Emc Review

UDK: 33

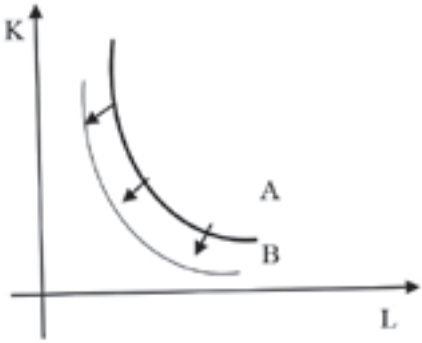
ISSN 2232-8823 (Print)

ISSN 2232-9633 (Online)

pp. 1-288

Časopis za ekonomiju *i tržišne komunikacije*

Economy and Market *Communication Review*



Technical progress and economies of scale

APEIRON
ΑΠΕΙΡΟΝ

God./Vol. **XV** • Br./No. **I** • Jun/June 2025.

UDK: **33**

ISSN 2232-8823 (Print), **ISSN 2232-9633** (Online)

PANEVROPSKI UNIVERZITET APEIRON

Banja Luka

Fakultet poslovne ekonomije

The Excellence School of Management

Emc Review

Časopis za ekonomiju *i tržišne komunikacije*

Economy and Market *Communication Review*

God./Vol. **XV** • Br./No. **I** • Jun/June, 2025.

Impressum

Economy and Market Communication Review – **Časopis za ekonomiju i tržišne komunikacije**

International scientific journal of the College of modern management of Pan-European University „Apeiron" in Banja Luka
Međunarodni naučni časopis Fakulteta za poslovnu ekonomiju Panevropskog univerziteta „Apeiron" u Banja Luci

ISSN: 2232-8823 (Print) / ISSN: 2232-9633 (Online) / UDK: 33

PUBLISHER / IZDAVAČ:
PAN-EUROPEAN UNIVERSITY „APEIRON" (PUA), COLLEGE OF MODERN MANAGEMENT
PANEVROPSKI UNIVERZITET „APEIRON" (PUA), FAKULTET POSLOVNE EKONOMIJE
Pere Krece 13, 78102 Banja Luka, BiH/RS, **www.apeiron-uni.eu**

RESPONSIBLE PERSON OF PUBLISHER / ODGOVORNO LICE IZDAVAČA: Darko UREMOVIĆ

EDITOR OF PUBLISHER / UREDNIK IZDAVAČA: Aleksandra VIDOVIĆ

Editor-in-chief / Glavni i odgovorni urednik:
Sanel JAKUPOVIĆ, (PUA), BiH

Vice Editor–in-chief / Zamjenik glavnog i odgovornog urednika:
Aleksandra VIDOVIĆ, (PUA), BiH

Technical Secretary / Tehnički sekretar:
Tanja ŠKORIĆ (PUA), BiH

Technical editor / Tehnički urednik:
Sretko BOJIĆ (PUA), BiH

Lector of the Serbian language / Lektor srpskog jezika:
Tanja ANČIĆ (Serbian language) (Banja Luka)

Lector of the English language / Lektor engleskog jezika:
Stojanka RADIĆ (English langueage) (Banja Luka)

Web design / Web dizajn:
Marko MILOVANOVIĆ (PUA), BiH

Printed by / Štampa: MARKOS, Banja Luka

Circulation / tiraž: 300 issues / primjeraka

Journal is referred in (Abstracting and Indexing) / Časopis je naveden u (prikaz apstrakata i indeksiranje):

ip-science.thomsonreturers.com
doaj.org
erihplus.nsd.no
ebscohost.com
citefactor.org/contact
scholar.google.com
doisrpska.nub.rs
crossref.org
road.issn.org
worldcat.org
esjindex.org
Index Copernicus value (ICV) for 2021 = 100

EMC Review - Economy and Market Communication Review is placed in the **first category - from 30 to 40 points** ranking list of the categorized scientific journals in the Republika Srpska - 08/13/2018

EMC Review-časopis za ekonomiju i tržišne komunikacije se nalazi u **prvoj kategoriji – od 30 do 40 bodova** rang liste kategorisanih naučnih časopisa u Republici Srpskoj - 13.08.2018.

By Decision of the Ministry of Education and Culture of the Republic of Srpska No. 07.030-053-85-8 / 11, of 23 May 2011, "Economy and Market Communication Review - Časopis za ekonomiju i tržišne komunikacije" Banja Luka, is registrated in the Register of Public Media under serial number 618. The Journal is printing partly by financial support of the Ministry for Scientific and Technological Development, Higher education and Information Society of the Republika Srpska.

Rješenjem Ministarstva prosvjete i kulture Republike Srpske br: 07.030-053-85-8/11, od 23. 5. 2011. godine, "Economy and Market Communication Review - Časopis za ekonomiju i tržišne komunikacije" Banja Luka, upisano je u Registar javnih glasila pod rednim brojem 618. Časopis se štampa uz djelimično financiranje Ministarstva za naučnotehnološki razvoj, visoko obrazovanje i informaciono društvo Republike Srpske.

The journal published twice a year / Časopis izlazi dva puta godišnje
(December and June, from 2011) / (Decembar i juni, od 2011. godine).

Annual subscription / godišnja pretplata:
For / za BiH: 80,00 KM + 17 % (PDV)
For abroad / za inostranstvo: 40,00 EUR + 17% (VAT)

JOURNAL COUNCIL / SAVJET ČASOPISA:
- Darko UREMOVIĆ *(PUA), predsjednik / chairman*
- Siniša ALEKSIĆ *(PUA), zamjenik predsjednika / vice-chairman*
- Zoran GAJIĆ *(PUA)*
- Ljubiša TOMIĆ *(PUA)*
- Elveldina TATAREVIĆ *(PUA)*

EDITORIAL BOARD / UREDNIČKI ODBOR:
- Sanel JAKUPOVIĆ *(PUA), glavni i odgovorni urednik / editor-in-chief*
- Aleksandra VIDOVIĆ *(PUA), zamjenik glavnog i odgovornog urednika / vice editor-in-chief*
- Mirjana LANDIKA *(PUA)*
- Nina UREMOVIĆ *(PUA)*
- Jana ALEKSIĆ *(PUA)*
- Bogdana V. GLIGORIĆ *(PUA)*
- Dragan KOLEV *(PUA)*
- Vesna NOVAKOVIĆ *(PUA)*
- Velibor PEULIĆ *(PUA)*
- Vanja SREDOJEVIĆ *(PUA)*
- Živana KLJAJIĆ *(PUA)*
- Ibrahim OBHOĐAŠ *(University of Vitez)*

INTERNATIONAL EDITORIAL BOARD / MEĐUNARODNI UREDNIČKI ODBOR:
- Srđan REDŽEPAGIĆ, *(Université Côte d'Azur, Nice, France), predsjednik / chairman*
- Vlatka BILAS, *(University of Zagreb, Faculty of Economics, Croatia), zamjenik predsjednika / vice-chairman*
- Kıymet TUNCA CALIYURT *(Trakya University Edirne, Turkey)*
- Jovanka BILJAN *(Univerzitet SV Kliment Ohridski, Bitola, North Macedonia)*
- Viktor KOVAL *(Kyiv National University of Trade and Economics, Ukraine)*
- Katarina AŠKERC ZADRAVEC *(Ljubljana School of Business – LSB, Slovenia)*
- Bojan ROSI *(Faculty of Logistics Celje, University of Maribor, Slovenia)*
- Miloš DRAGOSAVAC *(College of modern business in Belgrade, Serbia)*
- Saša JOVANOVIĆ *(College of modern business in Belgrade, Serbia)*
- Jelena LUKIĆ NIKOLIĆ *(College of modern business in Belgrade, Serbia)*
- Sanja FRANC *(University of Zagreb, Faculty of Economics, Croatia)*
- Mile BOŠNJAK *(University of Zagreb, Faculty of Economics, Croatia)*
- Ružica ŠKURLA BABIĆ *(University of Zagreb, Faculty of Transport and Traffic Sciences, Croatia)*
- Maja MARTINOVIĆ *(Zagreb School of Economics and Management, Croatia)*
- Vuk OGNJANOVIĆ *(Faculty of Transportation, communications and logistics, Berane, Montenegro)*
- Dinh Tran Ngoc HUY *(Banking University, Vietnam)*
- Syed Abdul Rehman KHAN *(Tsinghua University, Beijing, China)*

COUNCIL OF EXPERTS / SAVJET EKSPERATA:
- Jasmin BAJIĆ *(Croatia airlines, Zagreb, Croatia), predsjednik / chairman*
- Marian WAKOUNIG *(BMF, Wien, Austria), zamjenik predsjednika / vice-chairman*
- Wolfgang BERGER *(BMF, Wien, Austria)*
- Alexandar M. PAKHOMOV *(Tambov State University, Russia)*
- Čedomir LJUBOJEVIĆ *(College of modern business in Belgrade, Serbia)*
- Vinko KANDŽIJA *(University „Libertas" in Zagreb, Croatia)*
- Vedran ŠUPUKOVIĆ *(Handball Club Zagreb, Croatia)*
- Tomaž KRAMBERGER *(University of Maribor, Slovenia)*
- Diego MOSCHENI *(Istituto di Ricerca per le Relazioni Associative, Italy)*

TECHNICAL SECRETARIAT OF THE EDITORIAL BOARD / TEHNIČKI SEKRETARIJAT REDAKCIJE:
- Tanja ŠKORIĆ (PUA), Technical secretary
- Sretko BOJIĆ (PUA),
- Marko MILOVANOVIĆ (PUA)

Address of Editorial Office / Adresa redakcije:
Pan-European University Apeiron, College of modern management
Pere Krece 13, 78102 Banja Luka, Bosnia and Herzegovina, Phone: +387(0)51 247 927; (0)66 844 033
E-mail: **emc@apeiron-edu.eu**

All papers published in journal have been peer reviewed. / Svi radovi objavljeni u časopisu imaju anonimnu recenziju.
Manuscripts are not returned. / Rukopisi autora se ne vraćaju.

This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

Full-text available free of charge at / Časopis u punom tekstu dostupan na:
http://www.emc-review.com

Sadržaj|Contents

ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

SPILLOVER OF VOLATILITY ON THE FINANCIAL MARKETS; M-GARCH INSIGHTS FROM PRE- AND POST-CRISIS PERIODS IN EU COUNTRIES 8
Petra Palić

DIVERGING PATHS: HIRING IN THE PUBLIC AND PRIVATE SECTORS 31
Branka Zolak Poljašević, Nemanja Berber, Dragana Došenović Milaković

PERCEPTIONS AND CHALLENGES OF ESG REPORTING FOR THE ACCOUNTING PROFESSION IN BOSNIA AND HERZEGOVINA 48
Miloš Grujić, Isidora Džombić

THE IMPACT OF SALES PROMOTION METHODS ON CUSTOMER-BASED BRAND EQUITY 68
Stefan Alimpić, Milica Slijepčević, Vladan Madić

CLICK, SHARE, RECOMMEND: EXPLORING USER BEHAVIOUR IN MOBILE APP USAGE 87
Katija Vojvodić, Matea Matić Šošić

AUDITING GREENWASHING: THE ROLE OF AUDITORS IN DETECTING MISLEADING SUSTAINABILITY CLAIMS 99
Miloš Pavlović, Čedomir Gligorić, Danijela Pavlović

THE ROLE OF CROATIAN CULTURAL HERITAGE IN CREATING A RECOGNIZABLE TOURIST BRAND – RESPONDENTS' ATTITUDES AND PREFERENCES 113
Marina Guzovski, Mara Gedžić

THE FUTURE OF WORK IN BANKING 5.0: EXAMINING THE IMPACT OF AUTOMATION AND ARTIFICIAL INTELLIGENCE ON EMPLOYEES IN SERBIAN BANKS 127
Jelena Lukić Nikolić, Slađana Andrian Sredojević

A COMPARATIVE ANALYSIS OF BRAND VALUATION: THE HIROSE METHOD VS. BRAND FINANCE 144
Çağatay Mirgen, Funda Bayrakdaroğlu

PHILLIPS CURVE AND OKUN'S LAW IN TRANSITION COUNTRIES WITH MODERATE AND INCREASED INFLATION 159
Selma Vidimlić

Payment:

- Account number for domestic payments (in KM): 567 241 1100 0110 97 (Beneficiary name: APEIRON Panevropski univerzitet)
- Foreign account number for foreign payments (in EUR) at Raiffeisen Bank dd Bosnia and Herzegovina, Swift code: RZBABA2S; Address: Zmaja od Bosne bb, Sarajevo BiH; IBAN code: BA391611450000306895, Beneficiary name: APEIRON Panevropski univerzitet, Beneficiary Address: Vojvode Pere Krece 13.

Uplate:

- Broj računa za domaća plaćanja (u KM): 567 241 1100 0110 97 (korisnik: Panevropski univerzitet Apeiron)
- Broj deviznog računa za strana plaćanja (u EUR) kod Raiffeisen Bank dd Bosna i Hercegovina, Swift code: RZBABA2S; Address: Zmaja od Bosne bb, Sarajevo BiH; IBAN code: BA391611450000306895, Beneficiary name: APEIRON Panevropski univerzitet, Beneficiary Address: Vojvode Pere Krece 13.

PREGLEDNI NAUČNI RAD / OVERVIEW SCIENTIFIC PAPER

REPREZENTATIVNOST KULTURNE BAŠTINE ISTRE I KVARNERA NA NAJČITANIJIM HRVATSKIM PORTALIMA I DRUŠTVENIM MREŽAMA TURISTIČKIH ZAJEDNICA 176
Krešimir Dabo, Hrvoje Jakopović, Dejan Gluvačević
REPRESENTATION OF THE CULTURAL HERITAGE OF ISTRIA AND KVARNER ON THE MOST READ CROATIAN NEWS WEBSITES AND IN THE SOCIAL MEDIA OF TOURIST BOARDS

TECHNICAL PROGRESS AS A FACTOR OF ECONOMIC GROWTH 195
Dejan Gligović

OBJECTIVES OF MONITORING AND EVALUATING WORK PERFORMANCE 205
Dejan Gligović

UPOTREBA SISTEMA BESPILOTNIH VAZDUHOPLOVA (DRONOVA), POREĐENJE: BOSNA I HERCEGOVINA SA OSTALIM ZEMLJAMA 214
Zoran Injac, Danislav Drašković, Boris Mikanović
USE OF UNMANNED AIRCRAFTS (DRONES) COMPARISON: BOSNIA AND HERZEGOVINA WITH OTHER COUNTRIES

LEVERAGING ARTIFICIAL INTELLIGENCE FOR HUMAN RESOURCES DIGITALIZATION: TRANSFORMING WORKFORCE MANAGEMENT IN THE ERA OF SMART TECHNOLOGIES 230
Aleksandar M. Damnjanović, Siniša M. Arsić, Dragan Kolev

SUSTAINABILITY VS. STABILITY: SHOULD CENTRAL BANKS INVEST IN GREEN BONDS? 240
Branka Topić – Pavković

PEPSI AND FLEXIBLE MARKETING STRATEGY IN PAKISTAN – AN ERA SPANNING THREE DECADES 255
Syed Ali Abbas

Price of Advertisements (VAT 17% is not included): B&W printing: 1/4 page - 50 Euro; 1/2 page - 100 Euro and 1/1 page - 200 Euro.
For colour printing is required to make extra arrangements.
Cijena oglašavanja (PDV 17% nije uračunat): B&W štampa: ¼ stranice – 100 KM; 1/2stranice – 200 KM i 1/1 stranice – 400 KM.
Za kolor štampu je potrebno dodatno ugovoriti uslove.

https://doi.org/ 10.7251/EMC2501008P
UDK: 336.76(4-672EY):[330.342:316.323
Datum prijema rada: 17. oktobar 2024.
Submission Date: October 17, 2024
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 8-30

ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

SPILLOVER OF VOLATILITY ON THE FINANCIAL MARKETS; M-GARCH INSIGHTS FROM PRE- AND POST-CRISIS PERIODS IN EU COUNTRIES

Petra Palić | Assistant Professor, Department of Sociology, Catholic University of Croatia, Zagreb, Croatia, petra.palic@unicath.hr; ORCID ID: 0000-0001-5181-6657

***Abstract*:** *This research aims to investigate whether increased volatility occurs within the government bond market, stock market, and foreign exchange market during periods of crisis, using European Union countries as a case study. Additionally, this paper explores whether there are variations in the strength and dynamics of correlations among these three markets before and after the onset of the global economic crisis. Recognizing the global significance of the Lehman Brothers' collapse as the official commencement of the crisis, this analysis is divided into two distinct periods. The first period scrutinizes the volatility within these three markets from January 1, 2005, to September 14, 2008. The second period covers the period from September 15, 2008, to December 31, 2016. To conduct this investigation, it is employed Engel's Dynamic Conditional Correlation (DCC) Multivariate Generalized Autoregressive Conditional Heteroskedasticity (MGARCH) model. This model is instrumental in examining the relationships between volatilities originating from multiple markets concurrently, enabling the estimation of conditional and time-varying correlations and covariances among different markets. Using an appropriate MGARCH (1,1) model, it is assessed the intensity and direction of the conditional correlation between the government bond market, stock market, and foreign exchange markets for European Union countries before and after the official commencement of the global economic crisis.*

***Keywords*:** *volatility, financial markets, MGARCH (1,1) model, global economic crisis*

JEL classifacation: *C32, E44, F30, G01*

INTRODUCTION

The aim of this research is to investigate whether there is increased volatility between government bond markets, stock markets, and foreign exchange markets during periods of crisis, using EU member countries as a case study. Additionally, it examines whether there are differences in the strength and dynamics of correlations among these three markets before and after the onset of the global economic crisis. Given that the turning point on the global stage was the collapse of Lehman Brothers, which is

considered the official beginning of the crisis, the analysis is divided into two periods. The first period examines the volatility of these markets from January 1, 2005, to September 14, 2008. The second period spans from September 15, 2008, to December 31, 2016. Engel's Dynamic Conditional Correlation (DCC) Multivariate Generalized Autoregressive Conditional Heteroskedasticity (MGARCH) model is employed for this investigation, estimating the MGARCH model for each country in both the pre-crisis and post-crisis periods for the three markets of interest.

The formulation and examination of volatility propagation, or financial contagion, within different markets—specifically the government bond market, stock market, and foreign exchange market—and their interactions remain inadequately explored in both Croatian and global literature.

Financial contagion, broadly defined, refers to the spread of detrimental shocks that can trigger financial crises. Without a clear definition and understanding of financial contagion and its underlying mechanisms, it is challenging to effectively evaluate the problem or devise appropriate policy measures to mitigate it.

The concept of financial contagion is prevalent in both international and domestic literature and is often synonymous with adverse economic spillovers. Even in contemporary times, the term "contagion" carries negative connotations, suggesting unfavorable developments. According to the World Bank, much of the discourse over the past decade regarding reforms to the international financial architecture has focused on mitigating the risk of contagion. The World Bank defines financial contagion as a significant increase in connectivity between markets following a shock in a single country or a group of countries. This definition underscores the importance of various channels through which shocks are transmitted, including trade. In times of crisis, these transmission mechanisms differ markedly, and these distinctions are crucial as they define various interpretations of financial contagion. This research investigates the presence of increased volatility within the government bond market, stock market, and foreign exchange market during crisis periods, using EU countries as a case study.

The study also explores variations in the strength and dynamics of correlations among these markets before and after the onset of the global economic crisis, with a particular focus on the collapse of Lehman Brothers as the crisis's official commencement. By conducting a comprehensive analysis of the relevant literature, this research presents significant theoretical and empirical contributions related to the spillover effects of volatility between these markets for European Union member countries.

LITERATURE REVIEW

Despite its widespread use, the term "financial contagion" lacks a precise definition. Many economists employed it to comprehend and provide insights into the East Asian crisis and the Russian crisis, thus forming a consensus on which countries were genuinely affected (Forbes & Rigobon, 2001). A review of relevant articles published since 1997 revealed that the term "contagion" appeared in almost all of them when describing the transmission and upheavals in financial markets across different countries. It has become an integral part of the vocabulary of both international economists and policymakers worldwide (Claessens & Forbes, 2004).

Contagion elucidates the dissemination of disturbances within markets, often originating in a single country and then extending to others. It is a phenomenon ob-

served through comparative movements and alterations in interest rates, stock prices, government bond yields, and capital flows. Conceptually, the causes of contagion can be categorized into two groups (Dornbusch, Park, & Claessens, 2000; Masson, 1998; Wolf, 1999; Forbes & Rigobon, 2001; Pritsker, 2001). The first group underscores spillovers resulting from the natural interdependence among market economies. This interdependence implies that shocks, whether micro or macro-level, can cross borders due to genuine financial interconnections. For example, Calvo & Reinhart refer to this type of contagion as "fundamentals-based contagion" (Calvo & Reinhart, 1996). Such comparative movements would not typically represent contagion under normal circumstances. However, during times of crisis, if these effects are unfavourable, they can be termed as contagion. Most empirical studies aim to elucidate the degree of comparative movements and the mechanisms responsible for transmitting shocks in financial markets.

As already has been mentioned, financial contagion, a phenomenon where disturbances in one sector or country spread to others, has been a significant area of study in the field of finance. This part of the review delves into relevant studies on contagion in the foreign exchange market, government bond market, and systemic risk models to provide insights into the transmission of crises and the importance of interconnectedness.

For example, Han et al. (2003) investigated the Mexican peso crisis, revealing a pivotal aspect of financial contagion in the foreign exchange market (Han, Lee, & Suk, 2003). Their research demonstrated that a currency crisis in one country could trigger contagion in other emerging market currencies. This finding underscores the intricate interconnections among currencies and the potential for crises in one nation to affect neighbouring economies. It emphasized the importance of understanding contagion dynamics in the foreign exchange market, especially within emerging markets. On the other side, Tai (2007) extended the exploration of contagion by studying its effects on various financial markets. This research provided empirical evidence of the pure contagion effects between stock and foreign exchange markets for each Asian country during the 1997-98 Asian crisis. Notably, it is found that these crises were not confined solely to the foreign exchange market; they also had spillover effects on stock markets. This study emphasized the complex web of connections among different segments of the financial system, highlighting the need for a comprehensive understanding of contagion phenomena in the global financial landscape (Tai, 2007). Also, Muratori (2014) furthered the exploration of contagion effects on government bond markets during the European sovereign debt crisis. Their research emphasized the intricate relationships among government bond markets within the European Monetary union. It highlighted the interconnectedness and vulnerability of these markets to contagion, prompting a closer examination of the European sovereign debt crisis's extensive implications. This study served as a reminder of the interwoven nature of global financial markets and the importance of understanding the dynamics of contagion (Muratori, 2014).

Silva et al. (2017) introduced a model that addressed systemic risk and contagion within the financial sector. Their model emphasized the critical role of interconnectedness between financial institutions in propagating systemic risk and contagion. It highlighted the importance of understanding the network structure within the financial sector to manage systemic risk effectively (Silva, da Silva, & Tabak, 2017).

In recent research, Leung et al. (2017) examined hourly volatility spillovers between the New York (DJI), London (FTSE 100), and Tokyo (N225) stock markets and their associated exchange rates (USD, EUR, GBP, and JPY) for the period 2001 to 2013. This period encompassed both crisis-free periods and significant crises like the global financial crisis and the euro debt crisis. The findings revealed a general increase in spillovers between stock and foreign exchange markets during crisis periods (Leung, Schiereck, & Schroeder, 2017). Similarly, Alexakis and Pappas (2018) employed the ADCC-GJR-GARCH model to investigate financial contagion in the European Union during the global financial crisis (GFC) of 2007-2009 and the European sovereign debt crisis (ESDC) that began in 2009. Their analysis included capital sector indices for 15 countries spanning 2004 to 2014, and the results indicated the presence of financial contagion in all sectors, with contagion spillovers to stock markets being particularly notable during crisis periods (Alexakis & Pappas, 2018).

Also, in more recent literature, Hung (2019) examined the short-term and long-term dynamics between China and four Southeast Asian countries (Vietnam, Thailand, Singapore, and Malaysia) during the period 2008–2018. His empirical research employed the Generalized Autoregressive Conditional Heteroskedasticity-Asymmetric Dynamic Conditional Correlation (MGARCH-ADCC) model and wavelet coherence technique to estimate time-varying correlations and co-movements in both time-frequency spaces of the stock markets of China and its neighboring countries. The study's findings indicate that the stock markets of China and its trading partners became relatively integrated after the global financial crisis of 2008, with frequency changes in co-movement patterns showing a positive linkage throughout the sample period (Hung N. T., 2019). Similarly, Hung (2022) empirically analyzes the dynamic relationship and volatility spillover effects between exchange rates and stock returns of five Central and Eastern European (CEE) countries; Hungary, Poland, the Czech Republic, Romania, and Croatia for the period 2000–2017. The analysis employs the bivariate Generalized Autoregressive Conditional Heteroskedasticity-Baba, Engle, Kraft, and Kroner (GARCH-BEKK) framework, as well as constant and dynamic conditional correlation (CCC and DCC) models (Hung N. T., 2022).

The existing literature, both globally and in Croatian scholarly work, has inadequately investigated the transmission of financial contagion across these three specific markets. Most prior research primarily concentrates on individual markets and the cross-border transmission of volatility through the chosen market (Hamao, Masulis, & Ng, 1990; Bekaert & Harvey, 1997; Bekaert, Harvey, & Lundblad, 2005; Baele, 2005; Jurun, Pivac, & Arnerić, 2007; Posedel Šimović, Tkalec, & Vizek, 2015; Palić, Posedel Šimović, & Vizek, 2017; Hung N. T., 2022). This research contributes to the field by being the first to comprehensively investigate the transmission and modelling of financial contagion across these three markets—namely, the government bond market, stock market, and foreign exchange market—over time. Specifically, the focus is on the period from 2005 to 2016, encompassing 27 European Union countries. This comprehensive analysis of volatility and shock transmission across the government bond, stock, and foreign exchange markets in European Union countries offers new insights into the phenomenon of financial contagion over time. This research is particularly valuable for economic policymakers and regulators striving to prevent the emergence of contagion.

METHODOLOGY

It has been established that correlations between volatilities across different markets vary over time, and in such cases, multivariate GARCH models have proven to be suitable. Moreover, Engel's Dynamic Conditional Correlation (DCC) multivariate GARCH model was employed to examine whether there is increased volatility between the government bond market, stock market, and foreign exchange market during crisis periods. The purpose of the multivariate GARCH (M-GARCH) model is to study the relationship between volatilities from several different markets simultaneously, enabling the estimation of conditional and time-varying correlations and covariances among these markets.

Multivariate GARCH models defined by a linear combination of univariate GARCH models are given by the expression (Arnerić, 2012);

$$\Sigma_t = WD_tW' \tag{1.1}$$

if for each t the decomposition of the variance and covariance matrix of the standardized yields of k securities is valid. Here, W is the orthogonal matrix of factor constraints of order mxk, and D_t is the diagonal matrix of the variances of m main components. At the same time, in fact, the expression, that is, the decomposition of the matrices of the estimated coefficients C, A and B with Choleski factorization

$$\begin{bmatrix} \sigma_{1,t}^2 & 1 \\ \sigma_{21,t} & \sigma_{2,t}^2 \end{bmatrix} = \begin{bmatrix} c_1 & 0 \\ c_2 & c_3 \end{bmatrix} \cdot \begin{bmatrix} c_1 & c_2 \\ 0 & c_3 \end{bmatrix} + \begin{bmatrix} a_{11} & 0 \\ a_{21} & a_{22} \end{bmatrix} \cdot \begin{bmatrix} a_{11} & a_{21} \\ 0 & a_{22} \end{bmatrix} \odot \begin{bmatrix} \varepsilon_{1,t-1}^2 & 0 \\ \varepsilon_{2,t-1}\varepsilon_{1,t-1} & \varepsilon_{2,t-1}^2 \end{bmatrix} + \begin{bmatrix} b_{11} & 0 \\ b_{21} & b_{22} \end{bmatrix} \cdot \begin{bmatrix} b_{11} & b_{21} \\ 0 & b_{22} \end{bmatrix} \odot \begin{bmatrix} \sigma_{1,t-1}^2 & 0 \\ \sigma_{21,t-1} & \sigma_{2,t-1}^2 \end{bmatrix} \tag{1.2}$$

represents an orthogonal transformation of m univariate GARCH(p,q) models. The model $\Sigma_t = WD_tW'$ is called an orthogonal GARCH model (OGARCH (1,1,m)). Given that in multivariate GARCH models with four or more than four values, the problem of too many parameters appears in empirical analyses, orthogonal GARCH models are used and $m \leq k$ must be satisfied. It can be concluded that this actually leads to a significant simplification of the model (Enders, 2008).

