews were conducted. Both surveys were conducted in August 2023, using a deliberate sample. A total of 8 people participated in the focus group, 4 men and 4 women. Of these, 3 persons were between the ages of 24 and 30, 3 persons were between the ages of 30 and 36, 1 person was between the ages of 36 and 42, and one person was between the ages of 61 and 66. Furthermore, 2 people participated in the in-depth interview, marketing experts, and both are women aged 24 to 30.

4.1. Objectives and Research Questions

The goals of the work were to investigate the understanding of the current awareness of consumers, as well as experts, on the topic of greenwashing. Also, to investigate their attitude towards such campaigns, the level of personal responsibility and knowledge through the consumer process about the ways of launching and consuming information. Furthermore, the goal was to examine how consumers, as well as marketers, fight against greenwashing and similar unethical practices, and to examine the views on sanctions as a consequence of unethical business and communication. In order to determine the framework and conduct the research more credibly, it was necessary to ask research questions that would clearly express the meaning and answers that are

required from these researches. The research questions were as follows: how does public interest in green topics affect marketing manipulations? What is consumer awareness of greenwashing? How do marketers perceive the role of greenwashing in brand management?

4.2. Method and Sample

Qualitative methodology was used in the research, specifically focus group methods and in-depth interviews. These are methods that are used to conduct pilot research, and which enable research into the deeper context of a certain topic. Focused discussion and strictly structured questions following the set goals, the possibility of adaptation to the respondents, are just some of the advantages of these research methods (Wimmer & Dominick, 2011, pp. 132 - 140). In the focus group, the questions were divided into 3 parts: general attitudes, personal experience, consumer behavior and sanctions, while in an in-depth interview with experts, the questions examined the attitude towards greenwashing through the prism of current employment and profession. Both researches concluded with a better understanding of the participants' views and answers to the research questions. The structure of the in-depth interview was divided into three areas: representation of green messages - differentiating green marketing from greenwashing, eco-manipulation and influence on consumer perception, informed purchase and responsible business.

4.3. Discussion and research results

4.3.1. Focus Group

In the introductory part of the interview, the familiarity of the research participants with the term greenwashing was explored. Namely, all but participant number 3 declared that they were familiar with the term. When asked whether they check the accuracy of the claims on the packaging or in marketing communication, the research participants mostly answered in the affirmative. While the majority stated that they are generally skeptical of the information on the packaging, two focus group participants pointed out that they do not check the claims on the packaging at all.

„I sometimes check the claims on the packaging by reading the product declaration, and the claims from marketing communication rarely because I hardly follow advertisements and marketing materials.“ (Participant 7)

„Sometimes with more detailed research on the brand and ingredients.“ (Participant 2)

Examining the participants' awareness of greenwashing in the marketing campaigns they were in contact with showed that half of the participants noticed this phenomenon in marketing communication.

„For years, I thought that certain lines of antiperspirants were 'good' and harmless because they did not contain certain harmful chemicals, until I read that instead of harmful substances they contain even more toxic ones, e.g. Nivea, Dove, Rexona.“ (Participant 2)

„I noticed greenwashing in the communication on the electric car market.“ (Participant 3)

Several participants agreed that electric cars are marketed as an ecological alternative to cars with an internal combustion engine, although the storage processes of batteries and other types of

waste generated by electric vehicles, as well as the burden on the current electrical infrastructure, can have negative effects, have not yet been worked out. Furthermore, the participants of the focus group, inspired by one comment during the conversation, held a short discussion about the harmfulness, but also the prevalence of so-called fast fashion, and confirmed that they most often buy products from such brands themselves. On the other hand, the desire for greater availability of environmentally friendly or neutral brands in shopping centers was also expressed. In the continuation of the conversation, it was shown that the use of greenwashing methods in marketing communication can influence their perception of products or services, and finally the purchase decision.

„Using such methods has a bad effect on my perception of products and services because I feel like companies that use greenwashing want to deceive me and think that consumers are unintelligent.“ (Participant 1)

„It slightly irritates me, sometimes reduces the chance of me buying the product because they achieve a counter-effect.“ (Participant 7)

„I always, if I have the option, will take something that is ecologically acceptable, I think that as soon as we all see that a brand cares about ecology, it automatically becomes our favorite. That’s why many use greenwashing.“ (Participant 8)

With the loss of consumer trust, many brands feel a negative impact on business (Saeed et al., 2013), directly caused by bad and misleading communication (Di Domenico & Visentin, 2020). According to the participants, by investing resources in changing the business and creating better quality and environmentally friendly products instead of greenwashing marketing, the business would be rationalized. Furthermore, when asked how they would prefer companies to communicate their environmental initiatives to have more confidence in their claims, participants stated that trust is built through transparent, honest and clear communication based on evidence without half-assets.

„Transparency of business and clear communication of the production process, the origin of ingredients and the like.“ (Participant 2)

„Communicating your environmental initiatives through research and provable claims, internal striving to rationalize production, procurement and distribution processes as well as focusing on messages that resonate with consumers and communicate the true values and advantages of your brand.“ (Participant 6)

The survey showed that the majority of interview participants (as many as 5 out of 8) do not recognize certificates or marks of environmental responsibility that they consider reliable. These responses indicate the need for more education about labels and certifications among consumers. Previous research (Gomes et al., 2023; Laroche et al., 2001) showed that consumers are more willing to pay more for products or services that have passed strict environmental checks and are not subject to greenwashing, which was confirmed by half of the participants of our research, but with a note that the difference must be reasonable.

„I am willing to pay more for a product that I know has passed strict environmental checks, but I have to be absolutely sure of the promise that is being sold to me with the product.“ (Participant 8)

„I probably wouldn't, because in the end the most important thing is the quality of the product or service I get. I believe that with approximately the same costs it is possible to create an equally high-quality product or service ecologically.“ (Participant 6)

At the same time, other participants believed that such messages are an effective way of marketing communication and that they can achieve the desired effect on the market. Part of the group stated that they prefer products that pay special attention to ecological and socially responsible information on their packaging. The participants declared that fines are necessary for market regulation. They believe that fines are an appropriate response and a tool for sanctions because they motivate companies to think about placing untrue claims in the public. On the other hand, it was pointed out that the regulation and punishment systems are not up-to-date or strict enough, and that many gray areas are exploited.

„Financial penalties yes, withdrawal of the product until the packaging and the way of advertising are changed, which truly represent the product.“ (Participant 1)

„I don't believe that it is achievable in reality. A bad reputation is punishment enough.“ (Participant 7)

4.3.2. In-Depth Interviews

The second research aimed to examine the attitudes and awareness of marketing professionals within their current employment on the topic of greenwashing. Two participants, named „Participant A“ and „Participant B“, took part in this research using the in-depth interview method. One is currently employed by Philips, while the other is employed by Croatian Airlines. Concerning employment, both participants offer insight into their own experience within their industry, i.e. manufacturing technology and the aerospace industry. The discussion was opened by participant A, who immediately cited numerous greenwashing campaigns and attempts to mislead the public, and expressed a certain level of suspicion and distrust towards green-labeled products.

„All products today are advertised as eco, plastic free, vegan, green certificates... And in the end, these are empty stories. The last example I came across is H&M, which collects old clothes and recycles them for its customers, and in various online articles I find claims that these old clothes, or waste, are sold to third world countries where they accumulate in piles on local beaches and similar places.“ (Participant A)

„It associates me with false advertising of sustainability and care for the environment.“ (Participant B)

The topic of the level of use of green marketing in their industries - green sources of energy in air transport and new generations of vehicles - was also raised. The desire for electric cars is universally present in the world, while the means of air transport have not been affected by the electric revolution to such an extent, but also in this matter, a brighter and greener orientation is visible in marketing and communication strategies.

„Not in my own company, but in the aviation industry in general, I notice that marketing campaigns emphasize sustainability while fossil fuels are still primarily used.“ (Participant A)

„I did not notice greenwashing at my workplace.“ (Participant B)

Both participants confirmed that within their current employment, they strive towards environmental awareness and rationalization of the use of resources to achieve sustainability. The awareness of a high level of mistrust among consumers was also mentioned, which is one of the main reasons for the loss of loyalty and turning to the competition, which, of course, one tries to avoid.

„Greenwashing can certainly bring a positive effect at first, but as in everything, the truth always comes out, and in the end, any falsehood will bring more harm than good.“ (Participant A)

„I believe that there is already distrust on the part of consumers towards many brands that push veganism and sustainability. Many beauty brands use terms like vegan, ECO, sustainability, etc. just to increase sales.“ (Participant B)

During the discussion, the exceptional importance of critical thinking and questioning of the messages communicated as a basis for conscious shopping was highlighted. The goal of creating sales messages is precisely persuasion towards a purchase (Bové & Thill, 2012), and not necessarily informing, educating, or referring to the processes of creating and distributing products, and often only those messages that present the brand in a positive light are emphasized.

„Most often when “clean” messages are very loud (we see them in visuals, slogans,... almost all components of the marketing campaign) I notice that there is often just an empty story behind them. Brands that really behave in accordance with ecological principles do so for reasons other than clickbait.“ (Participant A)

„Many companies falsely present sustainable and environmentally friendly products, when in fact they consume a lot of water or endanger nature during the production of that product, but they will not highlight this on the market. Of course, this is not in practice, but excessive presentation of false information about the product due to its positive impact on the market can also bring negative consequences to the company.“ (Participant B)

The participants pointed out that marketing campaigns, although they have their own specific life cycle, in creating a brand image last forever. In other words, it is important to look at the bigger picture and create content that has long-term benefits. For this reason, the use of greenwashing as a method of communication is avoided by both participants.

„I believe that there are better strategies than misleading consumers when it comes to the success of marketing campaigns. My view is that it can only be justified if the fact that the product is environmentally friendly enhances its effectiveness.“ (Participant A)

„I believe that in general green marketing should be used cautiously and justified. If there is a way and possibility to connect the product with sustainability and ECO then that method makes sense. I believe that customers recognize fraudulently presented products. Each claim needs to be supported by research evidence.“ (Participant B)

The research participants emphasize the importance of recognizing the role of various institutions, but also the personal responsibility of each member of society in achieving a balance

between the desire for profit and the preservation of the environment. The importance of education in the workplace was also emphasized. The participants recognized their professional role in creating marketing content while emphasizing the importance of continuously checking the credibility of information, following trends, and also following a personal moral compass.

„Checking information and its sources before they become available to the general public, consulting with experts in the field of work, but also using their own moral/ethical judgment.“
(Participant A)

„In such a way that I do not endanger others with my work, I consciously and responsibly respect the rules of society, take care of the environment and cultural diversity.“ (Participant B)

Furthermore, they stated that the Internet as an information base is full of incorrect information and that it is important to check information multiple times so that we do not unknowingly participate in the creation of untrue content.

„Detailed verification of information, market research, trend monitoring and the like.“
(Participant A)

„I would advise thorough research on the relationship between the product and the customer or y product with x product in order to really state the correct communication and facts about the product. If they want to promote products with the help of influencers who deal with these topics, they should carefully choose which influencer they should work with and whether he meets their standards and needs.“ (Participant B)

The development of green marketing in the future is perceived very positively by the interview participants. They believe that the customer, who will be increasingly informed, will have the main say. Nevertheless, participant B believes that many companies will find a way to make an additional profit based on the ecological (lack of) awareness of consumers. The fact that these are two separate problems was highlighted and the ecological revolution will certainly have negative segments, but it is necessary to implement it in the way of doing business, consumption and life.

„I believe that in the near future, stricter rules and standards will be imposed, and there may not be as much need for greenwashing, because the majority of brands will act according to ecologically acceptable principles. I'm optimistic to the end!“ (Participant A)

„I believe that greenwashing will develop even more because the young generation likes sustainability and such products. Today's customer is informed, but it is possible to deceive him in very cunning but also simple ways, for example at today's festivals it is possible to rent special plastic cups that can be kept.“ (Participant B)

5. CONCLUSION

Greenwashing is a deep-rooted problem that is universally present in almost all industries and our everyday lives. Greenwashing is recognized by its features, but with its development and the emergence of new trends in greenwashing, navigating the forest of marketing messages becomes increasingly difficult, and recognizing and not supporting immoral companies or initiatives is almost impossible. As a global problem that adversely affects many spheres of life,

markets and the general state of consciousness of the population, it is important to act and call out negative actions to regulate market standards. It is recognized the need to create consistent regulations and further define the rules when it comes to creating sales and marketing content, as well as increasing the level of responsibility of companies for launching untrue or incomplete information on the market. Education on this topic and other topics that pass under the radar of the public is extremely important in creating and forming a population that makes informed and conscientious purchasing decisions, decisions on the use of Earth's resources and decisions on waste management. In conclusion, the fight against greenwashing must be the systematic action of all involved in the process of communication, production, distribution and consumption, starting with governments, companies, regulatory bodies, non-governmental and non-profit organizations of civil society, the private sector, the media, educational institutions, the consumer market and all other actors in order to properly address this ubiquitous and complex problem. Recognizing and preventing greenwashing are indispensable steps towards real sustainability and a new era of environmental awareness.


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Sustainability Index and Corporate Performance: A Study of the FTSE4Good IBEX

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Received: January 15, 2024
Accepted: May 6, 2024
Published: August 6, 2024

Keywords:

ESG Practices;
Financial performance;
Sustainability index



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Abstract: *In response to the evolution of global paradigms, contemporary companies have moved beyond the exclusive pursuit of traditional financial metrics, embracing environmental, social, and governance (ESG) considerations as fundamental components of their strategic agendas. This study delves into ESG's influence on financial performance among Spanish companies listed on the FTSE4Good IBEX versus the IBEX 35 from 2015 to 2022. Surprisingly, sustainability index inclusion doesn't guarantee superior financial outcomes; IBEX 35 firms showcase stronger liquidity, solvency, return on assets, and investment compared to FTSE4Good counterparts. Return on equity and financial leverage, however, display no significant divergence between the groups, adding intricacy to the ESG-finance correlation. The findings emphasize addressing financial hurdles for ESG-centric entities and challenge the FTSE4Good IBEX's comprehensive reflection of ESG practices. Continuous exploration of factors shaping the relationship between ESG and financial results remains imperative for comprehensive insights.*

1. INTRODUCTION

In recent decades, the business landscape has undergone a fundamental transformation in how companies measure and assess performance. Beyond traditional financial indicators, there has emerged a more comprehensive and integrative approach encompassing environmental, social, and governance (ESG) factors. Companies are no longer solely judged based on their profits and losses but also on their commitment to sustainability and corporate responsibility.

ESG activities have become an essential component of business strategy in a world where ethics, sustainability, and social responsibility are key factors for organizational success and longevity (Brooks & Oikonomou, 2018; Coluccia et al., 2018; Durand et al., 2019). Firms consistently adopting ESG practices can benefit from an enhanced reputation, stronger stakeholder relationships, and a competitive edge in the market (Kim et al., 2018).

The significance of ESG criteria is also reflected in financial markets, with a growing emphasis on sustainable investments (Friede et al., 2015). According to the Global Sustainable Investment Alliance (GSIA, 2020), in major global financial markets at the beginning of 2020, socially responsible investments (SRI) reached a value of \$35.3 trillion, representing 36% of total institutional investment in the United States, Canada, Japan, Australia, and Europe, with a 15% growth in two years. In the Spanish financial market, sustainable assets accounted for 51% of total investments in 2021, a 10% increase from the previous year (Spainsif, 2022).

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Sustainability indices play a vital role in this context. They provide a framework for evaluating and comparing companies' ESG performance, allowing investors and businesses to measure their commitment to sustainability and corporate responsibility, potentially influencing investment decisions (Durand et al., 2019). Some of the most prominent and recognized sustainability indices globally include the Dow Jones Sustainability Index (DJSI), the FTSE4Good Index Series, the MSCI ESG Indexes, and the S&P 500 ESG Index.

Interest in these indices and SRI, in general, has fueled extensive academic production focused on exploring the relationship between ESG activities and the financial performance (FP) of companies (Friede et al., 2015). Although the majority of these works establish a positive relationship between ESG and FP, many studies present ambiguous results, lack definitive conclusions, or show negative relationships (Brooks & Oikonomou, 2018; Revelli & Viviani, 2015). A recent study conducted by Whelan et al. (2021) centered on meta-analyzing over 1,000 empirical works studying the relationship between ESG and FP from 2015 to 2020. According to the results, among studies measuring FP using indicators like ROE, ROA, or stock prices, 58% found a positive relationship with ESG performance, 13% a neutral impact, 8% a negative relationship, and 21% yielded mixed results, indicating that a single study observed both positive, neutral, and negative outcomes. Moreover, among works analyzing FP through risk-related variables like alpha or the Sharpe ratio in a stock portfolio, 33% showed better performance compared to conventional investment approaches, 26% similar performance, 28% mixed results, and only 14% found negative returns.

This paper follows a structured approach, beginning with a theoretical framework, objectives, research methodology, and the presentation and discussion of findings. Finally, concluding remarks encapsulate key insights gleaned from the study.

2. LITERATURE REVIEW

The relationship between ESG performance and the financial performance of companies has been extensively studied in literature. Although results are inconclusive, most studies suggest that effective management of ESG factors positively influences financial performance. It is believed that strong ESG performance helps reduce legal risks, improves corporate management, enhances brand reputation, attracts and retains skilled employees, leading to increased financial returns.

Orlitzky et al. (2003) conducted a meta-analysis of 52 studies comprising 33,878 observations, concluding a positive relationship between ESG and financial performance, highlighting that how variables are measured may moderate this relationship. Busch and Friede (2018) further delved into the ESG-FP relationship based on 25 meta-analyses and over 1,000,000 observations, finding significant, positive, and robust results supporting a bidirectional relationship between ESG and FP, particularly when FP is measured through operational performance.

However, some researchers argue that ESG only represents a cost for the company without offering real benefits, consequently decreasing profitability (Kim & Lyon, 2015). García and Orsato (2020) study a sample of companies from emerging and developed countries and find a negative relationship between ESG and FP, whether FP is measured using market or accounting indicators.

There are also studies indicating a non-significant or mixed relationship between ESG activities and financial performance. Nelling and Webb (2009) found a very weak relationship between both variables, suggesting that higher FP drives investments in ESG but ESG activities do not

contribute to increased FP. Han et al. (2016) analyzed the relationship between the three dimensions of ESG and FP, discovering that good governance performance increases FP, environmental performance reduces it, and social performance is unrelated.

Regarding specific studies comparing the relationship between ESG performance and FP of companies listed in sustainable indices versus traditional ones, there are mixed results. Charlo et al. (2015), focusing on companies listed in the FTSE4Good IBEX, concluded that Spanish sustainability index companies exhibit superior profitability for the same systematic risk level and are more sensitive to market changes. Lassala et al. (2017) analyzed companies in both FTSE4Good IBEX and solely IBEX and found that good ESG performance facilitates access to funding, reduces costs significantly, and has a substantial impact on ROE, provided the company maintains a certain ROA, indicating efficient asset utilization.

Santis et al. (2016) compared the performance between companies belonging to IBOVESPA (Sao Paulo Stock Exchange index), ISE (sustainability corporate index), and both groups, finding no differences between companies except for the general liquidity ratio, which they attributed to sustainable companies being more focused on the long term. The study suggests that sector characteristics have a greater impact on companies' economic and financial performance.

Given the growing interest in sustainability and corporate responsibility in financial markets, the aim of this study is to investigate the effect of ESG activities on the financial performance of companies listed on the Spanish sustainability index (FTSE4Good IBEX) between 2015 and 2022, compared to companies listed on the traditional IBEX 35 index. Considering the ambiguity and variations in previous findings, this research seeks to shed light on how ESG activities and listing on a sustainability index may influence the financial performance of companies in the Spanish market, providing valuable insights for decision-making purposes for both investors and companies aiming to balance their financial objectives with their commitment to superior environmental, social, and governance practices.

3. METHODOLOGY AND DATA

To examine the impact of ESG practices on Financial Performance, a comparative descriptive analysis of the financial performance of Spanish companies included in the FTSE4Good IBEX index (22 companies) and the IBEX 35 (16 companies) was conducted during the period from 2015 to 2022. Table 1 presents the companies forming part of the sample for this study. Companies from the financial and insurance sectors are excluded due to different accounting regulations, which hinder the comparison of financial statements with those of companies in other sectors (Nirino et al., 2021).