The correlation matrix of standardized yields of k securities can be defined as a linear combination of m main components that are mutually independent, i.e. orthogonal. At the same time, the main components P_j, j=1,2,3,…m are the diagonal elements of the matrix D_t and are generally explained with the help of the GARCH(1,1) model, where each main component is also a linear combination of the values of the standardized returns variables (Enders, 2008);

$$p_{1=}w_{11} \cdot z_1 + w_{12} \cdot z_2 + \ldots + w_{ij}z_i \ldots + w_{1k} \cdot z_k \tag{1.3}$$

$$p_{2=}w_{12} \cdot z_1 + w_{22} \cdot z_2 + \ldots\ldots + w_{ij}z_i \ldots + w_{2k} \cdot z_k \tag{1.4}$$

$$\vdots$$

$$p_{m=}m \cdot z_1 + w_{2m} \cdot z_2 + \ldots\ldots + w_{ij}z_i \ldots + w_{mk} \cdot z_k \tag{1.5}$$

Or matrix:

$$P_{i=}\, Zw_i \tag{1.6}$$

where w_j is the eigenvector of the matrix Z of order kx1. At the same time, each vector of the matrix of standardized returns of the entire system can be written in the form of a linear combination of the main components

$$Z=PW^t \tag{1.7}$$

given that $W^t = W^{-1}$ is valid. It can also be written as $WW^t=I$. Decomposition of matrix Σ_t for each t into m main components P_j, j=1,2,3,…m which are described by GARCH(1,1) models, is based on the eigenvalues and eigenvectors of the yield correlation matrix

$$RW = W\Lambda \tag{1.8}$$

where $R=Z^TZ$. In the expression above, the matrix Λ is a diagonal matrix of eigenvalues of order kxk with elements $\lambda_1>\lambda_2>\lambda_3>\ldots.>\lambda_k$. In order to solve the problem of large dimensions, only those principal components that explain the largest part of the common variance of the standardized returns are included in the analyses.

The expression:

$$\frac{\lambda_i}{k} \qquad i=1,2\ldots.k \tag{1.9}$$

represents the proportion with which each principal component explains part of the common variance. As for the labels, λ_i is the i-th eigenvalue of the correlation matrix, while k represents the number of principal components.

For the purpose of modeling Engel's DCC model is defined as

$$H_t=D_tRD_t \tag{1.10}$$

D_t is defined as

$$D_t = diag(h_{11t\ldots..}^{1/2} h_{NNt}^{1/2}) \tag{1.11}$$

where h_{iit} is defined as a univariate GARCH model and R_t as

$$R_t=\text{diag}(q_{11,t\ldots..}^{-1/2} q_{NN,t}^{1/2})Q_t\text{diag}(q_{11,t\ldots..}^{-1/2} q_{NN,t}^{1/2}), \tag{1.12}$$

N x N is a symmetric positive definite matrix of the parameter $Q_t=(q_{ij,t})$ given as

$$Q_t = (1-\alpha-\beta)\bar{Q}+\alpha u_{t-1}u_{t-1}^{'}+\beta Q_{t-1} \tag{1.13}$$

while u_t is defined as

$$u_t=(u_{1t}u_{2t}\ldots u_{Nt}), \tag{1.14}$$

$\bar{Q}$ is an N x N unconditional variance matrix u_t, α i β are non-negative scalar parameters satisfying the condition $\alpha+\beta<1$.

Engle's correlation coefficient in the DCC model is defined as:

$$\rho_{12t} = \frac{(1-\alpha-\beta)\bar{q}_{12}+\alpha u_{1,t-1}u_{2,t-1}+\beta q_{12,t-1}}{\sqrt{(1-\alpha-\beta)\bar{q}_{11}+\alpha u_{1,t-1}^2+\beta q_{11,t-1}((1-\alpha-\beta)\bar{q}_{22}+\alpha u_{2,t-1}^2+\beta q_{22,t-1})}} \quad (1.15)$$

Engle (2002) formulated conditional correlation as a weighted sum of past correlations. In fact, the matrix is written as a GARCH equation and then transformed into a correlation matrix. Also, for this model one can test $\theta_1 = \theta_2 = 0$ or $\alpha=\beta=0$ respectively to determine whether the implied constant of conditional correlations is empirically relevant (Engle R. , 2002).

RESULTS AND DISCUSSION

Engel's (DCC) MGARCH model was implemented, which was previously defined. Based on the adequate MGARCH (1,1) model, the intensity and direction of the conditional correlation between the government bond market, stock market and foreign exchange markets for the European Union countries in the period before and after the official start of the world economic crisis was estimated. For the purpose of the analyses, the econometric software OxMetrics was utilized.

Regarding data frequency, weekly data was used for all three markets of interest in this study. The variable used to explain the government bond market is the spread, which is defined as the difference in government bond yields representing the difference in the level of development, risk, expected returns and other important characteristics of the countries whose bond yields are being compared. Germany was taken as the benchmark country and the spreads were calculated in relation to the German government bond. Since these are financial time series, the data are differentiated for modelling purposes. The source of these data is Eurostat.

In the analysis, the nominal exchange rate was used for the foreign exchange market. In doing so, the EUR/USD exchange rate was used for eurozone countries, and for countries that were not members of the Eurozone at the time (for example, Croatia - HRK/EUR). Also, the source of these data is Eurostat. The variable used to explain the stock market is the stock market index, which measures the value of the stock market. It is usually calculated using the prices of selected stocks (most often in the form of a weighted average). It was used for the purpose of describing the market and for comparing the returns of individual investments. The data source is the Bloomberg database. Since these are financial time series, the data are differentiated for modelling purposes.

Using Engle's MGARCH (1,1) model, the existence of increased volatility between the government bond market, the stock market and the foreign exchange market in periods of crisis was examined. It can be said that it was actually examined whether there was a difference in the strength and dynamics of the correlation of these three markets before and after the beginning of the world economic crisis. Considering that the turning point on the global scene was the fall of Lehman Brothers, which is taken as the official beginning of the crisis, the analysis is divided into two periods. In the first period, the transfer between the government bond market, the stock market and the foreign exchange market was examined in the period from 1 January 2005. until

September 14, 2008. year, while for the second period, the analysis was carried out in the period from September 15, 2008. until 31.12.2016. years.

Tables 1 and 2 reveal that the coefficients α and β are higher in the second observed period, signifying a greater level of volatility following the crisis. Moreover, the parameters (γ_(2,1), γ_(3,1), γ_(2,3)) are predominantly statistically significant at the 1 percent level after the crisis began. This further validates that the volatility among these three markets was more pronounced in the period following the official commencement of the crisis (Table 2). In both periods, diagnostic tests for autocorrelation of the residual Q(5) and the autocorrelation of the squared residual Q2(5) (Tables 1, 2) confirm that the equations for conditional expectations and conditional variances and covariances are appropriately specified. This implies that autocorrelation and ARCH effects are no longer present in the estimated models. As such, the null hypothesis of no autocorrelation is accepted. It is crucial to note that Ljung-Box bivariate (group) portmanteau tests are conducted, specifically focusing on group tests of residuals' autocorrelation and autocorrelation of squared residuals over a 5-time shift.

Table 1: Results of estimations of the MGARCH (1,1) model for government bond markets, stock markets, and foreign exchange markets of EU countries in the period from January 1, 2005, until September 14, 2008

Multivariate GARCH (1,1) model Dynamic Correlation Model (Engle)										
Country	Correlation coefficient between the government bond market and the stock market	Correlation coefficient between the government bond market and the foreign exchange market	Correlation coefficient between the stock market and the foreign exchange market	α	β	Information criteria (Akaike)	Information criteria (Schwarz)	Jarque–Bera test	Hosking Q(5)	Hosking (5)
AT	-0,15	-0,05	0,04	0,02	0,90***	0,65	1,04	31,93 [0,00]**	60,65 [0,04]	45,81 [0,36]
BE	-0,23***	0,03	-0,04	0,05	0,68***	-0,50	-0,11	58,92 [0,00]**	42,55 [0,49]	45,64 [0,36]
CY	-0,23***	-0,04	0,01	0,06	0,46	3,94	4,33	40,22 [0,00]**	27,92 [0,96]	42,53 [0,49]
CZ	-0,40**	0,41**	-0,34*	0,02**	0,98***	5,84	6,23	44,62 [0,00]**	46,98 [0,31]	26,64 [0,98]
DK	-0,09	0,03	0,15**	0,0000002	0,66	-7,70	-7,30	44,71[0,00]**	41,17 [0,55]	27,28 [0,97]
FI	-0,14	0,01	0,07	0,06	0,51	1,66	2,05	84,09 [0,00]**	43,33 [0,46]	170,89 [0,64]
FR	-0,10	0,06	0,06	0,02	0,62***	0,67	1,06	91,05 [0, 00]**	48,71 [0,25]	40,34 [0,59]
EL	-0,25***	0,05	0,05	0,04	0,36	0,86	1,25	64,50 [0,00]**	37,03 [0,73]	23,12 [0,99]
IE	-0,07	0,11	-0,01	0,00	0,63	3,00	3,39	76,92 [0,00]**	39,73 [0,61]	65,52 [0,02]
IT	-0,27***	0,03	-0,0004	0,09***	0,74***	4,31	4,70	51,93 [0,00]**	38,64 [0,66]	25,69 [0,98]
LV	0,12	-0,01	0,17*	0,05	0,60***	14,63	15,02	143,30 [0,00]**	43,19 [0,46]	73,50 [0,003]
LT	0,08	0,08	-0,03	0,07	0,50**	-0,51	-0,12	24,50 [0,04]**	36,25 [0,76]	33,76 [0,84]
LU	-0,14	-0,01	-0,01	0,03	0,76***	-0,05	0,34	164,83 [0,00]**	40,70 [0,57]	15,83 [1,00]
HU	-0,43***	0,58***	-0,36***	0,00	0,62	18,34	18,73	138,18 [0,00]**	55,83 [0,09]	49,76 [0,22]

MT	-0,13	-0,003	-0,16**	0,07	0,00	2,53	2,92	47,34 [0,00]**	44,27 [0,42]	54,47 [0,11]
NL	-0,07	-0,01	-0,02	0,02	0,62***	-4,04	-3,65	72,82 [0,00]**	49,90 [0,22]	44,78 [0,40]
DE	0,35***	0,03	-0,01	0,09*	0,46**	3,72	4,11	30,04 [0,00]**	40,18 [0,60]	35,42 [0,79]
PL	-0,33***	0,35***	-0,32***	0,02	0,91***	5,10	5,50	13,66 [0,03]*	36,61 [0,74]	38,78 [0,65]
PT	-0,05	0,07	-0,04	0,002	0,23	2,72	3,11	85,56 [0,00]**	61,67 [0,03]	20,65 [1,00]
RO	-0,002	-0,01	-0,36***	0,02	0,31	8,72	9,13	140,10 [0,00]**	37,81 [0,70]	28,43 [0,96]
SI	-0,22**	-0,09	0,12	0,14**	0,44***	1,88	2,27	106,70 [0,00]**	49,62 [0,23]	29,39 [0,94]
SK	-0,33***	-0,04	-0,01	0,09**	0,55***	-1,66	-1,27	71,89 [0,00]**	32,84 [0,87]	23,98 [0,99]
ES	-0,19**	0,05	0,04	0,04	0,84***	-2,51	-2,12	23,14 [0,08]**	42,82 [0,48]	27,91 [0,96]
SE	0,01	-0,16*	-0,25***	0,05	0,40**	1,06	1,45	29,22 [0,01]**	53,59 [0,13]	43,65 [0,44]
UK	-0,09	-0,27***	0,10	0,004	0,78***	0,55	0,95	42,11 [0,00]**	36,45 [0,75]	21,11 [1,00]

Notes: *** Significant at 1 percent significance level. ** Significant at 5 percent significance level. * Significant at 10 percent significance level.

Source: Authors' calculations.

Table 2: Results of estimations of the MGARCH (1,1) model for government bond markets, stock markets, and foreign exchange markets of EU countries in the period from September 15, 2008, until December 31, 2016

Multivariate GARCH (1,1) model Dynamic Correlation Model (Engle)										
Country	**Correlation coefficient between the government bond market and the stock market**	**Correlation coefficient between the government bond market and the foreign exchange market**	**Correlation coefficient between the stock market and the foreign exchange market**	α	β	**Information criteria (Akaike)**	**Information criteria (Schwarz)**	**Jarque–Bera test**	**Hosking Q(5)**	**Hosking (5)**
AT	-0,27***	-0,10	0,25**	0,03***	0,96	2,35	2,56	125,35 [0,00]**	38,79 [0,65]	26,40 [0,98]
BE	-0,28*	-0,15	0,22	0,02***	0,97***	2,51	2,73	110,28 [0,00]**	41,21 [0,55]	42,48 [0,49]
BG	-0,17***	-0,02	0,01	0,000003	0,85	-1,39	-1,15	1848,1 [0,00]**	190,91 [0,00]	60,30 [0,04]
CY	-0,20***	-0,17**	0,24***	0,05**	0,58*	0,64	0,85	1041,0 [0,00]**	34,53 [0,82]	43,69 [0,44]
CZ	-0,20 ***	-0,17**	0,24***	0,05**	0,58*	0,64	0,85	1041,0 [0,00]**	34,53 [0,82]	43,69 [0,44]
DK	-0,06	-0,05	-0,01	0,08	0,0002	-6,08	-5,87	273,77 [0,00]**	51,9 [0,17]	62,35 [0,03]
FI	-0,17	-0,02	0,15	0,03*	0,95***	3,32	3,54	118,10 [0,00]**	40,14 [0,60]	32,86 [0,87]
FR	-0,13	-0,08	0,21**	0,03**	0,96***	2,92	3,13	50,48 [0,00]**	35,85 [0,77]	65,67 [0,01]
EL	-0,48***	-0,17**	0,34***	0,11***	0,65***	6,53	6,79	269,92 [0,00]**	36,40 [0,75]	29,45 [0,94]
HR	0,01	0,12**	-0,07	0,0000009	0,65	1,34	1,71	37,33 [0,00]**	46,34 [0,34]	61,71 [0,03]
IE	-0,31***	-0,15**	0,04	0,03	0,94***	5,08	5,30	68,35 [0,00]**	46,62 [0,33]	51,19 [0,18]
IT	-0,44	-0,10	0,24	0,03***	0,97	7,90	8,11	181,19 [0,00]**	28,39 [0,96]	75,64 [0,002]
LV	-0,05	-0,15**	0,10*	0,02	0,83***	0,63	0,85	403,73 [0,00]**	42,44 [0,50]	24,92 [0,99]

LT	-0,09	-0,09	0,08	0,00	0,97***	0,42	0,63	3105,0 [0,00]**	46,79 [0,32]	48,23 [0,27]
LU	-0,18***	-0,09*	0,10*	0,0000006	0,77***	0,74	0,95	239,38 [0,00]**	56,42 [0,08]	42,05 [0,51]
HU	-0,45***	0,56***	-0,45***	0,01**	0,98***	19,16	19,38	38,02 [0,00]**	49,26 [0,24]	37,32 [0,72]
MT	-0,04	-0,20**	0,01	0,02**	0,94***	1,55	1,77	102,98 [0,00]**	27,63 [0,97]	32,96 [0,87]
NL	-0,12	-0,04	0,19	0,02***	0,97***	-2,50	-2,28	69,06 [0,00]**	43,38 [0,46]	37,64 [0,70]
DE	0,31***	0,24**	0,18**	0,04*	0,93***	5,06	5,28	43,20 [0,00]**	25,32 [0,99]	56,89 [0,08]
PL	-0,44***	0,48***	-0,54***	0,024952	0,85	4,85	5,07	25,82 [0,00]**	36,57 [0,74]	45,01 [0,39]
PT	-0,45***	-0,09	0,29***	0,03	0,94***	6,96	7,17	139,39 [0,00]**	30,27 [0,93]	26,90 [0,97]
RO	-0,18***	0,11**	-0,25***	0,02	0,85***	7,63	7,84	432,53 [0,00]**	59,62 [0,05]	26,41 [0,98]
SI	-0,07	-0,17***	0,20***	0,06	0,59*	1,97	2,22	95,59 [0,00]**	47,99 [0,28]	37,11 [0,72]
SK	-0,14	-0,15	0,15	0,05	0,90	-0,36	-0,14	268,41 [0,00]**	31,49 [0,90]	27,09 [0,97]
ES	-0,40**	-0,12	0,29**	0,02**	0,98***	2,15	2,40	93,12 [0,00]**	30,54 [0,92]	78,56 [0,001]
SE	0,06	-0,27***	-0,30***	0,004	0,98	3,56	3,80	56,24 [0,00]**	46,23 [0,34]	61,18 [0,04]
UK	0,04	-0,34***	0,04	0,01	0,97***	2,75	2,96	180,64 [0,00]**	47,79 [0,28]	49,27 [0,24]

Notes: *** Significant at 1 percent significance level. ** Significant at 5 percent significance level. * Significant at 10 percent significance level.

Source: Authors' calculations.

Table 3: Average volatility spillovers between government bond markets, stock markets and foreign exchange markets of European Union countries

Country	The percentage of spillover between the government bond market and the stock market in the period from January 1, 2005, to September 14, 2008	The percentage of spillover between the government bond market and the stock market in the period from September 15, 2008, until December 31, 2016	The percentage of spillover between the government bond market and the foreign exchange market in the period from January 1, 2005, to September 14, 2008	The percentage of spillover between the government bond market and the foreign exchange market in the period from September 15, 2008, until December 31, 2016	The percentage of spillover between the stock market and the foreign exchange market in the period from January 1, 2005, to September 14, 2008	The percentage of spillover between the stock market and the foreign exchange market in the period from September 15, 2008, until December 31, 2016.
AT	2,80	8,37	0,33	3,38	0,41	9,12
BE	5,45	12,97	0,53	5,53	0,70	8,94
BG	-	2,73	-	0,04	-	0,00
CY	5,37	4,15	0,49	3,31	0,41	6,28
CZ	10,92	6,25	9,63	1,89	6,74	5,24
DK	0,86	0,87	0,10	0,70	2,30	0,47
FI	2,35	5,31	0,38	1,14	0,94	4,33
FR	1,16	5,84	0,46	3,98	0,47	8,72
EL	6,20	23,46	0,37	4,16	0,42	13,51
HR	-	0,01	-	1,42	-	0,49
IE	0,50	10,74	1,13	2,85	0,00	1,54
IT	7,84	33,81	1,19	8,08	1,99	12,86
LV	1,35	0,38	0,00	2,38	3,21	1,21
LT	1,21	1,01	1,10	1,13	0,64	1,08
LU	2,22	3,14	0,19	0,74	0,30	1,08
HU	18,07	20,97	33,35	34,34	12,85	22,44

MT	2,02	0,64	0,41	5,40	2,96	0,85
NL	0,52	4,53	0,06	1,82	0,08	6,50
DE	12,68	11,84	1,00	9,16	0,98	5,98
PL	11,12	19,43	13,07	23,44	10,50	29,59
PT	0,30	23,01	0,51	1,86	0,19	10,01
RO	0,05	3,23	0,06	1,41	12,70	6,25
SK	11,56	5,53	1,20	4,62	0,97	5,27
SI	5,71	0,75	2,20	3,28	2,88	4,62
ES	4,02	26,62	1,11	8,35	0,92	15,43
SE	0,21	0,36	2,88	7,06	6,47	9,49
UK	0,83	0,50	7,06	11,63	0,94	0,69

Source: Authors' calculations.

The empirically performed MGARCH analysis results indicate a higher intensity, or mutual correlation, among these three markets in the second observed period for all analyzed countries, corresponding to the period following the onset of the global economic crisis. To provide a comprehensive analysis, it is also presented the averages of spillovers between the government bond market and the stock market, the government bond market and the foreign exchange market, and the stock market and the foreign exchange market (Table 3). These averages further demonstrate that volatility is higher in the second observed period for the all analyzed countries, after the onset of the global economic crisis.

In light of these findings, it is evident that the onset of the crisis significantly impacted the transmission of volatility between the government bond market, the foreign exchange market, and the stock market for European Union countries. Consequently, the results suggest an increased transfer of volatility among these markets in the period following the crisis.

CONCLUSION

Globalization of financial markets imposed the need to measure and examine the spread of volatility and shocks, i.e. contagion in financial markets. The issue itself, and the spread of contagion in the government bond markets, stock markets and foreign exchange markets has been insufficiently researched both in the international and domestic literature. Through a thorough analysis, this paper presents and explains the most important theoretical and empirical research on the effect of financial contagion.

Also, a detailed econometric analysis of conditional covariances and correlations over time suggest that there is a significant transfer of volatility between the government bond market, the stock market and the foreign exchange markets of the European Union countries.

Considering that the turning point on the global scene was the fall of Lehman Brothers, which is considered the official beginning of the crisis, the analysis is divided into two periods. In the first period, the interaction between the government bond market, the stock market, and the foreign exchange market was examined from January 1, 2005, to September 14, 2008. For the second period, the analysis covered September 15, 2008, to December 31, 2016. Based on the implemented multivariate GARCH models for both periods for all analyzed EU Countries, differences were observed, particularly showing higher dynamics in the second period, which followed the crisis.

Additionally, for the purpose of examination, the average volatility spillovers between these three markets before and after the start of the global financial crisis and its spillover to the countries of the European Union are given. What is evident is that the intensity, that is, the mutual correlation of these three markets is greater in the second observed period, that is, after the onset of the global economic crisis. From all of the above, it can be concluded that periods of crisis significantly affect the transfer of volatility between the government bond market, the foreign exchange market and the stock market for members of the European Union.

The theoretical and empirical conclusions of this research are certainly useful for researchers in terms of new knowledge presented about the phenomenon of financial contagion itself, and economic policymakers and regulators who should make additional efforts to prevent the recurrence and spread of financial contagion.

It should be noted that in modeling with multivariate GARCH models, it is recommended to use two to three variables. For this reason, the MGARCH model was estimated for each country in both the pre-crisis and post-crisis periods for the three markets of interest. In the future, it would be interesting to model the transfer of volatility of an individual financial market and, for example, the real estate market or the oil market.

Apendix

Table 1: Descriptive statistics of government bond spreads for EU countries from 2005 to 2016.

Country	Variable	Mean	Median	Max	Min	Standard deviation	Skewness	Excess kurtosis	Jarque-Bera (p- value)
AT	DSpread-AT	0,000	-0,002	0,40	-0,39	0,06	0,94	17,09	5263,77
									(0,00)
BE	DSpread-BE	0,001	-0,002	0,41	-0,65	0,08	-0,11	17,64	5585,44
									(0,00)
BG	DSpread-BG	0,000	0,000	2,40	-0,67	0,18	3,79	54,75	21,98
									(0,00)
CY	DSpread-CY	0,001	0,008	1,08	-1,59	0,14	-2,86	44,77	46298,22
									(0,00)
CZ	DSpread-CZ	0,000	-0,002	0,61	-0,34	0,09	0,97	9,21	1102,32
									(0,00)
DK	DSpread-DK	0,000	0,000	0,19	-0,22	0,04	0,07	12,39	2294,37
									(0,00)
FI	DSpread-FI	0,000	0,000	0,16	-0,14	0,03	0,69	7,97	693,23
									(0,00)
FR	DSpread-FR	0,001	0,000	0,32	-0,46	0,05	-0,27	16,58	4813,67
									(0,00)
EL	DSpread-EL	0,011	0,002	5,52	-12,57	0,76	-6,04	131,07	430944,80
									(0,00)
HR	DSpread-HR	-0,001	0,001	0,77	-0,59	0,13	0,72	10,49	504,42
									(0,00)
IE	DSpread-IE	0,001	-0,002	1,74	-1,69	0,20	0,15	24,08	11574,44
									(0,00)
IT	DSpread-IT	0,000	0,006	3,39	-5,09	0,33	-2,87	129,07	414744,90
									(0,00)
LV	DSpread-LV	0,000	-0,002	1,39	-2,12	0,22	-0,81	29,58	18467,88
									(0,00)

LT	DSpread-LT	0,000	0,006	3,39	-5,09	0,33	-2,87	129,07	414744,90
									(0,00)
LU	DSpread-LU	0,000	-0,002	0,57	-0,29	0,05	2,24	28,97	18088,14
									(0,00)
HU	DSpread-HU	-0,001	-0,004	1,66	-1,66	0,24	0,29	13,02	2620,77
									(0,00)
MT	DSpread-MT	-0,001	-0,002	0,27	-0,21	0,06	0,14	4,55	64,31
									(0,00)
NL	DSpread-NL	0,000	0,000	0,17	-0,20	0,04	0,22	8,14	692,59
									(0,00)
DE	DYield-DE	-0,006	-0,008	0,29	-0,27	0,08	0,11	3,82	18,88
									(0,00)
PL	DSpread-PL	0,002	-0,008	0,81	-0,44	0,11	0,72	7,58	598,42
									(0,00)
PT	DSpread-PT	0,006	0,002	1,83	-2,21	0,28	-0,55	15,89	4359,97
									(0,00)
RO	DSpread-RO	0,001	0,004	3,48	-2,59	0,36	1,84	35,35	26994,36
									(0,00)
SK	DSpread-SK	0,000	0,000	0,88	-0,83	0,12	-0,05	18,58	6323,23
									(0,00)
SI	DSpread-SI	0,001	0,002	1,09	-0,70	0,15	1,09	13,86	3192,87
									(0,00)
ES	DSpread-ES	0,002	0,000	0,64	-1,01	0,14	-0,95	14,67	3643,57
									(0,00)
SE	DSpread-SE	0,000	-0,002	0,25	-0,22	0,05	0,38	5,89	232,61
									(0,00)
UK	DSpread-UK	0,000	0,000	0,35	-0,34	0,07	0,13	7,23	468,52
									(0,00)

Source: Authors' calculations.

Table 2: Descriptive statistics of stock indicies for EU countries from 2005 to 2016.

Country	Variable	Mean	Median	Max	Min	Standard deviation	Skewness	Excess kurtosis	Jarque-Bera (p- value)
AT	DEquity-AT	0,28	10,58	262,46	-456,39	80,34	-1,14	6,49	453,54 (0,00)
BE	DEquity-BE	0,99	8,92	235,78	-342,34	65,45	-0,90	5,58	256,91 (0,00)
BG	DEquity-BG	-0,06	0,14	115,28	-161,27	22,98	-1,17	17,42	5559,80 (0,00)
CY	DEquity-CY	-1,51	-0,12	334,95	-462,48	78,04	-1,21	10,95	1799,24 (0,00)
CZ	DEquity-CZ	-0,23	2,46	113,44	-182,16	29,40	-1,16	8,40	899,12 (0,00)
DK	DEquity-DK	0,95	2,25	60,17	-80,18	13,00	-0,93	9,20	1092,32 (0,00)
FI	DEquity-FI	4,24	23,49	576,52	-770,39	181,18	-0,73	4,54	117,38 (0,00)
FR	DEquity-FR	1,59	12,53	341,64	-504,77	94,52	-0,70	5,19	176,50 (0,00)
EL	DEquity-EL	-3,35	2,04	237,27	-401,59	72,41	-1,19	7,45	656,46 (0,00)
HR	DEquity-HR	0,68	-0,71	261,57	-455,72	66,72	-1,14	12,57	2518,14 (0,00)
IE	DEquity-IE	0,31	19,72	560,05	-666,68	130,23	-1,06	6,87	508,04 (0,00)
IT	DEquity-IT	-18,84	47,91	2133,80	-3265,00	596,80	-0,69	5,03	156,55 (0,00)
LV	DEquity-LV	0,51	0,82	68,13	-52,77	10,41	-0,36	10,75	1578,36 (0,00)
LT	DEquity-LT	0,40	0,52	47,93	-58,72	8,19	-1,03	11,74	2099,91 (0,00)
LU	DEquity-LU	0,62	4,51	131,48	-220,14	36,55	-1,18	7,62	699,42 (0,00)
HU	DEquity-HU	27,40	62,11	1975,03	-2728,87	554,02	-0,71	5,39	201,08 (0,00)
MT	DEquity-MT	2,48	-1,22	337,51	-334,08	60,05	0,15	8,88	901,87 (0,00)
NL	DEquity-NL	0,21	0,77	29,60	-43,28	8,68	-0,78	5,10	179,05 (0,00)
DE	DEquity-DE	11,48	25,51	660,87	-772,20	177,16	-0,71	5,39	201,79 (0,00)

PL	DEquity-PL	0,02	4,22	188,71	-275,64	64,29	-0,67	5,36	191,06 (0,00)
PT	DEquity-PT	-4,84	10,64	625,43	-1212,47	180,01	-1,05	7,64	675,75 (0,00)
RO	DEquity-RO	3,38	14,22	693,31	-793,58	171,62	-0,68	5,97	277,39 (0,00)
SK	DEquity-SK	0,49	1,50	26,75	-31,65	7,58	-0,52	4,37	77,21 (0,00)
SI	DEquity-SI	-0,33	0,58	148,11	-172,02	30,38	-1,16	11,83	1942,47 (0,00)
ES	DEquity-ES	-0,03	2,36	100,18	-115,31	26,54	-0,45	4,13	54,43 (0,00)
SE	DEquity-SE	1,24	4,05	80,03	-95,47	23,67	-0,43	4,18	55,75 (0,00)
UK	DEquity-UK	3,62	12,85	324,05	-544,89	106,54	-0,65	4,79	126,51 (0,00)

Source: Authors' calculations.

Table 3: Descriptive statistics of exchange rates for EU countries from 2005 to 2016.

Country	Variable	Mean	Median	Max	Min	Standard deviation	Skewness	Excess kurtosis	Jarque-Bera (p- value)
BG	DEX-BG	-6.4E-08	0.0E+00	2.4E-03	-2.4E-03	1.5E-04	1.2E-01	2.0E+02	9.9E+05 (0,00)
CZ	DEX-CZ	-5.4E-03	-2.6E-03	8.5E-01	-1.0E+00	1.8E-01	7.4E-02	7.9E+00	6.4E+02 (0,00)
DK	DEX-DK	-6.1E-06	2.0E-05	1.7E-02	-1.0E-02	2.1E-03	4.8E-01	1.2E+01	2.2E+03 (0,00)
Eurozone	DEUR-US	-4.5E-04	-3.6E-04	9.3E-02	-6.1E-02	1.5E-02	5.3E-02	5.8E+00	2.1E+02 (0,00)
HR	DEX-HR	-5.4E-05	2.0E-04	8.2E-02	-6.8E-02	1.8E-02	1.9E-01	4.5E+00	6.2E+01 (0,00)
HU	DEX-HU	1.0E-01	-3.6E-02	1.6E+01	-1.4E+01	2.9E+00	3.1E-01	6.2E+00	2.9E+02 (0,00)
PL	DEX-PL	5.0E-04	-9.0E-04	2.2E-01	-1.3E-01	4.2E-02	8.9E-01	7.3E+00	5.7E+02 (0,00)
RO	DEX-RO	1.0E-03	-5.0E-04	1.6E-01	-1.4E-01	2.7E-02	4.8E-01	8.1E+00	7.0E+02 (0,00)
SE	DEX-SE	9.2E-04	-6.0E-05	4.2E-01	-3.4E-01	7.3E-02	6.4E-02	7.3E+00	4.9E+02 (0,00)
UK	DEX-UK	2.4E-04	-1.8E-04	5.4E-02	-5.5E-02	8.1E-03	4.2E-01	1.1E+01	1.7E+03 (0,00)

Source: Authors' calculations.

LITERATURE

Alexakis, C., & Pappas, V. (2018). Sectoral dynamics of financial contagion in Europe-The cases of the recent crises episodes. *Economic Modelling, 73*, 222-239.

Arnerić, J. (2012). Modeliranje volatilnosti na financijskim tržištima. U *Matematički modeli u analizi razvoja hrvatskog financijskog tržišta.* Split: Ekonomski fakultet Sveučilišta u Splitu.

Baele, L. (2005). Volatility spillover effects in European equity markets. *Journal of Financial and Quantitative Analysis, 40*(2), 373-401.

Bekaert, G., & Harvey, C. R. (1997). Emerging equity market volatility. *Journal of Financial economics, 43*(1), 29-77.

Bekaert, G., Harvey, C. R., & Lundblad, C. (2005). Does financial liberalization spur growth?. *Journal of Financial economics, 77*(1), 3-55.

Calvo, S. G., & Reinhart, C. (1996). Capital flows to Latin America: is there evidence of contagion effects? *Available at SSRN 636120.*

Claessens, S., & Forbes, K. (2004). International financial contagion: The theory, evidence and policy implications. *In Conference "The IMF's role in emerging market economies: Reassessing the adequacy of its resources".* Amsterdam.

Dornbusch, R., Park, Y. C., & Claessens, S. (2000). Contagion: Understanding how it spreads 15(2), . *The World Bank Research Observer*, 177-197.

Enders, W. (2008). *Applied econometric time series.* John Wiley & Sons.

Engle, R. (2002). Dynamic conditional correlation: A simple class of multivariate generalized autoregressive conditional heteroskedasticity models. *Journal of business & economic statistics, 20*(3), 339-350.

Forbes, K., & Rigobon, R. (2001). Measuring contagion: conceptual and empirical issues. *In International financial contagion Boston,* , 43-66.

Hamao, Y., Masulis, R. W., & Ng, V. (1990). Correlations in price changes and volatility across international stock markets. *The review of financial studies, 3*(2), 281-307.

Han, K. C., Lee, S. H., & Suk, D. (2003). Mexican peso crisis and its spillover effects to emerging market debt. *Emerging Markets Review, 4*(3), 310-326.

Hung, N. T. (2019). Equity market integration of China and Southeast Asian countries: further evidence from MGARCH-ADCC and wavelet coherence analysis. *Quantitative Finance and Economics, 3*(2), 201-220.

Hung, N. T. (2022). Spillover effects between stock prices and exchange rates for the central and eastern European countries. *Global Business Review, 23*(2), 259-286.

Jurun, E., Pivac, S., & Arnerić, J. (2007). Historical and prognostic risk measuring across stocks and markets. *Journal of WSEAS Transactions on Business and Economic, 4*, 126-134.

Leung, H., Schiereck, D., & Schroeder, F. (2017). Volatility spillovers and determinants of contagion: Exchange rate and equity markets during crises. *Economic Modelling, 61*, 169-180.

Masson, M. P. (1998). *Contagion: Monsoonal effects, spillovers, and jumps between multiple equilibria.* International Monetary Fund.

Muratori, U. (2014). Contagion in the Euro area sovereign bond market. *Social Sciences, 4*(1), 66-82.

Palić, P., Posedel Šimović, P., & Vizek, M. (2017). The determinants of country risk premium volatility: Evidence from a panel VAR model. *Croatian Economic Survey, 19*(1), 37-66.

Posedel Šimović, P., Tkalec, M., & Vizek, M. (2015). Time-varying integration in European post-transition sovereign bond market. *Radni materijali EIZ-a, 1*, 5-36.

Pritsker, M. (2001). The channels for financial contagion. *In International financial contagion*, 67-95.

Silva, T. C., da Silva, M. A., & Tabak, B. M. (2017). Systemic risk in financial systems: a feedback approach. *Journal of Economic Behavior & Organization, 144*, 97-120.

Tai, C. S. (2007). Market integration and contagion: Evidence from Asian emerging stock and foreign exchange markets. *Emerging markets review, 8*(4), 264-283.

Wolf, H. (1999). International asset price and capital flow comovements during crisis: the role of contagion, demonstration effects, and fundamentals . *In World Bank/IMF/WTO conference on "Capital Flows, Financial Crises, and Policies"* (str. 15-16). In World Bank/IMF/WTO conference.

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501031P
UDK: 625.739(497.11):336.14(497.6)
Datum prijema rada: 8. januar 2025.
Submission Date: January 8, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 31-47
ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

DIVERGING PATHS: HIRING IN THE PUBLIC AND PRIVATE SECTORS

Branka Zolak Poljašević | Associate Professor; University of Banja Luka, Faculty of Economics, Banja Luka; branka.zolak-poljasevic@ef.unibl.org; ORCiD ID: 0000-0003-3715-9616

Nemanja Berber | Associate Professor, University of Novi Sad, Faculty of Economics Subotica, nemanja.berber@ef.uns.ac.rs; ORCiD ID: 0000-0002-1433-6416

Dragana Došenović Milaković | Associate Professor; University of Banja Luka, Faculty of Economics, Banja Luka; dragana.dosenovic@ef.unibl.org; ORCiD ID: 0009-0004-9976-05087

Abstract: *This study investigates the differences in recruitment and selection practices between public and private sector organizations in Serbia and Bosnia and Herzegovina. The research aims to explore the extent to which sectoral characteristics influence the adoption of traditional and contemporary hiring techniques and the mediating role of formal human resource (HR) departments in these processes. Data were collected through the CRANET survey conducted in 2021–2022, encompassing responses from 151 organizations, including 119 private and 32 public sector entities. The study employs non-parametric statistical methods, including the Mann-Whitney U test, to compare hiring practices and a three-step regression analysis to examine the mediating effect of HR departments. The results reveal significant sectoral differences in recruitment and selection techniques, with public sector organizations demonstrating a greater reliance on traditional methods, while private sector organizations adopt contemporary techniques more frequently. The presence and influence of formal HR departments partially mediate the relationship between sector and hiring practices, particularly in the adoption of structured and innovative hiring methods. These findings align with theoretical frameworks of sectoral differentiation and highlight the critical role of institutional factors in shaping HR practices. Furthermore, findings contribute to the understanding of HR practices in transitional economies and provide a basis for further research into additional mediators, such as organizational culture and leadership, that may influence hiring strategies in public and private sectors.*

Keywords: *hiring, recruitment, selection, public, private*

JEL classification*: M50, M51*

INTRODUCTION

The recruitment and selection of individuals with the requisite knowledge, skills, and abilities, who also align with an organization's values and behaviors, represents an inherently complex process. This complexity is further intensified by the ongoing disparity between labor market demands and the provisions of educational systems, frequently leading to a shortage of candidates with specialized skills (Zolak Poljašević & Ilić, 2016). Organizations that recognize this challenge utilize recruitment as an opportunity to gain a competitive advantage. Conversely, many organizations, constrained by outdated management philosophies, often neglect the importance of recruitment, thereby creating a foundation for future operational challenges.

Sectoral differences add another layer of complexity to recruitment and selection processes, as structural, operational, and institutional factors shape the approaches used in public and private organizations. In the public sector, hiring process is typically governed by regulatory frameworks and procedural requirements, prioritizing transparency and accountability. Conversely, the private sector emphasizes flexibility and innovation, often employing contemporary methods (Ostapenko, Kubetska, & Sidorov, 2024; Vodianka, Ratushniak, & Luste, 2022; Monteiro, Correia, & Gonçalves, 2019) such as digital platforms, proactive sourcing, and psychometric testing to maintain competitiveness. Understanding these differences is particularly relevant in transitional economies, such as Serbia and Bosnia and Herzegovina, where public and private sectors face unique challenges in aligning hiring practices with contemporary trends in human resource management (HRM). Transitional economies are characterized by dynamic changes in institutional frameworks and labor market demands, which significantly influence hiring practices (Chaltseva & Shvets, 2021). These sectoral distinctions necessitate a more nuanced understanding of how organizations adapt their hiring strategies to navigate these challenges and leverage opportunities.

The subject of this research is an in-depth examination of sectoral differences in recruitment and selection practices, focusing specifically on contrasting traditional and contemporary hiring techniques. Traditional methods, often associated with the public sector, include print advertisements, formal applications, and panel interviews, which ensure procedural transparency but may lack flexibility. In contrast, contemporary approaches, prevalent in the private sector, leverage digital technologies, social media platforms, and artificial intelligence, offering faster candidate filtering and better alignment with organizational goals (Biradar, et al., 2024). This study aims to determine the extent to which sectoral characteristics influence these practices and assess the mediating role of formal HR departments in shaping hiring strategies. The motivation for this research stems from the growing need to optimize HR practices in transitional economies, where institutional transformations and evolving market dynamics demand a deeper understanding of sectoral distinctions.

In this paper, it is assumed that public and private sector organizations differ significantly in their adoption of traditional and contemporary recruitment and selection techniques (H1). Furthermore, the analysis explores the mediating role of the presence and functional influence of a formal HR department in shaping the relationship between sector affiliation and hiring practices (H2). The analysis draws on data collected through the CRANET survey, employing statistical methods to compare hiring

practices and evaluate the mediating effects of HR departments. This focus on sectoral differences and the mediating role of HR departments provides a foundation for the study's theoretical and practical contributions. Theoretically, the research enhances existing literature by offering a nuanced understanding of how sectoral characteristics influence recruitment practices in transitional economies. The inclusion of HR departments as mediators offers new insights into their strategic role in bridging institutional differences and operational needs. Practically, the findings have implications for both policymakers and HR practitioners, providing actionable recommendations for enhancing recruitment processes to align with the specific needs of public and private sector organizations in transitional contexts.

This paper is structured as follows: the next section presents a review of relevant literature on recruitment and selection practices in public and private sectors. The methodology section details the research design, data collection methods, and analytical approach. The results and discussion section outlines the study's findings, contextualizing them within existing research. Finally, the conclusion revisits the hypotheses, evaluates the implications of the findings, and suggests paths for future research.

LITERATURE OVERVIEW

In today's knowledge-based economy, human resources are a critical driver of long-term competitive advantage, as the expertise and capabilities of employees provide substantial benefits to organizations through the effective management of human capital (Katolik Kovačević, Požega, & Vučemilović, 2024). Among the most pressing challenges for companies today is the ability to attract, develop, and retain top talent (Gallardo-Gallardo, Thunnissen, & Scullion, 2019), underscoring the growing importance of strategic HRM practices. This highlights the pivotal role of processes such as recruitment and selection in maximizing workforce potential and aligning it with organizational goals. However, these processes vary significantly across sectors (Jakobsen, Løkke, & Keppeler, 2023; Suzuki & Hur, 2021; Leisink, Borst, Knies, & Battista, 2021), with the public sector standing out due to its unique complexities and characteristics, which make its HRM particularly distinctive and challenging (Reina & Scarozza, 2021; Sievert, Vogel, & Feeney, 2020).

The comparison of the public and private sectors in terms of hiring practices has been the subject of numerous studies (Vogel & Satzger, 2023). These studies indicate that the results are not uniform. While many highlight the private sector as more attractive for employment (Pepermans & Peiffer, 2022; Santinha, Carvalho, Forte, Fernandes, & Tavares, 2021; Fowler & Birdsall, 2020), others present evidence to the contrary (Cordes & Vogel, 2023; Weske, Ritz, Schott, & Neumann, 2020). Such divergent findings reflect the different methodologies and variables examined in the research. Regardless of the conclusions, both groups of studies emphasize the distinct approaches, goals, and priorities of the private and public sectors. While private organizations typically focus on performance-driven hiring to enhance efficiency and competitiveness, public organizations often consider broader societal objectives, such as promoting the inclusion of underrepresented groups or accommodating political appointees. These priorities are shaped by the legal and legitimacy requirements inherent to the public sector, which distinguish its hiring practices from those of the private sector (Jakobsen, Løkke, & Keppeler, 2023).

Public organizations often operate within strict regulations, standardized systems, and formalized procedures, emphasizing transparency, equality, and accountability in hiring processes. Conversely, the private sector is characterized by greater flexibility, focusing on speed, efficiency, and business outcomes. Hiring in private organizations often involves innovative methods, such as proactive candidate sourcing, digital platforms, and direct recruitment through networks (Vodianka, Ratushniak, & Luste, 2022; Monteiro, Correia, & Gonçalves, 2019). These methods allow private organizations to attract candidates with specific skills and competencies necessary for competitiveness. In contrast, public sector hiring prioritizes equal access and accountability, aligning with broader societal goals.

Both sectors employ a range of methods, techniques, and instruments to attract and select suitable candidates. The choice of recruitment and selection method often depends on the organization's specific needs, the nature of the job position, and the current labor market situation (Ostapenko, Kubetska, & Sidorov, 2024; Vodianka, Ratushniak, & Luste, 2022). These methods can be broadly classified into formal and informal approaches, relying on either internal or external recruitment sources (Osoian & Zaharie, 2014). In this study, recruitment practices are examined based on their fundamental characteristics and organizational implications, and classified into two primary categories: traditional and contemporary hiring methods. Traditional methods, such as print advertisements, formal applications, and multi-stage panel interviews, are often preferred in the public sector for their procedural transparency and adherence to regulatory standards. Contemporary methods, on the other hand, leverage digital technologies, psychometric testing, and applicant tracking systems (ATS) to streamline processes and align candidates more effectively with organizational goals. Digital transformation has significantly influenced recruitment practices across sectors, emphasizing the integration of digital technologies into all business processes (Jerković, Gavrić, & Ljubas Ćurak, 2024; Mia, Hossain, & Sangwan, 2024). Contemporary methods, particularly those supported by artificial intelligence, allow faster candidate filtering, shorter timelines, and improved alignment between candidates and organizational culture (Biradar, et al., 2024). These methods, however, require advanced technological literacy and adaptability from HR professionals. While traditional approaches ensure transparency and consistency, they are often slower and less flexible compared to modern techniques (Ostapenko, Kubetska, & Sidorov, 2024; Vodianka, Ratushniak, & Luste, 2022). These observed differences in the characteristics and applications of hiring methods across public and private sectors underline the need to examine how organizations prioritize these techniques depending on their sectoral contexts. This leads to the formulation of the first hypothesis:

H1: Public and private sector organizations differ in their prioritization of recruitment methods and selection techniques.

HR departments play a pivotal role in bridging organizational needs and labor market potential (Turek, 2020). In the private sector, HR functions extend to strategic workforce planning, identifying key competencies, and implementing innovative recruitment solutions. With the advancement of digital technologies, HR roles have expanded to include adapting recruitment processes for digital talent and supporting organizations' digital transformation (Gilch & Sieweke, 2021). Public sector HR departments, while evolving towards more strategic roles, remain deeply rooted in

procedural transparency. Their responsibilities often include organizing recruitment competitions, evaluating candidates against formal criteria, and coordinating with other governmental institutions to ensure accountability (Reina & Scarozza, 2021). Whether in the private or public sector, an effective HR department is essential for professionalizing recruitment and selection processes, minimizing errors, and improving the quality of newly hired employees. In today's competitive landscape, where talent is a critical asset, these processes have become strategic imperatives, directly influencing workforce quality, organizational performance, and long-term goals (Sai Sharan & Karpagavalli, 2023). By acting as a bridge between organizational goals and labor market demands, HR departments influence the adoption of recruitment practices in line with sector-specific needs. This mediating effect provides the foundation for the second hypothesis:

H2: The adoption of recruitment methods and selection techniques is influenced by sector, with the mediating effect of the presence and influence of a formal HR department.

To provide more focused testing, this hypothesis was divided into two auxiliary hypotheses:

H2.1: The relationship between sector and the adoption of traditional hiring techniques is mediated by the presence and influence of a formal HR department.

H2.2: The relationship between sector and the adoption of contemporary hiring techniques is mediated by the presence and influence of a formal HR department.

The proposed hypotheses underscore the importance of understanding how HR departments mediate recruitment practices across sectors. This is particularly relevant in transitional economies, where dynamic institutional and regulatory changes create additional complexities for both public and private sector organizations. These challenges often necessitate adaptations in recruitment strategies to align with evolving labor market demands and organizational goals.

The imbalance between labor market demands and the limitations of educational systems often results in a shortage of qualified candidates (Babić & Slavković, 2011; Ilić & Zolak Poljašević, 2017; Zolak Poljašević & Ilić, 2016). This issue has been evident even during periods of high unemployment, highlighting the misalignment between labor market needs and educational outcomes. During transition period, these challenges primarily affected the private sector, which needed to adapt rapidly to new economic and market conditions. In contrast, the public sector, though burdened by politicization and non-transparent practices, was perceived as a more attractive workplace due to job security and favorable working conditions. However, in recent years, the public sector has also faced increasing challenges in attracting and retaining qualified and talented workers. Although public institutions in transitional economies often aim to align their practices with international standards of transparency and accountability, they still struggle with political influence, rigid procedures, and a lack of flexibility (Chaltseva & Shvets, 2021). To overcome these challenges, it is essential to professionalize recruitment and selection processes through transparent procedures and the adoption of contemporary methods tailored to the unique demands of transitional economies.

From the previous elaboration, it is clear that in transitional economies, recruitment and selection processes are influenced by various external and internal factors,

making them challenging for both private and public sectors. This complexity highlights the need for further research into hiring practices in these countries, aiming to better understand how contextual factors affect the efficiency and transparency of these processes. Deeper analysis of these practices can contribute significantly to the development of strategies that improve recruitment, optimize the use of available talent, and align with the demands of the modern labor market. Building on this foundation and the proposed hypotheses, this study explores hiring practices in the public and private sectors of two transitional economies, Serbia and Bosnia and Herzegovina, and presents the findings of empirical research detailed in the methodology section.

METHODOLOGY

This study investigates recruitment and selection practices in public and private sector organizations in Serbia and Bosnia and Herzegovina, examining their alignment with contemporary HRM trends. The hypotheses tested in this study were derived from the literature review, which highlights sectoral differences in hiring practices and the mediating role of HR departments.

The data were collected through the CRANET survey, a global research initiative conducted in nearly 40 countries to facilitate comparative studies of human resource management practices. The survey consisted of closed-ended questions targeting HR managers in organizations with more than 100 employees (Zolak Poljašević & Berber, 2024). The dataset for this study comprises responses from 151 organizations, including 119 private sector entities and 32 public sector entities.

Data analysis was performed using SPSS, ensuring the reliability and rigor of statistical procedures. The independent variable, sector, was dichotomously coded to distinguish between public and private organizations. The dependent variables were categorized into two composite measures reflecting hiring practices: traditional hiring techniques (e.g., panel interviews, newspaper advertisements) and contemporary hiring techniques (e.g., social media profiling). These measures were designed to capture variations in the adoption of established and innovative hiring practices.

To ensure the reliability of the composite measures, Cronbach's Alpha was calculated for both constructs. The results indicated an acceptable level of internal consistency for traditional hiring techniques ($\alpha = 0.700$) and strong reliability for contemporary hiring techniques ($\alpha = 0.829$). These values confirm that the items within each composite measure consistently represent their respective constructs, validating their use in subsequent analyses. The analysis was further conducted across two employee groups: managers and professional staff, and administrative and technical staff. This categorization allowed for a nuanced examination of hiring practices, contrasting established methods with innovative approaches that leverage digital tools.

The normality of the composite variables was tested using the Shapiro-Wilk test, which indicated significant deviations from normal distribution ($p < 0.05$). Consequently, the Mann-Whitney U test, a robust non-parametric alternative, was employed to compare public and private sectors. This approach accounted for the non-normal distribution of data and the imbalance in group sizes ($N = 119$ for the private sector; $N = 32$ for the public sector).

To examine the mediating role of HR departments in the adoption of recruitment practices, a three-step regression analysis was conducted. First, linear regression

models were used to examine the direct effect of sector on hiring techniques. Second, separate regression models tested the relationship between the mediating variable and the adoption of traditional and contemporary hiring techniques. Finally, multiple regression models incorporated both the sector and the mediating variable to assess the adjusted relationships. The Sobel test was performed to validate the mediation effect, assessing the significance of the indirect effect of sector on hiring techniques through the mediating variable.

This rigorous methodological framework provides a comprehensive understanding of the direct and mediated effects of sector on recruitment practices. By distinguishing between traditional and contemporary hiring techniques, the analysis captures sector-specific dynamics and highlights the functional role of HR departments in shaping recruitment practices in public and private sector organizations.

RESULTS AND DISCUSSION

As detailed in the methodology section, the Mann-Whitney U test was employed to evaluate the first hypothesis. The results, presented in the following tables, compare recruitment and selection techniques across sectors for different employee groups.

Table 1. Mann-Whitney U Test: Recruitment techniques by sector for managers and professional staff

Ranks		N	Mean Rank	Sum of Ranks	Test Statistics[a]	
Managers and professional staff					Mann-Whitney U	1533.500
Traditional recrutiment techniques	Private sector	119	79.11	9414.50	Wilcoxon W	2061.500
	Public sector	32	64.42	2061.50	Z	-1.726
	Total	151			Asymp. Sig. (2-tailed)	.084
Managers and professional staff					Mann-Whitney U	833.500
Contemporary recrutiment techniques	Private sector	119	85.00	10114.50	Wilcoxon W	1361.500
	Public sector	32	42.55	1361.50	Z	-4.935
	Total	151			Asymp. Sig. (2-tailed)	.000

[a]. Grouping Variable: Sector

Source: Authors based on CRANET 2021 database

For traditional recruitment techniques, the p-value (0.084) exceeds the significance threshold (0.05), indicating no statistically significant difference between public and private sector organizations. Conversely, for contemporary recruitment techniques, the p-value (0.000) is below 0.05, indicating a significant difference. The negative Z-value highlights that private sector organizations utilize modern recruitment methods, such as psychometric testing and social media profiling, more frequently than their public sector counterparts.

Table 2. Mann-Whitney U Test: Recruitment techniques by sector for administrative and technical staff

Ranks		N	Mean Rank	Sum of Ranks	Test Statistics[a]	
Administrative and technical staff					Mann-Whitney U	1209.000
Traditional recrutiment techniques	Private sector	119	81.84	9739.00	Wilcoxon W	1737.000
	Public sector	32	54.28	1737.00	Z	-3.221
	Total	151			Asymp. Sig. (2-tailed)	.001
Administrative and technical staff					Mann-Whitney U	874.000
Contemporary recrutiment techniques	Private sector	119	84.66	10074.00	Wilcoxon W	1402.000
	Public sector	32	43.81	1402.00	Z	-4.755
	Total	151			Asymp. Sig. (2-tailed)	.000

[a]. Grouping Variable: Sector

Source: Authors based on CRANET 2021 database

The results in Table 2 reveal statistically significant differences in both traditional ($p = 0.001$) and contemporary recruitment techniques ($p = 0.000$) between the sectors for administrative and technical staff. The private sector demonstrates greater reliance on contemporary methods, reflecting its adaptability and strategic focus. Public sector organizations, by contrast, prioritize traditional recruitment practices, aligning with their regulatory and procedural frameworks.

Table 3. Mann-Whitney U Test: Selection techniques by sector for managers and professional staff

Ranks		N	Mean Rank	Sum of Ranks	Test Statistics[a]	
Managers and Professional staff					Mann-Whitney U	1128.500
Traditional selection techniques	Private sector	119	82.52	9819.50	Wilcoxon W	1656.500
	Public sector	32	51.77	1656.50	Z	-3.730
	Total	151			Asymp. Sig. (2-tailed)	.000
Managers and Professional staff					Mann-Whitney U	1345.000
Contemporary selection techniques	Private sector	119	80.70	9603.00	Wilcoxon W	1873.000
	Public sector	32	58.53	1873.00	Z	-2.738
	Total	151			Asymp. Sig. (2-tailed)	.006

[a]. Grouping Variable: Sector

Source: Authors based on CRANET 2021 database

Table 3 summarizes the results for selection techniques among managers and professional staff. The p-values for traditional (p = 0.000) and contemporary (p = 0.006) techniques indicate significant differences between sectors. The private sector is more likely to adopt innovative, technology-driven selection methods, whereas the public sector predominantly uses traditional approaches.

Table 4. Mann-Whitney U Test: Selection techniques by sector for administrative and technical staff

Ranks		N	Mean Rank	Sum of Ranks	Test Statistics[a]	
Administrative and technical staff					Mann-Whitney U	1314.000
Traditional selection techniques	Private sector	119	80.96	9634.00	Wilcoxon W	1842.000
	Public sector	32	57.56	1842.00	Z	-2.862
	Total	151			Asymp. Sig. (2-tailed)	.004
Administrative and technical staff					Mann-Whitney U	1345.000
Contemporary selection techniques	Private sector	119	80.70	9603.00	Wilcoxon W	1873.000
	Public sector	32	58.53	1873.00	Z	-2.738
	Total	151			Asymp. Sig. (2-tailed)	.006

[a]. Grouping Variable: Sector

Source: Authors based on CRANET 2021 database

Table 4 demonstrates that both traditional (p = 0.004) and contemporary (p = 0.006) selection techniques differ significantly between sectors for administrative and technical staff. The findings again confirm that private sector organizations prioritize modern approaches, while the public sector leans towards conventional methods.

The findings across all tested relationships confirm significant differences in recruitment and selection techniques between public and private sector organizations, supporting the first hypothesis (H1). These results align with existing research highlighting the private sector's strategic reliance on contemporary methods to maintain competitiveness. For example, Monteiro, Correia and Gonçalves (2019) emphasize the role of digital platforms and e-recruitment systems in streamlining candidate sourcing and selection processes, methods increasingly adopted in the private sector to meet evolving candidate expectations. Furthermore, Biradar et al. (2024) underscore the transformative impact of artificial intelligence (AI) on recruitment practices, enhancing efficiency by enabling faster candidate filtering and better alignment with organizational culture. These trends resonate with the findings of this study, which highlight the private sector's adoption of innovative recruitment techniques, such as psychometric testing and social media profiling, to attract top talent. This shift towards digitization reflects broader changes in HRM, emphasizing the necessity for organizations to integrate modern tools and methods to remain competitive in a digitally driven labor market.