Table 1. Components of the IBEX 35 and FTSE4Good IBEX

IBEX 35	FTSE4Good IBEX
Abertis (ABE), Acerinox (ACX), Aena (AENA), Endesa (ELE), Grifols (GFR), Merlin Properties (MRL), Técnicas Reunidas (TRE), Jazztel (JAZ), Viscofan (VIS), Inmobiliaria Colonial (COL), Ence Energía (ENC), Masmovil (MAS), Almirall (ALM), Pharma Mar (PHM), Solaria Energía (SLR), Laboratorios Rovi (ROVI)	Abengoa (ABG), ACS Actividades Construcciones y servicios (ACS), Applus Services (APPS), Codere (CDR), Construcciones y Auxiliar de Ferrocarriles (CAF), Deoleo (OLE), Dia (DIA), Ebro Foods (EBRO), Ence Energía (ENC), Euskaltel (EKT), Fluidra (FDR), Fomento de Construcciones y Contratas (FCC), Gestamp Automocion (GEST), Lar España Real Estate (LRE), Logista (LOG), Mediaset España (TL5), Meliá (MEL), NH Hotel Group (NHH), Obrascon Huarte Lain (OHL), Promotora de Informaciones (PRS), Prosegur (PSG), Sacyr (SCYR)

Source: Own elaboration

From the financial statements of the companies obtained from the National Securities Market Commission and the companies' websites, various financial ratios were calculated. According to López et al. (2007), these ratios are more reliable and more accurately reflect the company's situation than market indicators. The ratios analyzed in this study, summarized in Table 2, are widely recognized and used in academic and professional fields to gain a comprehensive understanding of companies' financial situations and performance. They are categorized into three principal groups: liquidity, solvency, and profitability.

Liquidity measures a company's ability to convert its current assets into cash to cover its short-term debts. High liquidity suggests that the company can meet its financial obligations without issues. Solvency indicates a company's ability to meet its long-term obligations using all its assets. This indicator is valuable in assessing how debt affects asset management (Pertwi Lolo & Yuliandhari, 2020).

Return on Assets (ROA) is a key indicator that evaluates a company's effectiveness in utilizing its assets to generate profits. It is calculated as the ratio between net income and total assets. A high ROA indicates that the company is generating good returns with its assets. Return on Equity (ROE) is an essential measure that assesses how efficiently a company uses its equity to generate profits. It is calculated as the ratio between the company's net income and its equity. A high ROE indicates that the company is providing a solid return for its shareholders compared to the capital investment. Return on Investment (ROI) is another valuable indicator that measures the profits generated with total investments made. It is a widely used ratio to evaluate companies' profitability (Vergíu & Bendezú, 2007).

Lastly, financial leverage is related to the use of external financing or debt to invest in assets and maximize profits. This approach is based on the idea that incorporating additional financial resources can enhance a company's returns and profits, although this indebtedness also entails increased associated risk. When this indicator is greater than 1, it denotes that the return generated through financial debt investment surpasses the interest accrued by it, ultimately leading to increased financial profitability. If the indicator is below 1, it implies that the interest generated by the debt surpasses the return obtained from the same investment, suggesting the need for debt restructuring to balance the ratio and bring it to 1.

Table 2. Analyzed Variables

Variable	Description
Liquidity (LIQ)	Current Assets/Current Liabilities
Solvency (SOLV)	Total Assets/(Current Liabilities + Non-current Liabilities)
Return on Assets (ROA)	Earnings Before Interest and Taxes (EBIT) / Total Assets
Returns on Equity (ROE)	Net Income/Equity
Return on Investment (ROI)	Net Income/Non-current Assets
Financial Leverage (FL)	Assets / Equity x Earnings Before Taxes / EBIT

Source: Own elaboration

For the statistical analysis of the mentioned variables, SPSS 28.0 software was utilized. Prior to hypothesis testing, a normality test (Kolmogorov-Smirnov) was conducted to assess data distribution. However, since the data did not follow a normal distribution, non-parametric inference was chosen. Specifically, to determine if there were significant differences between the financial indicators of companies listed on the FTSE4Good and the IBEX 35, the Mann-Whitney U test was employed. This statistical approach enabled the derivation of robust and significant results for the research.

4. RESULTS AND DISCUSSION

Below, in Table 3, descriptive statistics (mean, median, and standard deviation) of the calculated accounting indicators for companies belonging to the IBEX 35 and the FTSE4Good IBEX are presented. The table also indicates the median difference for each ratio, along with the statistical significance of these differences.

Table 3. Descriptive Statistics and Mann-Whitney U Test

	FTSE4Good IBEX			IBEX 35			Difference Stockings
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	U
Liquidity	1,2027	1,1192	0,626	1,8272	1,547	1,0521	0,4278**
Solvency	1,2581	1,2144	0,4626	1,7092	1,582	0,4828	0,3676***
ROA	0,0449	0,0418	0,1286	0,0872	0,055	0,0897	0,0132***
ROI	0,0043	0,0356	0,4671	0,1841	0,070	0,3233	0,0344***
ROE	-0,0467	0,1094	1,8404	0,1619	0,151	0,2210	0,0416
Financial Leverage	-0,468	2,5788	77,1203	4,2024	1,921	13,7556	-0,6578

Note: ** $p < 0,05$; *** $p < 0,01$.

Source: Own elaboration

The results of the liquidity analysis reveal statistically significant differences between companies comprising the IBEX and those in the FTSE4Good IBEX. While both groups exhibit adequate liquidity levels, IBEX 35 companies enjoy a more favorable position in meeting their short-term obligations compared to companies in the sustainability index.

Concerning solvency, there are also statistically significant differences identified between companies listed in the sustainability index and the traditional index. Upon examining the mean values of this indicator, IBEX 35 companies demonstrate 36% more solvency than those in the FTSE4Good IBEX. These findings contrast with previous studies by [Santis et al. \(2016\)](#) and [DiSegni et al. \(2015\)](#), who observed that sustainable companies displayed better solvency justified by a long-term management focus. Several explanations might influence this result. On one hand, it is plausible that IBEX 35 companies allocate less toward environmental, social, and governance aspects, potentially providing them with increased short-term cash availability and hence, improved solvency. Additionally, investor-perceived risk plays a significant role. If investors perceive that companies excelling in ESG standards pose higher financial risk due to more rigorous environmental, social, and governance standards, they might favor companies with less stringent criteria, potentially boosting the solvency of the latter.

Regarding profitability, the results indicate that Return on Assets (ROA) for IBEX 35 companies is significantly higher than that of companies included in the FTSE4Good IBEX. Upon analyzing the ROI, it's also noted that IBEX 35 companies achieve a significantly greater return on investment compared to those in the FTSE4Good IBEX. This implies that substantial investment in ESG-related initiatives might correlate with reduced profitability, suggesting the possibility that additional costs associated with ESG activities, as proposed by [Madaleno and Vieira \(2020\)](#), could negatively impact the economic profitability of companies emphasizing these practices. In line with agency theory, [Buchanan et al. \(2018\)](#) suggest that at times, managers might channel company resources toward ESG projects that do not substantially benefit shareholders, potentially diminishing business profitability and, ultimately, shareholders' interests.

Moreover, no significant differences in profits generated by companies from both groups concerning their equity are observed in the results. Certain studies, such as those conducted by

Charlo et al. (2015) and Curran and Moran (2007), imply that being part of a sustainable development index, at least within the Spanish context, does not seem to substantially impact financial profitability measured by ROE. However, it is important to highlight that, as displayed in Table 3, companies forming part of the IBEX35 present a median of this indicator that is 50% higher than that of companies included in the FTSE4Good IBEX.

Finally, the results also do not indicate significant differences between the financial leverage of IBEX 35 companies and the FTSE4Good IBEX. However, as observed in Table 3, companies in the FTSE4Good IBEX exhibit a lower value for this ratio. According to the data, IBEX 35 companies generate profits that exceed the interest associated with their debt, suggesting that financial leverage functions beneficially by increasing shareholders' profitability in these companies. In contrast, companies in the FTSE4Good IBEX show profitability lower than the cost of debt, indicating that financial leverage may be less advantageous in this scenario.

5. CONCLUSION

This study analyzed the financial performance of companies listed in the FTSE4Good IBEX and IBEX 35 indices during the period from 2015 to 2022. The results highlight that inclusion in the sustainability index does not guarantee better financial performance compared to companies that are not part of it.

The analysis reveals that IBEX 35 companies stand out in terms of liquidity and solvency, contrasting with previous evidence from studies on sustainability indices (DiSegni et al., 2015; Santis et al., 2016). It is likely that, in the Spanish context, companies with higher ESG performance face additional challenges in their short and long-term financial obligations. Additionally, the results show that IBEX 35 companies are the most profitable in terms of ROA and ROI, although no significant differences are observed in terms of Return on Equity (ROE) compared to FTSE4Good IBEX companies.

However, it is important to note that inclusion in the FTSE4Good IBEX does not fully reflect the ESG practices that companies may be implementing in their daily operations (Han et al., 2016). This aspect is particularly relevant since companies included in the IBEX 35 are also actively engaged in ESG activities. Therefore, it is necessary to recognize that IBEX 35 companies might be undertaking a wide variety of ESG initiatives, even if their ESG ratings do not fully capture the breadth and impact of these actions. This potential discrepancy between ESG scores that do not allow them to be included in the sustainability index and the specific actions they actually implement in this area could significantly influence the results observed in our study.

Furthermore, it is essential to underline that financial analysis and ESG performance assessment are complex and multifaceted processes. The results presented in this study offer a snapshot of a specific period and may be influenced by various factors affecting companies and their performances. These factors can be both external, such as the level of competition or the economic cycle, and internal, including aspects like management quality and business strategy. Therefore, it is essential to further explore these factors to obtain a more comprehensive understanding of the relationship between ESG performance and the financial performance of companies.

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Eco-Metals Unveiled: A Deep Dive into Commodity Resilience

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Received: November 11, 2023

Accepted: March 15, 2024

Published: August 6, 2024

Keywords:

Events of 2020 and 2022;

Energy metals;

Persistence;

Arbitrage



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Abstract: *The drive for sustainability and carbon emissions reduction is fueling the demand for clean energy solutions, with energy metals playing a crucial role in this transition. The environmental and ethical implications of mining and supplying these materials impact market dynamics, influenced by environmental regulations and consumer preferences for sustainable sources. This article aims to analyze the persistence of commodities, including gold (XAU), silver (XAG), platinum (XPT), aluminum (MAL3), nickel futures (NICKELc1), and copper futures (HGU3), from July 13, 2018, to July 11, 2023. The study divides the sample into four sub-periods: tranquil, COVID-19 pandemic, pre-conflict, and conflict (Russian invasion of Ukraine). Results indicate varying behaviors, with some commodities showing anti-persistence, suggesting distinct patterns, while others exhibit efficiency or random walk behavior. Understanding these patterns and market efficiency is valuable for informed investment strategies and risk management amid evolving global economic conditions.*

1. INTRODUCTION

The Efficient Market Hypothesis (EMH) is a foundational concept in finance that posits that security prices reflect their intrinsic values, with all available information swiftly incorporated into these prices. This implies equal access to information among market participants, eliminating any informational advantages one investor may hold over others. The EMH is a pivotal concept in finance and holds significant implications for the functioning of financial markets (Fama, 1965, 1970, 1991; Fama & French, 1988).

The global popularity of environmentally friendly investments is on the rise due to growing concerns about the long-term viability of the planet and a desire among individuals to allocate their assets toward companies that prioritize sustainable operations. The clean energy business, encompassing renewable sources such as solar, wind, hydropower, geothermal, and biomass, is widely recognized as a prominent and swiftly expanding investment sector (Dutta et al., 2020).

Financial and commodity markets are the primary attractions for investors, but they are highly sensitive to external crises, such as financial and health crises. An example is the overwhelming drop in asset prices traded in most of these markets during the COVID-19 pandemic. The pandemic heightened market fear beyond what is historically known, thus demanding an empirical assessment of its degree of persistence. Studying the behavior of commodities such as silver (XAG), platinum (XPT), aluminum (MAL3), nickel futures (NICKELc1),

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copper futures (HGU3), and gold (XAU) is relevant in the context of sustainable energies for several reasons. Silver, platinum, and nickel are key components in the manufacturing of photovoltaic cells used in solar panels. Copper is a critical material in electrical wiring, making it vital for electricity distribution in renewable energy systems. Nickel and aluminum are essential for battery production, including lithium-ion batteries used in electric vehicles and energy storage systems. Understanding the supply and demand dynamics of these products is crucial for evaluating the feasibility and cost-effectiveness of energy storage solutions (Dias, Alexandre, et al., 2023; Dias, Chambino, Teixeira, et al., 2023; Dias, Horta & Chambino, 2023; Dias, Teixeira, et al., 2023).

This article endeavors to scrutinize the persistence dynamics of commodities, including gold (XAU), silver (XAG), platinum (XPT), aluminum (MAL3), nickel futures (NICKELc1), and copper futures (HGU3), spanning the period from July 13, 2018, to July 11, 2023. The investigation into the persistence of energy markets, particularly during the turbulent times of the 2020 pandemic and the Russian invasion of Ukraine in 2022, assumes paramount significance for several reasons. These occurrences marked substantial upheavals in the global economy and the markets for energy metals. Delving into the persistence of market behavior during these crises is instrumental in gauging the level of investment risk within the energy sector. Investors and enterprises can harness this understanding to make well-informed decisions and enhance the management of their portfolios. In essence, exploring the persistence of energy markets amid the unprecedented events of the 2020 pandemic and the Russian invasion of Ukraine is imperative for a comprehensive understanding of how these markets respond to significant disruptions. The insights gained from such an analysis hold immense value for a diverse range of stakeholders, from investors seeking strategic investment decisions to policymakers shaping the regulatory landscape. This collective knowledge contributes to fortifying the resilience of the energy market and fostering a more informed and adaptive approach to navigating future challenges.

The following sections of this study are divided into four divisions. Section 2 is a thorough examination of the existing literature on persistence in commodity markets. Section 3 describes the data presentation and methods used. Section 4 then takes on the twin responsibility of presenting and analyzing the results of the study's analysis. Section 5 highlights future research directions. Lastly, Section 6 summarizes the study's findings and brings the discussion to a close.

2. LITERATURE REVIEW

Market efficiency leads to the discovery of transparent and fair prices in commodity markets, thereby enhancing the value chain for competitive advantage. Wang and Jia (2019) investigated the persistence in daily returns of futures and spot markets for basic metals like copper, aluminum, and zinc. Their findings reveal long-range power-law cross-correlations and multifractal characteristics within and between the two systems. The multifractal strengths of autocorrelations and cross-correlations for the spot system and its components exceed those of the futures system and its corresponding components. Additionally, Mokni and Youssef (2020) explored persistence to ascertain whether the effect of crude oil prices on agricultural commodity markets is immediate or delayed. Utilizing daily data spanning 2003–2017, results indicate that the delayed effect of crude oil prices on agricultural commodity prices is less than the immediate effect. Furthermore, dependence is strongly persistent and more affected by the food crisis than the oil crisis.

The authors, [Memon et al. \(2022\)](#) examined persistence across four energy markets (crude oil, Brent, gasoline, and natural gas), five agricultural markets (corn, wheat, soybeans, cocoa, and coffee), and three metal markets (gold, silver, and copper). Beyond the complete sample, the analysis considered two critical sub-periods: the 2008 financial crisis and the 2020 global pandemic. Results indicate strong multifractal patterns and resulting inefficiency to varying degrees in commodity markets, highlighting higher inefficiency in the copper market, followed by the silver market. Energy markets continue to be more efficient compared to the other two groups. Additionally, the results confirm that crisis events significantly impact the efficiency of commodity markets and exhibit persistent behavior in returns. In complementarity, [Adekoya and Oliyide \(2022\)](#) show that analyzed markets displayed mean reversion before the COVID-19 pandemic, implying that shock effects are transitory. However, persistence is higher during the pandemic period, with indexes of the gold market (GVZ), the energy sector (VXXLE), and the euro currency market (EVZ) reaching highly pronounced (in)efficiency ratios. [Wang et al. \(2022\)](#) jointly studied the efficiency and connectivity of commodity markets, examining this issue at the nexus of energy, industrial metals, and financial markets. Results indicate that efficient markets process more information and are more connected. Moreover, efficient markets act as net information transmitters to less efficient markets. A stronger connection does not necessarily exist within the same market sector but emerges between efficient markets regardless of their sector categorization. The relationship between market efficiency and connectivity is more pronounced during extreme events.

In more recent studies, [Erer et al. \(2023\)](#) examined the efficiency of Turkey's main stock index and eight sectoral indexes, including industrial, financial, service, information technology, basic metals, tourism, real estate investment, and chemical plastic, during the COVID-19 outbreak and global financial crisis (GFC). Results show that all sectoral returns had higher persistence during the COVID-19 outbreak than during the GFC. Additionally, the authors also highlight that the real estate and information technology sectors had the lowest efficiency levels during the 2008 financial crisis and the 2020 pandemic outbreak. In complementary research, [Dias, Horta & Chambino, 2023](#) examined the multifractal scale behavior and efficiency of green financial markets, as well as traditional markets like gold, crude oil, and natural gas, between January 1, 2018, and March 9, 2023. Empirical results showed signs of (in)efficiency in the return time series. Additionally, there is a negative autocorrelation between the crude oil market and Clean Energy Fuels, clean energy global indexes, the gold market, and the natural gas market.

Studying the persistence of energy metal markets, especially in light of the events in 2020 and 2022, is indeed relevant and crucial. The energy metal market encompasses minerals and elements essential to producing renewable energy technologies and energy storage solutions. These metals play a vital role in transitioning to a more sustainable and low-carbon energy system. Advances in renewable energy technologies, such as solar panels, wind turbines, and electric vehicles, are directly linked to the demand for energy metals like copper, aluminum, silver, nickel, and rare earth elements. As technology evolves, so do the requirements for these materials. Given this sustainable shift, it becomes pertinent to effectively study the market persistence of energy metals, stay informed about these factors, and conduct continuous research and analysis. This can assist businesses, policymakers, and investors in making informed decisions in a highly important and rapidly evolving sector.

3. METHODOLOGY

3.1. Data

The data utilized in this study comprises the price indexes of commodities gold (XAU), silver (XAG), platinum (XPT), aluminum (MAL3), nickel futures (NICKELc1), and copper futures (HGU3), spanning from July 13, 2018, to July 11, 2023, sourced from the Thomson Reuters Eikon database. All prices under examination are quoted in U.S. dollars to mitigate exchange rate distortions, ensuring a consistent comparison across diverse assets and indexes. The sample period is partitioned into four sub-periods: the first is termed Tranquil, encompassing the years from July 2018 to December 2019; the second is referred to as the COVID-19 Pandemic, covering January 2020 to December 2020; the third is denoted as Pre-Conflict, spanning January 2021 to February 23, 2022; and finally, the fourth and last sub-period encompasses the years from February 24, 2022, to July 11, 2023.

3.2. Methods

This investigation unfolds in distinct phases. Initially, for sample characterization, we will employ key measures of descriptive statistics and the [Jarque and Bera \(1980\)](#) adherence test, which assumes data normality. To validate the assumption of time series stationarity, we will utilize the [Dickey and Fuller \(1981\)](#) test with Fisher Chi-square transformation [Choi \(2001\)](#). This test statistic follows a chi-square distribution, and its significance level is employed to determine the presence of a unit root. Additionally, the Choi Z-stat version of the ADF test is an alternative approach that computes the test statistic based on the maximum likelihood estimate of the autoregressive model. Addressing the research question, we will employ the Detrended Fluctuation Analysis (DFA) model. DFA is an analytical method that explores temporal dependence in non-stationary data series. By assuming that time series are non-stationary, this technique avoids spurious results when analyzing data series relationships over the long term. DFA's interpretation is as follows: $0 < \alpha < 0.5$ indicates an anti-persistent series; $\alpha = 0.5$ suggests a random walk series; $0.5 < \alpha < 1$ indicates a persistent series. The purpose of this technique is to examine the relationship between values x_k and x_{k+t} at different moments ([Guedes et al., 2022](#); [Zebende et al., 2022](#)).