In contrast, the public sector's reliance on traditional practices, such as panel interviews and print advertisements, underscores its focus on procedural transparency and compliance with regulatory frameworks. However, these approaches are often accompanied by rigid procedural frameworks and formalization that hinder the ability to attract and recruit skilled personnel. Research highlights that public organizations frequently face reduced applicant interest despite increasing vacancies, driven by perceptions of inflexible working conditions and complex recruitment processes (Fowler & Birdsall, 2020; Rose, 2013). As Sievert, Vogel, and Feeney (2020) argue, generational shifts also play a role in this dynamic. The retirement of the baby boomer generation (Pollitt, 2016) has created substantial vacancies that are difficult to fill, particularly as Generation Z, now entering the labor market, perceives public administration as an unattractive career option. This generational perspective is shaped by factors such as the public sector's traditional image, rigid work structures, and the sector's perceived inability to meet the career aspirations and workplace expectations of younger professionals. Also, formalized recruitment processes, intended to ensure fairness and equity, often result in administrative burdens that increase the cost of participation for applicants. These burdens include requirements for extensive legal documentation and compliance with standardized procedures. Moynihan, Herd and Harvey (2015) define administrative burdens as the compliance and psychological costs associated with interacting with bureaucratic systems, which discourage candidates from pursuing public sector roles. Furthermore, the use of formalized language and legal jargon in job advertisements, as noted by Gravier and Roth (2020), creates a perception of excessive bureaucracy, signaling a rigid organizational culture that may deter highly qualified applicants. Addressing these challenges requires the public sector to adopt more strategic and targeted recruitment practices (Sievert, Vogel, & Feeney, 2020). Emphasizing intrinsic rewards, such as the prosocial impact and job security of public sector roles, can appeal to candidates motivated by public service values (Asseburg & Homberg, 2020; Linos, 2018). Furthermore, rebranding efforts that align the public sector's image with the career aspirations of younger generations could mitigate some of the generational challenges identified.

Addressing these challenges not only requires rethinking recruitment strategies but also highlights the critical role of formal HR departments in mediating the relationship between sector-specific characteristics and recruitment practices. To explore this mediating effect, regression analysis was performed as part of a three-step approach. The results for H2.1 and H2.2 are presented in subsequent tables.

Table 5. Direct relationship between sector and traditional hiring techniques

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta			
1	(Constant)	13.815	.695		19.882	.000
	Sector (Public vs. Private)	-2.250	.515	-.335	-4.372	.000
Dependent Variable: Traditional Hiring Techniques						

Source: Authors based on CRANET 2021 database

The regression analysis demonstrates a statistically significant negative relationship between the sector and the adoption of traditional hiring techniques (B = -2.250, p < 0.001). This finding indicates that organizations in the private sector adopt, on average, 2.25 fewer traditional hiring techniques compared to public sector organizations. The sector accounts for 11.2% of the variance in traditional hiring techniques (R^2 = 0.112).

Table 6. Influence of HR department on the adoption of traditional hiring techniques

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta			
1	(Constant)	9.955	.497		20.043	.000
	HR_Presents_Influence	1.963	.612	.274	3.209	.002
Dependent Variable: Traditional Hiring Techniques						

Source: Authors based on CRANET 2021 database

The results reveal that the presence and influence of a formal HR department significantly impact the adoption of traditional hiring techniques (B = 1.963, p = 0.002). Organizations with a formal HR department adopt nearly two additional traditional hiring techniques compared to those without. The presence and influence of a formal HR department explain 7.5% of the variance in traditional hiring techniques (R^2 = 0.075).

Table 7. Combined effect of sector and HR department on traditional hiring techniques

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta			
1	(Constant)	13.125	1.123		11.692	.000
	HR_ Presents_Influence	1.518	.609	.212	2.494	.014
	Sector (Public vs. Private)	-2.491	.797	-.265	-3.125	.002
Dependent Variable: Traditional Hiring Techniques						

Source: Authors based on CRANET 2021 database

When the presence and influence of a formal HR department are included in the model, the sector remains a significant predictor of traditional hiring techniques (B = -2.491, p = 0.002). The coefficient for the presence and influence of a formal HR department also remains significant (B = 1.518, p = 0.014), indicating that the mediator explains part, but not all, of the sector's influence. The combined model explains 14.2% of the variance in traditional hiring techniques (R^2 = 0.142).

The Sobel test suggests that the mediation effect of the presence and influence of a formal HR department on the relationship between sector and traditional hiring techniques is marginally non-significant (Z = -1.94). This implies that while the presence and influence of a formal HR department play a role in mediating this relationship, their effect is not robust enough to be statistically confirmed at $p < 0.05$. The results provide partial support for H2.1.

The results of the analysis for contemporary hiring practices are presented below.

Table 8. Direct effect of sector on contemporary hiring techniques

Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Std. Error	Beta			
1	(Constant)	11.626	.827		14.058	.000
	Sector (Public vs. Private)	-3.611	.612	-.433	-5.897	.000
Dependent Variable: Contemporary Hiring Techniques						

Source: Authors based on CRANET 2021 database

The analysis demonstrates a significant negative relationship between the sector and contemporary hiring techniques (B = -3.611, $p < 0.001$). This finding indicates that organizations in the private sector adopt, on average, 3.61 fewer contemporary hiring techniques compared to public sector organizations. The sector accounts for 18.7% of the variance in contemporary hiring techniques ($R^2 = 0.187$).

Table 9. Influence of HR department on the adoption of contemporary hiring techniques

Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Std. Error	Beta			
1	(Constant)	5.773	.600		9.615	.000
	HR_ Presents_Influence	2.639	.740	.302	3.568	.001
Dependent Variable: Contemporary Hiring Techniques						

Source: Authors based on CRANET 2021 database

The regression results reveal that the presence and influence of a formal HR department significantly impact contemporary hiring techniques (B = 2.639, $p = 0.001$). Organizations with a formal HR department adopt 2.64 more contemporary hiring techniques compared to those without. The presence and influence of a formal HR department explain 9.1% of the variance in contemporary hiring techniques ($R^2 = 0.091$).

Table 10. Combined effect of sector and HR department on contemporary hiring techniques

Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Std. Error	Beta			
1	(Constant)	10.837	1.317		8.227	.000
	HR_ Presents_Influence	1.928	.714	.221	2.700	.008
	Sector (Public vs. Private)	-3.979	.935	-.347	-4.254	.000
Dependent Variable: Contemporary Hiring Techniques						

Source: Authors based on CRANET 2021 database

When the presence and influence of a formal HR department are included in the model, the sector remains a significant predictor of contemporary hiring techniques ($B = -3.979$, $p < 0.001$). The coefficient for the presence and influence of a formal HR department also remains significant ($B = 1.928$, $p = 0.008$), indicating that the mediator explains part, but not all, of the sector's influence. The combined model explains 20.5% of the variance in contemporary hiring techniques ($R^2 = 0.205$).

The Sobel test confirms a statistically significant mediation effect of the HR department on the relationship between sector and contemporary hiring techniques ($Z = -2.04$, $p < 0.05$). This finding indicates that the presence and influence of a formal HR department partially mediate the effect of the sector. The results provide strong support for H2.2.

The results for H2 indicate that the presence of formal HR departments mediates the relationship between sector and recruitment practices, though this effect is partial. While HR departments facilitate the adoption of structured and innovative methods, sectoral characteristics independently shape these processes.

The partial mediation effect observed in this study suggests that, while HR departments play an important role, numerous studies have identified a wide range of influential factors on hiring practices, including organizational culture (Gambhir, et al., 2024), demographic variables (Thangaraja, 2023), job matching and differentiated needs (Hu, Lyu, & Sun, 2023), and working conditions (Lee & Mao, 2020), among others.

Future research could explore these additional mediators to provide a more comprehensive understanding of sectoral differences in recruitment practices. For instance, examining how organization culture or external labor market conditions interact with HR department functions could offer deeper insights into the dynamics of recruitment in transitional economies.

CONCLUSION

This study provides critical insights into sectoral differences in recruitment and selection practices in transitional economies, with a particular focus on Serbia and Bosnia and Herzegovina. The findings support the hypothesis (H1) that public and private sector organizations differ significantly in their adoption of traditional and contemporary recruitment techniques. The private sector demonstrates a greater reliance

on contemporary methods, such as psychometric testing and digital platforms, reflecting its strategic adaptability and competitive imperatives. Conversely, the public sector remains rooted in traditional practices, which emphasize transparency and adherence to regulatory frameworks. Furthermore, the study confirms that the presence and influence of formal HR departments partially mediate the relationship between sector affiliation and recruitment practices (H2), underscoring their critical role in shaping innovative hiring strategies.

These insights have significant implications for both research and practice. Theoretically, the study contributes to understanding how sectoral characteristics influence recruitment priorities, particularly in the unique institutional contexts of transitional economies. The findings highlight the need for future research to explore additional mediating factors, such as organizational culture, leadership styles, and technological adoption, to provide a more nuanced understanding of recruitment practices. From a practical perspective, the results offer actionable recommendations for enhancing HR strategies. Public sector organizations should consider integrating digital tools and streamlining administrative procedures to reduce bureaucratic barriers and attract top talent. Private sector entities, on the other hand, can benefit from continued innovation in recruitment technologies and targeted skill-matching initiatives. Both sectors should invest in strengthening HR capabilities, ensuring that HR departments are equipped to adopt flexible and forward-thinking approaches to recruitment.

In the broader context of transitional economies, this research underscores the importance of aligning recruitment practices with institutional and market demands. By addressing sector-specific challenges and leveraging contemporary recruitment methods, organizations can enhance workforce quality and contribute to broader institutional development. This alignment is particularly critical for fostering economic stability and competitiveness in rapidly changing environments. In conclusion, the study emphasizes that recruitment and selection are not merely administrative functions but strategic imperatives that directly impact organizational performance and societal outcomes. As transitional economies continue to evolve, adapting recruitment practices to meet the demands of a dynamic labor market will remain a key priority for both public and private sector organizations.

However, this study has several limitations that should be considered. First, the reliance on self-reported data from the CRANET survey may introduce response biases, as participants may provide socially desirable answers rather than accurate reflections of their practices. This limitation underscores the need for future studies to incorporate objective measures, such as organizational records or external audits, to validate self-reported data. Second, the focus on two transitional economies, Serbia and Bosnia and Herzegovina, restricts the generalizability of findings to other countries with different institutional, cultural, and economic contexts. Expanding the geographical scope to include a broader range of transitional and non-transitional economies could provide a more comprehensive understanding of sectoral recruitment practices.

Third, the study primarily examines the mediating role of HR departments, but other factors, such as organizational culture, leadership styles, and external labor market conditions, may also influence recruitment practices. Future research could explore these additional mediators to develop a more holistic framework. Lastly, while the study touches on the role of digital technologies in transforming recruitment processes,

it does not delve deeply into the specific tools, implementation challenges, and outcomes associated with their use. This area represents a critical path for future research, particularly given the increasing importance of digital transformation in HR practices.

LITERATURE

Asseburg, J., & Homberg, F. (2020). Public service motivation or sector rewards? Two studies on the determinants of sector attraction. *Review of Public Personnel Administration, 40*(1), 82–111. doi:https://doi.org/10.1177/0734371X18778334

Babić, V., & Slavković, M. (2011). Povezanost obrazovnog sistema i potreba privrede. U J. Zubović, *Aktivne mere na tržištu rada i pitanja nezaposlenosti* (str. 1–26). Beograd: Institut ekonomskih nauka.

Biradar, A., Ainapur, J., Kalyanrao, K., Aishwarya, A., Sudharani, S., Shivaleela, S., & Monika, M. (2024). The impact of artificial intelligence on modern recruitment practices: A multi-company case study analysis. *International Journal of Business and Management Invention, 13*(9), 143-150. doi:https://doi.org/10.35629/8028-1309143150

Chaltseva, O. M., & Shvets, K. A. (2021). Experience of application of modern concepts and models of public governance in transitional systems. *Political Life, 1*, 58–65. doi:https://doi.org/10.31558/2519-2949.2021.1.8

Cordes, J., & Vogel, R. (2023). Comparing employer attractiveness of public sector organizations to nonprofit and private sector organizations: An experimental study in Germany and the U.S. *Review of Public Personnel Administration, 43*(2), 260–287. doi:https://doi.org/10.1177/0734371X211065349

Fowler, L., & Birdsall, C. (2020). Are the best and brightest joining the public service. *Review of Public Personnel Administration, 40*(3), 532–554. doi:https://doi.org/10.1177/0734371X19836152

Gallardo-Gallardo, E., Thunnissen, M., & Scullion, H. (2019). Talent management: Context matters. *The International Journal of Human Resource Management, 31*(4), 457–473. doi:https://doi.org/10.1080/09585192.2019.1642645

Gambhir, V., Sidhu, J., Kalidhas, A., Goyal, S., Shah, B., Nagpal, M., & Upadhyay, A. (2024). A comprehensive study of the impact of organizational culture on HR management practices. *Evolutionary Studies in Imaginative Culture, 8*(2), 849–859. doi:https://doi.org/10.70082/esiculture.vi.1083

Gilch, P., & Sieweke, J. (2021). Recruiting digital talent: The strategic role of recruitment in organisations' digital transformation. *German Journal of Human Resource Management, 35*(1), 53–82. doi:https://doi.org/10.1177/2397002220952734

Gravier, M., & Roth, C. (2020). Bureaucratic representation and the rejection hypothesis: A longitudinal study of the European Commission's staff composition (1980–2013). *Journal of Public Administration Research and Theory, 30*(1), 4–21. doi:https://doi.org/10.1093/jopart/muz001

Hu, Y., Lyu, Z., & Sun, W. (2023). Review of research on influencing factors of personnel recruitment. *Lecture Notes in Education Psychology and Public Media, 18*(1), 1–7. doi:https://doi.org/10.54254/2753-7048/18/20231272

Ilić, G., & Zolak Poljašević, B. (2017). Ownership structure of the organisation as a determinant of human resource management in the context of transition countries. *Acta Economica, 15*(26), 75–102. doi:https://doi.org/10.7251/ACE1726075P

Jakobsen, M., Løkke, A.-K., & Keppeler, F. (2023). Facing the human capital crisis: A systematic review and research agenda on recruitment and selection in the public sector. *Public Administration Review, 83*(6), 1635-1648. doi:https://doi.org/10.1111/puar.13733

Jerković, D., Gavrić, T., & Ljubas Ćurak, J. (2024). Digital transformation in Bosnia and Herzegovina companies: Analysis of the degree of integration and impact on business. *Economy and Market Communication Review, 14*(1), 116–139. doi:https://doi.org/10.7251/EMC2401116J

Katolik Kovačević, A., Požega, Ž., & Vučemilović, V. (2024). The influence of the amount of material compensation per employee on the company's business. *Economy and Market Communication Review, 14*(1), 84–96. doi:https://doi.org/10.7251/EMC2401084K

Lee, S. W., & Mao, X. (2020). Recruitment and selection of principals: A systematic review. *Educational Management Administration & Leadership, 51*, 6–29. doi:https://doi.org/10.1177/1741143220969694

Leisink, P., Borst, R. T., Knies, E., & Battista, V. (2021). Human resource management in a public-sector context. U E. Parry, M. J. Morley, & C. Brewster, *The Oxford handbook of contextual approaches to human resource management* (str. 415-436). Oxford University Press. doi:https://doi.org/10.1093/oxfordhb/9780190861162.013.19

Linos, E. (2018). More than public service: A field experiment on job advertisements and diversity in the police. *Journal of Public Administration Research and Theory, 28*(1), 67–85. doi:https://doi.org/10.1093/jopart/mux032

Mia, M. A., Hossain, M., & Sangwan, S. (2024). Determinants of digitalization: Evidence from Asia and the Pacific countries. *Digital Transformation and Society, 3*(4), 340–358. doi:https://doi.org/10.1108/DTS-10-2023-0097

Monteiro, I., Correia, M., & Gonçalves, C. (2019). Transforming a company's staffing process: Implementing e-recruitment. *Journal of Information Systems, 7*, 144–157.

Moynihan, D., Herd, P., & Harvey, H. (2015). Administrative burden: Learning, psychological, and compliance costs in citizen-state interactions. *Journal of Public Administration Research and Theory, 25*(1), 43–69. doi:https://doi.org/10.1093/jopart/muu009

Osoian, C., & Zaharie, M. (2014). Recruitment for competencies in public and private sectors. *Transylvanian Review of Administrative Sciences, 10*(41), 129–145.

Ostapenko, T., Kubetska, O., & Sidorov, O. (2024). Formation of the human capital of the enterprise in terms of recruiting. *Business Inform, 3*(554), 329–335. doi:https://doi.org/10.32983/2222-4459-2024-3-329-335

Pepermans, R., & Peiffer, M. (2022). Choosing jobs in the public, non-profit, and for-profit sectors: Personal career anchors moderating the impact of sector image and reputation. *Review of Public Personnel Administration, 44*(2), 295–324. doi:https://doi.org/10.1177/0734371X221130972

Pollitt, C. (2016). Be prepared? An outside-in perspective on the future public sector in Europe. *Public Policy and Administration, 31*(1), 3–28. doi:https://doi.org/10.1177/0952076715590696

Reina, R., & Scarozza, D. (2021). Human resource management in the public administration. U M. Decastri , S. Battini, F. Buonocore, & F. Gagliarducci, *Organizational development in public administration* (str. 61–101). Palgrave Macmillan. doi:https://doi.org/10.1007/978-3-030-43799-2_3

Rose, R. P. (2013). Preferences for careers in public work: Examining the government-nonprofit divide among undergraduates through public service motivation. *American Review of Public Administration, 43*(4), 416–437. doi:https://doi.org/10.1177/0275074012444900

Sai Sharan, A., & Karpagavalli, G. (2023). A study on the effectiveness of recruitment and selection process in public sector. *Research and Review: Human Resource and Labour Management, 4*(2), 26–36. doi:https://doi.org/10.46610/rrhrlm.2023.v04i02.004

Santinha, G., Carvalho, T., Forte, T., Fernandes, A., & Tavares, J. (2021). Profiling public sector choice: Perceptions and motivational determinants at the pre-entry level. *Sustainability,*

13(3), 1272. doi:https://doi.org/10.3390/su13031272

Sievert, M., Vogel, D., & Feeney, M. (2020). Formalization and administrative burden as obstacles to employee recruitment: Consequences for the public sector. *Review of Public Personnel Administration, 42*, 3–30. doi:https://doi.org/10.1177/0734371X20932997

Suzuki, K., & Hur, H. (2021). Revisiting the old debate: Citizens' perceptions of meritocracy in public and private organizations. *Public Management Review, 24*(8), 1226–1250. doi:https://doi.org/10.1080/14719037.2021.1895545

Thangaraja, T. (2023). Challenges faced by HR on recruitment process. *MET Management Review, 10*(2), 19-24. doi:https://doi.org/10.34047/mmr.2020.10203

Turek, D. (2020). The competencies employers expect – the results of qualitative research. *Krakow Review of Economics and Management, 4*(982), 59–76. doi:https://doi.org/10.15678/ZNUEK.2019.0982.0404

Vodianka, L., Ratushniak, D., & Luste, O. (2022). Innovative methods of personnel recruitment in the conditions of digitalization. *Business Inform, 1*, 403-409. doi:https://doi.org/10.32983/2222-4459-2022-1-403-409

Vogel, R., & Satzger, M. (2023). What drives the attractiveness of public and private employers? Comparative evidence from an online employer review platform. *The American Review of Public Administration, 54*, 180–197. doi:https://doi.org/10.1177/02750740231206805

Weske, U., Ritz, A., Schott, C., & Neumann, O. (2020). Attracting future civil servants with public values? An experimental study on employer branding. *International Public Management Journal, 23*(5), 677–695. doi:https://doi.org/10.1080/10967494.2018.1541830

Zolak Poljašević, B., & Berber, N. (2024). From theory to practice: Incentives for managers and professionals. *Our Economy, 70*(1), 13–23. doi:https://doi.org/10.2478/ngoe-2024-0002

Zolak Poljašević, B., & Ilić, G. (2016). Empirical research into the relationship between the employment process and business performance. *Acta Economica, 14*(25), 9–31. doi:https://doi.org/10.7251/ACE1625009P

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501048G
UDK: 330.322.4:005.915]:338.45
Datum prijema rada: 20. februar 2025.
Submission Date: February 20, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 48-67

ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

PERCEPTIONS AND CHALLENGES OF ESG REPORTING FOR THE ACCOUNTING PROFESSION IN BOSNIA AND HERZEGOVINA

Miloš Grujić | Docent, Grant Thornton B&H, Banja Luka; milos.grujic@ba.gt.com
ORCID ID: 0000-0001-5566-5921

Isidora Džombić | master, Grant Thornton B&H, Banja Luka; isidora.dzombic@ba.gt.com
ORCID ID: 0009-0005-5303-9405

***Abstract**: ESG reporting is becoming increasingly significant in the global business environment; however, there remains a paucity of research regarding the readiness of accountants to implement these standards in Bosnia and Herzegovina. This study aims to assess the perceptions and preparedness of accountants in Bosnia and Herzegovina for adopting ESG principles, whilst also identifying the primary barriers and drivers to adopting such principles. Employing a quantitative methodology, we surveyed a sample of accountants to gather data on their knowledge of ESG, their perception of its importance, their readiness for change, and their expectations concerning implementation. The findings indicate a certain level of awareness of ESG among accountants, yet substantial obstacles to implementation persist, such as the lack of clear guidelines, the unavailability of data, and insufficient resources. The research underscores the necessity of education and support from professional associations in embracing ESG reporting. The results obtained provide valuable insights for decision-makers, regulatory bodies, and professional associations in Bosnia and Herzegovina, and may serve as a foundation for the development of strategies to promote ESG reporting within the country.*

***Keywords**: ESG reporting, sustainability, accounting*

***JEL classification**: M41, G34, Q56*

INTRODUCTION

The concept of environmental, social, and governance (ESG) constitutes a crucial framework increasingly recognized for their significance in today's business environment. The environmental factor pertains to the impact of business operations on the environment, encompassing resource management, climate change, nature conservation, and emission reductions. Business activities should align with environmental standards to mitigate negative effects on the environment and contribute to the sus-

tainability of the planet. The social factor relates to corporate social responsibility, including relationships with employees, suppliers, and the wider community. This encompasses issues such as employment, working conditions, inclusivity, and community support. The governance factor addresses how a company is managed and controlled, including governance structures, transparency, ethics, integrity, accountability, and compliance with laws and standards. Good corporate governance is essential for fostering trust among investors, creditors, employees, and other stakeholders. All these ESG factors are significant as they contribute to the long-term success of the enterprise and have broader social, economic, and environmental implications. Practices that consider ESG factors can aid in risk reduction, enhance reputation, attract investments, empower employees, increase operational efficiency, and contribute to the sustainable development of the community and planet.

The ESG concept seamlessly aligns with the broader framework of the 17 Sustainable Development Goals (SDGs) established by the United Nations. These goals, adopted in 2015, set ambitious targets to address global challenges such as poverty, inequality, climate change, and environmental degradation. ESG, with its emphasis on environmental, social, and governance aspects of business, represents a tangible means through which companies can contribute to achieving these goals. (Barbier & Burgess, 2017) For instance, investments in renewable energy and reductions in carbon footprints are linked to the goal of combating climate change, while promoting diversity and inclusion in the workplace aligns to achieve gender equality (Baratta et al., 2023).

The adoption of sustainable business practices is increasingly becoming an imperative for companies across all sectors and regions. ESG reporting has emerged as a global trend in the business world. More and more companies recognize the importance of transparent reporting on their ESG performance to meet the demands of stakeholders, such as investors, analysts, clients, and regulatory bodies.

In recent years, we have observed a rise in the number of companies reporting on their ESG activities and practices, along with heightened interest from investors in ESG factors when making investment decisions. This increased interest in ESG reporting results from a growing awareness of social, environmental, and governance issues in business, as well as the need for responsible business practices that consider all relevant factors.

The adoption of ESG reporting is not just a trend, but a key element of conducting business in today's environment. Companies that regularly report on their ESG performance have the opportunity to build greater trust with their stakeholders, increase market competitiveness, attract investors who value sustainable business practices, and contribute to broader social responsibility. Therefore, ESG reporting is expected to continue growing and become standard practice among all companies striving for long-term sustainability and success.

Adhering to international standards such as the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), and the Integrated Reporting Framework also plays a crucial role in enhancing sustainable reporting. By adopting these standards, organizations can ensure consistency and transparency in their practices, facilitating comparability with competitors (Ogata et al., 2018).

ESG reporting is particularly important for Bosnia and Herzegovina (BiH) for several reasons. BiH is a signatory to the Stabilization and Association Agreement

with the European Union, and thus ESG factor standards align with EU regulations. The introduction of ESG reporting allows companies in BiH to adapt to European regulations and standards, which can improve the country's position in the EU accession process. Furthermore, BiH, like many other countries, faces challenges in the areas of environmental protection, strengthening social responsibility, and enhancing corporate governance.

ESG reporting can serve as a tool for monitoring and improving performance in these areas, contributing to sustainable development and better corporate governance in BiH. Additionally, the implementation of ESG reporting at the national level can have a positive impact on economic growth, attracting investments, improving the business environment, and strengthening the competitiveness of companies in Bosnia and Herzegovina. Therefore, companies and regulatory bodies in BiH need to recognize the significance of ESG factors and take steps towards implementing responsible and sustainable business practices.

The primary problem investigated in this research is the lack of knowledge and readiness among accountants for the implementation of ESG reporting in BiH, which poses a barrier to broader implementation of ESG reporting in the country. Management must recognize the importance of conducting business in accordance with ESG principles to become drivers of these principles within their companies. Accountants, as key players in financial reporting, have a crucial role in adopting ESG principles. However, the lack of knowledge and readiness among accountants presents a barrier to the broader implementation of ESG reporting in BiH. Accordingly, there is a significant gap in research on this topic in the context of BiH. Given the lack of knowledge and readiness among accountants, the objective of this research is to assess the perceptions and readiness of accountants in BiH for the implementation of ESG reporting and to identify the main barriers and drivers. The primary research question is: How familiar are accountants in BiH with ESG concepts, and how ready are they to implement them in their business practices?

LITERATURE REVIEW

Accounting is currently at a significant crossroads due to substantial changes spurred by digital transformation (Berikol & Killi, 2021; Gonçalves et al., 2022; Yigitbasioglu et al., 2023).

Advanced technologies such as artificial intelligence, data analytics, and blockchain profoundly impact how accounting tasks are performed and the provision of accounting services (Qasim & Kharbat, 2020). This phenomenon has important implications for the accounting profession, requiring accountants to adapt to emerging circumstances as well as to develop new skills and knowledge.

Although a consensus has been established regarding the significance of ESG (environmental, social, governance) standards for the long-term sustainability of organizations (Raghavan, 2022), research addressing accountants' preparedness for the implementation of these standards remains scarce, particularly in the context of transition countries such as Bosnia and Herzegovina (Grujić & Vretenar Cobović, 2024). While studies such as that by Karwowska and Raulinajtys-Grzybek (2021) underscore the importance of ESG standards in risk management, less attention has been given to the perceptions and challenges faced by accountants during the implementation process.

In Bosnia and Herzegovina, it is anticipated that the adoption of ESG standards will be associated with a range of specific challenges, including a lack of awareness regarding ESG concepts, insufficient infrastructure for the collection and reporting of relevant data, as well as limited resources. This research aims to contribute to the existing body of knowledge by providing empirical evidence on the perceptions and readiness of accountants in Bosnia and Herzegovina, while also identifying specific barriers and drivers for the implementation of ESG standards in this context.

In recent years, an increasing number of investors have focused on the ESG performance of companies when making investment decisions (Yang & Han, 2023). The adoption of ESG standards enables organisations to access a broader spectrum of investment opportunities, attracting investors who value companies with robust ESG practices (Sun, Wang, Wang & Sun, 2023). Conducting business in alignment with ESG standards is more likely to enhance long-term sustainability. Effectively managing sensitive aspects, combined with good corporate governance, reduces reputational, legal, and regulatory risks, thereby improving the long-term viability of the organisation (Lei & Yu, 2023).

ESG standards can assist organisations in gaining and maintaining trust and reputation among all stakeholders and the market (Tsang, Frost & Cao, 2023). Accountants involved in the adoption of ESG standards can play a crucial role in monitoring and reporting on ESG performance, which helps build trust among investors and company owners. Ultimately, the adoption of ESG standards encourages organisations to manage their resources more effectively, including energy, materials, and workforce, which can lead to savings and more efficient resource utilisation, thereby contributing to improved financial performance in the long term (Peng, Chen & Li, 2023).

ESG standards present certain challenges for accountants. Firstly, ESG standards require the collection and measurement of data that is not traditionally encompassed by accounting systems, which includes data on the environmental, social, and governance aspects of business operations (Chopra et al., 2024). ESG standards are not yet fully standardised (Luo & Tang, 2023), and there are many different initiatives, guidelines, and frameworks being used across various regions. This situation can create confusion and challenges when aligning with relevant norms and guidelines (Novaković, 2024). Furthermore, the establishment of ESG standards in financial reporting necessitates adjustments to existing accounting practices (Cort & Esty, 2020; Tettamanzi et al., 2022). This process may entail changes in the recognition, measurement, and reporting of data to reflect ESG dimensions. Additionally, ESG standards require accountants to possess specific knowledge in the area of sustainability and social responsibility. It appears that accountants, internal auditors, and external auditors are placed under significant pressure. Accountants should seek additional qualifications and educate themselves on ESG issues to apply the standards correctly and provide the necessary information (Hoang, 2018). Moreover, these standards necessitate the monitoring of changes in business practices and reporting on them regularly. Consequently, accountants need to be able to track changes and ensure consistent, accurate, and transparent reporting in accordance with ESG standards. Furthermore, the adoption of ESG principles may entail substantial initial costs for companies in terms of aligning processes, training technologies, and the time that must be dedicated away from regular operations to focus on these principles (Apergis et al., 2022).

Consequently, to adequately prepare for the adoption of ESG standards, accountants require continuous education, monitoring of regulatory changes, and the integration of ESG standards into accounting and reporting systems.

From the above, it is apparent that accountants can play a key role in promoting ESG reporting through the establishment of reporting standards, integrating ESG into financial reporting, and timely providing quality information.

The adoption of ESG standards brings numerous advantages for accountants and organisations, including enhanced transparency, risk management, investment opportunities, long-term sustainability, corporate reputation, and resource management. However, there are also downsides to adopting ESG principles; one of them is the potential for greenwashing, where many companies exaggerate their ESG performance to attract investors (Nielsen & Villadsen, 2023). Greenwashing deceives consumers and investors by overstating ESG performance (de Freitas Netto et al., 2020). Secondly, greenwashing may divert attention from genuine sustainability issues and slow progress towards a sustainable society. Thirdly, greenwashing can lead to unfair competition, as companies genuinely committed to sustainability may suffer in comparison to those merely simulating such practices.

Stakeholders, including investors, customers, and regulatory bodies, demand greater transparency from organisations regarding their social and environmental impact. Accountants are at the forefront of providing the necessary information for decision-making; therefore, they must adapt to new reporting expectations (Cunha et al., 2021). This involves more open communication about sustainability goals and performance. Accounting practices and standards are increasingly being tailored to the needs of sustainable development and corporate social responsibility (CSR) to meet stakeholder demands and enhance all aspects of business. Adjusting accounting practices and standards to the requirements of sustainable development and CSR is an evolutionary process that demands a strategic approach. The role of accountants and auditors is becoming increasingly significant, as they enable organisations to transparently report their impact on society and the environment. As expectations around branding and business evolve, so too will the preparation of sustainability and social responsibility reports become key elements of accounting practice. Through the effective integration of these factors, organisations can contribute to sustainable and responsible business operations.

METHODOLOGY

In the study, data from various scientific papers published in journals indexed in Web of Science and Scopus were utilized, which have been cited multiple times. The research highlights the similarities and differences in conclusions and results reached by different authors. In addition to citation and indexing, the criteria used for selecting the literature were the intention to utilize works published in the last decade in English or in BHS languages, and to ensure they are categorized as scientific papers.

For assessing attitudes, the Likert scale with five response options was employed: strongly disagree, mostly disagree, neutral, mostly agree, and strongly agree.

Based on the above, the following hypotheses can be established:

H1: Accountants in BiH are familiar with the concept of ESG reporting.

H2: There is a positive correlation between the level of knowledge of ESG and

the willingness to invest in professional development in this area.

H3: Company managements are increasingly interested in ESG reporting and encourage their employees to engage in this process.

H4: Accountants believe that ESG reporting can have a positive impact on the financial performance of companies. This hypothesis is based on the question regarding accountants' belief that ESG can improve financial performance.

H5: There is a connection between the level of knowledge about ESG and the perception of the need for new services and consulting activities in this area.

Characteristics of the sample

The survey was sent to the addresses of certified accountants and accounting technicians in Bosnia and Herzegovina. In September 2024, 276 individuals employed in accounting positions in Bosnia and Herzegovina were surveyed to examine the readiness and differences among accountants regarding ESG reporting. The questionnaire included questions about the attitudes and perceptions of accountants concerning the implementation and reporting according to ESG standards. Descriptive statistics were used to describe the data, while statistical hypotheses were tested using t-tests and ANOVA.

The ages of the respondents ranged from 19 to 65 years, with an average age of 45.80 years and a median age of 48 years. The majority of respondents, numbering 185 (over 67.27%), have at least 20 years of work experience, and as many as 29.45% have more than 30 years of experience.

Women constitute the majority of the sample, with 203 women and 73 men. The average net salary is 1,651.32 BAM, but there are significant differences in salaries among different groups. Women's salaries are, on average, slightly lower (1,633.87 BAM) compared to men's salaries (1,699.84 BAM). At the same time, women have fewer years of work experience. The average number of years of experience is 22.01, with 21.67 years for women and 22.95 years for men. Individuals with a doctorate have the highest average net salary (2,826.67 BAM), but also the highest variability in salaries, indicating significant differences within this group, likely due to varying areas of specialization and experience. Conversely, individuals with a secondary education have the lowest average salary (1,329.38 BAM) and the least variability in salaries (Table 1).

On the other hand, individuals with higher vocational education (VŠS) have the most years of work experience, averaging 30.74 years, and an average salary that is lower than the overall average at 1,556.88 BAM. Employees in medium and large enterprises have a significantly higher average salary compared to those in small enterprises, and salaries in these larger companies are also more dispersed.

Financial directors have the highest average salary (2,740.51 BAM), while accounting assistants have the lowest (1,325.14 BAM) and the fewest years of work experience. This sample, in terms of age, experience, education, and company size, provides a suitable environment for studying the attitudes and perceptions of accountants towards digital transformation in their profession.One significant limitation of this study is the potential influence of social desirability bias on the respondents' answers. Social desirability is a tendency among respondents to provide answers that align with perceived societal norms or expectations. This conformity bias may lead participants to overestimate their knowledge, aiming to present themselves more favorably during interviews.

Structure of the Survey

The survey aimed to investigate the knowledge, attitudes, and readiness of accountants to engage in ESG reporting. Through a series of questions, the survey sought to determine the level of accountants' familiarity with global standards and tools for ESG reporting, as well as their opinions on the importance of this process for domestic companies. Additionally, the survey examined accountants' perceptions of the advantages and risks associated with ESG reporting, as well as their willingness to pursue professional development in this area. Special emphasis was placed on the role of company management in promoting ESG and on accountants' expectations regarding the future of this discipline. The questions included:

1. Am I familiar with the tools and resources available to facilitate ESG reporting?
2. Do I know the main standards and frameworks for ESG reporting (Global Reporting Initiative, Sustainability Accounting Standards Board, Task Force on Climate-Related Disclosures)?
3. Should the government encourage domestic businesses to adopt ESG reporting?
4. Do I believe that ESG reporting can improve the financial performance of companies?
5. Do I think that ESG reporting will become increasingly important for domestic companies in the next five years?
6. Am I largely willing to invest in my own professional development related to ESG reporting?
7. How interested am I in learning about ESG reporting?
8. Are my current skills and knowledge fully sufficient for effective work with ESG reporting?
9. Do I expect accountants to offer new services and advisory activities to their clients in the future?
10. Do professional associations of accountants play a significant role in promoting and supporting ESG reporting?

RESEARCH RESULTS

Table 1. Desriptive statistic

Description	Total sample	Men	Women
Mean	1.651,32	1.699,84	1.633,87
Standard Error	39,81	87,50	44,11
Median	1.450	1.450	1.450
Mode	1.490	1.300	1.090
Standard Deviation	661,31	747,64	628,49
Sample Variance	437.336,55	558.961,61	394.993,52
Kurtosis	5,59	6,16	4,94
Skewness	2,18	2,38	2,03
Range	3.715,00	3.715,00	3.520,00
Minimum	950	950	950
Maximum	4.665	4.665	4.470

Sum	455.764,00	124.088,00	331.676,00
Count	276	73	203
Confidence Level (95,0%)	78,36	174,44	86,98

Source: authors calulation

Men have a slightly higher average salary compared to women and the overall sample, suggesting a potentially greater earning capacity among men. The median is the same for all three groups, which means that the "average" respondent, regardless of gender, had the same value for the analysed variable. The mode differs among all groups, indicating different most common values within each group.

Although the standard deviation is similar across all groups, men exhibit somewhat greater variability in salary amounts within the data. This means that men's results are more diverse in comparison to those of women and the overall sample. Kurtosis and skewness describe the shape of the data distribution. A high kurtosis value indicates a "peaked" distribution, while a high skewness value suggests asymmetry in the distribution. In this case, all three groups display positive skewness, meaning that the distributions are positively asymmetric (with a longer right tail).

Considering that the T-test value is 0.465849384, we cannot reject the null hypothesis that there is no significant difference between the salaries of men and women in the sample. This confirms that there is no statistically significant difference in average salaries between men and women.

Table 2. Regression statistics

Regression Statistics	
Multiple R	0,2501
R Square	0,0629
Adjusted R Square	0,0596
Standard Error	641,3135
Observations	276

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	7.576.010,47	7576010	18,42043	2,46E-05
Residual	274	112.691.541,47	411283		
Total	275	120.267.551,94			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	1320,249	86,25811	15,3058	1,22E-38	1150,436	1490,062	1150,436	1490,062
X Variable 1	15,0412	3,504552	4,291903	2,46E-05	8,141927	21,94047	8,141927	21,94047

Source: authors calulation

The correlation coefficient (Multiple R) is 0.250984, indicating a positive but weak linear relationship between years of service and salary (Table 2).

The R-squared value is 0.062992972, meaning that 6.3% of the variance in salaries can be explained by the variance in years of service. This indicates that years of service accounts for only a small portion of the variation in salaries, suggesting that there are other significant factors influencing salary levels, such as education, employer size, job complexity, and so on.

The Adjusted R-squared is similar to the R-squared but takes into account the number of independent variables in the model. In this case, since there is only one independent variable (years of service), the difference between R-squared and Adjusted R-squared is minimal.

The standard error is 641.315, representing the average distance of actual salary values from the values predicted by the regression model. A smaller value indicates a more accurate model in predicting salaries.

Based on these results, we can conclude that there is a positive relationship between years of service and salary, meaning that, on average, employees with longer service tend to have higher salaries. However, this relationship is weak, indicating that other factors are more significant in determining salary levels. Therefore, years of service is not the primary determinant of salary: only a small portion of the variation in salaries can be explained by variations in years of service. This implies that other factors, such as education, position, bargaining power, experience, company size, sector, etc., have a greater impact on salary levels.

Table 3. Salary statistics by educational group

Education	Average ears	Number of people in the sample	Average salary	Number of years of experience	SD number of years	S D of salary
Doctor of Science	44,83	6,00	2.826,67	20,83	5,98	914,48
Master's	41,15	27,00	2.494,30	17,15	11,14	951,69
Vocational secondary education	35,00	21,00	1.329,38	13,81	19,47	325,25
Higher professional education	46,39	195,00	1.556,88	22,39	9,94	545,45
University degree	54,74	27,00	1.479,59	30,74	5,83	140,84

Source: authors calulation

Doctors of Science have the highest average salaries, but this group is also the smallest sample size. The high average years of service and relatively high standard deviation in salaries indicate possible significant dispersion within this group. The second highest average salary is found among those with Master's degrees. The larger sample size compared to the doctoral group supports this positioning (Table 3).

The largest sample size belongs to the Higher Education (VSS) group, which allows for more reliable conclusions. Their average salary is slightly lower than that of

Master's degrees but still above the other groups. The Secondary Vocational Education (SSS) group has similar average salaries to the VSS but has a significantly higher average years of service. Lastly, the Secondary Vocational degree has the lowest average salaries, which is expected given the lower level of education.

In general, there is a positive correlation between education level and salary. Accountants with higher education levels, such as Doctors of Science and Master's degrees, tend to have higher average salaries. The number of years of service also affects salary levels. Accountants with more years of experience, regardless of their education level, tend to earn higher salaries.

The standard deviation of salaries varies among different groups, indicating different data dispersions within each group. For instance, the large standard deviation among Doctors of Science suggests significant differences in salaries within this group, possibly due to specialization, employer size, or other factors. Therefore, while a higher level of education is associated with higher average salaries, the substantial standard deviation in salaries within educational groups indicates that other factors also influence salary levels, aside from education.

Table 4. Average grades and standard deviations by gender

	Average			Standard deviation		
Question	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
1	1,808219	1,871921	1,855072464	1,022762	0,940481	0,961444
2	1,739726	1,852217	1,822463768	0,866465	0,860481	0,861923
3	3,780822	3,665025	3,695652174	0,931644	0,904394	0,911412
4	3,287671	3,118227	3,163043478	0,588771	0,86506	0,803771
5	3,328767	3,438424	3,40942029	0,764758	0,777086	0,773976
6	3,739726	3,729064	3,731884058	1,027773	0,850447	0,898806
7	2,753425	2,64532	2,673913043	0,434	0,683841	0,628569
8	2,945205	3,024631	3,003623188	1,245998	0,977157	1,053128
9	3,808219	3,546798	3,615942029	0,966919	0,862604	0,897045
10	3,328767	3,428571	3,402173913	0,898375	0,78259	0,814323

Source: authors calulation

The average familiarity score with ESG reporting tools stands at 1.85, suggesting that, in general, respondents are not particularly well-acquainted with these tools. However, significant differences emerge among various respondent groups. Women display a slightly higher level of familiarity with ESG reporting tools compared to men, although the difference is minimal (Table 4). Individuals with Master's degrees demonstrate the highest familiarity, which aligns with expectations based on their advanced education. Doctoral degree holders also exhibit a high score; however, due to the small sample size in this category, these results should be interpreted with caution. Those with vocational and higher education qualifications exhibit moderate scores,

indicating a reasonable level of familiarity, while individuals with secondary education have the lowest score, indicating limited familiarity with the tools.

Similar to the previous inquiry regarding familiarity with tools, we observe that the overall level of awareness concerning the principal standards and frameworks for ESG reporting (such as GRI, SASB, and TCFD) is relatively low. The average score of 1.82 indicates that the majority of respondents lack in-depth knowledge of these standards. Women display slightly greater familiarity with the standards compared to men, mirroring the trend observed in the previous analysis. As before, respondents holding Master's degrees consistently exhibit the highest awareness of these standards along with the least variability in their responses (Table 5).

Table 5. Average grades and standard deviations by professional qualification

	Average						Standard deviation					
Question	PhD	Master	High chool	University egre	Higher professional education (VŠS)	Total	PhD	Master	High chool	University degre	Higher rofessional ducation (VŠS)	Total
1	2,0000	3,5556	1,2857	1,6564	2,0000	1,8551	1,0954	0,6405	0,7171	0,8310	-	0,9614
2	1,6667	3,4815	1,5238	1,6051	2,0000	1,8225	0,8165	0,5092	0,7496	0,7056	-	0,8619
3	3,3333	,5556	3,4762	3,7180	3,9259	3,6957	0,5164	1,2810	0,6796	0,8357	1,1743	0,9114
4	3,3333	,4815	3,0476	3,0769	3,5185	3,1630	0,5164	0,5092	0,5896	0,8730	0,5092	0,8038
5	3,3333	2,7778	3,8571	3,5128	2,9630	3,4094	0,5164	,5021	0,3586	0,5213	1,0184	0,7740
6	3,6667	3,1852	3,5714	3,7949	3,9630	3,7319	0,5164	,3312	1,1212	0,7591	1,0184	0,8988
7	3,0000	,0000	2,9524	2,5436	3,0000	2,6739	-	-	0,2182	0,7048	-	0,6286
8	2,5000	,4444	3,2857	2,9897	3,5556	3,0036	1,2247	,5275	0,7838	1,0102	0,5064	1,0531
9	3,8333	,8519	3,0476	3,6359	3,6296	3,6159	0,9832	1,0991	0,4976	0,9000	0,7415	0,8970
10	4,5000	,4444	3,0952	3,3128	4,0000	3,4022	0,5477	,2506	0,3008	0,7796	-	0,8143

Source: authors calulation

Large enterprises have the highest average score, suggesting that ESG reporting tools are more likely to be accessible and recognized within larger organisations (Table 6). Conversely, small businesses have the lowest average score, which may be attributed to fewer resources and a lesser focus on ESG reporting in smaller entities. Respondents who are receptive to change and inclined to take risks demonstrate the greatest familiarity with these tools. In contrast, those who are resistant to change score the lowest, indicating that openness to change and innovation is related to a higher familiarity with new tools and technologies. Financial directors exhibit the highest familiarity with these tools, which is to be expected given their roles in financial management. Accounting assistants score somewhat lower, which may reflect their reduced direct involvement in the ESG reporting process.

Table 6. Average scores and standard deviations by employer size

	Average				Standard deviation				
Question	**Small**	**Medium**	**Large**	**Total**	**Small**	**Medium**	**Big**	**Large**	**Total**
1	1,5238	1,8165	2,0962	1,8551	1,0000	0,5639	0,9829	1,0660	0,9614
2	1,4286	1,8807	2,0000	1,8225	2,0000	0,4988	0,7903	1,0240	0,8619
3	3,3810	3,7248	3,8558	3,6957	3,0000	0,9907	0,7054	1,0089	0,9114
4	3,4444	3,0000	3,1635	3,1630	4,0000	0,5009	1,0184	0,6402	0,8038
5	3,3492	3,6330	3,2115	3,4094	5,0000	0,8262	0,5030	0,9103	0,7740
6	3,7302	3,7064	3,7596	3,7319	6,0000	0,9539	0,6709	1,0658	0,8988
7	2,5873	2,5321	2,8750	2,6739	7,0000	0,8159	0,6745	0,3323	0,6286
8	3,2381	2,7248	3,1539	3,0036	8,0000	1,1600	1,0876	0,8788	1,0531
9	3,3492	3,7248	3,6635	3,6159	9,0000	0,7220	0,8910	0,9715	0,8970
10	3,0159	3,4771	3,5577	3,4022	10,0000	0,6597	0,7277	0,9119	0,8143

Source: authors calulation

Table 7. Average ratings and standard deviations according to respondents' preferences[1]

	Average										SD									
Question	**I**	**II**	**III**	**IV**	**V**	**VI**	**VIII**	**VIII**	**IX**	**X**	**I**	**II**	**III**	**IV**	**V**	**VI**	**VIII**	**VIII**	**IX**	**X**
1,0000	1,5588	2,0000	2,1482	1,0000	2,0000	2,7308	1,9811	1,2963	2,0000	1,8551	0,6126	-	1,0267	-	-	1,5377	0,8202	0,6086	1,0094	0,9614
2,0000	1,3824	2,0000	2,1852	1,0000	2,0000	2,5769	1,7736	1,4815	2,1111	1,8225	0,4933	-	0,9623	-	-	1,4744	0,4225	0,5092	0,9648	0,8619
3,0000	3,5882	3,9286	3,1111	3,3214	3,9231	4,1923	3,7170	4,1852	3,6296	3,6957	1,0479	1,4917	0,4237	0,7228	0,7596	1,3570	0,6615	0,7357	0,7083	0,9114
4,0000	2,2353	4,0000	2,4444	3,5000	3,0000	3,6154	3,2453	3,4815	3,2963	3,1630	0,4306	-	1,5275	0,5092	-	0,5711	0,4344	0,5092	0,5002	0,8038
5,0000	3,7059	2,0000	3,5185	4,0000	4,0000	2,2308	3,2453	3,4815	3,7778	3,4094	0,5239	-	0,5092	-	-	1,1066	0,4344	0,5092	0,4624	0,7740
6,0000	3,6176	4,2143	3,3333	3,6429	3,6923	3,6923	3,8679	3,9630	3,7037	3,7319	0,7791	1,2514	0,7338	0,7800	0,6304	1,5942	0,6516	0,7586	0,8156	0,8988
7,0000	2,6176	3,0000	2,4815	3,0000	3,0000	3,0000	2,2642	2,1111	3,0000	2,6739	0,4933	-	0,5092	-	-	-	0,8355	0,9740	-	0,6286
8,0000	2,6471	4,0000	2,5185	3,0000	3,0769	4,0000	3,2642	2,5556	2,6852	3,0036	1,2764	-	0,5092	1,0184	0,2774	-	1,1792	0,5774	1,1463	1,0531
9,0000	3,7059	3,2857	3,4444	3,3571	4,0000	4,4231	3,8491	3,3333	3,2963	3,6159	0,7988	0,7263	0,8473	0,7310	0,5774	1,0648	0,9687	0,7338	0,7680	0,8970
10,0000	3,0000	4,0000	3,5185	3,0000	4,0000	4,2308	3,1887	3,4815	3,2778	3,4022	-	-	0,5092	-	-	1,4507	1,1104	0,5092	0,4521	0,8143

Source: authors calulation

Larger enterprises report the highest average score, which suggests that employees in such organisations are likely exposed to information about ESG standards.

1 I - I don't like change; II - I don't like change; III - I don't like change, I like change; IV - I am neutral towards changes; V - I am neutral towards changes, I tend to avoid any risk; VI - I tend to avoid any risk; VIII - I tend to take risks; VIII - i like changes; IX - I like changes, I tend to avoid any risk; X - I like changes, I am inclined to take risks.

Employees in large companies remain the most informed regarding ESG standards. Financial directors possess the highest level of familiarity with these standards among various positions within the accounting sector. As seen previously, respondents who are open to change and willing to take risks show a greater likelihood of being acquainted with ESG standards. Groups characterised by a propensity for risk-taking and those associated with large enterprises exhibit a higher standard deviation, indicating greater variability in opinions within these groups. This suggests that while there is an overall trend, significant individual differences in the understanding of ESG standards persist within these categories.

Conversely, groups such as those who prefer stability and individuals with higher vocational qualifications demonstrate lower standard deviations, indicating a greater homogeneity in their responses. Although there is a general inclination towards awareness of ESG standards, notable variability exists among those who embrace change (Table 7). This indicates that, while a correlation between openness to change and knowledge of ESG standards exists, it is not necessarily a definitive relationship. Financial directors, as expected, exhibit the highest familiarity with the standards, aligning with their roles in financial management. Notably, the trends observed are similar to those noted in the previous section concerning awareness of tools. Groups demonstrating greater familiarity with tools (e.g., women, Master's degree holders, employees of large corporations) also display enhanced knowledge of the standards. However, the differences among groups are somewhat less pronounced compared to the previous question, suggesting a broader general knowledge of ESG standards relative to knowledge of specific tools.

The majority of respondents concur that the government should actively encourage domestic enterprises to adopt ESG reporting, which is reflected in an average rating of 3.69, indicating a broad support for this initiative. Interestingly, no significant differences are observed between male and female respondents when it comes to support for governmental incentives for ESG reporting. Generally, a higher level of education correlates with stronger support for state incentives. Respondents with a master's degree or higher demonstrate a somewhat more pronounced backing compared to other groups. However, doctors of science assigned the lowest average score of 3.33, which may suggest a lack of a clear stance on this issue.

Respondents from larger enterprises exhibit slightly greater support than those from smaller firms. Moreover, individuals who are inclined towards change and risk-taking tend to favour governmental incentives for ESG reporting. Groups that identified as "I am inclined to take risks" and "employed in large enterprises" display a higher standard deviation, indicating greater diversity of opinion within these groups. Conversely, groups such as "I am neutral towards change" and "higher vocational qualification" exhibit a lower standard deviation, implying a greater consensus within those categories. As expected, financial directors provide the strongest support for governmental incentives, given their insight into the financial implications of ESG reporting.

Overall, support for governmental incentives for ESG reporting is robust, with a prevailing view that the government should substantially contribute to this initiative, despite such incentives still being inadequately implemented. In principle, a higher level of education correlates with greater backing for governmental incentives, while

employees in larger enterprises demonstrate more pronounced support. Although the majority of groups endorse governmental incentives, variations in the intensity of this support are evident, as illustrated by the standard deviation. Groups predisposed to change and risk-taking demonstrate greater variability in their responses, indicating differing perspectives within that group regarding the implementation of ESG policy.

Regarding the belief in the positive impact of ESG reporting on corporate financial performance, respondents generally believe that ESG reporting can have a beneficial effect. The average rating of 3.16 suggests a moderate level of confidence in this relationship. Respondents with master's and doctoral degrees exhibit the highest confidence in the positive impact of ESG reporting on financial performance, while those with vocational education express the least confidence (Table 5). Respondents from smaller enterprises also display the highest levels of confidence regarding this connection. Individuals who are more open to change and risk-taking tend to have a stronger belief in the positive effects of ESG reporting. Financial directors show slightly more confidence in this relationship compared to respondents in other positions. The variability of opinions among different groups indicates a lack of consensus on this topic, and those inclined towards change exhibit a wider array of views, suggesting a broad spectrum of perspectives on the relationship between ESG factors and financial performance.

The majority of respondents believe that ESG reporting will become increasingly important for domestic enterprises over the next five years. An average rating of 3.41 indicates a relatively high level of agreement with this statement. There is considerable variability in the responses; however, it can be concluded that respondents with a secondary education exhibit the greatest confidence in the future importance of ESG reporting. This may be surprising, given that it is often assumed that respondents with higher levels of education possess a better understanding of long-term trends and the significance of sustainability. There are no significant differences in opinions between respondents from businesses of varying sizes. Those who are more inclined towards change and risk-taking also tend to have a stronger belief in the future importance of ESG reporting. No significant differences in viewpoints are observed among individuals in different accounting positions. In many groups, there is significant variability in opinions, indicating a lack of complete consensus on this issue. Groups that are more open to change demonstrate greater variability in their responses, suggesting the presence of differing views on the pace and intensity of changes expected in the ESG domain.

Respondents displayed a relatively high level of willingness to invest in their own professional development related to ESG reporting. An average score of 3.73 indicates that most respondents consider it important to expand their knowledge and skills in this area. Respondents with a higher vocational qualification show the greatest willingness to invest in professional development, while those with a master's degree exhibit slightly lower readiness. This may suggest that respondents with a higher vocational qualification feel a greater need for additional knowledge in this field. There are no significant differences in readiness to invest in professional development among respondents from different-sized enterprises. Individuals who are inclined towards change and risk-taking show a somewhat greater willingness to invest in professional development. Financial directors demonstrate the highest readiness for investment in

professional development, which is expected given their crucial role in financial management. In many groups, there is significant variability in opinions, indicating a lack of complete consensus on the issue of investing in professional development. Groups that are more predisposed to change exhibit greater variability in their responses, suggesting differing views within those groups regarding the need for additional knowledge and skills.

Respondents displayed a moderate interest in learning about ESG reporting. An average score of 2.67 on the Likert scale indicates that there is some curiosity and willingness to acquire new knowledge in this area, but not an overwhelming desire. This difference between the scores of 3.73 and 2.67 may suggest that while there is a willingness to pay for certain training, there isn't a strong eagerness for learning. Those who are more open to change and risk-taking show a greater readiness to invest in professional development, highlighting the correlation between personal traits and the propensity for learning. Respondents with a secondary education demonstrate a slightly higher interest in learning about ESG reporting compared to other groups. This may indicate that they are more aware of the need for additional knowledge in this field. Respondents from larger enterprises exhibit the greatest interest in learning about ESG reporting, which could be linked to greater exposure to ESG issues in larger organisations. Individuals who are more inclined towards change and risk-taking show a somewhat greater interest in learning about ESG reporting. There are no significant differences in interest in learning about ESG reporting between different accounting positions. In many groups, there is considerable variability in opinions, suggesting a lack of consensus on the issue of interest in learning about ESG reporting. Groups that are more predisposed to change demonstrate greater variability in their responses, indicating different views within those groups regarding the need for additional knowledge and skills.

Overall, respondents demonstrated a moderate level of confidence that their current skills and knowledge are sufficient for effective work with ESG reporting. An average score of 3.00 on the Likert scale suggests that most respondents believe they possess some foundational knowledge, but that further development would be beneficial. Respondents with a higher vocational qualification show the greatest confidence in their skills and knowledge, while those with a master's degree exhibit the least. This may indicate that respondents at the master's level have a broader perspective on the complexity of ESG reporting and are therefore more aware of their limitations. Respondents from small enterprises display the highest confidence in their skills and knowledge, which may be associated with less pressure and less complex requirements compared to larger organisations. There are no significant differences in confidence in their own knowledge among groups with varying attitudes towards change. Likewise, no significant differences in confidence levels are found between individuals in different accounting positions. In many groups, there is significant variability in opinions, indicating a lack of consensus regarding the adequacy of their own skills and knowledge. Groups with different levels of education exhibit varying degrees of variability, suggesting that there are different factors influencing the self-assessment of their own competencies.