4. EMPIRICAL RESULTS AND DISCUSSION

Figure 1 depicts the evolution of daily returns for commodities gold (XAU), silver (XAG), platinum (XPT), aluminum (MAL3), nickel futures (NICKELc1), and copper futures (HGU3) from July 13, 2018, to July 11, 2023. Through visual inspection, the return mean suggests some stability, with values close to zero. However, the data exhibit significant variations, highlighting the volatility to which these markets were subject, particularly in the early months of 2020, coinciding with the impact of the COVID-19 pandemic on the global economy, as well as in the initial months of 2022, associated with the event of the Russian invasion of Ukraine.

Table 1 provides a summary of key descriptive statistics for daily returns of the time series related to commodities gold (XAU), silver (XAG), platinum (XPT), aluminum (MAL3), nickel futures (NICKELc1), and copper futures (HGU3) from July 13, 2018, to July 11, 2023. The mean returns are positive, with MNKC1 (0.024283) exhibiting the highest standard deviation. Skewness values are mostly negative, except for MNKC1 (8.135917). Additionally, we observe that all stock indices present kurtosis values exceeding 3, with MNKC1 (185.9311) being particularly notable. To

corroborate these findings, the [Jarque and Bera \(1980\)](#) test also indicates the rejection of the null hypothesis (H_0) for all analyzed commodities, suggesting non-Gaussian distributions.

In order to validate the stationarity assumption concerning commodities gold (XAU), silver (XAG), platinum (XPT), aluminum (MAL3), nickel futures (NICKELc1), and copper futures (HGU3) from July 13, 2018, to July 11, 2023, we applied the panel unit root test of [Dickey and Fuller \(1981\)](#) - Fisher Chi-square and Choi Z-stat. The results indicate that the time series exhibits unit roots when estimating the original price series. To achieve stationarity, a logarithmic transformation was applied to the first differences, highlighting the rejection of the null hypothesis in the [Dickey and Fuller \(1981\)](#) - Fisher Chi-square and Choi Z-stat tests (see [Table 2](#)).

In [Table 3](#), we present the results of the Detrended Fluctuation Analysis (DFA) exponent for precious metals (gold, silver, and platinum) and energy metals (aluminum, nickel futures, and copper futures) during the tranquil and COVID-19 outbreak periods. In the tranquil period, XAU (0.48), XAG (0.47), MAL3 (0.43), and HGU3 (0.47) exhibit anti-persistent slopes, while XPT (0.52) and NICKELc1 (0.54) demonstrate persistence, suggesting potential above-average gains without additional risk. During the COVID-19 pandemic, XPT (0.60), XAG (0.57), HGU3 (0.57), XAU (0.52), and HGU3 (0.57) showed pronounced persistence. However, NICKELc1 and MAL3 display signs of efficiency, indicating that market information is adjusted, limiting arbitrage strategies.

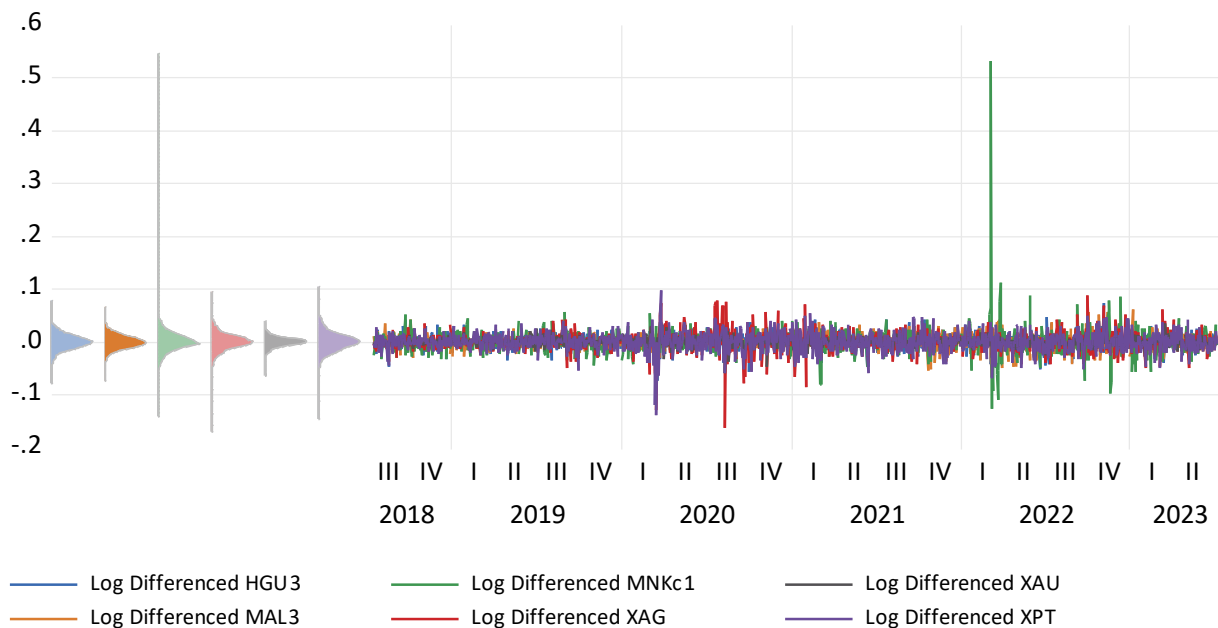


Figure 1. Evolution, in daily returns, of metal markets, from July 13, 2018, to July 11, 2023

Source: Own elaboration (software: Eviews12)

Table 1. Summary table of key statistics for energy metals from July 13, 2018, to July 11, 2023

	HGU3	MAL3	MNKc1	XAG	XAU	XPT
Mean	0.000242	5.46E-05	0.000491	0.000303	0.000351	8.94E-05
Std. Dev.	0.014330	0.013571	0.024283	0.018690	0.009164	0.018104
Skewness	-0.182271	-0.042690	8.135917	-0.582112	-0.430383	-0.570660
Kurtosis	4.602964	5.078401	185.9311	11.71614	6.273462	8.079954
Jarque-Bera	141.8751	227.1697	1770749.	4059.640	601.4647	1423.198
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	1260	1260	1260	1260	1260	1260

Source: Own elaboration (software: Eviews12)

Table 2. Summary table of stationarity tests for energy metals, covering the period from July 13, 2018, to July 11, 2023

Null Hypothesis: Unit root (individual unit root process)				
Method		Statistic	Prob.*	
ADF - Fisher Chi-square		1580.34	0.0000	
ADF - Choi Z-stat		-39.1918	0.0000	
Intermediate ADF test results				
Series	Prob.	Lag	Max Lag	Obs.
HGU3	0.0000	0	22	1258
MAL3	0.0000	0	22	1258
NICKELc1	0.0000	3	22	1255
XAG	0.0000	0	22	1258
XAU	0.0000	0	22	1258
XPT	0.0000	0	22	1258

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

Source: Own elaboration (software: Eviews12)

Table 3. Summary table of DFA exponents for energy metals during the Tranquil and COVID-19 outbreak periods

Markets	DFA Exponent (Tranquil)	DFA Exponent (COVID-19)
XAU	0.48** \cong 0.0044 ($R^2 = 0.99$)	0.52** \cong 0.0025 ($R^2 = 0.94$)
XAG	0.47** \cong 0.0037 ($R^2 = 0.99$)	0.57** \cong 0.0035 ($R^2 = 0.94$)
XPT	0.52** \cong 0.0061 ($R^2 = 0.99$)	0.60** \cong 0.0055 ($R^2 = 0.94$)
MAL3	0.43** \cong 0.0018 ($R^2 = 0.99$)	0.50 \cong 0.0128 ($R^2 = 0.94$)
NICKELc1	0.54** \cong 0.0025 ($R^2 = 0.99$)	0.49 \cong 0.0291 ($R^2 = 0.94$)
HGU3	0.47** \cong 0.0013 ($R^2 = 0.99$)	0.57** \cong 0.0021 ($R^2 = 0.94$)

Note: The hypotheses are $H_0: \alpha = 0.5$ and $H_1: \alpha \neq 0.5$

Source: Own elaboration (software: Eviews12)

Table 4. Summary table of DFA exponents for energy metals during the Pre-Conflict and Conflict periods

Markets	DFA Exponent (Pre-conflict)	DFA Exponent (Conflict)
XAU	0.55** \cong 0.0013 ($R^2 = 0.97$)	0.54** \cong 0.0049 ($R^2 = 0.99$)
XAG	0.52** \cong 0.0010 ($R^2 = 0.97$)	0.55** \cong 0.0088 ($R^2 = 0.99$)
XPT	0.50 \cong 0.0181 ($R^2 = 0.97$)	0.48** \cong 0.0070 ($R^2 = 0.99$)
MAL3	0.47** \cong 0.0026 ($R^2 = 0.97$)	0.50 \cong 0.0019 ($R^2 = 0.99$)
NICKELc1	0.52** \cong 0.0027 ($R^2 = 0.97$)	0.49 \cong 0.0102 ($R^2 = 0.99$)
HGU3	0.49 \cong 0.0129 ($R^2 = 0.97$)	0.57** \cong 0.0018 ($R^2 = 0.99$)

Note: The hypotheses are $H_0: \alpha = 0.5$ and $H_1: \alpha \neq 0.5$

Source: Own elaboration (software: Eviews12)

Table 4 displays the DFA exponent results for precious metals and energy metals during the pre-conflict and conflict periods. In the pre-conflict period, XPT and HGU3 are efficient, supporting the random walk hypothesis, while XAU (0.55), XAG (0.52), and NICKELc1 (0.52) exhibit persistence, and MAL3 (0.47) displays anti-persistence. During the conflict period (Russian invasion of Ukraine), HGU3 (0.58), XAU (0.54), and XAG (0.55) show significant persistent slopes, whereas XPT (0.48) exhibits anti-persistence. Notably, aluminum (MAL3) and nickel futures (NICKELc1) prove to be efficient during this period of global economic uncertainty, partially aligning with validations by scholars such as [Zebende et al. \(2022\)](#), [Guedes et al. \(2022\)](#), [Dias, Chambino and Horta \(2023\)](#), and [Santana et al. \(2023\)](#) for international financial markets.

5. FUTURE RESEARCH DIRECTIONS

In light of the insights gained from this comprehensive analysis of commodity persistence during various economic periods, future research directions could explore the dynamic interaction between market forces and sustainable energy transitions. Investigating how environmental policies, technological advancements, and geopolitical events influence the persistence patterns of energy metals would provide valuable foresight for investors and policymakers. Additionally, delving into the potential impact of emerging technologies, such as quantum computing and artificial intelligence, on commodity market behaviors could offer a nuanced understanding of future market dynamics. Furthermore, considering the global shift towards green finance and the rise of decentralized energy systems, future studies could assess the resilience and persistence of commodities within these evolving financial landscapes. Integrating a forward-looking perspective into the analysis of market persistence would contribute to a more holistic understanding of the intricate interplay between economic, technological, and environmental factors shaping the future of commodity markets.

In conclusion, the study of commodity persistence, with a specific focus on energy metals, emerges as a vital undertaking with far-reaching implications for various stakeholders. From guiding investors in managing risks to informing policymakers, shaping regulatory frameworks, and facilitating informed decisions in the realm of sustainable finance, the insights gained contribute to a comprehensive understanding of market dynamics. This knowledge, in turn, equips stakeholders to navigate economic uncertainties adeptly, fostering resilience in financial systems and promoting sustainable investment practices.

6. CONCLUSION

This research aimed to examine the temporal persistence of commodities, including gold (XAU), silver (XAG), platinum (XPT), aluminum (MAL3), nickel futures (NICKELc1), and copper futures (HGU3), over the period from July 13, 2018, to July 11, 2023. The investigation encompasses four distinctive phases: the Tranquil period, the COVID-19 pandemic, the pre-conflict stage, and the conflict period marked by the Russian invasion of Ukraine. During the tranquil period, commodities XAU, XAG, MAL3, and HGU3 display anti-persistence, while XPT and NICKELc1 exhibit persistence in returns, suggesting the potential for above-average gains without an associated increase in risk. Throughout the COVID-19 pandemic, XPT, XAG, HGU3, XAU, and HGU3 exhibit notable persistence in returns, contrasting with NICKELc1 and MAL3, which demonstrate efficiency. This implies that market information is well-adjusted, posing challenges for arbitrage strategies. In the pre-conflict stage, XPT and HGU3 adhere to the random walk hypothesis, indicating market efficiency. Conversely, XAU, XAG, and NICKELc1 exhibit persistence in returns, indicating discernible price formation patterns. In contrast, MAL3 displays anti-persistence, suggesting a distinct pattern or short-term memory. During the conflict period (Russian invasion of Ukraine), metals HGU3, XAU, and XAG exhibit significant persistent declines, indicating discernible patterns in their returns. In contrast, XPT demonstrates anti-persistence, while NICKELc1 and MAL3 remain efficient even amidst the global economic uncertainty of this period. In conclusion, the comprehensive analysis of these financial instruments reveals dynamic and nuanced behavior, exhibiting diverse patterns across distinct periods. Certain commodities demonstrate discernible and repeatable patterns, providing potential insights for investors seeking strategic opportunities. Concurrently, a subset adheres to the principles of market efficiency, reflecting prompt assimilation of information into prices, making it

challenging for arbitrage strategies. Additionally, another subset displays anti-persistence, signifying resistance to conforming to established patterns and a potential source of risk. The profound comprehension of these patterns and efficiency levels serves as a valuable tool for shaping informed investment strategies and enhancing risk management practices in the ever-evolving landscape of financial markets.

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Mobile Banking Acceptance in Austria and Romania: An Empirical Study

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Received: February 2, 2024
Accepted: June 3, 2024
Published: August 6, 2024

Keywords:

Mobile banking;
UTAUT;
Technology acceptance;
Trust;
Risk



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Abstract: *The global surge in mobile banking, accelerated also by the COVID-19 pandemic, has heightened competition in the banking sector, emphasizing the need to understand mobile banking adoption across countries. However, cross-cultural research in this field appears to be limited, especially in Austria and Romania. This study uses the Unified Theory of Adoption and Use of Technology (UTAUT) to investigate factors influencing mobile banking acceptance in both countries. Data was collected from 425 participants in Austria and Romania. The results of the hierarchical multiple regression analysis highlight that performance expectancy is the primary predictor of mobile banking acceptance. Effort expectancy, facilitating conditions, and trust show varied effects across countries. The findings suggest financial institutions should prioritize performance, risk, and social approval in marketing mobile banking in both countries, with an additional focus on trust in Austria and ease of use in Romania.*

1. INTRODUCTION

The financial crisis of 2008 initiated a series of transformative changes which have revolutionized the banking industry. Over the past decade, the market entrance of neobanks (financial institutions operating solely online) and challengers (smaller banks with a physical location) significantly increased competition. In 2022 alone, challengers were found to be at the forefront of innovation, outpacing the services of traditional banks by enabling users to share transaction history and conduct cryptocurrency operations (Deloitte, 2022). Although traditional banks benefit from longstanding customer relationships, a solid reputation, and high switching costs, acquiring new customers has become particularly challenging due to the variety of digital banking services available.

Over the past years, mobile banking applications have become indispensable for both customers and banks. Their proliferation is attributed not only to the lockdown periods during the COVID-19 pandemic but also to changes in consumer behavior (Baltrusaitis, 2023). Opening a bank account has become easier than ever, as it no longer requires bank appointments or long waiting times. Mobile banking apps allow individuals to submit their documentation, identify themselves through a selfie video, and activate their debit card once received.

Several studies investigated the adoption factors of mobile banking, however, a few questions remain unanswered. Whereas the positive effect of performance expectancy on the adoption intention seems to be widely accepted amongst researchers, the influence of effort expectancy or social influences appears to vary across research contexts (e.g., Jadil et al., 2021). In addition, consumers' risk perception is expected to affect adoption, but research has failed to reach an agreement. Whereas Thusi and Maduku (2020) and Abu-Taieh et al. (2022) found that perceived

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risk is a negative predictor of mobile banking adoption, [Saprikis et al. \(2022\)](#) found no direct effect on usage intention, but rather on the creation of anxiety, which in turn negatively impacted the intention to use mobile banking services. Some researchers acknowledged that such discrepancies may be attributed to cultural variations in mobile banking adoption (e.g., [Alalwan et al., 2017](#); [Chu et al., 2019](#)). In addition, [Chu et al. \(2019\)](#) found a trend in previous cross-cultural information systems research to compare a developed to a developing country.

Building upon these findings, our study proposes the investigation of mobile banking adoption in Austria and Romania. The countries were selected due to their discrepancies in cultural indicators, according to the country comparison tool ([The Culture Factor Group, 2024](#)) by Hofstede. The greatest cultural difference lies in the level of power distance. Romania exhibits a very high level, while Austria is positioned at the other extreme with a very low power distance. According to the categorization, Romanians' societal norms are defined by tolerance for inequality, while Austrians promote more egalitarian values. The individualism-collectivism distinction reveals a closer alignment between Austria and Romania compared to power distance. Austria leans more individualistic, while Romania exhibits a more collectivistic orientation. In terms of motivation towards achievement and success, Austrians appear to be more decisive, valuing work recognition, while Romanians are oriented towards consensus, prioritizing family and collaboration. Both countries exhibit high uncertainty avoidance, displaying a preference for rules and security.

The primary aim of this paper is to advance the understanding of mobile banking in this cross-cultural context by examining which technology acceptance factors influence Austrians' and Romanians' intention to adopt mobile banking. This, in turn, allows us to respond to the call of [Venkatesh et al. \(2012, p. 173\)](#) for cross-cultural validation of the UTAUT2 framework and verify whether the effect of technology acceptance factors on the behavioral intention varies across countries, as suggested by previous research (e.g., [Ho et al., 2020](#); [Merhi et al., 2019](#); [Zhang et al., 2018](#)). Consequently, the research question is:

Research Question: Which technology acceptance factors influence the intention to adopt mobile banking applications in Austria and Romania?

The remainder of this article is structured as follows. Section 2 highlights related works. Section 3 introduces the conceptual framework and hypotheses. The research methodology is detailed in Section 4, while Section 5 presents the results. In Section 6, the findings are discussed, together with limitations and future research, while Section 7, summarizes the study's main findings.

2. RELATED WORKS

Although extensive research has been conducted on mobile banking adoption factors since the emergence of mobile banking applications in 2010, only a limited number of studies attempted to address adoption factors in different countries. One such study was conducted by [Merhi et al. \(2019\)](#) who investigated mobile banking adoption in Lebanon and England using the UTAUT framework. The authors found that performance expectancy was the most important predictor of adoption intention in Lebanon, but not in England, whereas effort expectancy predicted the adoption intention of English participants, but not of Lebanese respondents. It appears that participants from Lebanon value the usefulness of mobile banking services compared

to respondents from England for whom the ease of use seems to be more important when considering adoption. In addition, trust was found to positively influence adoption intention in both countries. Users must be able to trust that the service will work and not fear any failures, as these might be costly. In a similar vein, trust was found to be an important predictor of mobile banking adoption in a comparison between participants from Egypt and the United States (Hassan & Wood, 2020). Contrary to the findings from Merhi et al. (2019), the effect of performance expectancy on the adoption intention in the study from Hassan and Wood (2020) was reported to be significant for both the participants from Egypt and the United States, whereas the ease of use of mobile banking was not a significant explanatory variable. The insignificant effect of effort expectancy has been reported in previous studies and could be attributed rather to a direct effect on performance expectancy than on use intention, as pointed out by Zhou et al. (2010). In addition, the authors reported a positive effect of social influences on the adoption intention for both samples, which was not found to be significant in the comparison between participants from Lebanon and England.

Another cross-country comparison was conducted by Ho et al. (2020) in Taiwan and Vietnam. Contrary to their expectations, the effect of innovativeness in new technologies, attitudes towards adopting, subjective norms, and perceived behavioral control were not found to vary between the participants from Taiwan and Vietnam. The authors discovered that perceived usefulness, compatibility, and perceived risk play a significant role in the development of attitudes towards mobile banking in both countries, which in turn influence the adoption intention, however, the perceived ease of use did not seem to contribute to the formation of attitudes. In addition, the authors examined the effect of subjective norms on the intention to adopt mobile banking and found no significant effects. This result provides evidence that the social environment among both sets of participants does not seem to influence the decision to use mobile banking, which coincides with the results from Merhi et al. (2019). They acknowledge that the limited number of differences between Taiwan and Vietnam might be driven by the differences between adoption stages.

3. CONCEPTUAL FRAMEWORK AND HYPOTHESES

This section presents research focussing on the individual effect of technology acceptance factors on mobile banking adoption intention in order to develop the hypotheses and conceptual framework depicted in Figure 1.

Performance expectancy is defined as the productivity increases of an individual by adopting a certain technology (Venkatesh et al., 2012). In the context of mobile banking, several studies reported positive effects of performance expectancy on usage intention (e.g., Hanif & Lallie, 2021; Thusi & Maduku, 2020). In addition, the meta-analysis from Jadil et al. (2021) covering 127 studies found it to be the strongest predictor of mobile banking use. Consequently, the following effect is hypothesized:

Hypothesis One: Performance expectancy will positively influence individuals' intention to adopt mobile banking apps.

Venkatesh et al. (2012) refer to the effort expectancy as “the degree of ease associated with consumers' use of technology” (p. 159). Considering mobile banking services, consumers are interested in a user-friendly design and an application that allows them to conduct their transactions

as easily as possible. With low ease of use, consumers may turn to alternative banking methods, such as Internet banking or physical bank visits. Effort expectancy may also refer to switching costs by having to adapt to the smaller screen of the mobile version or to change the bank if it does not offer a mobile banking app (Ha et al., 2012, p. 223). Al Tarawneh et al. (2023) found the effort expectancy to positively predict mobile banking adoption among millennials. Similar results were reported by previous research (Abu-Taieh et al., 2022; Majumdar & Pujari, 2022; Samartha et al., 2022). Therefore, it is expected:

Hypothesis Two: Effort expectancy will positively influence individuals' intention to adopt mobile banking apps.

Social influence is related to the image construct of Moore and Benbasat (1991), as Venkatesh et al. (2003) note. Laukkanen (2016) found that image barriers negatively influence the decision to adopt mobile banking services, whereas positive images towards a technology favor the chances of adoption. In addition, Saprikis et al. (2022) and Dilger et al. (2023) found that social influences are a positive predictor of adoption intention. Hence, we expect the influence of the social environment to be significant, and propose:

Hypothesis Three: Social influence will positively influence individuals' intention to adopt mobile banking apps.

Conceptualized as "consumers' perceptions of the resources and support available to perform a behavior" (Venkatesh et al., 2012, p. 159), Venkatesh et al. (2003) initially assumed the relationship between facilitating conditions and behavioral intention to be insignificant. However, from the perspective of an individual, personal resources may affect the intention to adopt a certain technology. In the mobile banking context, individuals may have mobile phones with different technologies which may ease the adoption process. Al Tarawneh et al. (2023) found that participants were more likely to use mobile banking if they had the resources necessary, while Ho et al. (2020) found it to positively influence the formation of perceived behavioral control, which in turn, impacts the intention to adopt mobile banking. Hence, we predict the following effect:

Hypothesis Four: Facilitating conditions will positively influence individuals' intention to adopt mobile banking apps.

Adopting a new technology usually implies switching costs, which could be monetary or non-monetary, such as knowledge and time. As banks process transaction fees, individuals may be reluctant to adopt mobile banking if they perceive any monetary costs involved in the process. Yu (2012) and Chong et al. (2012) found a significant negative impact of perceived financial cost on the behavioral intention to use mobile banking. By contrast, more recent literature (e.g., Thusi & Maduku, 2020), found no such effect. As the literature reports mixed results, we aim to consolidate the findings and investigate this effect. Consequently, it is expected:

Hypothesis Five: Perceived financial cost will negatively influence individuals' intention to adopt mobile banking apps.

Although price is an important factor when deciding whether to adopt a certain technology or not, trust may be more important for potential customers. This prediction is confirmed by Samartha et al. (2022) and Sharma and Sharma (2019) in the mobile banking context. Kim et al.

(2009) proposed that initial trust is an appropriate measure of trustful behavior and identified a positive influence of initial trust in mobile banking services on usage intention. Similar results were reported by Shankar et al. (2020). In addition, another trust construct found to influence mobile banking adoption is an individual's disposition to trust which was found to be significant in the decision to adopt mobile banking (Luo et al., 2010). Based on these findings, the following hypotheses are proposed:

Hypothesis Six: Individual's initial trust in mobile banking apps positively influences the intention to adopt them.

Hypothesis Seven: Individual's disposition to trust positively influences the intention to adopt mobile banking apps.

While trust has been acknowledged to be an important decision factor in adoption behavior, Mayer et al. (1995) noted that it arises only in combination with risk. Dilger et al. (2023) found the perceived risk to be the most important driver of mobile payment adoption intention, whereas Thusi and Maduku (2020), Abu-Taieh et al. (2022), and Alalwan et al. (2017) found it to be a negative predictor of the behavioral intention and actual use of mobile banking services. Consequently, the following effect is expected:

Hypothesis Eight: Perceived risk will negatively influence individuals' intention to adopt mobile banking apps.

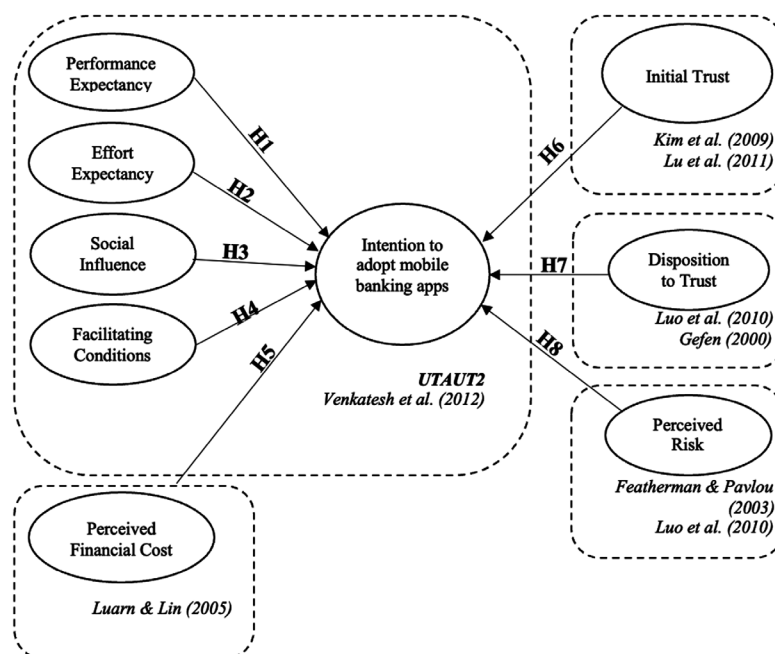


Figure 1. Proposed conceptual framework of mobile banking apps adoption intention

Source: Own research

4. RESEARCH METHOD

Data was collected from June 2019 to August 2019 through an online survey, which was translated from English into both German and Romanian. The participants were required to rate statements on a 6-point Likert scale. A total of 425 individuals participated in the survey, out of

which 196 were Austrians (60.71% male and 39.29% female) and 229 Romanians (43.67% male and 56.33% female). In terms of regional distribution, 146 out of the 229 Romanian participants were from Maramureș, whereas the participants from Austria were more equally distributed across the seven regions. The income was measured based on different scales in each country due to the different currencies.

In terms of the variable instrumentation, the technology acceptance factors and intention to use mobile banking were retrieved from Venkatesh et al. (2012), with additional measurement items taken from the research of Baptista and Oliveira (2015), Lee (2009), and Moore and Benbasat (1991). The model was extended with perceived financial cost from the studies of Luarn and Lin (2005), initial trust, adapted from the research of Kim et al. (2009) and Lu et al. (2011) and disposition to trust based on Gefen (2000). The perceived risk construct was an aggregate of the items: performance, privacy, time, and overall risk, which were retrieved from Featherman and Pavlou (2003).

The data was processed using the STATA software and analyzed using the hierarchical multiple linear regression analysis method. As the conceptual model was developed based on theoretical considerations and the importance of some independent variables could be estimated from the results presented in the literature review, a combination of the hierarchical regression method with forced entry was implemented. The order of variable entry adhered to the hypotheses sequence, commencing with the variable, performance expectancy.

5. RESULTS

Among the Austrian participants, the effect of performance expectancy on behavioral intention to adopt mobile banking applications is significant and positive ($\beta = .428$, $p = .000$), confirming **Hypothesis One**. Considered alone, the variable explains 54.44% of the variance in behavioral intention. In addition, the behavioral intention to adopt mobile banking applications was found to be positively influenced by social influence ($\beta = .235$, $p = .000$) and initial trust ($\beta = .295$, $p = .000$). Hence, **Hypotheses Three** and **Six** are confirmed. Including initial trust and disposition to trust in the model increased R-squared (R^2), with effort expectancy becoming insignificant. If trust concerns are part of the decision process, the ease of use appears to become insignificant in explaining adoption intention. Contrary to expectations, **Hypotheses Four** and **Seven**, the effect of facilitating conditions ($\beta = -.187$, $p = .029$) and disposition to trust ($\beta = -.108$, $p = .046$) on adoption intention were found to be significant but negative. The degree to which Austrian participants may benefit from the help of others and their general tendency to trust other people appear to be negative predictors of mobile banking app acceptance. In addition, the perceived risk was found to negatively impact the adoption intention ($\beta = -.416$, $p = .085$), providing support to **Hypothesis Eight**. Furthermore, the adoption intention could not be significantly explained by effort expectancy ($p = .506$) and perceived financial cost ($p = .312$). Consequently, the results could not provide support for **Hypotheses Two** and **Five**. The consideration of trust and risk in the UTAUT2 model resulted in an R^2 increase of 15.02%. Consequently, the overall model explains 71.27% of the variance in the intention to adopt mobile banking applications for the Austrian sample.

Among the Romanian participants, performance expectancy positively influenced behavioral intention ($\beta = .387$, $p = .000$), confirming **Hypothesis One**. The variable alone explains 45.68% of the variance in behavioral intention. The inclusion of effort expectancy and social influences

increased the explanatory power by 5.82%, while the inclusion of facilitating conditions yielded minor improvement. Consequently, the adoption intention of mobile banking applications is positively influenced by the effort expectancy ($\beta = .264$, $p = .002$) and social influences ($\beta = .329$, $p = .000$). The ease of use of the service and the influence of the social environment appears to impact Romanian participants' intention to adopt the service. Therefore, **Hypotheses Two** and **Three**, are supported. Comparable to the results among the Austrian sample, the disposition to trust negatively influenced the behavioral intention ($\beta = -.177$, $p = .002$). Consequently, **Hypothesis Seven** is not confirmed, as the reversed effect was proposed. Moreover, perceived risk was found to be a negative predictor of mobile banking app acceptance ($\beta = -.322$, $p = .000$), similar to the results obtained among the Austrian sample. Concerns over the performance, privacy, social, and overall risk tend to decrease the intention to adopt the service. This confirms **Hypothesis Eight**. The intention to adopt mobile banking applications appears to not be significantly influenced by considerations on facilitating conditions, financial costs, and initial trust toward the service. Hence, **Hypotheses Four**, **Five**, and **Six** could not be confirmed for the Romanian participants. The final model explains 56.85% of the variance in the behavioral intention to adopt mobile banking apps, and the inclusion of trust and risk in the UTAUT2 model resulted in an improvement to R^2 by 3.45%.

Table 1. Path coefficients and their significance

Hypothesis	Path	Austria		Romania	
		β	Results	β	Results
Hypothesis One	PE \rightarrow BI	.428***	Supported	.387***	Supported
Hypothesis Two	EE \rightarrow BI	.044	Not supported	.264**	Supported
Hypothesis Three	SI \rightarrow BI	.235***	Supported	.329***	Supported
Hypothesis Four	FC \rightarrow BI	-.187**	Not supported	-.078	Not supported
Hypothesis Five	PFC \rightarrow BI	.068	Not supported	-.102	Not supported
Hypothesis Six	IT \rightarrow BI	.295***	Supported	-.070	Not supported
Hypothesis Seven	DT \rightarrow BI	-.108**	Not supported	-.177***	Not supported
Hypothesis Eight	PR \rightarrow BI	-.416***	Supported	-.322***	Supported

Source: Own calculations

6. DISCUSSION, LIMITATIONS, AND FUTURE RESEARCH DIRECTIONS

In both countries, the most important predictor of mobile banking application acceptance was found to be performance expectancy. This finding is consistent with previous research (e.g., [Jadil et al., 2021](#); [Merhi et al., 2019](#)). The extent to which individuals perceive these services as valuable for simplifying daily money management or handling financial transactions significantly influences their adoption intention. Considering differences between countries, the performance expectancy appeared to weigh more for Austrians' intention to adopt mobile banking applications than for Romanians. In general, Austria is considered to have a more favorable economic situation compared to Romania, which means that individuals may have higher incomes at their disposal and may exhibit a greater interest in technology. In addition, the positive effect of effort expectancy on the adoption intention in Romania, but not in Austria might be attributed to differences in digital literacy between the two countries. Romanians exhibited lower basic digital skills in 2021 than Austrians ([European Commission, 2022](#)), which might make them more interested in the ease of use when considering the adoption of a new technology. The insignificant effect of effort expectancy on behavioral intention for the Austrian participants is consistent with findings from [Dilger et al. \(2023\)](#). Moreover, the degree to which individuals are influenced by their social environment was found to significantly influence adoption intention in both countries. For Romanians, the social influence was found to be greater than for

Austrians. Considering that [Venkatesh and Davis \(2000\)](#) proposed that social influences enter the decision process through compliance, internalization, and identification with the behavior of others, it may be concluded that Romanians appear to be more ready to internalize and identify with socially accepted behaviors than Austrians. This finding provides support for the research of [Picoto and Pinto \(2021\)](#), which highlighted that the influence of social norms is higher for Eastern than for Western cultures.

Surprisingly and contrary to our hypothesis, the degree to which Austrians believed they had the resources necessary for adoption, in terms of knowledge and/or help from other individuals, negatively influenced their adoption intention. This apparent inconsistency may be due to the greater importance of other factors, such as risk. The discussion on data protection in Austria with the introduction of the General Data Protection Regulation in 2018 may have raised public awareness on possible threats from digital services. Hence, individuals may be unwilling to disclose personal information in an application. To gain additional insights, a simple linear regression between facilitating conditions and behavioral intention for the Austrian participants was conducted. The results show that the effect of facilitating conditions on the intention to adopt mobile banking applications was not significant. This suggests that the effect is significant only in combination with other factors, and the facilitating conditions alone are no predictor of mobile banking app acceptance among Austrian participants. In addition, neither Austrians nor Romanian participants were influenced by the perceived financial costs in the adoption intention of mobile banking applications. Although earlier research found monetary considerations to negatively influence the adoption of mobile banking (e.g., [Chong et al., 2012](#); [Yu, 2012](#)), this finding is in line with more recent research which found that the perceived financial cost is no longer a driver of use intention ([Malaquias & Silva, 2020](#); [Thusi & Maduku, 2020](#)). A possible explanation is the availability of free basic versions and consumers' lack of awareness of costly features.

Unlike other research carried out in the mobile banking context, the effect of disposition to trust was found to negatively influence adoption intention among both samples. There are several possible explanations for this result. Firstly, a general tendency to trust other people may be a consequence of a preference for human interaction. As mobile banking applications are self-service systems, individuals can handle financial activities on their own and do not depend on help from bank employees. Secondly, [Chan et al. \(2022\)](#) found the disposition to trust to influence the initial trust in the context of open banking adoption. It is very likely that the disposition to trust positively influences the initial trust formation, but not the adoption intention of technology. Thirdly, in both countries, individuals exerted on average a medium level of disposition to trust. It cannot be ruled out that a higher level of disposition to trust may have resulted in different effects. In line with previous studies (e.g., [Malaquias & Silva, 2020](#); [Thusi & Maduku, 2020](#)), the results of this investigation highlight the crucial importance of consumers' perceived risk. In both countries, the potential risks in terms of performance failures, privacy loss, time loss, and overall risk negatively influenced the adoption intention. For Austrians, the perceived risk was found to influence the intention to a greater degree than for Romanians. One explanation for this result may be that Austrians are better informed on potential threats of mobile banking compared to Romanians.

This study has many potential limitations. Firstly, we proposed eight determinants of mobile banking adoption, however, across the literature several additional factors have emerged, such as digital literacy ([Elhajjar & Ouaida, 2020](#)), rewards ([Saprikis et al., 2022](#)), social media ([Sharma & Sharma, 2019](#)) or personal innovativeness ([Reiting et al., 2020](#)). Their inclusion in the model could change the relative importance of the investigated variables amongst the Austrian

and Romanian participants. Future research could try to replicate the study and include additional variables. A second limitation may be the investigation of potential users of the service and not actual users. As highlighted by Saprikis et al. (2022), the technology acceptance factors vary across different stages of adoption. Future research could aim to conduct a comparison between users and non-users of mobile banking applications in a cross-cultural setting. Thirdly, the regional distribution of participants might limit the results. Future research could try to replicate our study with a more diverse sample in Romania. In addition, the sample was not chosen entirely through random selection, and therefore, will not be fully representative of the population in both countries. Finally, another limitation of this study is the analysis of cultural differences at the national level of analysis. In this context, the research from Domuta and Strauss (2024) highlighted the importance of culture measurement to account for the effect of technology acceptance factors on mobile banking adoption intention. Future research could aim to measure the culture of participants and assess the contribution of technology factors to the adoption intention from an individual level of analysis.

7. CONCLUSION

Over the past decade, extensive research has delved into the factors influencing mobile banking adoption, often using variations of the UTAUT framework. However, only a limited number of studies have explored cross-country differences in the context of mobile banking adoption. In this global landscape, shaped by the emergence of neobanks and challenger banks, understanding the drivers of mobile banking adoption across different countries becomes imperative to develop sustainable business models.

This study aimed to fill this gap by investigating the determinants of mobile banking adoption in two countries that have been overlooked in prior research, while also validating the adapted UTAUT2 model. The findings reveal that amongst Austrian participants, the intention to adopt mobile banking applications is primarily driven by performance expectancy, social influences, and initial trust, while facilitating conditions, disposition to trust, and perceived risk negatively contribute to the behavioral intention process. Conversely, for Romanian respondents, the adoption intention is positively influenced by performance expectancy, effort expectancy, and social influences, while disposition to trust and perceived risk act as negative predictors.

Recommendations for financial institutions with a presence in both countries include emphasizing performance benefits, providing risk mitigation measures, and highlighting social approval to encourage adoption. In addition, tailored marketing strategies should target trust formation in Austria and ease of use in Romania.

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The Impact of Standards and Patents on Economic Growth in Western Balkan Countries

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Received: February 2, 2024
Accepted: May 8, 2024
Published: August 6, 2024

Keywords:

Standards;
Patents;
Economic Growth;
Panel data



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Abstract: Standards are documents that determine the rules and establish conditions for the production of products, the offering of services, the management of processes, etc. Since the standards are formulated by consensus, the application of the standards by businesses and organizations is important because they are considered guarantors of quality. Businesses that apply international standards have a competitive advantage and offer greater value to their consumers.

Patents are exclusive rights granted to an innovation, which provide investors with protection of their intellectual property. The number of patents in a country is an indicator of the technological development of that country. It can influence economic growth, by encouraging investments in research and development, promoting competition and innovations, facilitating knowledge spillovers, etc.