Respondents expect accountants to expand their range of services and offer more advisory services to their clients in the future. An average score of 3.62 indicates

a high level of agreement with this statement. Men have slightly higher expectations than women regarding the expansion of accountants' services. Respondents with master's and doctoral degrees have the highest expectations, while those with a secondary vocational qualification have somewhat lower expectations. There are no significant differences in expectations among respondents from various sizes of enterprises. Respondents who are more inclined towards change and risk-taking have the highest expectations regarding the expansion of accountants' services. There are no significant differences in expectations between different positions in accounting (Table 8).

Table 8. Average response scores and standard deviations according to employer position

	Average				Standard deviation			
Quesrion	Assistant in accounting	financial director	Certified accountant	Total	Assistant in accounting	Financial irector	Certified accountant	Total
1	1,7377	2,3191	1,7851	1,8551	1,0269	1,1249	0,7272	0,9614
2	1,8770	2,3191	1,5421	1,8225	0,9233	1,0654	0,5191	0,8619
3	3,5574	3,8936	3,7664	3,6957	0,9452	0,8656	0,8750	0,9114
4	3,2213	3,3830	3,0000	3,1630	1,0485	0,5338	0,4953	0,8038
5	3,4344	3,3617	3,4019	3,4094	0,9090	0,8950	0,5114	0,7740
6	3,6230	3,9149	3,7757	3,7319	1,0391	0,7754	0,7562	0,8988
7	2,5820	3,0000	2,6355	2,6739	0,6535	-	0,6922	0,6286
8	3,1311	2,8723	2,9159	3,0036	1,0281	1,2268	0,9917	1,0531
9	3,5492	3,7234	3,6449	3,6159	0,8917	0,9487	0,8822	0,8970
10	3,5082	3,5532	3,2150	3,4022	0,7301	0,9043	0,8358	0,8143

Source: authors calulation

In most groups, there is moderate variability in opinions, suggesting that there is a certain degree of uncertainty surrounding the future development of accounting services. Groups that are more open to change show greater variability in their responses, indicating that there are differing expectations within that group regarding the speed and extent of changes in accounting services.

Respondents generally believe that professional accounting associations play a significant role in promoting and supporting ESG reporting. An average score of 3.40 on the Likert scale suggests moderate to high confidence in this assertion. Women have slightly more confidence in the role of professional accounting associations compared to men. Respondents with a doctoral degree exhibit the highest level of confidence, while those with a secondary vocational qualification display somewhat lower confidence. Respondents from larger enterprises have slightly more confidence in the role of professional accounting associations. Those who are more inclined towards change and risk-taking also have the highest confidence in the role of these associations. There are no significant differences in opinions among different positions in accounting. In most groups, there is moderate variability in opinions, indicating a certain level of

uncertainty regarding the actual impact of professional accounting associations on promoting ESG. Groups with varying levels of education and differing attitudes towards change show greater variability in their responses, suggesting that there are various factors influencing the perception of the role of professional accounting associations. These results emphasise the important role that professional accounting associations play in shaping the future of accounting and promoting sustainable business practices. Through active participation in the development of ESG frameworks and providing education to their members, professional associations can significantly contribute to raising awareness about the importance of ESG and encouraging its implementation in practice.

DISCUSSION AND CONCLUSION

Based on the results, we can state that the hypothesis asserting that accountants are familiar with the concept of ESG reporting has been refuted. Accountants do not possess sufficient knowledge of ESG tools and standards. The average scores for familiarity are low (1.85 for tools and 1.82 for standards), indicating a lack of knowledge. However, the majority believe that ESG reporting will become increasingly important in the future, even though they currently do not demonstrate a high level of familiarity.

The hypothesis suggesting that there is a positive correlation between the level of knowledge about ESG and the willingness to invest in professional development in that area has been partially confirmed. Respondents showed a relatively high willingness to invest in professional development (3.73), but a strong correlation between knowledge level and willingness to invest was not directly highlighted. Respondents with higher educational qualifications exhibited greater willingness, while those with master's and postgraduate degrees were somewhat less inclined, indicating potential variability within the groups.

The hypothesis that company managements are increasingly interested in ESG reporting and encourage employees to engage in this process has been confirmed. Respondents from larger companies demonstrate greater familiarity with ESG tools and standards. Furthermore, the majority of respondents agree that governments should promote the adoption of ESG reporting, implying that there is interest and support at higher levels within companies.

The hypothesis that accountants believe ESG reporting can positively influence a company's financial performance has been confirmed. Respondents largely believe that ESG can have a positive impact on financial performance, although there is variability among different groups (average score 3.16).

The hypothesis that there is a relationship between the level of knowledge about ESG and the perception of the need for new services and advisory activities in this area has been confirmed. Most respondents believe that accountants will expand their range of services, including advisory services related to ESG (average score 3.62). Expectations are particularly pronounced among those with higher education and those inclined towards change.

The conclusions of the research indicate significant differences in familiarity with ESG tools among different groups of respondents. Education, company size, position within the organisation, and attitude towards change are key factors influencing these differences. Larger companies are generally better acquainted with ESG tools,

while smaller companies and employees with lower levels of education have more room for improvement. Respondents displayed moderate interest in learning about ESG, and various factors, including education and openness to change, impact their willingness to invest in professional development.

Larger companies, due to their greater familiarity with ESG standards, can play a crucial role in promoting them and disseminating knowledge. Conversely, there is a pronounced need for additional education on ESG among employees in smaller companies and those with lower educational attainment. Educational programmes should be tailored to different educational levels and the specifics of organisations. Additionally, larger companies can encourage the exchange of experiences and best practices with smaller firms, further strengthening the implementation of ESG principles.

Respondents show general support for government incentives for ESG reporting, but the intensity of that support varies depending on demographic and psychographic characteristics. This heterogeneity of views suggests the need for further research to better understand the reasons behind differing opinions. Political measures encouraging ESG reporting should be flexible and customised to the specific needs of different sectors and sizes of enterprises.

A significant number of respondents believe that ESG reporting can positively influence financial performance, although opinions on the strength of that relationship vary. The majority of respondents expect ESG reporting to become increasingly important in the future, while various factors, including education, attitude towards change, and company size, influence the speed and intensity of that process. Furthermore, most respondents are willing to invest in their own professional development related to ESG reporting, although there is diverse awareness regarding the importance of this process. These results highlight the need for a continuous investment in developing skills and knowledge to effectively respond to future challenges in the field of ESG.

Organisations should foster a culture of continuous learning and development through specialised programmes, mentoring, and coaching, enabling employees to acquire the necessary skills for working with ESG reporting. It is important to provide practical examples of companies that have successfully implemented ESG strategies and achieved positive outcomes. In addition, collaboration with the academic community, regulators, and professional associations should be strengthened to jointly promote and implement ESG.

According to respondents' expectations, accountants will need to adapt their services and acquire new skills to meet the growing market demands. Professional associations for accountants should play an important role in educating their members and providing guidance on the implementation of ESG, thereby facilitating organisations in better understanding the advantages and challenges of sustainable business practices. These conclusions emphasise the crucial role of accountants in the future of business, where their adaptation to ESG standards will be of great significance for sustainable development.

LITERATURE

Apergis, N., Poufinas, T., & Antonopoulos, A. (2022). ESG scores and cost of debt. *Energy Economics, 112, 106186.* doi:DOI: 10.1016/j.eneco.2022.106186

Baratta, A., Cimino, A., Longo, F., Solina, V., & Verteramo, S. (2023). The impact of ESG practices in industry with a focus on carbon emissions: Insights and future perspectives. *Sustainability, 15*(8), 1-20. doi:10.3390/su15086685

Barbier, E. B., & Burgess, J. C. (2017). Barbier, E. B; Burgess, J. C. *Economics, 11*(1). doi:10.5018/economics-ejournal.ja.2017-28

Berikol, B. Z., & Killi, M. (2021). The effects of digital transformation process on accounting profession and accounting education. *Ethics and Sustainability in Accounting and Finance, 2*, 219-231. doi:10.1007/978-981-15-1928-4_13

Chopra, S. S., Senadheera, S. S., Dissanayake, P. D., Withana, P. A., C. R., R. J., & Ok, Y. S. (2024). Navigating the Challenges of Environmental, Social, and Governance (ESG) Reporting: The Path to Broader Sustainable Development. Sustainabilit. *Sustainability, 16*(2). doi:https://doi.org/10.3390/su16020606

Cort, T., & Esty, D. (2020). ESG standards: Looming challenges and pathways forward. *Organization & Environment, 33*(4), 491-510. doi:10.1177/1086026620945342

Cunha, F. A., Meira, E., & Orsato, R. J. (n.d.). Sustainable finance and investment: Review and research agenda. *Business Strategy and the Environment, 30*(8), 3821-3838. doi:10.1002/bse.2842

de Freitas Netto, S. V., Falcão Sobral, M. F., Ribeiro, B. A., & da Luz Soares Gleibson, R. (2020). Concepts and forms of greenwashing: a systematic review. *Environmental Sciences Europe, 32*(19). doi:https://doi.org/10.1186/s12302-020-0300-3

Gonçalves, M. J., da Silva, A. C., & Ferreira, C. G. (2022). The Future of Accounting: How Will Digital Transformation Impact the Sector? *Informatics, 9*(1), 1-17. doi:https://doi.org/10.3390/informatics9010019

Grujić, M., & Cobović Vretenar, M. (2024). Grujić, M., & Cobović, M. V. (2024). Analysis of the attitudes of Bosnia and Herzegovina residents towards the pension system and private pension insurance. *EMC review-economy and market communication review, 27*(1), 97-115. doi:https://doi.org/10.7251/EMC2401097G

Hoang, T. (2018). The role of the integrated reporting in raising awareness of environmental, social and corporate governance (ESG) performance. *Stakeholders, Governance and Responsibility*, 47-69. doi:10.1108/S2043-052320180000014003

Karwowski, M., & Raulinajtys-Grzybek, M. (2021). The application of corporate social responsibility (CSR) actions for mitigation of environmental, social, corporate governance (ESG) and reputational risk in integrated reports. *Corporate Social Responsibility and Environmental Management, 28(4), 1270-1284., 28*(4), 1270-1284. doi:https://doi.org/10.1002/csr.2137

Lei, X., & Yu, J. (2023). Striving for sustainable development: Green financial policy, institutional investors, and corporate ESG performance. *Corporate Social Responsibility and Environmental Management., 31*(3), 1177-1202. doi:10.1002/csr.2630

Luo, L., & Tang, Q. (2023). The real effects of ESG reporting and GRI standards on carbon mitigation: International evidence. *Business Strategy and the Environment, 32*(6), 2985-3000. doi:10.1002/bse.3281

Nielsen, H. &. (2023). The ESG discourse is neither timeless nor stable: How Danish Companies 'tactically'embrace ESG concepts. *Sustainability, 15*(3). doi:10.3390/su15032766

Novaković, V. Ç. (2024). Introduction Challenges in Collecting Climate Finance Data: Case Study for Bosnia and Herzegovina. U K. Tunca Çalıyurt, *Ethics and Sustainability in Accounting and Finance, Volume IV. Accounting, Finance, Sustainability, Governance*

& Fraud: Theory and Application. Singapore: Springer. doi:https://doi.org/10.1007/978-981-97-4351-3_1

Ogata, K., Inoue, S., Ueda, A., & Yagi, H. (2018). The Functional Differentiation Between the International Integrated Reporting Council (IIRC) and the Global Reporting Initiative (GRI) in the Sphere of Sustainability Reporting. U *Accounting for Sustainability: Asia Pacific Perspectives* (str. 261-279). doi:10.1007/978-3-319-70899-7_11

Qasim, A., & Kharbat, F. F. (2019). Blockchain technology, business data analytics, and artificial intelligence: Use in the accounting profession and ideas for inclusion into the accounting curriculum. *Journal of emerging technologies in accounting*(17), 107-117. doi:10.2308/jeta-52649

Raghavan, K. (2022). ESG Reporting Impact on Accounting, Finance. . *Journal of Global Awareness, 3*(1), 1-16. doi:10.24073/jga/3/01/09

Sun, Z., Wang, W., Wang, W., & Sun, X. (2023). Sun, Z., Wang, W., Wang, W., & Sun, X. (2023). How does digital transformation affect corporate social responsibility performance? From the dual perspective of internal drive and external governance. *Corporate Social Responsibility and Environmental Management, 31*(2), 1156-1176. doi:10.1002/csr.2615

Tettamanzi, P., Venturini, G., & Murgolo, M. (2022). Sustainability and financial accounting: A critical review on the ESG dynamics. *Environmental Science and Pollution Research, 29*(11), 16758-16761. doi:10.1007/s11356-022-18596-2

Tsang, A., Frost, T., & Cao, H. (2023). Environmental, social, and governance (ESG) disclosure: A literature review. *The British Accounting Review, 55(1), 101149., 55*(1), 101149. doi:10.1016/j.bar.2022.101149

Yang, Y., & Han, J. ((2023).). Digital transformation, financing constraints, and corporate environmental, social, and governance performance. *Corporate Social Responsibility and Environmental Management, 30*(6), 3189-3202. doi:10.1002/csr.2546

Yang, Z., Nguyen, T. T., Nguyen, H. N., Nguyen, T. T., & Cao, T. T. (2020). Greenwashing behaviours: Causes, taxonomy and consequences based on a systematic literature review. *Journal of business economics and management, 21*(5), 1486-1507. doi:10.3846/jbem.2020.13225

Yigitbasioglu, O., Green, P., & Cheung, M. Y. (2023). Digital transformation and accountants as advisors. *Accounting, Auditing & Accountability Journal, 36*(1), 209-237. doi:10.1108/AAAJ-02-2019-3894

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501068A
UDK: 005.336.3:[659.131.7:004.738.5
Datum prijema rada: 25. januar 2025.
Submission Date: January 25, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 68-86

ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

THE IMPACT OF SALES PROMOTION METHODS ON CUSTOMER-BASED BRAND EQUITY

Stefan Alimpić | PhD Assistant professor, Belgrade Metropolitan University, Faculty of Management, Belgrade, Serbia; stefan.alimpic@metropolitan.ac.rs; ORCID ID: 0000-0002-2918-2480

Milica Slijepčević | PhD Associate professor, Belgrade Metropolitan University, Faculty of Management, Belgrade, Serbia; milica.slijepcevic@metropolitan.ac.rs; ORCID ID: 0000-0002-0431-2998

Vladan Madić | PhD Assistant professor, Belgrade Metropolitan University, Faculty of Management, Belgrade, Serbia; vladan.madic@metropolitan.ac.rs; ORCID ID: 0009-0003-9736-9065

***Abstract**: This paper investigates the relationships between selected sales promotion methods and customer-based brand equity. The authors propose a conceptual model in which sales promotion methods (monetary - discounts, and non-monetary - specialized advertising) are observed in relation to the dimensions of brand equity (perceived quality, brand awareness, brand associations, and brand loyalty). These dimensions were initially linked to customer-based brand equity. Data analysis was done with the help of factor, regression and reliability analysis. According to the research results, all four dimensions of brand equity have been confirmed to have a statistically significant impact on customer-based brand equity. On the other hand, it was determined that customers' perception of both monetary and non-monetary sales promotion methods has a negative impact on the observed dimensions of brand equity. Therefore, it can be concluded that the observed sales promotion methods do not influence customer-based brand equity. The findings of this paper will benefit brand managers, marketers, customers and the academic community.*

***Keywords**: sales promotion, monetary and non-monetary methods, brand equity, customer perception*

***JEL classification**: M31, M37*

INTRODUCTION

There are various theoretical perspectives regarding the role of sales promotion in building, measuring, and managing brand equity. Pauwels et al. (2002) believe that sales promotion provides only a temporary competitive advantage to brands and, therefore, has no long-term effects. Other authors (Alimpić, Perić, & Mamula, 2020) (Shu-Ling, Yung-Cheng, & Chia-Hsien, 2009) (Vasić Nikčević, Alimpić, & Perić, 2020) hold similar views, emphasizing that the benefit of sales promotion lies exclusively

in stimulating so-called impulse purchases, where the customer buys a certain product unplanned, simply because it is on sale, even when they have no previous experience consuming the product or possess no information about it. However, if customers, influenced by persistent exposure to sales promotion activities, develop an attitude toward a particular brand that endures beyond the conclusion of the promotional campaign, sales promotion should be considered more than just a tool aimed at increasing sales volume in the short term (Cvijović, Kostić-Stanković, & Petronijević, 2014). Some authors also claim that sales promotion influences not only the choice of a particular brand but also its perception and image (Alvarez & Casielles, 2005). From the perspective of companies that allocate a significant portion of their marketing budget to sales promotion, it is essential to understand the factors that affect this tool's ability to foster a positive brand attitude or loyalty. It is also important to know how these factors change over time so that long-term sales promotions become standard business practices (Raghubir, Inman, & Grande, 2004). Therefore, this paper analyzes the impact of sales promotion methods on customer-based brand equity. More precisely, this research focuses on the theoretical and practical understanding of sales promotion, specifically short-term promotional methods designed to encourage customers to purchase a manufacturer's products rather than those of competitors, alongside the theoretical and practical insights into the concept of customer-based brand equity. The study will employ causal research to assess the influence of observed sales promotion methods on customer-based brand equity. To achieve this objective, the study will initially examine how the identified brand equity dimensions impact overall brand equity and how various forms of sales promotions, both monetary and non- monetary, impact overall brand equity through their effect on the identified brand equity dimensions. In line with the defined research objective, the following primary and derived hypotheses have been formulated:

H1: Brand equity dimensions have a positive impact on brand equity;

H1-1: Perceived quality has a positive impact on brand equity;

H1-2: Brand awareness has a positive impact on brand equity;

H1-3: Brand associations have a positive impact on brand equity;

H1-4: Brand loyalty has a positive impact on brand equity;

H2: Customer perception of monetary sales promotion methods has a positive impact on the brand equity dimensions;

H2-1: Customer perception of monetary sales promotion methods has a positive impact on perceived quality;

H2-2: Customer perception of monetary sales promotion methods has a positive impact on brand awareness;

H2-3: Customer perception of monetary sales promotion methods has a positive impact on brand associations;

H2-4: Customer perception of monetary sales promotion methods has a positive impact on brand loyalty;

H3: Customer perception of non-monetary sales promotion methods has a positive impact on the brand equity dimensions;

H3-1: Customer perception of non-monetary sales promotion methods has a positive impact on perceived quality;

H3-2: Customer perception of non-monetary sales promotion methods has a positive impact on brand awareness;

H3-3: Customer perception of non-monetary sales promotion methods has a positive impact on brand associations;

H3-4: Customer perception of non-monetary sales promotion methods has a positive impact on brand loyalty.

The following will first present literature review, then explain the methodology used, and finally present the results of the research with a special emphasis on the contributions and limitations of the manuscript.

LITERATURE REVIEW

Since the emergence of the brand equity concept in the 1980s, following numerous business arrangements in the form of mergers and acquisitions, interest in this concept has surged among marketers and researchers (Cobb-Walgren, Ruble, & Donthu, 1995). For this reason, there are many different definitions of brand equity today. One of the basic ones is that it represents the superior value a company gains from owning a product with a distinctive name—that is, a product that stands out from other products and services designed to meet the same needs (Kotler & Keller, 2006). On the other hand, Aaker & Joachimsthaler define brand equity as "a set of claims and obligations associated with the brand, its name, and symbol, which add to or subtract from the value delivered by the company's products and services" (Crescitelli & Figueiredo, 2009, p. 103). Based on these and all other definitions, it can be concluded that brands are the most valuable assets of companies and, accordingly, creating their superior value is the primary goal of every company. Specifically, creating and adequately managing brand equity has become a priority for companies of all sizes, in all industries, and in all markets (Lehmann, Keller, & Farley, 2008).

Brand equity can be analyzed from multiple perspectives, with the most prominent in marketing literature being the financial perspective (from the company's point of view) and the customer perspective (Bailey & Ball, 2006). However, this paper focuses on observing brand equity from the customer's point of view, as has been the case with many previously conducted studies (Aaker, 1991; Christodoulides, de Chernatony, Furrer, Shiu, & Abimbola, 2006; Pappu, Quester, & Cooksey, 2006; Vázquez, del Río, & Iglesias, 2002; Yoo & Donthu, 2001).

The starting point for customer-based brand equity models is that brand equity rests on brand knowledge, i.e., on what customers see, read, hear, learn, think, and feel about the brand over time (Washburn & Plank, 2002). More precisely, brand equity resides in the awareness of existing or potential customers and in their direct or indirect experiences with the brand (Faircloth, Capella, & Alford, 2001; Leone, et al., 2006). Therefore, if brands establish robust, affirmative, and distinctive relationships with customers in the long run, enabling them to readily distinguish those brands from the competing ones, superior customer-based brand equity is effectively generated (Marinković & Savović, 2009). Accordingly, every company aims to create and deliver value to its customers by meeting their needs and desires. In this way, a high level of customer satisfaction and loyalty is also achieved, leading to profitable operations (Kim & Kim, 2004; Kovač-Žnideršić, Grubor, Miličević, & Leković, 2014). To achieve this goal, companies must permanently search for sources of brand equity. In this context, it is necessary to identify the strengths and weaknesses of the brand in relation to competitors, i.e., to measure its equity.

Today, the literature distinguishes a large number of models for measuring brand equity. Nonetheless, Aaker's model is the most commonly referenced and empirically examined in various studies (Atilgan, Askoy, & Akinci, 2005; Kim & Kim, 2004; Yoo, Donthu, & Lee, 2000). According to this model (Aaker, 1996), brand equity is defined as a set of five dimensions, i.e., categories of assets and liabilities associated with the brand that add to or subtract from the value that the product or service provides to the company and/or its customers. These dimensions are: (1) brand loyalty, (2) brand awareness, (3) perceived quality, (4) brand associations, and (5) other proprietary assets, such as patents, trademarks, and distribution channel relationships. The first four dimensions reflect the customer's assessment and response to the brand, which they can easily understand (Yoo & Donthu, 2001). Therefore, they are widely accepted as variables in the process of measuring brand equity, both in previous studies (Buil, de Chernatony, & Martínez, 2013; Gill & Dawra, 2010; Pappu, Quester, & Cooksey, 2005; Pappu, Quester, & Cooksey, 2006; Salelaw & Singh, 2016; Yoo, Donthu, & Lee, 2000; Yoo & Donthu, 2001) and in this paper.

Perceived quality is defined as the customer's opinion of a product (or brand) capacity to meet their expectations. It refers to the customer's perception of the overall quality or superiority of a product (or service) compared to competitors, particularly regarding its purpose, i.e., meeting customer expectations (Zeithaml, 1988). Therefore, if customers believe that a particular brand can meet their expectations, they will certainly buy it. Therefore, perceived quality provides customers with a reason to purchase. For the company behind this brand, this will mean that it is superior to competitors (Chattopadhyay, Shivani, & Krishnan, 2010). This allows the company to charge premium prices (Keller, 2013; Netemeyer, et al., 2004) and facilitates the development of brand extensions (Aaker, 1991). It is evident from the aforementioned research, as well as numerous others (Adam, Lema, & Argusa, 2012; Kocić, Marinković, & Alimpić, 2016; Kotler & Armstrong, 2009; Mohan & Sequeira, 2012; Yoo, Donthu, & Lee, 2000) that perceived quality has a substantial impact on the overall customer-based brand equity, i.e., its growth. However, according to the results of more recent research (Salelaw & Singh, 2016; Shashikala & Suresh, 2013; Tong & Hawley, 2009; Umar, Mat, Tahir, & Alekam, 2012) the opposite conclusion was reached. Specifically, these studies showed that perceived quality has a very weak impact on overall customer-based brand equity.

Brand awareness is one of the key objectives of brand building. This dimension refers to the extent to which potential buyers recognize the brand and associate it with the corresponding product (Aaker, 1991). In other words, brand awareness refers to the customer's ability to recognize and differentiate a brand they have previously been exposed to, as well as their ability to recall it, i.e., to retrieve it from memory (Keller, 2013; Liu, Liston-Heyes, & Ko, 2010). Based on the above, it can be concluded that brand awareness plays an important role in a customer's purchasing decisions regarding brands they are already familiar with, as they provide them with a sense of security and justification for that decision (Pradhan & Prasad, 2014). Nevertheless, research conducted by many authors (Adam, Lema, & Argusa, 2012; Kocić, Marinković, & Alimpić, 2016; Mohan & Sequeira, 2012; Shashikala & Suresh, 2013; Tong & Hawley, 2009; Umar, Mat, Tahir, & Alekam, 2012; Yoo & Donthu, 2001; Yoo, Donthu, & Lee, 2000) revealed that brand awareness exerts a minimal or negligible direct influ-

ence on overall customer-based brand equity, which is why this dimension was merged with the dimension of brand associations in the last two mentioned studies.

Brand associations can be defined as anything that connects the customer to the brand, such as previous experiences with the brand, brand characteristics, the company behind the brand, etc. (Aaker & Joachimsthaler, 2000; Bailey & Ball, 2006; Keller, 2008). For this reason, marketers use this dimension to differentiate, position, and expand their brands, as well as to create positive attitudes and feelings toward them, thereby giving customers a reason to purchase them (Chen, 2001). From another perspective, customers use brand associations to recall certain brands and include them in their consideration when making a purchase decision (Aaker, 1991). It may be inferred that brand equity is established when customers possess a high degree of awareness and strong, favorable, and distinctive associations with the brand in their memories (Bridges, Keller, & Sood, 2000). According to previous research (Adam, Lema, & Argusa, 2012; Chen, 2001; Keller, 2003; Kocić, Marinković, & Alimpić, 2016; Mohan & Sequeira, 2012; Salelaw & Singh, 2016; Shashikala & Suresh, 2013; Tong & Hawley, 2009; Umar, Mat, Tahir, & Alekam, 2012) (Yoo, Donthu, & Lee, 2000), brand associations have a significant impact on creating overall customer-based brand equity.

Brand loyalty is measured by the likelihood that customers will continue to use products belonging to a particular brand in the future, regardless of changes in market conditions and competitors' marketing efforts offering the same product category (Aaker, 1991; Puška, Stojanović, & Berbić, 2018). According to Oliver (1997), this dimension refers to the customer's intention to remain loyal to a particular brand, so their primary choice will always be to purchase the same brand. In this way, a distinction is made between loyal and non-loyal customers (Bowen & Shoemaker, 1998). Among other things, this definition also emphasizes two different aspects of brand loyalty, which have been discussed in numerous previous studies (Bandyopadhyay, Gupta, & Dube, 2005; Chaudhuri & Holbrook, 2001; Moreau, Lehmann, & Markman, 2001). These factors are the frequency of purchasing a particular brand (behavioral loyalty) and the positive attitudes of customers toward the same brand (attitudinal loyalty), which also provide reasons for its purchase (Baloglu, 2002). By observing these two aspects together, the company can readily assess customer loyalty to its brand and evaluate any correlation between that loyalty and overall brand equity. Prior research (Aaker, 1991; Adam, Lema, & Argusa, 2012; Kocić, Marinković, & Alimpić, 2016; Mohan & Sequeira, 2012; Salelaw & Singh, 2016; Shashikala & Suresh, 2013; Tong & Hawley, 2009; Umar, Mat, Tahir, & Alekam, 2012; Yoo, Donthu, & Lee, 2000) indicates that this dimension substantially enhances the brand and/or the associated company by attracting a considerable number of loyal customers over an extended duration. As a result, the company secures consistent revenues and savings in marketing costs, as retaining loyal customers is less costly than acquiring new ones, and loyal customers can also recommend the brand to their friends and acquaintances.

Each of the defined dimensions of brand equity is potentially influenced by a large number of marketing actions. This refers to the term used by Kirmani & Wright (1989) to describe the marketing efforts undertaken by the company, which generally correspond to the elements of the marketing mix. One of these elements is promotion. It is the process of communication between companies and customers designed to cultivate a favorable perception of products and services, hence enhancing their appeal in

the purchasing process in the market (Kotler & Keller, 2006). Every communication method (promotional technique) has distinct qualities and necessitates appropriate expenses. Also, each of them affects brand creation and value, the brand image creation, sales growth, as well as company stock value (Projović & Popović Šević, 2013). However, according to a large number of authors, the key element of the promotional mix is sales promotion (Cvijović, Kostić-Stanković, & Petronijević, 2014; Kazmi & Batra, 2008; Köksal & Spahiu, 2014; Kotler & Armstrong, 2012; Mendez, Bendixen, Abratt, Yurova, & O'Leary, 2015; Oyedapo, Akinlabi, & Sufian, 2012; Palmer, 2004; Salelaw & Singh, 2016; Valette-Florence, Guizani, & Merunka, 2011). This term denotes a series of stimulating tools or methods, primarily short-term ones, aimed at motivating customers or business buyers to expedite or increase their purchases of particular products or services (DelVecchio, Henard, & Freling, 2006; Grubor, Đokić, & Milićević, 2015; Kotler & Armstrong, 2012; Laroche, Pons, Zgolli, Cervellon, & Kim, 2003; Oyedapo, Akinlabi, & Sufian, 2012; Palmer, 2004; Tong & Hawley, 2009). In simple terms, sales promotion is an accelerating tool designed to expedite the sales process and enhance sales volume by motivating customers who did not respond to the advertising. More precisely, while advertising appeals to the reason and emotions of customers or business buyers to give them a reason to buy, sales promotion primarily appeals to their wallets and offers an incentive to purchase, thereby influencing their behavior (Belch & Belch, 2015; Chandon, Wansink, & Laurent, 2000; Egan, 2007; Kazmi & Batra, 2008; Kotler & Keller, 2006; Leek & Christodoulides, 2011; Palmer, 2004).