The purpose of this research paper is to analyze the possible relationship between international ISO standards, patents, and economic growth in 5 Western Balkan countries. Panel data, for the period 2013-2021 is used to investigate this relationship. In addition to the number of standards, in the model are included other variables, such as gross capital formation, employment level, and innovation index as a proxy for the patents. The Hausman test suggests that the appropriate model is the fixed effects model. There is little research that investigates the impact of standards and patents on economic growth. This paper complements the literature on this topic.

1. INTRODUCTION

According to the International Organization for Standardization (ISO, n.d.), standards are rules that describe how, in the best possible way, a product can be produced, a service offered, a process managed, etc. Standards are considered an important link in the development of technology and knowledge diffusion (ISO, 2021). Some of the main goals of the standards are:

- Fitness for purpose and Compatibility: means that the products or services fulfill the purpose for which they were produced and identify the conditions in which they will achieve optimal performance.
- Safety: means ensuring the conditions for the production of products or services, protecting workers or the environment, but also the identification of parameters for the normal use of products or services on the part of consumers, as well as the identification of risks in cases of their misuse.
- Environmental protection: means the specification of conditions for the production or consumption of products or services by preserving the environment, reducing pollution, etc.
- Reduce non-tariff barriers: ensuring the production of products, according to the conditions and criteria agreed upon, increasing competitiveness.

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Standards are important for manufacturers and traders, but also for consumers, because they ensure the optimization of the production process, reducing production and inventory costs, serve as guarantors of product quality, increasing their value, etc (Kakouris & Sfakianaki, 2018; Terziovski & Guerrero, 2014). According to the Commission of the European Union, the contribution of standards across European economies is estimated to be between 5-35% of economic growth. Standards affect the productivity of production factors and influence international trade by promoting exports and FDI. On the other hand, the constant need of businesses to improve products means that standards are considered incentives for innovation (Mentel & Hajduk-Stelmachowicz, 2020).

According to the World Intellectual Property Organization (WIPO, n.d.), a patent is a legally granted exclusive right that is given to inventors, providing them with the ability to prevent others from making, using, selling, or importing their invention without their consent. A vital part of intellectual property rights, patents protect inventions and support the next generation of innovators. They are given for novel and unique inventions, which can include things like goods, procedures, techniques, etc. Patents play a crucial role in fostering innovation and driving economic development. They encourage the exchange of information and give a contribution to the progress of society (Gambardella, 2021).

The purpose of this paper is to investigate the possible association between ISO standards, patents and economic growth in Western Balkan countries. Little research has been done on this topic and this paper will be an added value to the existing literature.

2. LITERATURE REVIEW

Although the standards themselves are not designed to promote economic growth (ISO, 2021), studies have shown their impact on it.

Zhang et al. (2019) studied the impact of national and international standards on economic growth in China. Their analysis showed that the more companies apply the standards, the more developed the economy is. Between the two types of standards, the national ones had a higher influence than the international ones. Standards also had a positive effect on international trade and technological progress with international standards affecting more than national standards.

McWilliams and McWilliams (2022) analyzed the potential impact of standards on the UK economy. They estimated that, in the current century, standards have contributed to around 23% of UK economic growth. They also found a positive impact of the standards on the level of employment, in the reduction of debt, in the reduction of prices and interest rates.

With data for the period 1994-2018, Buts et al. (2020) studied the impact of standards on GDP in Belgium. The authors suggested that the standards have contributed to about 19% of economic growth in this country.

Hogan et al. (2016) concluded that the standards were estimated to have contributed to 9.7% of economic growth and 7.8% of the increase in the volume of international trade in Ireland for the period 1964-2005. For the period 2006-2013, they estimated that the impact on economic growth was about 17%, while on international trade it was about 23%.

With data for the period 1981-2014, in a panel of 11 EU countries, using a cointegration model, [Blind et al. \(2022\)](#) showed that international standards had a positive effect on economic growth, while the impact of national standards was not clear: in some countries the effect was positive, while in others it was negative. As for patents, no connection was found between them and the economic growth of the countries under study.

In a study of 6 developing countries for the period 1994-2019, [CEBR \(2023\)](#) finds a positive impact of the stock of standards in the economy due to their positive impact on labor productivity. For every 1% increase in the stock of standards, the increase in labor productivity is in the range of 0.02%-0.16%.

[Bakari \(2022\)](#) in a study for Romania, analyzed the possible impact of digitization and patents on economic growth for the period 1990-2020. He concluded that both of these factors had a strong positive impact on economic growth in this country.

[Nguyen and Doytch \(2022\)](#) studied the impact of patents in general, but also of Information and Communication Technology, on the economic growth of 26 developed countries and 17 developing countries. They use a Generalized Method of Moments model with data for the period 1998-2016. They suggested a positive reciprocal relationship between patents and economic growth in the short term, and this influence was stronger in developed countries than in developing countries. However, the authors found no impact of the total number of patents on the growth of the production sector. For ICT patents, the authors suggested a significant positive impact on the economic growth of developed countries, but a negative impact on developing countries. In the long term, the authors do not find the impact of patents on economic growth.

[Kissi and Gyedu \(2023\)](#) studied the impact of patents on economic growth for 9 African countries for the period 2000-2017. The econometric model they used suggested a positive relationship between patents and economic growth, but the magnitude of this effect was relatively small: a 1% increase in the number of patents will increase GDP per capita by 0.43% for all the countries included in the study.

Using a VAR model with data for the period 1996-2017 for groups of countries with income of all levels, [Das \(2020\)](#) analyzed the short-term and long-term relationship between the number of patents and income per capita. The author suggested a short-term impact of patents on income, but not in the long-term period.

In a similar research, [Inglesi-Lotz et al. \(2020\)](#) with data for the period 2008-2017 studied a group of 36 developed countries and 24 developing countries to analyze the possible link between innovation and economic growth, where innovation is measured by the number of patents. The authors suggested that there is a threshold effect: below a certain level, the impact of patents was insignificant for all countries together, but also for two different categories of them. After this level, the effect was statistically significant and positive for developed countries and the entire sample.

[Domazet et al. \(2022\)](#), in a study of Romania and Bulgaria for the period 2008-2018, found no long-term relationship between the number of patents and income per capita.

3. SOME DATA ABOUT WESTERN BALKAN COUNTRIES

Figure 1 shows the total ISO standards by sector. In 2021, there were about 24,000 standards prepared by the International Organization for Standardization (ISO, 2021). The highest number belongs to the information technology, graphics and technology sector with 21.1%, followed by mechanical engineering with 14.7% and transport with 12.6%. Meanwhile, the lowest number of approved standards is related to security, safety and risk (0.2%) and business management and innovation (0.3%).

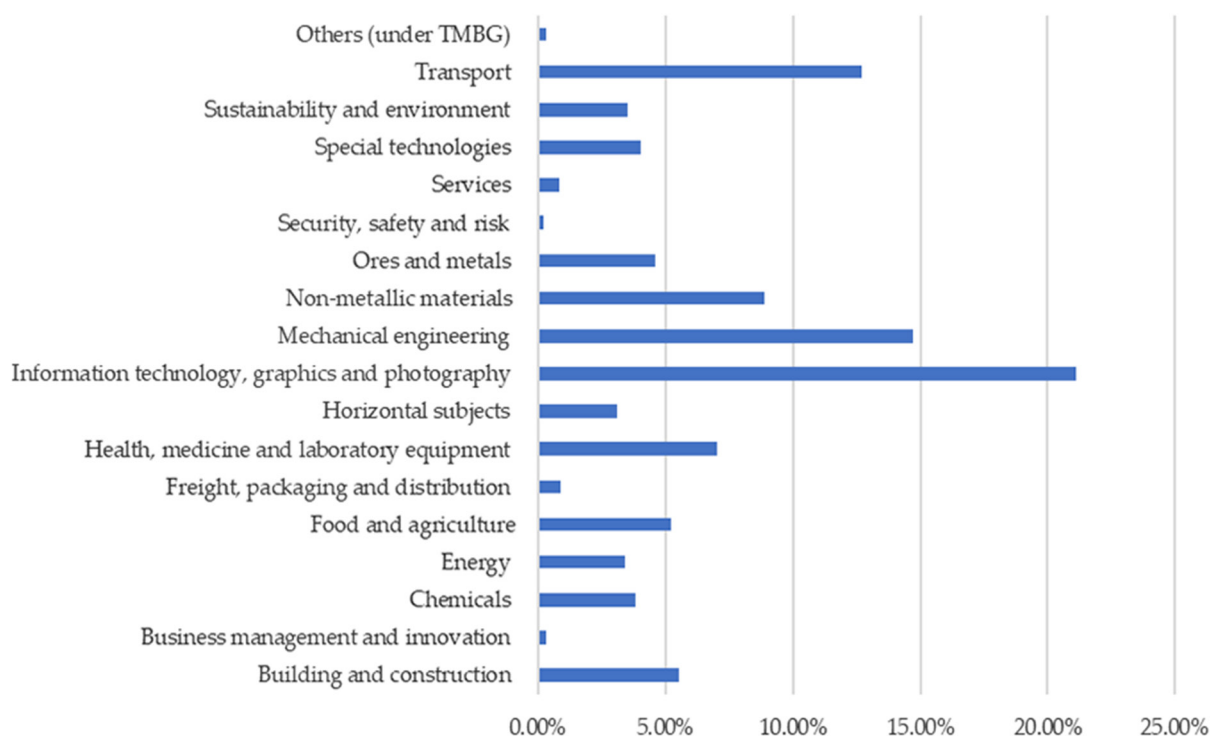


Figure 1. Total ISO standards by sectors (%)

Source: ISO, 2021

WB-5 countries have a relatively low number of valid ISO certificates, as it is shown in Figure 2. For the period 2013-2016, Albania had the highest number of them, on average around 60 valid certificates, while after this period their number has been significantly reduced. At the end of the period, Albania has only 30 valid ISO certificates. Meanwhile, even though it is the largest economy in the region, Serbia has the lowest number of valid certificates, with only 10 of them in 2021.

Figure 2 shows also that Montenegro, North Macedonia and Bosnia-Herzegovina have a relatively low number of ISO certificates during the period under study. At the end of the period, these countries have fewer certificates than at the beginning.

Figure 3 shows the gross domestic product of the Western Balkan countries for the period 2013-2021. From Figure 3, it appears that all countries have generally had an upward trend in GDP for this period. Bosnia and Herzegovina has the highest economic growth compared to other countries, with an average growth of 23%, while other countries have an average growth of about 18% compared to GDP at the beginning of the period.

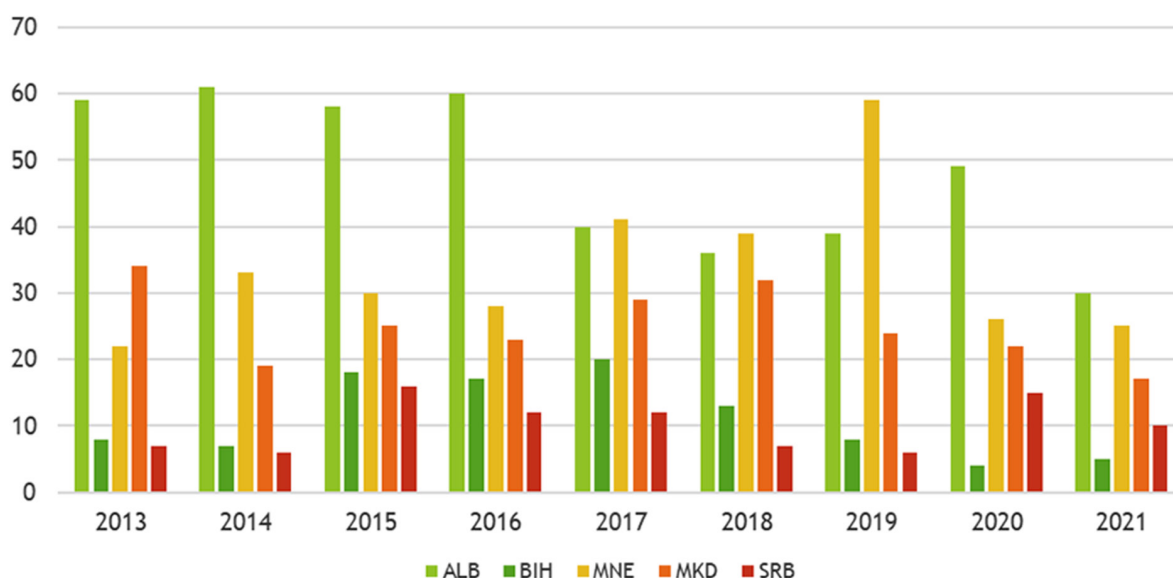


Figure 2. Total Valid Certificates in WB-5

Source: ISO, 2021

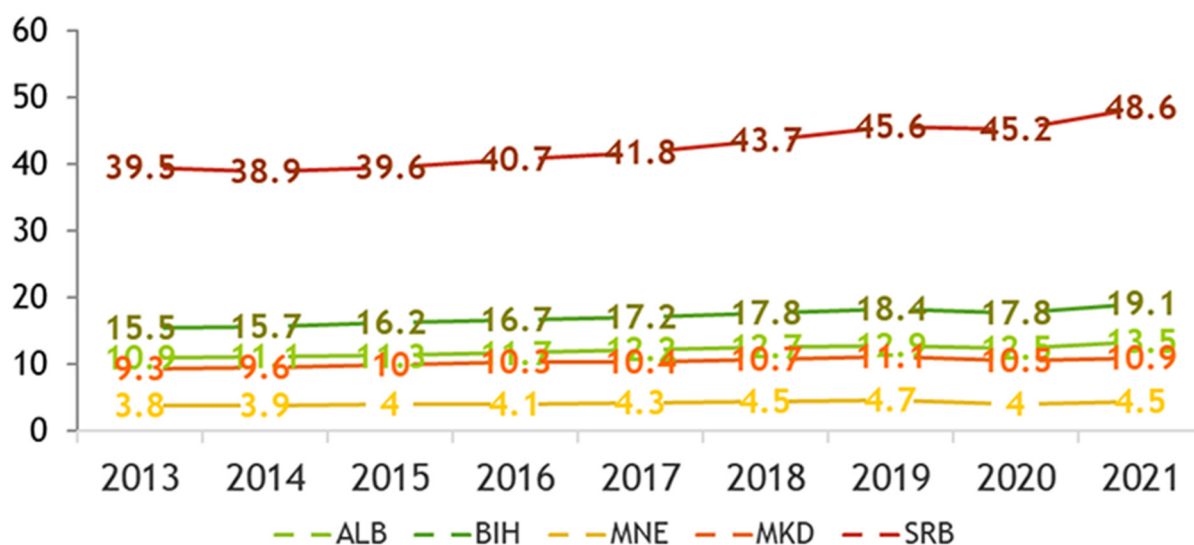


Figure 3. GDP in WB-5 (billion constant 2015 US\$)

Source: World Bank, 2021

4. METHODOLOGY

The relationship of standards with economic growth in the Western Balkan countries is analyzed through panel data. Due to the lack of data for Kosovo³, only Albania, Montenegro, North Macedonia, Serbia and Bosnia & Herzegovina are included in the study. The study covers the period 2013-2021. Real GDP (constant 2015 US\$) is the dependent variable, while independent variables in the model are included: standards STD, measured as the stock of them; gross capital formation K, measured in constant 2015 US\$, and employment level L, measured as the number of employed people. Since there is a lack of data for the number of patents for all countries involved in this study, an indicator for innovation INN is used as a proxy for them. The innovation index shows the capacity of countries to develop successful innovation. Data for this variable is taken from the World Intellectual Property Organization. Data for the real GDP, gross capital

³ Under the UN Resolution 1244.

formation and employment is taken from the World Development Indicators database, while data for the ISO certificates is taken from the ISO organization. Data is processed through the Eview 12 statistical package. All variables are included in the model in the log form, so their coefficients show elasticities.

$$Y = f(\text{STD}, \text{INN}, \text{K}, \text{L}) \quad (1)$$

The model is tested for fixed effects and random effects. The fixed effects method enables control for omitted variables that are constant over time, but differ across countries. In the random effects model, differences between countries are assumed to be random and uncorrelated with the independent variables of the model. Through the Hausman test (Hausman, 1978) it is identified whether fixed effects or random effects model is more appropriate. The null hypothesis states that the error term is uncorrelated with the regressors, while the alternate hypothesis states that there is a correlation.

5. RESULTS

The model is first analyzed for fixed effects. Table 1 gives a summary of the test results. The variables L and K are positive and statistically significant at 1%, with elasticity coefficients of around 0.52% and 0.27% respectively. The variable for standards STD is negative and statistically significant at 5%: for an increase in the number of standards by 1%, a decrease of around 0.0015% of the real GDP is expected. The variable for innovation INN is negative but not statistically significant because its p-value is very large.

Table 1. Fixed effects model results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.06696	2.340971	4.300335	0.0001
L	0.525679	0.180407	2.913849	0.0061
K	0.272562	0.029865	9.126553	0.0000
STD	-0.001449	0.000706	-2.052420	0.0475
INN	-0.000229	0.000552	-0.414782	0.6808

Source: Own processing

After testing for fixed effects, the model is tested for random effects. Table 2 summarizes the results of the test. All variables in the model are statistically significant. Two variables for the capital and employment have a positive association with the real GDP, while the other two variables STD and INN have a negative association: for an increase of 1% in the number of standards, a decrease by around 0.0045% of the real GDP is expected, while for an increase by 1% in the value of the innovation index, a decrease of the real GDP by 0.0022% is expected.

Table 2. Random effects model results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.133938	0.296437	27.43898	0.0000
L	0.295642	0.026157	11.30279	0.0000
K	0.644691	0.023329	27.63421	0.0000
STD	-0.004487	0.000403	-11.14484	0.0000
INN	-0.002242	0.000288	-7.777583	0.0000

Source: Own processing

To decide whether the fixed or random effects model is appropriate, the Hausman test is run. The p-value of the test statistic is less than 5%, so there is enough evidence to reject the null hypothesis and conclude that the fixed effects model gives more consistent results compared to the random effects model.

Table 3. Hausman test results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	376.154896	4	0.0000

Source: Own processing

6. FUTURE RESEARCH DIRECTIONS

Organizations worldwide are increasingly interested in and in need of international quality management standards, particularly for certain of them, to gain a competitive edge internationally. The ISO standards are more concerned with management and process quality than with product and service quality, which is the idea of how and why goods and services meet consumer expectations. To improve the quality of goods and services, businesses adopt managerial functions, specify quality policy, strategic/operational objectives, and responsibilities, and put them into practice through planning, budgeting, leading, inspiring, and controlling.

Relating to these issues, future studies will investigate the possible impact of standards and patents on various processes at the firm level, such as human resources, strategic management, organizational behavior, supply chain management, etc. Since the future skills, knowledge and competencies required by employees are related mainly to creativity, innovation and quality management, the issue of the relationship between economic growth, intellectual property and quality management is going to be the core area for future research directions as well.

7. CONCLUSION

The purpose of this research paper was to analyze if there is a relationship between ISO standards and economic growth in 5 countries of the Western Balkans. For this purpose, a panel data model with data for the period 2013-2021 was used. In addition to standards, measured as valid ISO certificates, the model also included capital formation, employment and an indicator for innovation. The model was tested for fixed effects and random effects. According to fixed effects, all variables, except for innovation, are statistically significant, while according to random effects, innovation is also statistically significant. The Hausman test suggests that the most appropriate model is fixed effects FE. According to the FE model, the coefficient of standards has a negative sign, suggesting an inverse relationship between standards and economic growth in WB-5 countries, but the coefficient is very small, so there is practically no relationship between standards and economic growth in the Western Balkan countries.

This work will be improved in the future, including Kosovo⁴, when more data will be available. Likewise, other variables and other more advanced models will be tested to reveal the possible relationship between standards, patents and economic growth in Western Balkan countries. Future research will also investigate the impact of patents and standards on firm performance.

⁴ Under the UN Resolution 1244.

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Engel Expenditure Curves for Households in the Slovak Republic and Income Elasticity of Expenditure

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Received: January 15, 2024
Accepted: May 7, 2024
Published: August 6, 2024

Keywords:

Engel expenditure curves;
Impact of income;
Income elasticity of
expenditure



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Abstract: *The paper aims to investigate how household income in the Slovak Republic affects household expenditure on various goods and services. The data are drawn from the Statistical Office of the Slovak Republic for the period 2005-2022. The impact of income on expenditure was quantified through Engel expenditure functions for 11 groups of goods and services. The results of the regression analysis indicated that expenditure on all the goods and services under study increased with the increase in income. Income elasticities of expenditure indicated that the expenditure of a household with two children was the most elastic to a change in income. For example, the income elasticities of expenditure for transport and post and telecommunications were 1.791 and 1.2 respectively. The Engel curves for these goods converge to line 45. Expenditure trends for households with three or more children could be explained by income only for some goods and services. In general, these households also responded less elastically to changes in income compared to other households.*

1. INTRODUCTION

The empirical literature on food demand suggests mixed evidence on the roles of income and other socioeconomic attributes on food demand (Nsabimana et al., 2020). Household income has been identified as one of the main determinants of demand. Household size and composition, are also important factors that influence household consumption decisions. A comparison of elasticity estimates across the three specifications suggests that the model that uses household expenditure performs best (Jayasinghe et al., 2019). When comparing economic well-being using income or expenditure, equivalence scales are often used to adjust for differences in characteristics that affect needs (Daley et al., 2020). Distinguishing between household groups when estimating a linear expenditure system has substantial advantages, improving the model's predictive and economic properties (Clements et al., 2022).

Engel's law states that the share of food in total consumption expenditure is negatively related to household income (Chen, 2022). Household debt can significantly reduce the share of food expenditure (Huang & Chen, 2022). Although poor households have a larger share of food expenditures, they tend to protect their share of food consumption in the bundle (Panikkassery, 2020). The less educated middle class shows a propensity to spend on home furnishings when income increases (Soon, 2022). Education is also a key determinant of energy expenditure shares (Shafiullah et al., 2023). 7-9% of the surveyed households spent more than 10% of their income on energy expenditure (Das et al., 2022). The share of food expenditure at home in food expenditure excluding income increases with age, and household size and is highest at

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the lowest level of education (Burzig & Herrmann, 2012). A family of two is assumed to need more income than a single person, but not twice as much due to savings from consumption (Daley et al., 2020).

Given the above, hypotheses were established.

Hypothesis One: Household expenditure depends on household income.

Hypothesis Two: Income elasticity of expenditure will differ for different types of households.

This paper aims to find out how household income in the Slovak Republic affects household expenditure on various goods and services.

2. DATA AND METHODS

Data are drawn from the Statistical Office of the Slovak Republic for the period 2005-2022. Household income and expenditure are tracked for different types of households by number of children. Households without children, households with one child, households with two children and households with three or more children were included in the analysis. Household income refers to household net disposable income in EUR per person per month, equivalised by the number of inhabitants in the household. Household expenditure in EUR per person per month, equivalised by the number of inhabitants in the household, was included in the analysis. Expenditure on food, alcoholic beverages and tobacco, clothing, housing, furniture, health, transport, post and telecommunications, recreation and culture, education, transport, hotels, restaurants and cafes of all household types covered were monitored. A descriptive analysis was carried out to describe the current status and evolution of household expenditure. Regression analysis was used to estimate Engel expenditure functions. Linear and power functions were used. The linear function has the form:

$$E_{ij} = a + b_1 I_j \quad (1)$$

where: E_{ij} – expenditures on i -th good or service j -th household; I_j – income of j -th household.

The estimated coefficients b_1 from the linear function are further used to quantify the income elasticities of expenditures.

$$El_{ij} = b_1 \frac{I_j}{E_{ij}} \quad (2)$$

where: El_{ij} – income elasticity of expenditures on i -th good or service j -th household.

The power function has the form:

$$E_{ij} = a I_j^{b_2} \quad (3)$$

where: E_{ij} – expenditures on i -th good or service j -th household; I_j – income of j -th household.

The estimated coefficients b_2 from the power function represent the income elasticity of expenditure.

3. RESULTS

Expenditure on food and non-alcoholic beverages and expenditure on housing are among the highest household items, in Table 1. The average household without children spends €88.93 per month on food, representing 22.25% of their total monthly expenditure. Households with one child spend on average 19.57% of their average monthly expenditure on food, households with two children 20.02% and households with three or more children 21.14% of their average monthly expenditure. In absolute and relative terms, little difference is evident between the different types of households.

Table 1. Results of descriptive analysis for expenditure on food and non-alcoholic beverages and expenditure on housing

	Food and soft drinks				Housing, water, electricity, gas and fuels			
	Without children	One child	Two children	Three+ children	Without children	One child	Two children	Three+ children
Mean	88,933	68,472	59,314	51,857	87,159	59,264	47,733	37,028
Standard Deviation	7,765	6,861	6,131	4,401	4,728	3,968	3,082	2,885
Kurtosis	0,365	0,852	1,152	0,129	4,964	0,802	6,410	0,024
Skewness	0,622	0,885	0,909	-0,287	-1,816	-0,592	-2,060	-0,274
Range	30,120	27,560	25,480	17,680	20,090	15,330	14,410	11,760
	Transportation				Recreation and Culture			
	Without children	One child	Two children	Three+ children	Without children	One child	Two children	Three+ children
Mean	31,850	35,160	29,342	22,569	23,048	21,354	19,978	14,177
Standard Deviation	9,441	7,668	7,687	7,992	3,354	3,020	2,479	2,780
Kurtosis	-1,233	-1,595	-1,664	-1,252	0,026	-0,082	0,850	-0,567
Skewness	0,502	-0,030	0,082	0,535	-1,142	-0,918	-0,579	-0,048
Range	27,110	22,130	23,180	23,360	10,650	9,750	10,000	10,080
	Furniture, home furnishings and routine maintenance of the apartment				Posts and telecommunications			
	Without children	One child	Two children	Three+ children	Without children	One child	Two children	Three+ children
Mean	19,328	15,331	12,048	10,857	19,110	18,493	14,943	11,113
Standard Deviation	4,214	4,191	3,719	3,722	3,085	2,604	2,029	1,467
Kurtosis	-0,161	2,380	-1,119	-0,100	1,653	3,434	5,451	4,642
Skewness	0,467	1,643	0,195	0,770	0,045	-0,319	-1,311	-1,845
Range	15,300	15,930	12,780	13,430	14,090	12,970	10,410	6,680
	Clothing and footwear				Hotels, cafes and restaurants			
	Without children	One child	Two children	Three+ children	Without children	One child	Two children	Three+ children
Mean	17,254	17,819	16,311	12,741	17,434	19,688	18,025	13,955
Standard Deviation	1,670	1,341	1,309	2,507	4,283	4,642	3,555	2,192
Kurtosis	-0,138	0,969	1,635	-1,040	0,324	2,521	2,437	1,371
Skewness	-0,125	-0,097	-0,811	0,133	0,461	1,209	0,757	-0,387
Range	6,410	5,520	5,680	7,990	17,250	20,640	16,630	9,500
	Alcoholic beverages and tobacco				Health			
	Without children	One child	Two children	Three+ children	Without children	One child	Two children	Three+ children
Mean	12,351	9,648	6,971	4,844	14,518	8,418	7,015	5,685
Standard Deviation	1,655	1,515	0,949	0,562	3,339	2,107	1,874	1,673
Kurtosis	0,688	1,475	1,160	-0,065	9,208	6,625	7,465	3,925
Skewness	-0,061	0,689	0,486	-0,812	2,525	1,959	2,146	1,472
Range	6,870	6,550	4,150	1,840	15,820	9,670	8,730	7,350

Source: Own calculations

As regards the evolution of expenditure over the period under review, based on the relatively high standard deviation, it is possible to observe a greater average linear distance of the actual values from the average in each year. This is most pronounced in households without children, with an average of €7.77. Based on the skewness and skewness coefficients, food expenditure of SR households had a left-hand side distribution, more skewed than normal. The only exception was households with 3+ children, whose expenditures had a right-skewed distribution.

Housing expenditures include expenditures on housing, water, electricity, gas and fuel. These expenditures account for 21.08% of the monthly expenditures of households without children, 16.94% of households with one child, 16.11% of households with two children, and 15.09% of the monthly expenditures of households with three or more children. Based on the standard deviation, housing expenditures are, on average, between EUR 2.85 and EUR 4.73 away from the average, depending on the type of household. The distribution of housing expenditures was right-skewed, more skewed than the normal distribution, in all households during the period under review.

Households with one child had the highest average expenditure on transport during the period, Table 1. They accounted for 10.05% of their average monthly expenditures. 9.9% of transport expenditures were in households with two children, 9.2% in households with three or more children, and 7.97% of average monthly expenditures were transport expenditures in households with no children. The standard deviation is relatively high across all household types. Thus, the average linear distance of actual transportation expenditures fluctuated around the mean to a greater extent during the period under study. The distribution of transport expenditures is flatter than normal in all households in the period under study, except for the one-child household which is left-handed. The highest variability in absolute value occurred in households without children.

Average expenditure on recreation and culture was highest in absolute terms in households without children. However, in relative terms, they accounted for only 5.78% of the average monthly expenditure of these households. The highest share of expenditure on recreation and culture was in households with 1 child, namely 6.10%. The standard deviation is quite low. The most pronounced fluctuation of expenditure around the mean was in households without children. The distribution of expenditure on recreation and culture is more skewed than normal in households with no children and households with two children. In all households, the distribution of expenditure is right-handed. The range is fairly even, averaging €10.

The average expenditure on furniture, furnishings and routine maintenance of the dwelling was highest in households without children during the period under review, Table 1. These expenditures accounted for 4.83% of the average monthly expenditures of households without children. For other households, the share of expenditures on furniture, furnishings and routine maintenance of the dwelling oscillated around 4%. The standard deviation is quite low. Expenditures oscillated the most in households without children. However, the variation is highest in households with one child. The distribution of expenditures is left-skewed, more pointed than normal in households with no children, households with two children, and households with 3+ children.

Average expenditure on post and telecommunication was highest in households without children, where it accounted for 4.78% of average monthly expenditure. They accounted for 5.29% in households with one child, 5.04% in households with two children, and 4.53% in households with three or more children. The standard deviation and range are highest in households with no children. The distribution is flatter than normal and in all households except households without children, it is right-skewed.

Average expenditure on clothing and footwear is highest in households with one child, Table 1. Across all households, this item accounts for about 5% of average monthly expenditure. The fluctuation around the average over the period is low, especially in one-child households and two-child households. The distribution of expenditure is left-handed only in households with three or more children, and right-handed in other households. The distribution of expenditure is more skewed than normal in households with one and two children. It is flatter in households with no children and households with three or more children.

Average spending on hotels, cafes and restaurants is highest in households with one child, where it accounts for 5.63% of average monthly expenditure. In households with no children, it is 4.36%, with two children it is 6.08% and in households with three or more children it is 5.69%. The standard deviation is moderate, highest in households with one child. Similarly, the variation range is highest in these households.

The average expenditure on alcoholic beverages and tobacco during the study period was in households without children. They accounted for 4.32% of their average monthly expenditure. In households with one child, it was 2.76%, with two children 2.35% and with three or more children 1.97%. In households with no children, there is both the highest standard deviation and variation among expenditures across years. The distribution in all households is more pointed than normal, only flatter in households with three or more children. The right-hand skewness is exhibited by expenditure on alcoholic beverages in households without children and households with three or more children. Average health expenditures are highest in households with no children. These households also have the highest standard deviation and range.

Average health expenditure accounted for 3.63% of average monthly expenditure in households without children, 2.41% in households with one child, 2.37% in households with two children and 2.32% in households with three or more children. The distribution is left-handed, flatter than normal, in all households. Households with three or more children had the highest average expenditure on education, Table 2. These accounted for 1.09% of their average monthly expenditure. It was 0.18% in households with no children, 0.75% in households with one child, and 0.85% in households with two children. The highest standard deviation was in households with one child. However, the highest variation in education expenditure was in households with three or more children. The distribution of expenditures is flatter than the normal, left-hand side.

Table 2. Descriptive analysis results for education spending

	Education			
	Without children	One child	Two children	Three+ children
Mean	0,734	2,616	2,512	2,669
Standard Deviation	0,349	0,886	0,634	1,021
Kurtosis	-0,928	-1,421	-1,311	-1,456
Skewness	0,464	0,342	0,401	0,390
Range	1,200	2,580	1,950	2,920

Source: Own calculations

Table 3 provides the results of the basic tests in estimating Engel's expenditure functions. Based on the results of the adjusted index of determination (adjusted R square), it can be concluded that the variability in expenditure on goods and services is explained by income, especially in households with no children, and households with one and two children. In households with three or more children, the proportion of explained variability is lower. These results are

confirmed by Fisher's test. Engel functions explained the change in expenditure on individual goods and services with the least reliability in households with three or more children. The Engel expenditure functions for households without children explained the highest proportion of variability. The same estimated models have the highest reliability. Almost all expenditures on goods and services in these households can be described by the Engel expenditure function with 99% reliability. The least reliable functions are for recreation and culture and education. On the one hand, these functions have a low percentage of explained variability; on the other hand, they are not suitable for describing changes in expenditure across household types.

Table 3. Regression analysis results for the estimation of Engel's expenditure functions

*	Without children			One child			Two children			Three+ children		
	Adj.R ²	Fsign.	Mod	Adj.R ²	Fsign.	Mod	Adj.R ²	Fsign.	Mod	Adj.R ²	Fsign.	Mod
1	0,799	0,000	L	0,676	0,000	L	0,801	0,000	L	0,244	0,022	P
2	0,768	0,000	L	0,638	0,000	P	0,456	0,001	P	0,230	0,025	P
3	0,141	0,069	P	0,020	0,575	L	0,200	0,036	P	0,024	0,544	L
4	0,603	0,000	P	0,756	0,000	L	0,501	0,001	P	0,001	0,894	P
5	0,569	0,000	P	0,449	0,001	L	0,395	0,003	P	0,059	0,331	L
6	0,666	0,000	P	0,466	0,001	P	0,424	0,002	P	0,044	0,401	L
7	0,379	0,004	P	0,414	0,002	L	0,801	0,000	L	0,623	0,000	L
8	0,925	0,000	P	0,762	0,000	P	0,735	0,000	P	0,406	0,004	P
9	0,015	0,279	P	0,031	0,487	P	0,152	0,110	P	0,019	0,585	P
10	0,120	0,087	L	0,064	0,313	P	0,000	0,952	P	0,045	0,199	L
11	0,914	0,000	P	0,707	0,000	P	0,767	0,000	P	0,232	0,025	P

* Goods and services: 1 - Food and soft drinks; 2 - Alcoholic beverages and tobacco; 3 - Clothing and footwear; 4 - Housing, water, electricity, gas and fuels; 5 - Furniture, home furnishings and routine maintenance of the apartment; 6 - Health; 7 - Transportation; 8 - Posts and telecommunications; 9 - Recreation and culture; 10 - Education; 11 - Hotels, cafes and restaurants
Mod - model (1 linear, p power);

Source: Own calculations

Table 4. Estimates of the coefficients of Engel's expenditure functions

	Without children		One child		Two children		Three+ children	
	Intercept	B ₁	Intercept	B ₁	Intercept	B ₁	Intercept	B ₁
1	37,775**	0,104**	15,388**	0,131**	8,935	0,153**	1,494	0,462*
2	1,695	0,022**	-4,435**	1,115**	-2,961*	0,845**	-1,824*	0,639**
3	0,978	0,301*	16,057**	0,004	0,643	0,371*	16,587*	-0,019
4	2,509**	0,316**	26,958**	0,079**	1,257*	0,450**	3,468**	0,027
5	-4,304**	1,170**	-11,642	0,066**	-8,410**	1,874**	1,813	0,045
6	-4,445**	1,147**	-6,357**	1,410**	-6,333**	1,425**	2,156	0,017
7	-4,736*	1,318**	1,091	0,097**	-17,970**	0,160**	-9,696	0,132**
8	-4,086**	1,135**	-4,158**	1,177**	-4,255**	1,200**	-2,759**	0,971**
9	1,258	0,302	1,624	0,238	0,350	0,455	1,144	0,280
10	1,791**	-0,002	-3,704	0,768	1,088	-0,034	5,915*	-0,016
11	-4,262**	1,126**	-7,208**	1,694**	-6,109**	1,551**	-2,037	0,878*

*** Detto Table 3

* P < 0.05; ** P < 0.01

Source: Own calculations

Table 4 provides estimates of the coefficients of the Engel expenditure functions. Based on the t-test results for the estimated coefficients of b₁, it can be concluded that if household income changes, spending on most goods and services will also change. However, this cannot be said with statistical confidence for expenditure on clothing and footwear for households with one

child and households with three or more children, expenditure on recreation and culture, and expenditure on education for all household types. Coefficient estimates for households with three or more children were the least reliable.

However, expenditure on food for households with three or more children, alcoholic beverages and tobacco, transport, post and telecommunications, and hotels, cafes and restaurants change reliably with changes in income.

Table 5. Income elasticities of expenditure based on Engel expenditure functions

***	Without children	One child	Two children	Three+ children
1	0,575**	0,775**	0,849**	0,462*
2	0,863**	1,115**	0,845**	0,639**
3	0,301*	0,133	0,371*	-0,217
4	0,316**	0,545**	0,450**	0,027
5	1,170**	1,759**	1,874**	0,749
6	1,147**	1,410**	1,425**	0,518
7	1,318**	1,126**	1,791**	1,184**
8	1,135**	1,177**	1,200**	0,971**
9	0,302	0,238	0,455	0,280
10	-1,440	0,768	-0,034	-1,110
11	1,126**	1,694**	1,551**	0,878*

*** Goods and services: **1** - Food and soft drinks; **2** - Alcoholic beverages and tobacco; **3** - Clothing and footwear; **4** - Housing, water, electricity, gas and fuels; **5** - Furniture, home furnishings and routine maintenance of the apartment; **6** - Health; **7** - Transportation; **8** - Posts and telecommunications; **9** - Recreation and culture; **10** - Education; **11** - Hotels, cafes and restaurants

* $P < 0.05$; ** $P < 0.01$

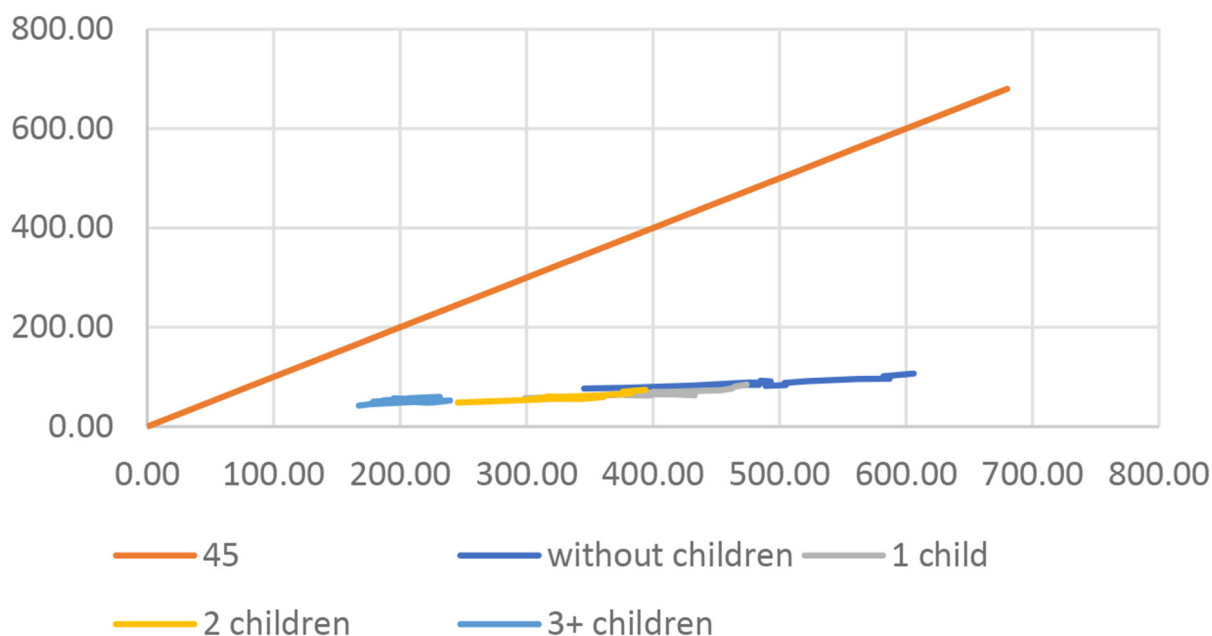
Source: Own calculations

The coefficients from the estimated models were further input into the calculation of income elasticities of expenditure to allow for a better comparison of the impact of income on household expenditure.