In theory, a multitude of sales promotion methods can be categorized into two primary groups: monetary and non-monetary (Tong & Hawley, 2009).

Sales promotion methods that contribute to short-term financial incentives are termed monetary. Discounts represent one of the most significant methods within this category. This method provides the buyer with a temporary price reduction (savings in money) and thus immediate value, making it an unambiguous purchase incentive (Jobber & Fahy, 2006). Discounts have been demonstrated to enhance short-term sales growth. Specifically, according to multiple research results, they are the sole factors that significantly influence customer behavior and are particularly effective in expediting purchases and product trials. Nonetheless, while discounts may induce temporary brand switching, they may not foster brand loyalty. This is because customers are momentarily drawn to the brand due to its short-term transactional utility, and once this incentive ceases, they lose interest in the brand and switch to another brand offering a comparable incentive (Raghubir, Inman, & Grande, 2004; Yoo, Donthu, & Lee, 2000). Additionally, price reductions can be readily followed by competitors, and if this method is employed consistently, it can devalue the brand image (Darke & Chung, 2005; Martinez, Montaner, & Pina, 2009; Montaner & Pina, 2011; Yang, Zhang, & Mattila, 2016). The main reason for this is the fact that customers perceive discounted products/services as inferior in quality (Buil, de Chernatony, & Martínez, 2013; DelVecchio, Henard, & Freling, 2006; Jørgensen, Taboubi, & Zaccour, 2003; Rahmani, Mojaveri, & Allahbakhsh, 2012; Shariq & Anjum, 2023; Suri, Manchanda, & Kohli, 2000; Villarejo-Ramos & Sánchez-Franco, 2005; Yoo, Donthu, & Lee, 2000). In addition, discounts lead customers to focus predominantly on the price of the product/service during the purchase, rather than on the brand itself (Chandon, Wansink, & Laurent, 2000; Neslin, 2002; Raghubir, Inman, & Grande, 2004; Yoo, Donthu, & Lee, 2000). Thus, it can be concluded that frequent use of

discounts adversely impacts perceived quality and brand associations, thereby diminishing brand equity (Bhakar & Bhakar, 2020; Buil, de Chernatony, & Martínez, 2010; Buil, de Chernatony, & Martínez, 2013; Campo & Yagüe, 2008; Kumar & Patra, 2017; Mullin & Cummins, 2008; Salelaw & Singh, 2016; Selvakumar & Vikkraman, 2011) (Shariq & Anjum, 2023; Yoo, Donthu, & Lee, 2000).

Non-monetary sales promotion methods, in contrast to monetary, positively influence brand equity (Chu & Keh, 2006; Kumar & Patra, 2017; Montaner & Pina, 2011; Palazón-Vidal & Delgado-Ballester, 2005; Salelaw & Singh, 2016; Tong & Hawley, 2009) by fostering distinction through the articulation of unique brand attributes (Chu & Keh, 2006) and encouraging brand loyalty (Aaker, 1991). Accordingly, when customers are exposed to non-monetary methods, such incentives are less likely to adversely affect perceived quality and brand associations (Buil, de Chernatony, & Martínez, 2010; Rojuee & Rojuee, 2017). Companies typically use these methods to achieve long-term marketing goals by improving brand image and strengthening customer commitment to the brand (Tong & Hawley, 2009). Moreover, these methods can enhance brand equity by creating both excitement and intangible value, while also delivering economic savings for customers (Aaker, 1991; Tong & Hawley, 2009). While monetary methods primarily relate to utilitarian benefits, non-monetary methods are more associated with hedonic benefits (Chandon, Wansink, & Laurent, 2000; Kumar & Patra, 2017; Liao, 2006; Mendez, Bendixen, Abratt, Yurova, & O'Leary, 2015) These advantages, such as entertainment and exploration, are linked to experiential emotions, satisfaction, and self-esteem. Therefore, non-monetary methods can elicit stronger associations related to brand personality, pleasant experiences, feelings, and emotions. Additionally, they foster more favorable and positive brand associations (Palazón-Vidal & Delgado-Ballester, 2005). One of the most frequent non-monetary methods is specialty advertising, which involves distributing specific product samples (items) to current and prospective customers to reinforce brand recall when they require the provider's products or services and to strengthen mutual relationships (Köksal & Spahiu, 2014). Companies use this method to draw the target audience's attention to their corporate identity, logo, upcoming event, brand, or specific product. Special promotional items distributed to a selected audience are relatively inexpensive, practical, and widely recognized. These items typically feature one or more of the company's identifiers (logo, name, phone number, address, or website). Examples include pens, fountain pens, calendars, notepads, address books, business card holders, coin wallets, lighters, key holders, keychains, portable phone chargers, USB flash drives, mousepads, laptop sleeves, flashlights, coffee mugs, glasses, T-shirts, caps, scarves, gloves, plastic raincoats, umbrellas, sweatbands, and other handy items. Other special promotional items are more expensive and are distributed more selectively. These include writing tool sets, travel bags, toolkits, and other appropriate gifts and reminders. This category also includes perfumes, leather goods, and electronic devices presented to celebrities at film festivals or award ceremonies for photographic purposes. These photographs may subsequently be utilized for advertising purposes (Alimpić S. , 2018). Gifts and free products must be carefully selected to reflect the preferences of the target customers and to provide them with value (Nunes & Park, 2003; DelVecchio, Henard, & Freling, 2006); otherwise, the intended sales stimulation effects may be lacking. Recent studies highlight that customers favor brands that offer complimentary gifts, only if the level of utility provided by the gifts is high (Palazón-Vidal & Delgado-Ballester, 2009).

METHODOLOGY

The primary research method in this study was an online survey. The research was conducted on a random sample of 144 elementary units. Of this number, 34% of respondents were male, and 66% were female; respondents' ages ranged from 19 to 60 years. A total of 59.7% of respondents had higher education, 9.7% had post-secondary education, 29.2% had secondary education, while only 1.2% had lower education levels. A total of 48.6% of respondents were from Šumadija and Western Serbia, 21.5% from Belgrade, 13.9% from Southern and Eastern Serbia, 13.2% from Vojvodina, and 2.8% from Kosovo and Metohija, demonstrating that the sample is representative. Regarding the measurement instrument, the questionnaire included 28 statements. Out of that number, 17 statements were defined for each of the observed brand equity dimensions, while three statements reflected the overall brand equity. Respondents expressed their level of agreement with the statements using a five-point Likert scale (1-strongly disagree, 2-disagree, 3-partially agree, 4-agree, 5-strongly agree). These statements were selected based on a review of relevant literature in the field of customer-based brand equity (Aaker, 1991; Atilgan, Askoy, & Akinci, 2005; Pappu, Quester, & Cooksey, 2005; Ruswidyo & Hudrasyah, 2012; Tong & Hawley, 2009; Yoo, Donthu, & Lee, 2000). On the other hand, four statements were defined for both monetary and non-monetary customer-oriented sales promotion methods. Respondents also expressed their level of agreement with these statements using previously mentioned five-point Likert scale. These statements were modeled after the work of Yoo et al. (2000). All collected data were stored in an SPSS database. Statistical data analysis was performed using several statistical methods. Factor analysis was initially employed to reduce the large set of variables or scale items related to brand equity dimensions into a smaller and more manageable number of factors (components). Subsequent to acquiring the results of this analysis, a regression analysis was performed to ascertain whether the derived components influence the dependent variable (overall brand equity). Furthermore, additional regression analyses were conducted to ascertain whether both monetary and non-monetary sales promotion methods influence each of the observed brand equity dimensions. Finally, it is important to note that a reliability analysis was conducted to measure the reliability of the obtained components and the internal consistency of the statements using Cronbach's alpha coefficient. A confidence level of $\alpha = 0.05$ was used to determine statistical significance.

RESEARCH RESULTS

Prior to the actual implementation of the factor analysis, the values of the KMO test (KMO = 0.877) and Bartlett's test ($p = 0.000$) confirmed justified conditions for its application. The KMO index ranges from 0 to 1, and this analysis is deemed inadequate if KMO values fall below 0.5. Bartlett's test is based on the chi-square statistic. The obtained value shows that the null hypothesis (absence of significant correlation between variables) is rejected. This research employed principal components analysis as a method for factor analysis, utilizing Varimax rotation for enhanced understanding. This analysis shows that 17 defined statements were grouped around four formed components. The first component, "brand awareness", pertains to all four brand awareness statements and explains 40.883% of the variance. The second component, "brand loyalty", explains 9.234% of the variance. It includes all five statements related to brand loyalty. The third component, "brand associations", which includes all five statements related to brand as-

sociations, explains 7.391% of the variance. The fourth component, "perceived quality", describes 7.271% of the variance and includes all three statements related to perceived quality. All four components describe 64.779% of the total variance.

Table 1. Results of exploratory factor analysis

Statements	Component 1	Component 2	Component 3	Component 4
Component 1: Brand awareness				
I can easily identify brand X among competitor brands	0.802			
I am familiar with brand X	0.747			
Brand X dominates compared to other competing brands	0.696			
I can easily recall certain characteristics of brand X	0.660			
Component 2: Brand loyalty				
I will gladly recommend brand X to my friends		0.465		
When I buy certain products, brand X is my first choice		0.843		
I am willing to continue buying brand X, even if its price is higher than that of competing brands		0.735		
I will continue to buy brand X as long as it meets my needs		0.633		
I consider myself loyal to brand X		0.612		
Component 3: Brand associations				
The company behind brand X is socially responsible			0.782	
I like the image of brand X			0.626	
Brand X has a very unique image, compared to other competing brands			0.623	
I can easily recall the logo or symbol of brand X			0.568	
I like and trust the company behind brand X			0.561	
Component 4: Perceived quality				
I believe in the quality of brand X				0.822
Brand X is of very high quality				0.794
Brand X has an exceptional price-to-quality ratio				0.645
Characteristic values (Eigenvalues)	6.950	1.570	1.257	1.236
Percentage of the variance described	40.883	9.234	7.391	7.271
Alpha coefficient	0.787	0.827	0.797	0.765

Source: authors

As seen from the table above, the alpha coefficient value for the second component is favorable, as it exceeds 0.8. Conversely, the alpha coefficient values for all other components are satisfactory, exceeding 0.7 (Kline, 1998). Therefore, it can be concluded that internal agreement exists among the statements within each distinct component. All these results largely coincide with the results of previous research conducted on the same topic (Mohan & Sequeira, 2012; Pappu, Quester, & Cooksey, 2005; Tong & Hawley, 2009).

Following the factor analysis results, a regression analysis was conducted to determine the influence of the four identified components on the overall customer-based brand equity (dependent variable). The observed dependent variable was assessed using three statements, specifically: Despite brand X being indistinguishable from other brands, I will opt for it; purchasing brand X is a smart and appropriate choice for me, and brand X represents more than just a product to me. The specified variable was generated by aggregating the total results on the scales. However, before conducting the regression analysis, verifying the fulfillment of assumptions regarding normality, linearity, multicollinearity, and homogeneity of variances was essential. The analysis demonstrated that the assumptions provided were not violated and that the decision to conduct this analysis was justified. More specifically, the Variance Inflation Factor (VIF) was employed to evaluate the issue of multicollinearity. The VIF for each component is 1, indicating the absence of multicollinearity among the observed variables. The coefficient of determination R^2 is 0.514, indicating that 51.4% of the variability in the dependent variable is explained by the four components identified. Based on Snedekor's F random variable (F = 36.763) and the realized level of significance (p = 0.000), it can be concluded that there is a statistically significant regression of the influence of the observed components on the overall customer-based brand equity, which is confirmed by the table above that presents the values of the standardized coefficients β, t-statistics, and realized significance levels (column Sig.).

Table 2. Results of regression analysis (dependent variable: overall customer-based brand equity)

Variables	β	t	Sig.
Component 1 (Brand awareness)	0.245	4.145	0.000*
Component 2 (Brand loyalty)	0.557	9.416	0.000*
Component 3 (Brand associations)	0.267	4.513	0.000*
Component 4 (Perceived quality)	0.270	4.565	0.000*

Notes: $p < 0,05$ (*); $R^2 = 0,514$; $F = 36,763$*

Source: authors

The β column reveals that the maximum coefficient value (0.557) is associated with the second component (brand loyalty). This indicates that this component (variable) independently contributes the most to explaining the dependent variable after excluding the variances that explain all other components (variables) in the model. Specifically, the statistically significant influence of all components on the dependent

variable was confirmed: overall customer-based brand equity (p = 0.000). In other words, the primary hypothesis (H1), and the derived hypotheses (H1-1, H1-2, H1-3, and H1-4), were confirmed. The results of previous research on this topic (Aaker, 1991; Adam, Lema, & Argusa, 2012; Amini, 2012; Chen, 2001; Keller, 2003; Kocić, Marinković, & Alimpić, 2016; Kotler & Armstrong, 2009) (Mohan & Sequeira, 2012; Salelaw & Singh, 2016; Shashikala & Suresh, 2013; Siby & James, 2011; Tong & Hawley, 2009; Umar, Mat, Tahir, & Alekam, 2012; Yoo & Donthu, 2001; Yoo, Donthu, & Lee, 2000) are, to a large extent, confirmed.

To evaluate the second primary hypothesis (H2) and its derived hypotheses (H2-1, H2-2, H2-3, and H2-4), four new regression analyses were performed as detailed below. The independent variable under examination in these analyses (monetary sales promotion method - discounts) was assessed using four statements, specifically: Overall, I appreciate the discounts provided by brand X; brand X frequently offers discounts; brand X occasionally offers discounts, and brand X offers discounts more frequently than the competing brand. On the other hand, the dependent variables under examination were measured based on the appropriate, previously described statements pertaining to brand equity dimensions. The specified variables were generated by aggregating the total results on the scales. However, in order to conduct each regression analysis, it was first necessary to verify the fulfillment of assumptions regarding normality, linearity, multicollinearity, and homogeneity of variances. The analysis demonstrated that the assumptions provided were not violated and that the decision to conduct these analyses was justified. More specifically, the Variance Inflation Factor (VIF) was employed to evaluate the issue of multicollinearity. The VIF for each conducted regression analysis is 1, indicating the absence of multicollinearity among the observed variables. The results of the four regression analyses are displayed in the subsequent table.

Table 3. The influence of monetary sales promotion method on brand equity dimensions

Hypothesis	Independent variable	Dependent variable	β	t	Sig.	Decision
Hypothesis 2-1	Monetary sales promotion method	Perceived quality	-0.090	-1.074	0.285	Not supported (Sig. > 0.05)
Hypothesis 2-2	Monetary sales promotion method	Brand awareness	-0.087	-1.041	0.300	Not supported (Sig. > 0.05)
Hypothesis 2-3	Monetary sales promotion method	Brand associations	-0.008	-0.097	0.922	Not supported (Sig. > 0.05)
Hypothesis 2-4	Monetary sales promotion method	Brand loyalty	-0.007	-0.083	0.934	Not supported (Sig. > 0.05)

Source: authors

The presented data indicates that the second primary hypothesis (H-2) is not supported; customer perception of monetary sales promotion methods does not positively influence brand equity dimensions. The results of previous research on the same topic (Buil, de Chernatony, & Martínez, 2010; Campo & Yagüe, 2008; Guizani, Florence, & Becheur, 2009; Mullin & Cummins, 2008; Selvakumar & Vikkraman, 2011; Shariq & Anjum, 2023; Villarejo-Ramos & Sánchez-Franco, 2005; Yoo, Donthu, & Lee, 2000) are, to a large extent, confirmed.

To evaluate the third primary hypothesis (H3) and its derived hypotheses (H3-1, H3-2, H3-3, and H3-4), four new regression analyses were performed as detailed below. The independent variable under examination in these analyses (non-monetary sales promotion method - specialty advertising) was assessed using four statements, specifically: Overall, I appreciate the gifts provided by brand X; brand X frequently offers gifts; brand X occasionally offers gifts, brand X offers gifts more frequently than the competing brand. On the other hand, the dependent variables under examination were measured based on the appropriate, previously described statements pertaining to brand equity dimensions. The specified variables were generated by aggregating the total results on the scales. However, in order to conduct each regression analysis, it was first necessary to verify the fulfillment of assumptions regarding normality, linearity, multicollinearity, and homogeneity of variances. The analysis demonstrated that the assumptions provided were not violated and that the decision to conduct these analyses was justified. More specifically, the Variance Inflation Factor (VIF) was employed to evaluate the issue of multicollinearity. The VIF for each conducted regression analysis is 1, indicating the absence of multicollinearity among the observed variables. The results of the four regression analyses are displayed in the subsequent table.

Table 4. The influence of non-monetary sales promotion method on brand equity dimensions

Hypothesis	Independent variable	Dependent variable	β	t	Sig.	Decision
Hypothesis 3-1	Non-monetary sales promotion method	Perceived quality	0.004	0.052	0.959	Not supported (Sig. > 0.05)
Hypothesis 3-2	Non-monetary sales promotion method	Brand awareness	-0.076	-0.903	0.368	Not supported (Sig. > 0.05)
Hypothesis 3-3	Non-monetary sales promotion method	Brand associations	-0.033	-0.399	0.690	Not supported (Sig. > 0.05)
Hypothesis 3-4	Non-monetary sales promotion method	Brand loyalty	-0.024	-0.290	0.772	Not supported (Sig. > 0.05)

Source: authors

The presented data indicates that the third primary hypothesis (H-3) is not supported; customer perception of non-monetary sales promotion methods does not positively influence brand equity dimensions. The results of previous research on the same topic (Buil, de Chernatony, & Martínez, 2010; Guizani, Florence, & Becheur, 2009; Nikabadi, Safui, & Agheshlouei, 2015; Shariq & Anjum, 2023; Yi & Yoo, 2011) are, to a large extent, confirmed.

CONCLUSION

As highlighted in the introductory section, the concept of brand equity is essential in brand management and can be used to measure the performance of a specific brand. Therefore, investigating this concept has been an imperative from the beginning of this study. Today, numerous definitions of brand equity exist, depending on the perspective taken. However, despite its capacity for diverse interpretations, this paper focused on studying brand equity from the customer's perspective, based on Aaker's most commonly used model - specifically, the four key dimensions of brand equity that

represent the customer's assessment and response to the brand, which they can easily comprehend (Yoo & Donthu, 2001). In other words, this study primarily examined the impact of these dimensions (selected components) on the overall customer-based brand equity. The factor analysis results indicated that the statements defined in the questionnaire, representing the basic brand dimensions, were grouped around four identified components. Of these, the component (brand equity dimension) that contributes the most to explaining the variance of the dependent variable (overall customer-based brand equity) is brand awareness. It is followed by brand loyalty, brand associations, and perceived quality. The reliability analysis results demonstrated that the four components that were obtained exhibited a high level of reliability. By conducting the initial regression analysis, it was shown that the observed dimensions of brand equity (i.e., the selected components) exert a statistically significant impact on the creation of overall customer-based brand equity. Specifically, the results of this analysis revealed that the β coefficient attained its maximum value for the second component (brand loyalty), indicating that this dimension of brand equity individually contributes the most to explaining the dependent variable once the variance explained by all other components (variables) in the model is excluded. The subsequent significant components are perceived quality and brand associations. On the other hand, brand awareness is the component that contributes the least to explaining the dependent variable. Therefore, the primary hypothesis, and the derived hypotheses, were supported. Several factors have contributed to making sales promotion an essential instrument in the promotional mix under contemporary market conditions. One of them is the prevention of purchase delays, considering that sales promotion represents an immediate driver for customers to respond, whether by purchasing or trialing a product or service. Additionally, the economic situation in both the domestic and global environments has heightened customer price sensitivity, necessitating additional time and effort in finding products that meet the desired quality level at an acceptable price. From a marketing theory perspective, sales promotion has evolved from a short-term promotional activity that complements other marketing instruments, such as advertising and personal selling, to an independent and effective promotional tool (Cvijović, Kostić-Stanković, & Petronijević, 2014). Therefore, the aim of this paper was to determine the impact of both monetary and non-monetary sales promotion methods on customer-based brand equity. To verify whether this impact exists, additional regression analyses were conducted. According to the results, discounts (as the observed monetary sales promotion method) and specialty advertising (as the observed non-monetary sales promotion method) do not influence any dimension of customer-based brand equity. Thus, it can be concluded that the observed sales promotion methods do not impact customer-based brand equity. Therefore, the second and third primary hypotheses, as well as theirs derived hypotheses, were not supported. This conclusion largely aligns with the results of other studies on this topic (Hajipour, Bavarsad, & Zarei, 2013; Kim & Hyun, 2011; Langga, Kusumawati, & Alhabsji, 2020). The contributions of this study will undoubtedly be significant for brand managers and marketers, as well as for customers and future research. Specifically, brand managers and marketers will be able to understand which dimensions of brand equity are most effective in creating overall customer-based brand equity and, accordingly, direct their limited resources (time, money, and human capital) toward these dimensions. This approach will enable them improve both their

marketing strategies and programs, as well as their companies' competitive positions, ultimately leading to higher profitability. As highlighted, numerous marketing actions can potentially impact each defined dimension of brand equity. If marketing managers understand how certain marketing activities - including sales promotion - can either contribute to or damage brand equity, it will help them develop effective marketing plans. Given that this and other studies indicate that sales promotion can adversely affect brand equity in the long term, marketers should prioritize the aforementioned brand equity dimensions over reliance on monetary and non-monetary sales promotion methods. In other words, since the research results show that brand loyalty exerts the greatest influence on the development of overall customer-based brand equity, companies should focus most of their marketing efforts on building and retaining a loyal customer base over the long term. By doing so, they will achieve steady revenue streams and marketing cost savings, as retaining loyal customers is less expensive than attracting new ones, and loyal customers can recommend the brand to their friends and acquaintances. Some effective marketing strategies that can be used to build brand loyalty include loyalty programs, celebrity endorsements, participation in various humanitarian initiatives, and advertising across different media (Aaker, 1991; Keller, 2003; Yoo, Donthu, & Lee, 2000). However, other dimensions of brand equity should not be overlooked, and achieving synergy among them should be a goal. From the customer perspective, this study reveals attitudes toward brand equity dimensions, with the aim of aiming to raising customer awareness of the dimensions that have a particular impact on the creation of overall brand equity. Additionally, this study shows that customer perceptions of both monetary and non-monetary sales promotion methods adversely affect each observed dimension of brand equity and, consequently, overall brand equity. Finally, this paper will also be useful to other researchers studying the same topic, providing them with adequate guidelines and recommendations. This research has two limitations. First, this paper did not analyze the interrelationships between the observed dimensions of brand equity. Specifically, the study did not aim to demonstrate whether and to what extent there are statistically significant interrelationships between the observed dimensions of brand equity. As a result, a more detailed analysis of the dimensions of brand equity that are most effective in creating overall customer-based brand equity was omitted. The second limitation is that the research only examined the most frequent monetary (discounts) and non-monetary (specialty advertising) sales promotion methods. In addition to discounts, monetary sales promotion methods include coupons, partial cash refunds, and more. On the other hand, in addition to specialty advertising, non-monetary sales promotion methods include bonus packs, free samples, premiums, contests, and sweepstakes. The incorporation of some of these methods may have resulted in different customer perceptions of their impact on brand equity. Therefore, future research should aim to address these limitations.

LITERATURE

Aaker, D. A. (1991). *Managing brand equity: Capitalizing on the value of a brand name.* New York: Free Press.

Aaker, D. A. (1996). *Measuring brand equity across products and markets.* New York: Free Press.

Aaker, D. A., & Joachimsthaler, E. (2000). *Brand leadership.* New York: Free Press.

Adam, A., Lema, J., & Argusa, J. (2012). Customer-based brand equity in the Maldives. *Journal of*

Tourism Research & Hospitality, 1(2), 1-7.

Alimpić, S. (2018). Uticaj metoda unapređenja prodaje na impulsivno ponašanje potrošača. *Doktorska disertacija*. Ekonomski fakultet Univerziteta u Kragujevcu.

Alimpić, S., Perić, N., & Mamula, T. (2020). Impact of certain sales promotion tools on consumers' impulse buying behavior. *Journal of Applied Economic Sciences, 15*(1), 45-55.

Alvarez, B. A., & Casielles, R. V. (2005). Consumer evaluations of sales promotion: The effect on brand choice. *European Journal of Marketing, 39*(1/2), 54-70.

Amini, A. (2012). Effectiveness of marketing strategies and corporate image on brand equity as a sustainable competitive advantage. *Interdisciplinary Journal of Contemporary Research in Business, 4*(2), 192-205.

Atilgan, E., Askoy, S., & Akinci, S. (2005). Determinants of the brand equity: A verification approach in the beverage industry in Turkey. *Marketing Intelligence and Planning, 23*(2/3), 237-248.

Bailey, R., & Ball, S. (2006). An exploration of the meanings of hotel brand equity. *The Service Industries Journal, 26*(1), 15-38.

Baloglu, S. (2002). Dimensions of customer loyalty: Separating friends from well-wishers. *Cornell Hotel & Restaurant Administration Quarterly, 43*(1), 47-59.

Bandyopadhyay, S., Gupta, K., & Dube, L. (2005). Does brand loyalty influence double jeopardy? A theoretical and empirical study. *Journal of Product & Brand Management, 14*(7), 414-423.

Belch, G. E., & Belch, M. A. (2015). *Advertising and promotion: An integrated marketing communications perspective* (10th ed.). McGraw-Hill Education.

Bhakar, S. S., & Bhakar, S. (2020). Impact of price promotion on brand equity model: A study of online retail store brands. *Journal of Content, Community & Communication, 11*(6), 124-142.

Bowen, J., & Shoemaker, S. (1998). Loyalty: A strategic commitment. *Cornell Hotel & Restaurant Administration Quarterly, 39*(1), 12-25.

Bridges, S., Keller, K. L., & Sood, S. (2000). Communication strategies for brand extensions: Enhancing perceived fit by establishing explanatory links. *Journal of Advertising, 29*(4), 1-11.

Buil, I., de Chernatony, L., & Martínez, E. (2010). The effect of advertising and sales promotions on brand equity. *6th Thought Leaders in Brand Management International Conference. 14.* Lugano: Università della Svizzera Italiana.

Buil, I., de Chernatony, L., & Martínez, E. (2013). Examining the role of advertising and sales promotions in brand equity creation. *Journal of Business Research, 66*(1), 115-122.

Campo, S., & Yagüe, M. J. (2008). Research note: Effects of price on tourist satisfaction. *Tourism Economics, 14*(3), 657-661.

Chandon, P., Wansink, B., & Laurent, G. (2000). A benefit congruency framework of sales promotion effectiveness. *Journal of Marketing, 64*(4), 65-81.

Chattopadhyay, T., Shivani, S., & Krishnan, M. (2010). Marketing mix elements influencing brand equity and brand choice. *Vikalpa: The Journal for Decision Makers, 35*(3), 67-84.

Chaudhuri, A., & Holbrook, M. B. (2001). The chain of effects from brand trust and brand affect to brand performance: The role of brand loyalty. *Journal of Marketing, 65*(2), 81-93.

Chen, A. (2001). Using free association to examine the relationship between the characteristics of brand associations and brand equity. *Journal of Product & Brand Management, 10*(7), 439-451.

Christodoulides, G., de Chernatony, L., Furrer, O., Shiu, E., & Abimbola, T. (2006). Conceptualising and measuring the equity of online brands. *Journal of Marketing Management, 22*(7/8), 799-825.

Chu, S., & Keh, H. T. (2006). Brand value creation: Analysis of the interbrand-business week brand value rankings. *Marketing Letters, 17*(2), 323-331.

Cobb-Walgren, C. J., Ruble, C. A., & Donthu, N. (1995). Brand equity, brand preferences, and purchase intent. *Journal of Advertising, 24*(3), 25-40.