Table 5 provides a comparison of income elasticities of expenditure on individual goods and services for the surveyed household types in the Slovak Republic. Expenditure on food and non-alcoholic beverages is one of the expenditures that increases less than income as household income increases. Among the households surveyed, households with two children respond most strongly to changes in income by spending on food. For a 10% increase in income, food expenditure increases by 8.49%. Households with three or more children are the least significant. Figure 1 provides a sketch of Engel's expenditure functions for food and non-alcoholic beverages. The orange 45° line represents a situation where a household spends all of its income only on the purchase of food and non-alcoholic beverages. The Engel expenditure curves move away from the 45° line, which is typical for essential goods. The Engel expenditure curve departs the furthest for households with three or more children, whose expenditures are the least elastic to changes in income.

Expenditure on alcoholic beverages increases more than income in households with one child as income increases. For a 10% increase in income, expenditure on alcoholic beverages will increase by 11.15% in these households. For other households, these expenditures respond inelastically. It is least elastic in households with three or more children. The income elasticity of household expenditures on clothing and footwear is statistically significant only in households with no children and households with one child. In both types of households, expenditure responds inelastically.

The Engel expenditure curve for households without children is the flattest. Their response is the least elastic. However, expenditures on housing, water, electricity, gas and fuel respond inelastically to changes in income in all types of households. In households with three or more children, the elasticity is statistically insignificant. The elasticity for expenditure on furniture and furnishings in these households is also insignificant. Expenditure on furniture and furnishings in other types of households is elastic to changes in household income. This is most pronounced in households with two children. For a 10% increase in their income, expenditure increases by 18.74%.



Graph 1. Engel expenditure curves for food and non-alcoholic beverages

Source: Own calculations

Similarly, households with two children are also the most elastic in terms of health expenditure, transport expenditure and expenditure on post and telecommunications. For a 10% increase in the income of a household with two children, health expenditures increase by 14.25%, transportation expenditures increase by 17.91%, and post and telecommunication expenditures increase by 12.00%. Recreation and culture and education expenditures are not estimated statistically reliably for any household type. Expenditure on hotels, restaurants and cafes also responds very significantly to the change in income. The income elasticity of expenditure is greater than 1 in all household types. In households with one child, a 10% increase in income increases this expenditure by 16.94%.

4. DISCUSSION

Other studies that have looked at the application of Engel's law and the estimation of Engel functions have compared household expenditures by several classifications. The consumption inequality based on Engel's expenditure elasticity is smaller than the inequality calculated by the ratio of high and low-income households (Fang & Shi, 2023). Inter-temporal analysis of expenditure elasticity suggests that the classification of necessity or luxury commodities has remained mostly unchanged over the study period (Jayasinghe et al., 2019). Engel's law and the functions of L. Tornqvist show that despite a more than threefold increase in

expenditures, the financial situation of households has not improved significantly, (Kyrylenko et al., 2022). Engel's coefficient is more strongly affected by the price of food necessities than by the price of food non-necessities (Chen, 2022). The income elasticity of food demand is between 0.62-0.79 (Aykaç, 2018). The share of household expenditure on food is inversely proportional to household income in the district, following Engel's law (Mulamba, 2022). The relationship between the Engel coefficient and income presents an inverted U-shaped pattern during periods of rapid debt growth (Huang & Chen, 2022). The estimated Engel curves suggest that food at home grows less with increasing income than food away from home (Burzig & Herrmann, 2012). The income elasticity for food away from home is 0.4609; i.e., a necessary good for households that maintained spending during the pandemic (Aguilar-Lopez & Kuhar, 2022). Some studies have used Engel's law to explain gender bias. Women and girls suffer from gender bias in food expenditure, which is an important determinant of women's health outcomes (Basu, 2021). Several studies have focused on the correlation between expenditure on different goods and services. Offsetting the rise in healthcare costs has caused a reduction in the share of non-food expenditure items, i.e. fuel, education, entertainment, clothing, and footwear (Panikkassery, 2020). The tobacco crowding out effect is modest due to the small share of tobacco in total household expenditure, it is reflected in education expenditure in low-income households, (Nguyen & Nguyen, 2020). Households that spend on tobacco also spend on alcohol, recreation, transport and communication, and less on food, housing and health needs (Masa-ud et al., 2020). Changes in benefits also resulted in spillover effects on non-food expenditures by seniors and younger adults, including transportation, utilities, health services, and other expenses (Waehrer, 2023).

5. FUTURE RESEARCH DIRECTIONS

Future research in this area could focus on Engel curves, which show the relationship between income and consumption of goods, and the income elasticities of demand derived from them. Income elasticities of demand for goods and services may, given the absence of price, be better suited to show the necessity or luxury nature of goods and services.

6. CONCLUSION

Expenditure on food and non-alcoholic beverages and expenditure on housing, water, electricity, gas and fuel are among the largest items of monthly household expenditure. At the same time, these goods and services, together with the need for clothing and footwear, are among the basic necessities of life for the population. Therefore, expenditure on them does not change elastically with changes in income. Expenditure on food is the least elastic in households with three or more children (income elasticity of expenditure 0.462), expenditure on clothing and footwear in households without children (0.031) and expenditure on housing, water, electricity, gas and fuel in households without children (0.316). Expenditure on furniture and home furnishings, health, transport, post and telecommunications vary more elastically. This is particularly pronounced in households with two children. Expenditure on hotels restaurants and cafes also responds significantly to income change, and especially in households with one child (1.694).

Acknowledgment

This research was supported by the GA FEM [grant number 03/2022/GA-FEM-SPU].

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Income Inequalities during the Post-covid Era in the Greek Tourism Industry

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Received: March 22, 2024
Accepted: May 20, 2024
Published: August 6, 2024

Keywords:

Oaxaca decomposition;
Tourism wage model;
Job location selection



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Abstract: *Tourism industry wages are dominated by seasonality, with no detailed key factors affecting monthly salary available for candidates and employers. Using Blinder-Oaxaca wage decomposition technique, the authors identified the impact of job location, education, gender and other factors within the Greek Tourism Industry during the summer season of 2023. Analyzing 600 job offers involving 2500 candidates and 320 companies, the paper provides a comprehensive dataset that can yield valuable insights into the dynamics of the market. The authors identified across-country income variations, based on geographic trends and emphasized the role of education. Based on the results, even though the pandemic has offered new job prospects, especially for female employees, the gender wage gap is still widely apparent in the industry. By exploring these aspects, this paper offers a nuanced understanding of salary variations providing valuable information for professionals making career decisions and businesses seeking to optimize their talent strategies.*

1. INTRODUCTION

In most Western European countries, over 75% of tourism workers' salaries are covered by collective bargaining agreements, typically negotiated at the national or sectoral level. A less-explored aspect of this centralized wage-setting system is its tendency to enforce uniform nominal wages across geographical areas, driven by considerations of fairness (Moretti et al., 2017).

Oshchepkov (2021) investigated the disparities in wages among different regions in Russia, with a specific emphasis on two enduring factors that contribute to these differences: diverse regional economic structures and varying living conditions. Wage compensations designed to offset relatively unfavorable living conditions, including higher price levels, colder winters, and inferior environmental conditions, contribute to approximately half of the remaining variation. These findings enhance our understanding of the underlying nature of interregional wage differentials in Russia and hold significant implications.

Moreover, the United Nations World Tourism Organization (UNWTO, 2019), mentions that tourism plays a crucial role in providing employment opportunities for women. Specifically, women constitute more than 60% of the workforce in the hotel industry, as reported by the World Travel and Tourism Council (WTTC, 2018), with the incorporation of women into the workforce being widely acknowledged as a positive outcome of tourism development (Freund & Hernandez-Maskivker, 2021).

Despite the growing representation of women in the hospitality labor market, empirical studies indicate enduring patterns of both horizontal and vertical segregation, along with a persistent

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gender pay gap. This situation perpetuates missed opportunities within the industry (Segovia-Pérez et al., 2019).

Sustainable tourism practices are inseparable from the concept of fair employment. However, a commitment to sustainability in tourism must also actively address and surpass instances of discrimination and inequality based on gender. Hence, the absence of a gender perspective in various aspects such as business policies, training programs, social research, tourism and employment policies, information handling, or union initiatives contribute to the persistence of discriminatory and unequal situations (Moreno-Alarcón & Cañada – Mullor, 2018).

Another factor is the issue of tourism seasonality, widely considered a concern for numerous primary destinations worldwide, especially when viewed through the lens of sustainability (Duro & Turrión-Prats, 2019).

Tourism plays a pivotal role in Greece's economy, showcasing considerable potential for growth in wealth and employment. Its significance extends beyond contributing to the GDP, also accounting for a substantial portion of total employment, approximately 10% in both aspects. The trend suggests a likelihood of further growth in importance in the years to come. Employment within the Greek tourism industry exhibits three prominent characteristics: i) Seasonality, ii) Spatial constraint, particularly prevalent in island tourism, and iii) a concentration of employment at the lower end of the skill scale. However, several studies have delved into the challenges within the tourism sector, revealing factors such as job insecurity, low educational levels, meager wages, and significant occupational segregation.

Furthermore, destinations that exhibit a disproportionate representation of women and youth workers in their tourism industries are anticipated to witness more significant job losses during pandemics. This is due to a higher concentration of these demographic groups in frontline roles, and part-time positions, and the absence of formal contract protections. Consequently, countries reporting a higher concentration of female and youth workers, a lower wage scale in the tourism sector, and a notable gender pay gap are expected to witness a substantial reduction in income for female and youth workers, particularly in the lower-earning quantile, during the COVID-19 pandemic.

2. COVID ERA

The global economic decline triggered by the COVID-19 pandemic represents the most substantial recession since the Great Depression (United Nations, 2021), particularly impacting the tourism industry. During COVID, numerous lower-income workers in the tourism industry face a decline in their incomes, whereas individuals with higher incomes in sectors unrelated to tourism are able to maintain their employment, earnings, and savings.

Amid this health crisis, employees experienced a deterioration in their employment conditions, including job decline, increased unemployment, shortened work hours, decreased wages, or unpaid leave. Nonetheless, the economic challenges were not uniformly distributed among tourism workers, as the majority were engaged in non-standard seasonal contracts. Our research incorporated information derived from seasonal employment, a pattern that has gained increased prominence globally, especially in the period following the pandemic.

3. METHODOLOGY

The Oaxaca-Blinder decomposition, is an analytical technique used in econometrics and labor economics to decompose the observed wage gap between two groups of individuals. The method was initially developed by Oaxaca (1973) and extended by Blinder (1973) in the same year. The Oaxaca-Blinder decomposition is primarily applied to understand and quantify the factors contributing to wage differences between different demographic groups, such as gender or race. It involves breaking down the wage differential into two main components:

- The Explained Component: This part represents the portion of the wage gap that can be attributed to observable characteristics such as education, experience, and job-related factors. It reflects the portion of the wage differential that can be justified by measurable factors.
- The Unexplained Component: This component accounts for the residual or unexplained part of the wage gap that cannot be attributed to observable characteristics. It is often interpreted as a measure of potential discrimination or other unobservable factors affecting wages.

By separating the explained and unexplained components, the Oaxaca-Blinder decomposition provides insights into the factors contributing to wage disparities between different groups. This methodology is widely used in studies examining wage gaps and disparities in labor markets (Elder et al., 2010).

The wages in the Hospitality and Tourism industry exhibit significant seasonality, and a comprehensive examination of key factors influencing monthly salaries for candidates, managers, and employers is lacking. This study employs the Blinder-Oaxaca wage decomposition technique to discern the impact of job location, education, gender, and other factors within the Greek Tourism Industry during the summer of 2023. A dataset encompassing 600 job offers, 2500 candidates, and 320 companies was analyzed, providing valuable insights into the dynamics of the tourism job market.

4. RESULTS

The following table (Table 1) provides insights into the demographic composition and geographical distribution of individuals based on their sex and workplace. Out of the 1571 individuals included in the survey, 54.1% (850 individuals) are women, whereas 45.9% (721 individuals) are men. Regarding job place, the majority of individuals work in the Cyclades, constituting 28.2% (443 individuals) of the total. Following closely, mainland locations employ 22.3% (350 individuals) of the surveyed population. Furthermore, Crete and the Ionian region both employ significant proportions, with 23.9% (376 individuals) and 14.4% (226 individuals) respectively. The Dodecanese region has the smallest representation with 11.2% (176 individuals) of the workforce. In summary, this data offers a thorough overview of how individuals are distributed according to their gender and where they work, showcasing the diverse proportions observed across various regions.

Table 2 provides a breakdown of individuals based on their educational attainment. The group of individuals who have completed Elementary/High School comprises 409 people, representing 26.0% of the total surveyed. The 142 individuals are classified as High/Vocational high school graduates, constituting 9.0% of the overall surveyed population. The group of people who have completed professional studies (except Tourism & Catering) includes 515 people, who constitute 32.8% of the total and 335 people belong to the category of graduates of professional studies in Tourism or Catering (such as Cooks, Confectioners, Bakers), representing 21.3% of the total. See also, 71 individuals, representing 4.5% of the total, have achieved university degrees in disciplines

other than Tourism and Food. 83 people, constituting 5.3% of the total, have earned degrees from a university-level School of Tourism. Additionally, 16 individuals, comprising 1.0% of the total, have obtained a Master’s degree in Tourism from a university. In total, the dataset comprises 1571 individuals with diverse educational backgrounds and levels of achievement.

Table 1. Frequency and relative frequency of Sex and Job Location

		N	%
Gender	Female	850	54.1%
	Male	721	45.9%
	Total	1571	100%
Job place	Mainland	350	22.3%
	Dodecanese	176	11.2%
	Crete	376	23.9%
	Cyclades	443	28.2%
	Ionian	226	14.4%
	Total	1571	100%

Source: Own research

Table 2. Frequency and relative frequency of Education

		N	%
Education	Elementary/High School graduate	409	26.0%
	High/Vocational high school graduate	142	9.0%
	Graduate of vocational studies (except the specialty of Tourism & Food)	515	32.8%
	Graduate of vocational studies in Tourism or Food (Cooks, Confectioners, Bakers, etc)	335	21.3%
	University Graduate (excluding Tourism and Food)	71	4.5%
	Graduate of School of Tourism (University)	83	5.3%
	Master in Tourism (University)	16	1.0%
	Total	1571	100%

Source: Own research

Figure 1 displays a point estimation of outcomes for each variable, accompanied by error bars representing 95% confidence intervals. In the endowments section, the majority of variables show a statistically insignificant (or only marginally significant) impact, except for males. It appears that a substantial portion of candidates with tourism education is influenced by variations in the proportion of males within different groups.

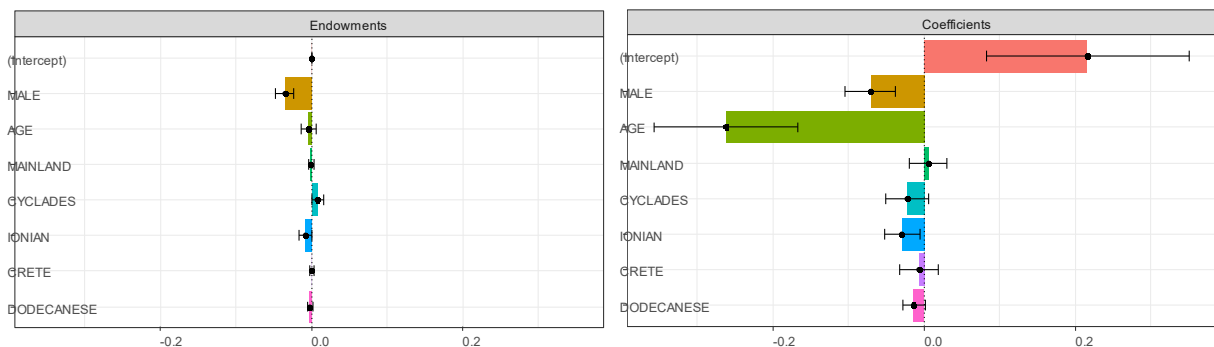


Figure 1. Oaxaca-Blinder Decomposition of salary among employees with tourism and non-tourism studies

Source: Own research

Moreover, the calculated $x.mean.diff$ value (-0.187) indicates that a larger percentage of female workers lack a background in tourism education. The contrast in the gender composition of workers with tourism education contributes to a portion of the higher wages observed among males.

To examine further the above results, Figure 2 shows that solely the discrimination components related to the age variable attain statistical significance beyond a marginal level. Judging by the proportional sizes of the bars, under the assumption that pooled regression coefficients indicate a non-discriminatory state, approximately half of the wage gap can be attributed to discrimination against individuals without tourism studies, mirroring the extent of discrimination favoring those with tourism studies.

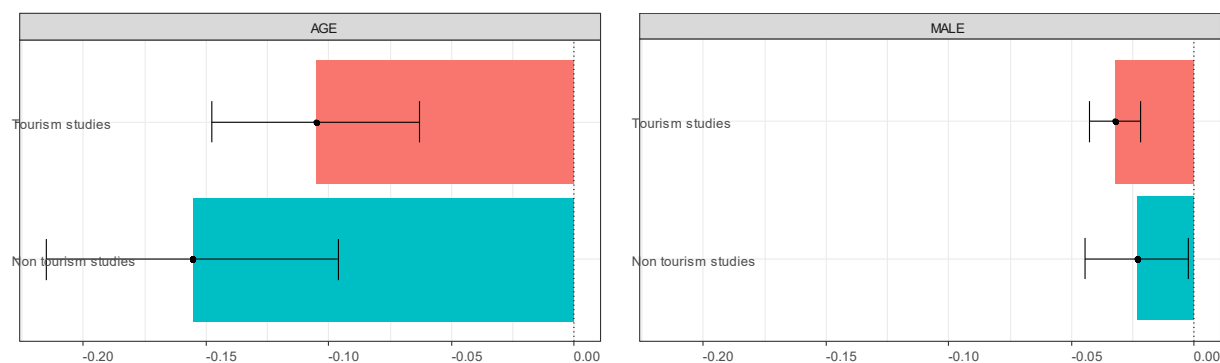


Figure 2. Oaxaca-Blinder Decomposition of salary results of tourism and non-tourism studies for age and gender

Source: Own research

Among the 330 million jobs directly and indirectly linked to tourism, women occupy 54%, as reported by UNWTO in 2019, and youth hold between 10% and 34%, according to WTTC in 2019. A study by Mariolis et al. (2021) indicated a job loss ranging from 2.1% to 6.4% in Greece. Despite this, international organizations such as the United Nations World Tourism Organization (UNWTO), the World Travel and Tourism Council (WTTC), and the International Labour Organization (ILO) underscore the pandemic's uneven impact on different geographical locations, particularly affecting women and youth.

In our study, we investigate the impact of the post-COVID situation on employment in the tourism sector, taking into account various factors such as job location, educational background, gender, and age within different regions of Greece. It is important to emphasize that recognizing the primary elements influencing monthly salaries is essential for both job seekers and employers.

5. CONCLUSION & FURTHER RESEARCH

Even four years from the initial onset of the COVID-19 pandemic in March 2020, the emergence of new virus variants and successive waves of infections has impeded employment, giving rise to novel trends and job characteristics that profoundly influence societal inequalities within countries and across various professions.

Global travel is considered a high-end commodity that responds to changes in income levels (Falk & Lin, 2018; Smeral, 2010). This type of travel facilitates the transfer of funds from wealthier individuals (tourists) to numerous small and medium enterprises, eventually benefiting workers who typically earn lower wages in the visited countries. Unlike exports of natural

resources such as precious metals and oil, where wealth is often concentrated among a privileged few, tourism exportation results in a more widespread redistribution of income among various stakeholders across nations (Smith, 2004). In the context of the COVID-19 pandemic, with restrictions on international tourism, anticipations point towards divergent shifts in income. Wealthier individuals experience an increase in wealth as their unused international travel funds transform into additional investments in capital assets like stocks or real estate. The heightened opportunities for those earning income from capital during the pandemic emerge as a significant driver of inequality (Murhekar et al., 2021). Conversely, workers reliant on tourism face economic hardships, leading to a relative decline in income compared to their non-tourism counterparts both domestically and internationally (Sun et al., 2022).

The susceptibility of tourism workers highlighted during the COVID-19 pandemic lacks specific data linking their vulnerability to income inequality. This research investigates the impact of reduced international tourism consumption on tourism employment and income loss potential across 132 countries. The findings reveal that a higher percentage of female (9.6%) and youth (10.1%) workers faced unemployment, receiving significantly lower pay (a decrease of 5%) due to their involvement in the tourism sector. Female workers experienced a more pronounced decline (-23%). Disparities in policy support and pre-existing economic conditions further contributed to significant variations in lost-income subsidies among countries. With an uneven financial burden affecting different groups and regions, the collapse of international travel exacerbates short-term income inequality within and between countries (Sun et al., 2022).

Through the utilization of comprehensive administrative datasets and the EUROMOD micro-simulation model, it is demonstrated that the COVID-19 crisis adversely impacted the employment income of both men and women. However, the wage compensation measures implemented in 2020 seemed to mitigate these effects. Although men experienced slightly greater income losses, the compensatory impact was more pronounced for women. While overall gender-based income disparities remained relatively stable during the crisis, the wage compensation initiative played a crucial role in preventing a further increase in such disparities, particularly within the hotels and restaurants sector (Laurimäe et al., 2022).

Tourism is a key player in the global economy, holding the potential to promote both economic development and environmental preservation. This underscores the urgency for tourism to actively participate in fostering the establishment of a more equitable society (Mtapuri & Giampiccoli, 2021).

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Logistics and Supply Chain a Perspective on Unstable Markets

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Received: January 30, 2024

Accepted: May 27, 2024

Published: August 6, 2024

Keywords:

Supply chain;
Family businesses;
Market orientation



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Abstract: *The main objective of this work is to investigate the logistic function in an organizational context and analyze the influence of logistical performance as a relevant factor for the orientation of these companies to the market and in the development of competitiveness standards with an impact on organizational performance. This relationship is investigated in the specific situation of the Portuguese industry, and for this purpose data was collected from a group of family businesses. The investigation model, derived from the formulated hypotheses, was tested using the analysis of structural equations using the partial least squares technique.*

1. INTRODUCTION

The rapid growth of uncertainty and risks perceived by economic agents, fueling the asymmetry of the effects and consequences of unfavorable economic situations, such as those arising from current war scenarios and the trend of growth in industrial costs in the global context, leads companies to adapt their business models for sustainability and prosperity in the market.

Family businesses are a multidimensional economic reality expanding globally and historically resilient, with low immunity to occasional shocks, whose survival and performance are influenced by factors of different natures (Eggers, 2020; Ramos, 2021).

From a supplier/client perspective, integrated supply management is likely to impact activities in which the diversity of flows and dependence on these inputs is very significant, as is the case with most activities linked to family business industries. It is in this context that this work was developed, studying the supply process in a sample of industrial family businesses in Portugal. This study analyzes how the management of supply chain processes in these industries can contribute to the development of competitiveness standards and market orientation for companies.

In the methodological field, this work was initially preceded by a review and documentary analysis in the main reference bases, at a scientific level. As this is an empirical study, data were collected using a questionnaire. The results allowed us to find empirical support to determine the influence between supply chain management practices, market orientation, and the performance of family-owned industrial companies.

2. THEORETICAL FRAMEWORK

Family businesses are the most common form of the organization worldwide (Ramadani et al., 2020; Wooldridge, 2015), whatever the economy and regardless of geographical location, small

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family businesses are the pillars of the regional economy and the internationalization of smaller countries on a global scale (Gamidullaeva et al., 2020; Memili et al., 2015). But, if on the one hand, this type of company, characterized by family involvement in ownership, management, and control, gives rise to a very centralized governance model, it is also a fact that these companies have a notable capacity for resilience, which is fundamental for the continuity and success of these companies (Calabrò et al., 2021; Kachaner et al., 2012; Mazzi, 2011). In this context, stable and sustainable family businesses are fundamental for the development and recovery of countries, particularly in the most difficult times such as the one we are going through resulting from armed conflicts, recession in demand, and increases in the operating costs of industries.

The challenge of governance in this type of family business is a critical issue for their future sustainability (Porfirio et al., 2020; Steier et al., 2015), as is the market orientation that results from the normal business demands caused by the intensification of competition (Hernández-Linares et al., 2021; Morgan et al., 2009). Orientation towards the market and customer satisfaction in products and services is naturally a determining element of the business performance of these companies, as mentioned by Powers et al. (2020), Hooley et al. (2005) and Kohli and Jaworski (1990), and according to Chaudhary et al. (2023) and Ramos (2021) corporate profitability is a consequence of market orientation.

Although logistics management processes have been seen as a strategic support function for companies, it has only recently gained more importance at the level of corporate governance (Anca, 2019; Moons et al., 2019). In this context, of the connection between supply chain management practices and customer satisfaction, some researchers such as Bielecki and Galinska (2017) observe that many companies focus on logistics capabilities to develop competitive advantages and differentiate themselves in the market. For Morgan et al. (2009), competitive advantages can only be achieved when the company combines resources in such a way that it can achieve a unique capability that is duly valued by the market. The logistics function, through the service provided to the customer, can provide the competitiveness factors necessary for the competitive dynamics of companies (Gunasekaran et al., 2017; Kalaitzi & Tsolakis, 2022; Maloni et al., 2017).

The theme of governance and its relationship with the performance of family businesses is not likely to be exhausted within the scientific community and is even a field of research that increasingly deserves the attention of professionals and academics from the most diverse areas of knowledge (Steier et al., 2015).

In the macroeconomic field, the relationships between the competitiveness of the economy and the performance that companies can achieve are studied, given that it is a fact that the new paradigms of a country's competitiveness derive, directly, from the performance achieved by its business fabric. At a micro-economic level, competitiveness can be observed through the market share and profitability of companies, whether family-owned or not, large or small.

At a business level, regarding the reasons for the existence of organizations and the objectives of their investors, Teixeira (2017) states that companies are formed because entrepreneurs hope, in this way, to obtain a return on their investments. According to the aforementioned author, the existence of a company that systematically does not exceed its breakeven point is unthinkable in the long term, and the best way for a company to compete in the market is to obtain a strategic position that allows it to develop certain competitive advantages, through economies of scale. However, size alone cannot be considered a strategic objective, because there are circumstances in the life of companies in which small companies have advantages over large organizations.

In general, organizational performance is defined as profitability or return, sales growth, and increase in market share, which represents the result of market orientation and is a consequence of the processes used by companies (Gligor et al., 2019; Kirca et al., 2005; Morgan et al., 2009; Ziggers & Henseler, 2016). Within the scope of this work, we can highlight that, at the level of small family businesses, if the performance of the supply chain reflects the performance of the company, with regard to market orientation through its ability to distribute products and services in the right quantity and at the right time for its clients, organizational performance represents “the *raison d’être*” of performance, namely its capacity in terms of profitability and return on investments, essentially in assets, when compared with its competitors (Banerjee & Deb, 2023; Green et al., 2008).

In terms of competitiveness, we note that there has been growing interest among researchers in the fact that logistics chain management can be a key factor in achieving competitive advantages in the market (Li et al., 2006; Sandberg & Abrahamsson, 2011; Sugiono et al., 2023). The literature is consensual regarding supply chains having a positive impact on market orientation at the company’s competitive level because they allow the development of key determinants to position itself in the market, with better levels of efficiency, cost reduction, and service differentiation to customers (Bielecki & Galinska, 2017; Christopher, 2016).

In the opinion of several authors, the concept of market orientation is based on a company governance policy, which is based on the integration of intra-organizational services with the focus of increasing organizational performance for the company.

The concept of market orientation was introduced by researchers such as Kohli and Jaworski (1990), who demonstrated the existence of a positive relationship between market orientation and the organizational performance of companies. Subsequently, other studies developed in this area concluded that there is a positive correlation between market commitment, return on investments, and asset profitability (Narver et al., 2004; Udriyah et al., 2019). Market orientation allows the company to leverage its profitability, development and increase market share, as well as create competitive advantages over competitors (Morgan et al., 2009; Udriyah et al., 2019).

At this specific point, the logistics practices of small family businesses can constitute a relevant factor for market orientation, given that logistics performance leverages higher levels of competitiveness, providing key differentiating factors in the market. This value creation allows the development of core competencies, which are used for market commitment, i.e. market orientation, linked to good performance in customer satisfaction and business margins (Udriyah et al., 2019).

Ralston et al. (2013), when addressing supply chain management in a group of companies in the United States of America, highlight the importance of Logistics in these companies and refer to the need to strengthen the function in the organizational structure so that the company can capitalize on the advantages of logistics, improving its capabilities and its impact on logistics performance. According to these authors, logistics innovation together with the differentiation of the logistics service influences business performance, which, based on the Resource-Based Theory, creates a set of essential skills with repercussions at the level of organizational performance.

Cahyono et al. (2023) and Li et al. (2006), defined competitive advantage as the extent to which companies can create a defensible position about competitors, comprising capabilities that allow an organization to differentiate itself from its competitors and that result from critical company governance decisions.

In the global competitive environment of Industry 5.0, with rapidly changing technologies and high customer expectations throughout supply chains, the company to obtain a competitive advantage needs to have a superior responsiveness to competitors (Alfalla-Luque et al., 2018).

Competitive advantages are only possible to develop in companies that establish a commitment to satisfying customer needs and desires, that is, market orientation. And, in the distribution of a product or service, the logistics function is one of the few functions that currently contact customers, representing the last contact between the organization and its customer, which constitutes a determining factor in a market orientation policy (Dadzie et al., 2023; Fugate et al., 2008; Gligor et al., 2019).

In the literature, there is consensus on the positive relationship between market orientation and organizational profitability, given the fact that it creates superior value for the customer (Gligor et al., 2019; Narver et al., 2004). Some authors such as Hernández-Linares et al. (2021), Roach (2011), and Morgan et al. (2009) highlight that market orientation has a positive correlation with organizational performance and mention that the implementation of a market orientation strategy has an impact on the company's financial performance, due to the financial flow component of the supply chain. Based on the conceptual framework derived from the literature research developed, the following hypotheses are considered in this study:

H1 – There is a direct relationship between supply chain performance and market orientation in small family businesses.

H2 – In Small Family Businesses, there is a direct positive relationship between market orientation and organizational performance, at a financial level.

3. METHODOLOGY

To develop the fieldwork of this research project, data collected in two phases were used. In the first, the method of collecting primary data of a quantitative nature was used, information that allows the study of logistical performance and its contribution to the development of competitive advantages in smaller companies and its influence on organizational performance.

In the second stage, the Iberian Companies Financial Analysis System database was used, as well as other specialized sources, to obtain secondary economic-financial data from companies related to organizational performance, given that the variable of business performance was the return on assets.

Given the exploratory nature of this research, the collection of information from primary data from companies, on the issues raised by the hypotheses that underlie the study, was carried out using a questionnaire, with scales previously validated in studies in the literature. The data was collected in the second quarter of 2023. The population under study consists of 61 small family businesses based in Portugal, commercial or industrial, whose activity is based on the sale of goods that can be classified as inventories.

In a stage before data analysis, an evaluation of the research model was carried out through an exploratory study, to better understand and justify how the variables considered in the structural model are grouped. This is a determining procedure, that is recommended by several authors and allows the reliability of the constructs to be previously analyzed.

Table 1. Factor analysis and reliability of variables

Variables	KMO	Bartlett Test of Sphericity	Variance Explained	Cronbach α
Market Orientation_ Competitive Advantage (MO_CV)	0.793	0	54.089	0.846
Supply Chain Management_ Logistics Performance (SCM_LP)	0.706	0	77.581	0.850
Financial Organizational Performance (FOP)	0.631	0	84.165	0.758

Source: Own research (SmartPLS Output)

Given the objectives of this investigation, we opted for exploratory factor analysis, using the SPSS statistical program. The table presents the results of the analysis in main components with Varimax rotation and Cronbach's Alpha coefficient. The research model, derived from the formulated hypotheses, was tested using structural equation analysis, using the partial least squares technique (PLS-SEM) using the SmartPLS software version 3.3 (Hair et al., 2021).

4. RESULTS

The analysis of the results estimated by SmartPLS begins with a significance test for the variable indicators. Thus, firstly, the Outer Model was analyzed, and then the Inner Model was analyzed, analyzing the trajectory coefficients and the model's predictive capacity indices.

The estimated Inner Model values, obtained through the bootstrapping algorithm, considering the resampling values suggested in the literature, such as Hair et al. (2021), as well as the respective t-values are shown in Table 2.

The estimates presented allow us to verify that the variables under study present indicators with very reasonable values, given the main criteria in the analysis of structural equations using the PLS-SEM method.

Table 2. Analysis of trajectories between constructs

Relation	Structural Coefficient	Sample Mean (M)	Standard Error	t-values
SCM_LP \rightarrow MO_CV	0.775	0.798	0.037	20.988
MO_CV \rightarrow FOP	0.524	0.542	0.064	7.702

Source: Own research (SmartPLS Output)

In the next step of analyzing the structural model, the internal consistency analysis, reliability and discriminant feasibility were checked, whose values obtained by SmartPLS are as follows:

The measures contained in the previous table allow the validation of the reflective measurement model, namely at the level of Reliability and Internal Consistency ($\alpha > 0.7$), Convergent Validity (AVE > 0.5), and Discriminant Validity, through the criterion of Fornell and Larker (Hair et al., 2021).

Table 3. Indices of latent variables

Construct	AVE > 0.5	Composite Reliability	α	R ²	Discriminant Validity
MO_VC	0.6	0.9	0.8	0.60	0.7
POF	0.6	0.9	0.7	0.27	0.8

Source: Own research (SmartPLS Output)

In general, given the results obtained, through the analysis of structural equations using the PLS-SEM method, we conclude that the hypotheses formulated between the constructs, from the initial theoretical model (Table 1), are statistically significant.

The results obtained also allow us to answer the research questions posed, in which the formulated hypotheses were empirically tested, the data for which are presented in Table 1, and allow us to confirm, in the light of statistical values, the research hypotheses. In a more detailed analysis, it appears that the hypotheses of the research model are corroborated at a confidence level of 99%.

Per the first hypothesis elaborated, we found that the performance of logistics activities (SCM_PL) has a direct influence on the market orientation (MO_CV) of small family businesses. Effectively, the results of the analysis of structural equations using the PLS_SEM method indicate the existence of a significant and positive connection between the two constructs. From the outset, it was possible to confirm hypothesis H1 (t-value= 20.98; p-value <0.01) of the relationship between logistics activities (SCM_LP) and market orientation (MO_CV), as suggested in the literature by [Bielecki and Galinska \(2017\)](#), [Christopher \(2016\)](#) and [Fugate et al. \(2008\)](#). This is an important result, as it provides empirical support for the conceptualization we adopted and the theoretical orientation in which we anchored ourselves to carry out the research, in a field with a relative scarcity of empirical studies. This significant influence can be indicated through the coefficient of determination (R^2) with an index of 60%, an estimated coefficient of $\beta=0.775$, and a p-value < 0.01.

In the business context of the sample, it was possible to observe the respondents' perception of the influence of market orientation in obtaining better organizational performance (POF), assessed through the profitability of their assets (ROA), in the PEFS (H2), meeting the investigated by [Gotteland et al. \(2020\)](#), and [Roach \(2011\)](#). The estimated results ($R^2=27\%$) reveal that market orientation in PEFS has a direct and significant relationship with business performance ($\beta=0.524$, t-value=7.702; p-value < 0.01).

These values are justified because logistical practices have a great influence on the competitive context of PEFS. As mentioned by [Kalaitzi et al. \(2019\)](#), [Fugate et al. \(2008\)](#), and [Mentzer et al. \(2004\)](#), logistics skills and capabilities can provide cost leadership, achieved through efficiency (reduction of costs and invested capital) and positioning through differentiation in the "eyes" of customers.

5. FUTURE RESEARCH DIRECTIONS

In terms of contributions, this work contributes to the research field of this area of investigation, providing theory and a conceptual model for the study of the logistics function in the business context and more specifically for organizational performance, an area in which the underlying theory has not been very focused on research agendas.

The field of study of small family businesses at a logistical level is an area of research that requires in-depth research that contributes with theory and research models on a scale proportional to the relevance of these organizations, namely in adding value and reducing regional asymmetries.

Small family businesses are the structural basis of economies and their resilience and flexibility in orienting their processes towards the market are decisive in the competitiveness of

industries, in the adjustment to new technological realities (Rev. 5.0), and in the transition to the circular economy.

Future research may focus on the relationship between logistics processes and organizational performance, trying to identify variables to include in the research model that are relevant, at the level of these companies, to the new economic and environmental dimension.

In parallel, another field that needs research concerns the role of logistics as an element of innovation and aggregation in the logistics channels of these companies. Finally, given the empirical study of this work, it would be interesting for the investigation to be extended and compared at the level of industries and countries.

6. CONCLUSION

This research work started with market orientation in small family businesses, focusing on the analysis of the relationship between logistics chain management, market orientation, and organizational performance. This theoretical framework converged to establish two axes of analysis on the influence of logistics performance on the competitive level and profitability of family businesses.

The data were collected using a research instrument previously validated for this purpose, and the latent variables were derived from literary research on the topic in question. Chain management performance was represented by a construct that included observed variables related to responsiveness, flexibility, and logistics costs. Concerning market orientation, components related to service differentiation and customer satisfaction were considered.

In analyzing the relationship between market orientation and the construct of organizational performance, it was possible to conclude from the results obtained that the market orientation variable has a positive and significant effect on the financial performance of the organizations studied. The inner model presents an explanatory power (R^2) of 27.1%, which in light of the literature can be considered as a good explanatory power of the endogenous construct due to the variables of the proposed model.

The conjecture that underpinned the formulation of the central axis of the investigation was the consideration that small family businesses, with a good performance of their logistics activities, increase customer satisfaction, which reinforces the company's competitive position and increases its performance. at the level of financial results. By analyzing the trajectories of the research model, it was possible to verify that the Market Orientation link is positively and significantly influenced by the construct of logistics performance. The results obtained indicate an estimated value of 0.775, with a t-value statistic of 20.9, which corresponds to a p-value < 0.01 .

This result is justified by the increases in the logistical variables of response capacity, effectiveness, and service level, reducing inventory and current expenses, guaranteeing the required service levels of the commitment assumed (right product, in the right quantity, in the right place) with the clients. These factors, which boost organizational profitability, because they increase the turnover of current assets, the return on total assets, and the company's overall performance, are extremely relevant for all organizations, in general, and for small family-owned companies, in particular.

The values presented are in line with what is shown in the literature, namely [Hernández-Linares et al. \(2021\)](#), [Karagöz and Akgün \(2015\)](#), [Roach \(2011\)](#) and [Morgan et al. \(2009\)](#), when stating that, in the current business context, a corporate governance strategy that allows the development of competitive advantages, market orientation, based on management practices of logistics activities and the supply chain, aiming for better relationships, satisfaction and customer loyalty customers, can provide better levels of business profitability.

To conclude, this study made it possible to fill a gap in research within the logistics framework, investigating the factors that influence logistics performance in small family businesses and, simultaneously, analyzing the development of competitive advantages in market orientation and the positive and significant impact of these variables in the organizational profitability of companies.

As a general conclusion of this investigation, we can highlight that the results presented, which derive from the confirmation of the established hypotheses, allow us to conclude that the logistics function represents a decisive activity for increasing the competitiveness and performance of small family businesses.

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