Crescitelli, E., & Figueiredo, J. B. (2009). Brand equity evolution: A system dynamics model. *Brazilian Administration Review, 6*(2), 101-117.

Cvijović, J., Kostić-Stanković, M., & Petronijević, M. (2014). Uloga unapređenja prodaje u izgradnji brenda. *Anali poslovne ekonomije, 10*, 15-27.

Darke, P. R., & Chung, C. M. (2005). Effects of pricing and promotion on consumer perceptions: It depends on how you frame it. *Journal of Retailing, 81*(1), 35-47.

DelVecchio, D., Henard, D. H., & Freling, T. H. (2006). The effect of sales promotion on post-promotion brand preference: A meta-analysis. *Journal of Retailing, 82*(3), 203-213.

Egan, J. (2007). *Marketing communications.* London: Thomson Learning.

Faircloth, J. B., Capella, L. M., & Alford, B. L. (2001). The effect of brand attitude and brand image on brand equity. *Journal of Marketing Theory and Practice, 9*(3), 61-76.

Gill, M. S., & Dawra, J. (2010). Evaluating Aaker's sources of brand equity and the mediating role of brand image. *Journal of Targeting, Measurement and Analysis for Marketing, 18*(3), 189-198.

Grubor, A., Đokić, N., & Milićević, N. (2015). Aktivnosti unapređenja prodaje u konceptu globalnog marketinga. *Časopis za ekonomiju i tržišne komunikacije, 5*(2), 253-264.

Guizani, H., Florence, P. V., & Becheur, I. (2009). The impact of brand personality and marketing communications on brand equity: An exploratory segmentation approach. *Australian & New Zealand Marketing Academy Conference.* Melbourne, Australia.

Hajipour, B., Bavarsad, B., & Zarei, S. E. (2013). Effect of marketing factors on brand relationship equity and affects the customers' purchase intention. *Journal of Management Research, 5*(1), 317-332.

Jobber, D., & Fahy, J. (2006). *Osnovi marketinga* (2nd ed.). Beograd: Data Status.

Jørgensen, S., Taboubi, S., & Zaccour, G. (2003). Retail promotions with negative brand effects: Is cooperation possible? *European Journal of Operational Research, 150*(2), 395-405.

Kazmi, S. H., & Batra, S. K. (2008). *Advertising and sales promotion* (3rd ed.). New Delhi: Excel Books.

Keller, K. L. (2003). *Strategic brand management: Building, measuring, and managing brand equity* (International Edition ed.). Upper Saddle River, NJ: Pearson.

Keller, K. L. (2008). *Strategic brand management* (3rd ed.). Upper Saddle River, NJ: Pearson Education.

Keller, K. L. (2013). *Strategic brand management: Building, measuring, and managing brand equity* (4th ed.). Pearson Education.

Kim, J. H., & Hyun, Y. J. (2011). A model to investigate the influence of marketing mix efforts and corporate image on brand equity in the IT software sector. *Industrial Marketing Management, 40*(3), 424-438.

Kim, W. G., & Kim, H. B. (2004). Measuring customer-based restaurant brand equity: Investigating the relationship between brand equity and firms' performance. *Cornell Hotel and Restaurant Administration Quarterly, 45*(2), 115-131.

Kirmani, A., & Wright, P. (1989). Money talks: Perceived advertising expense and expected product quality. *Journal of Consumer Research, 16*(3), 344–353.

Kline, R. B. (1998). *Principles and practice of structural equation modeling.* New York: NY: The Guilford Press.

Kocić, M., Marinković, V., & Alimpić, S. (2016). Merenje vrednosti brenda za potrošače: Empirijski dokazi sa tržišta prehrambenih proizvoda u Srbiji. *Anali Ekonomskog fakulteta u Subotici, 52*(35), 189-206.

Köksal, Y., & Spahiu, O. (2014). The efficiency of monetary and non-monetary sales promotions on brand preference: A case of Albanian GSM companies. *Istanbul University Journal of the School of Business Administration, 43*(2), 319-331.

Kotler, P., & Armstrong, G. (2009). *Principles of marketing* (13th ed.). Upper Saddle River, NJ: Prentice Hall.

Kotler, P., & Armstrong, G. (2012). *Principles of marketing* (14th ed.). Upper Saddle River, NJ: Prentice Hall.

Kotler, P., & Keller, K. L. (2006). *Marketing menadžment.* Beograd: Data Status.

Kovač-Žnideršić, R., Grubor, A., Miličević, N., & Leković, K. (2014). Uticaj lojalnosti na reakcije potrošača u situacijama nedostatka zaliha. *Marketing, 45*(4), 282-299.

Kumar, S., & Patra, S. (2017). Does promotion mix really help to enhance brand equity: A literature review. *Indian Journal of Commerce & Management Studies, 8*(2), 80-86.

Langga, A., Kusumawati, A., & Alhabsji, T. (2020). Intensive distribution and sales promotion for improving customer-based brand equity (CBBE), re-purchase intention, and word-of-mouth (WOM). *Journal of Economic and Administrative Sciences, 37*(4), 577-595.

Laroche, M., Pons, F., Zgolli, N., Cervellon, M., & Kim, C. (2003). A model of consumer response to two retail promotion techniques. *Journal of Business Research, 56*(7), 513-522.

Leek, S. H., & Christodoulides, G. (2011). A framework of brand value in B2B markets: The contributing role of functional and emotional components. *Industrial Marketing Management, 6*(1), 34-48.

Lehmann, D. R., Keller, K. L., & Farley, J. U. (2008). The structure of survey-based brand metrics. *Journal of International Marketing, 16*(4), 29-56.

Leone, R. P., Rao, V. R., Keller, K. L., Luo, A. M., McAlister, L., & Srivastava, R. (2006). Linking brand equity to customer equity. *Journal of Service Research, 9*(2), 125-138.

Liao, S. (2006). The effects of nonmonetary sales promotions on consumer preferences: The contingent role of product category. *The Journal of American Academy of Business, Cambridge, 196*(203), 196-203.

Liu, G., Liston-Heyes, C., & Ko, W. W. (2010). Employee participation in cause-related marketing strategies: A study of management perceptions from British consumer service industries. *Journal of Business Ethics, 92*(2), 195-210.

Marinković, V., & Savović, S. (2009). Marketinški pokazatelji atraktivnosti tržišta i konkurentnosti ciljnog preduzeća. *Marketing, 40*(4), 221-232.

Martinez, E., Montaner, T., & Pina, J. M. (2009). Brand extension feedback: The role of advertising. *Journal of Business Research, 62*(3), 305-313.

Mendez, M., Bendixen, M., Abratt, R., Yurova, Y., & O'Leary, B. (2015). Sales promotion and brand loyalty: Some new insights. *International Journal of Education and Social Science, 2*(1), 103-117.

Mohan, B., & Sequeira, A. H. (2012). Customer-based brand equity in the fast-moving consumer goods industry in India. *The International Journal of Management, 1*(4), 1-19.

Montaner, T., & Pina, J. M. (2011). The effect of promotion type and benefit congruency on brand image. *Journal of Applied Business Research (JABR), 24*(3), 15-28.

Moreau, P., Lehmann, D. R., & Markman, A. B. (2001). Entrenched knowledge structures and consumer response to new products. *Journal of Marketing Research, 38*(1), 14-29.

Mullin, R., & Cummins, J. (2008). *Sales promotion: How to create, implement and integrate campaigns that really work* (4th ed.). London: Kogan Page.

Neslin, S. A. (2002). *Sales promotion.* Cambridge, MA: Marketing Science Institute.

Netemeyer, R. G., Krishnan, B., Pullig, C., Wang, G., Yagci, M., Dean, D., . . . Wirth, F. (2004). Developing and validating measures of facets of customer-based brand equity. *Journal of Business Research, 57*(2), 209-244.

Nikabadi, M. S., Safui, M. A., & Agheshlouei, H. (2015). Role of advertising and promotion in brand equity creation. *Journal of Promotion Management, 21*(1), 13-32.

Nunes, J. C., & Park, C. W. (2003). Incommensurate resources: Not just more of the same. *Journal of Marketing Research, 40*(1), 26-38.

Oliver, R. L. (1997). *Satisfaction: A behavioral perspective on the consumer*. New York, NY: McGraw-Hill.

Oyedapo, W., Akinlabi, B., & Sufian, J. (2012). The impact of sales promotion on organizational effectiveness in Nigeria manufacturing industry. *Universal Journal of Marketing and Business Research, 1*(4), 123-131.

Palazón-Vidal, M., & Delgado-Ballester, E. (2005). Sales promotions effects on consumer-based brand equity. *International Journal of Market Research, 47*(2), 179-204.

Palazón-Vidal, M., & Delgado-Ballester, E. (2009). Effectiveness of price discounts and premium promotions. *Psychology and Marketing, 26*(12), 1108-1129.

Palmer, A. (2004). *Introduction to marketing theory and practice* (2nd ed.). United States: Oxford University Press Inc.

Pappu, R., Quester, P. G., & Cooksey, R. W. (2005). Consumer-based brand equity: Improving the measurement – Empirical evidence. *Journal of Product & Brand Management, 14*(3), 143-154.

Pappu, R., Quester, P. G., & Cooksey, R. W. (2006). Consumer-based brand equity and country-of-origin relationships: Some empirical evidence. *European Journal of Marketing, 40*(5/6), 696-717.

Pauwels, K., Hanssens, D. M., & Siddarth, S. (2002). The long-term effects of price promotions on category incidence, brand choice, and purchase quantity. *Journal of Marketing Research, 39*(4), 421–439.

Pradhan, J., & Prasad, D. (2014). Measuring customer-based brand equities of FMCGs in Indian rural markets: An empirical study. *International Journal of Business and Management Invention, 3*(1), 51-62.

Projović, I., & Popović Šević, N. (2013). Marketinške komunikacije u savremenom poslovanju. *Časopis za ekonomiju i tržišne komunikacije, 3*(1), 105-122.

Puška, A., Stojanović, I., & Berbić, S. (2018). The Impact of Chocolate Brand Image, Satisfaction, and Value on Brand Loyalty. *Economy and Market Communication Review, 8*(1), 37-54.

Raghubir, P., Inman, J. J., & Grande, H. (2004). The three faces of consumer promotions. *California Management Review, 46*(4), 23-42.

Rahmani, Z., Mojaveri, H. S., & Allahbakhsh, A. (2012). Review the impact of advertising and sales promotion on brand equity. *Journal of Business Studies Quarterly, 4*(1), 64-73.

Rojuee, H., & Rojuee, M. (2017). The impact of advertising and sales promotion methods on brand loyalty through brand equity: Case study of Chitoz Brand. *International Journal of Basic Sciences & Applied Research, 6*(1), 11-18.

Ruswidyo, A. N., & Hudrasyah, H. (2012). Validating the instrument for measuring brand equity in Indonesian fuel retail brands. *2nd International Conference on Business, Economics, Management and Behavioral Sciences.* Bali (Indonesia).

Salelaw, G. T., & Singh, A. (2016). The impact of sales promotion on brand equity: The case of brewery industry. *Journal of Marketing and Consumer Research, 22*(24), 68-81.

Selvakumar, J. J., & Vikkraman, P. (2011). Impact of advertising and price promotions on brand

equity in service sector. *Journal of Contemporary Research in Marketing, 6*(3), 51-65.

Shariq, S., & Anjum, S. (2023). Examining the role of advertising and sales promotion in brand equity creation of tea industry in Pakistan with moderating effect of brand experience. *Journal of Academic Research for Humanities, 3*(1), 170-185.

Shashikala, R., & Suresh, A. M. (2013). Measuring customer-based brand equity using Aaker's model. *Indian Journal of Marketing, 43*(3), 5-13.

Shu-Ling, L., Yung-Cheng, S., & Chia-Hsien, C. (2009). The effects of sales promotion strategy, product appeal, and consumer traits on reminder impulse buying behavior. *International Journal of Consumer Studies, 33*(3), 274-284.

Siby, Z., & James, M. (2011). The effect of sales promotion on consumer-based brand equity. *Doctoral dissertation, Cochin University of Science and Technology*.

Suri, J., Manchanda, R. V., & Kohli, C. S. (2000). Brand evaluations: A comparison between fixed price and discounted price offers. *Journal of Product and Brand Management, 9*(3), 193-204.

Tong, X., & Hawley, J. M. (2009). Measuring customer-based brand equity: Empirical evidence from the sportswear market in China. *Journal of Product & Brand Management, 18*(4), 262-271.

Umar, T. R., Mat, N. K., Tahir, F. A., & Alekam, J. M. (2012). The practicality and application of Aaker's customer-based brand equity model in the Nigerian banking sector. *American Journal of Economics, 2*(4), 149-152.

Valette-Florence, P., Guizani, H., & Merunka, D. (2011). The impact of brand personality and sales promotions on brand equity. *Journal of Business Research, 64*(1), 24-28.

Vasić Nikčević, A., Alimpić, S., & Perić, N. (2020). The efficiency of sales promotion methods emphasizing impulse behavior: Case of Serbia. *Quality-Access to Success, 21*(175), 13-17.

Vázquez, R., del Río, A. B., & Iglesias, V. (2002). Consumer-based brand equity: Development and validation of a measurement instrument. *Journal of Marketing Management, 18*(1-2), 431-445.

Villarejo-Ramos, A. F., & Sánchez-Franco, M. J. (2005). The impact of marketing communication and price promotion on brand equity. *Journal of Brand Management, 12*(6), 431-445.

Washburn, J. H., & Plank, R. E. (2002). Measuring brand equity: An evaluation of a consumer-based brand equity scale. *Journal of Marketing Theory and Practice, 10*(1), 46-62.

Yang, W., Zhang, L., & Mattila, A. S. (2016). Luxe for less: How do consumers react to luxury hotel price promotions? The moderating role of consumers' need for status. *Cornell Hospitality Quarterly, 57*(1), 82-92.

Yi, Y., & Yoo, J. (2011). The long-term effects of sales promotions on brand attitude across monetary and non-monetary promotions. *Psychology and Marketing, 28*(9), 879-896.

Yoo, B., & Donthu, N. (2001). Developing and validating a multidimensional consumer-based brand equity scale. *Journal of Business Research, 52*(1), 1-14.

Yoo, B., Donthu, N., & Lee, S. (2000). An examination of selected marketing mix elements and brand equity. *Journal of the Academy of Marketing Science, 28*(2), 195-211.

Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing, 52*(3), 2-22.

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501087V
UDK: 004.42:338.48-44(4-572EU)
Datum prijema rada: 21. januar 2025.
Submission Date: January 21, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 87-98

ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

CLICK, SHARE, RECOMMEND: EXPLORING USER BEHAVIOUR IN MOBILE APP USAGE

Katija Vojvodić | Full professor, Faculty of Economics and Business, University of Dubrovnik, Dubrovnik, Croatia, katija.vojvodic@unidu.hr , ORCID ID 0000-0001-7870-1438

Matea Matić Šošić | Associate Professor, Faculty of Economics and Business, University of Dubrovnik, Dubrovnik, Croatia, matea.matic@unidu.hr; ORCID ID 0000-0003-2788-2472

***Abstract**: In order to understand the use of mobile apps, this research examines potential differences in users' attitudes towards mobile app features, privacy policies and recommendations related to mobile apps. More specifically, it looks at the impact that mobile application features have on users' willingness to share personal data and on the propensity to recommend the mobile application. The study was performed between May and September 2023 and aimed at 230 participants with mobile app usage in the last 6 months. The data was obtained using a Google form that was shared on social media platforms. Factor analysis and analysis of variance were performed to achieve the research objectives. Results from the study reveal that there are significant differences between the factors usefulness and reliability, and users' attitudes towards using mobile apps. However, no significant differences were identified for the simplicity factor. The analysis of variance further indicates that there are significant differences between the extracted factors and users' attitudes towards mobile app privacy. Similarly, the results show significant differences between the extracted factors and users' attitudes towards mobile app recommendations.*

***Keywords**: mobile apps, mobile apps usage, mobile apps features, privacy, user behaviour*

***JEL Classification**: M31*

INTRODUCTION

The ever-growing number of mobile applications has significantly changed the way people use and interact with digital platforms, particularly in the areas of communication, commerce and entertainment. Mobile applications or mobile apps are a marketing tool and a common advertising tactic that offer great potential for customer engagement due to their unique features (Stocchi, L., Pourazad, N. & Michaelidou, N., 2020). In addition, they improve customer engagement by leveraging features such as novelty and interactivity that transform communication efforts into value-generating

experiences such as purchases and information access (Natarajan, T., Balasubramanian, S.A. & Kasilingam, D.L., 2017).

However, the widespread use of mobile applications has also brought new challenges in terms of user trust, privacy and behavioural intentions. With the increasing popularity of apps, academic research on this topic has also increased. Research has shown that trust-building mechanisms, such as transparent data practices and secure payment options, play an important role in promoting user trust (Gefen, D., Karahanna, E. & Straub, D. W., 2003). In addition, privacy concerns and security risks significantly influence users' willingness to adopt and use mobile applications (Binns, R., Veale, M., Van Kleek, M. & Shadbolt, N., 2018) (de Reuver, M., Sørensen, C., & Basole, R. C., 2018). As a result, understanding the factors that influence users' attitudes towards mobile app adoption, privacy and recommendations remains an important research focus.

However, there are still gaps in understanding the combined influence of app features on user behaviour, particularly in relation to users' willingness to disclose private information and the likelihood that they will recommend mobile apps to others. In that context, this paper fills this research gap by examining how mobile app features shape users' perceptions of privacy and influence their recommendation behaviour. By examining users' attitudes toward privacy and app recommendations, this study aims to provide insights for app developers, marketers, and policy makers seeking to improve user satisfaction and data security. The next sections deal with an overview of the relevant literature, a detailed explanation of the research methodology, the research results and discussion. Finally, limitations, future research directions and practical implications are outlined.

LITERATURE OVERVIEW

Previous research on mobile apps has distinguished three stages, i.e. the pre-adoption stage, adoption and the post-adoption stage (Stocchi, L., Pourazad, N., Michaelidou, N., Tanusondjaja, A. & Harrigan, P., 2022), where users in each stage may have different attitudes, characteristics, experiences and intentions. In this context, previous studies addressed a wide range of individual user characteristics such as hedonic characteristics (Alalwan, 2020), consumer innovativeness (Koenig-Lewis, N., Marquet, M., Palmer, A., & Zhao, A. L., 2015), customer's interest in the app (Taylor, G. D. & Levin, M., 2014) and personality (Fang, 2019).

As regards the perceived ease of use, it plays a critical role in fostering personal connections between consumers and the apps they use. These connections, in turn, influence not only their preference for purchasing through mobile apps compared to physical stores but also their overall purchasing behaviour and future intentions to continue using and recommending the apps (Newman, C. L., Wachter, K. & White, A., 2018). Additionally, the findings indicate that privacy concerns significantly shape users' attitudes and behaviours toward mobile apps (Axcell, S. & Ellis, D. , 2023). Consumers who perceive branded apps as customizable, privacy-friendly, and compatible with their needs tend to perceive the apps' usefulness and ease of use more strongly, which reinforces their intention to use the app (Stocchi, L., Michaelidou, N. & Micevski, M. , 2019). As a result, they are willing to recommend the app and pay for further access to its functions.

Ease of use is repeatedly emphasised as a key factor influencing users' intention to continue using mobile applications (Kang, 2014). However, with the increasing number of mobile apps available, the challenge of efficiently recommending relevant apps to users has become increasingly complex. Current recommendation approaches for mobile apps that use user attributes and behavioural patterns have proven to be effective, but often overlook the interdependencies and distribution patterns of topic-specific apps across different user groups (Chen, J., Cao, B., Peng, Z., Xie, Z., Liu, S. & Peng, Q., 2024). Recent studies also highlight the significant role of user engagement in shaping mobile app adoption and usage behaviours. Consumer interest in a retail app is positively related to the intention to engage in activities related to shopping and information-sharing (Taylor, G. D. & Levin, M. , 2014). This suggests that consumer engagement goes beyond transactional behaviour, extending to the active dissemination of information.

Brand trust also plays a major role in buying decisions. In this context, consumers who have a strong trust in brands are more willing to buy new and regular products (Sung, 2020). In addition, user trust mitigates privacy concerns and can be used to overcome privacy-related barriers to app adoption (Aydin, 2023). Behavioural factors, such as hedonic motivation and habitual use have also been recognised as strong predictors of mobile shopping app usage (Tak, P. & Panwar, S. , 2017). Offers and promotions increase user engagement, while facilitating conditions, such as technical support and ease of use, contribute to the sustained adoption of shopping apps.

User behaviour within app ecosystems tends to evolve over time. In the early stages, users typically download similar apps, reflecting a preference for familiar content. Over time, however, their preferences diversify based on their level of emotional attachment and the intensity of their need to share information (Son, 2017). Users willing to share information are more inclined to download communication and information-sharing apps rather than information-seeking apps, indicating a shift from passive to active digital engagement. Perceived app security plays a crucial role in building user trust, which, in turn, positively influences user involvement, commitment, and their willingness to provide feedback on app recommendations (Ravichandran, S., Osakwe, C. N., Elgammal, I. M. Y., Abbasi, G. A. & Cheah, J.-H. , 2024). Moreover, users' intentions to disclose personal information are shaped by both privacy concerns and privacy fatigue (Tang, J., Akram, U. & Shi, W. , 2021).

Privacy in the context of applications is considered a critical factor for acceptance and use, which primarily depends on consumer trust (Morosan, C. & DeFranco, A. , 2015) (Morosan, C. & DeFranco, A. , 2016). The security of mobile apps is another critical factor influencing in-app purchasing behavior (Liu, Y. (D)., Chung, H. F. L., Zhang, Z. (J). & Wu, M. , 2023). Mobile app features, such as perceived ubiquity, informativeness, and personalization, are positively associated with perceived usefulness, resulting in increased app retention and positive word-of-mouth (Kim, S., Baek, T. H., Kim, Y.-K. & Yoo, K. , 2016a). Among these characteristics, personalization is the strongest predictor of an app's usefulness and user engagement. Privacy concerns, on the other hand, have a negative impact on users' willingness to reveal personal information. However, privacy protection measures and perceived personalization contribute to consumer empowerment and promote a sense of control over data-sharing decisions (Luo, D., Ni, X., Aw, E. C.-X. & Tan, G. W.-H. , 2024). Malgieri, G. &

Custers, B., 2018 argued that empowering users to take control of their data increases trust and compliance.

Finally, user satisfaction also plays an important role in the decision to disclose personal information. Mobile app users are often faced with the decision to grant access to personal data to use certain functions. Research suggests that the perceived benefits of an app have a greater impact on satisfaction than the perceived risks. These benefits, in turn, indirectly influence users' willingness to disclose personal data by increasing their overall satisfaction with the app experience (Najjar, M. S., Dahabiyeh, L. & Algharabat, R. S., 2021).

METHODOLOGY

The study investigates the influence of mobile app features on user behaviour, particularly regarding the sharing of private information and the recommendation of mobile apps to others. Primary data were collected through a purposive sampling method from respondents aged 18 to 48, during the period from May to September 2023. The sample consisted of 230 respondents who actively use mobile apps. The target population comprised users who had made online purchases via mobile apps within the last six months. Respondents who had not engaged in mobile purchases during this period were excluded from the survey.

The items of the questionnaire were derived from the existing literature and adapted for the purposes of this study. The instrument consisted of two sections. The first section captured demographic characteristics, including gender, age, education level, income level and daily time spent on mobile apps. The second section focused on mobile app features, covering aspects such as perceived ease of use, service quality, perceived usefulness and perceived informativeness. The constructs related to perceived ease of use, service quality, perceived informativeness, and attitudes toward mobile app privacy and recommendations were adopted from (Hanjaya, S. M., Kenny, S. K. & Gunawan, S. F. 2019). Items measuring perceived usefulness and attitudes towards mobile app usage were modified from the study by (Moon, E. & Domina, T. , 2015).

Each item of the questionnaire was rated on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The statistical analysis methods used included descriptive statistical analysis, factor analysis, and analysis of variance. Descriptive statistical analysis was used to sum up the basic characteristics of the data to provide an overview of the most important sample attributes (Table 1). Methodology must be described clearly and precisely; the methodological contribution of authors (if available) must be established and it must all be done in a fashion that it allows for its testing by other authors.

Table 1. Sample characteristics

Sample characteristics	N	Percent (%)
AGE:		
18-26	141	61.3
27-37	33	14.3
38-48	56	24.4

GENDER:		
Male	75	32.6
Gender	155	67.4
Education level:		
Elementary school	3	1.3
High school	109	47.4
College	19	8.3
Graduate	78	33.9
Master and PhD	21	9.1
Monthly income (EUR):		
597-729,99	26	11.3
730-862,99	15	6.5
863-995,99	22	9.6
996 and more	73	31.7
I prefer not to provide an answer	22	9.6
I do not have any income	72	31.3

Source: Research findings (N=230)

The statistical analysis was performed using the Statistical Package for the Social Science (SPSS), version 29.

EMPIRICAL EVIDENCE

Confirmatory factor analysis was conducted to assess the convergent validity of the measurement scale. The Cronbach's alpha coefficient represents the weighted mean of the standard change resulting from the proportion of the total variance of the k statements in the scale to the total variance (Bryman, A. & Cramer, D. , 2011). The Cronbach's alpha coefficient was used to assess the reliability of the measurement scale (Table 2).

Table 2: Reliability of the measurement scale related to mobile app features

Number of variables	Cronbach's Alpha
19	.881

Source: Research findings (N=230)

The Cronbach's alpha value was 0.881, with each variable exhibiting an alpha value greater than 0.7, indicating high internal consistency and satisfactory reliability of the measurement scale. To further validate the research measurement scale, Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) test were performed. The results of these statistical tests are presented in Table 3.

Table 3: KMO test and Bartlett's test of sphericity for the measurement scale of mobile app features

KMO test		.878
Bartlett's test of sphericity x^2	Hi-square	1356.827
Degree of freedom (df)		78
Significance		.000

Source: Research findings (N=230)

The suitability of the data set for the factor analysis was checked using the KMO test and Bartlett's test of sphericity before the exploratory factor analysis was carried out. The p-value for the Bartlett's test was significant at the 0.001 level ($\alpha \leq 0.05$), indicating that the variables were sufficiently correlated to justify factor analysis. The KMO value is 0.878, indicating a high level of common variance among the variables. These results confirm that the sample is suitable for further factor analysis.

The validity of the measurement scale was tested using principal component analysis (PCA) with varimax rotation. PCA was considered more suitable in this context as it aimed to empirically reveal an existing structure rather than evaluate the suitability of statements for a particular construct (Tabachnick, B. G. & Fidell, L. S. , 2019). To further ensure the construct validity of the measurement scale, an exploratory factor analysis was performed. Table 4 shows the number of factors extracted from the measurement scale.

Table 4: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.657	43.512	43.512	3.111	23.929	23.929
2	1.487	11.441	54.953	2.899	22.298	46.227
3	1.223	9.408	64.362	2.358	18.135	64.362

Extraction Method: Principal Component Analysis

Source: Research findings (N=230)

Once the suitability of the data set for the factor analysis has been confirmed, an exploratory factor analysis was carried out using PCA with Varimax rotation. When determining the number of factors in the scale, factors with eigenvalues greater than 1 were taken into account. An internal consistency test was also performed to evaluate the reliability of the scale.

The exploratory factor analysis identified three factors within the scale, which comprises 13 statements. As shown in Table 3, three factors with eigenvalues above 1 were extracted. The analysis revealed that factor 1 explained 43.51% of the total variance, factor 2 explained 11.44% and factor 3 explained 9.40%. Together, the three factors explained 64.36% of the total variance using the varimax rotation method. The factor loadings for all items were above 0.50, which indicate a high convergent and discriminant validity. It can be concluded that factor 1 refers to the customized features of mobile app usage and is referred to as the usefulness factor. Factor 2 refers to the

reliable use of mobile apps and is referred to as the reliability factor, while factor 3 corresponds to the ease of use of mobile apps and is referred to as the simplicity factor.

Based on the result of the factor analysis, ANOVA was conducted to examine the differences between the identified factors and users' attitudes towards mobile app usage, their intention to use mobile apps, and their attitudes towards mobile app privacy. The results of the ANOVA between the factors and attitudes towards the mobile app usage are presented in Table 5.

Table 5: Analysis of variance between the factors and attitudes towards the mobile app usage

	Sum of squares	df	Mean square	F	Sig.
Usefulness factor	65.428	34	1.924	2.294	.000
Reliability factor	91.176	34	2.682	3.794	.000
Simplicity factor	39.949	34	1.175	1.212	.210

Source: Research findings (N=230)

Table 5 indicates a significant difference between the usefulness and reliability factors and users' attitudes towards using the mobile app. The results of the usefulness factor in relation to attitudes towards mobile app usage show statistically significant differences ($p<0.000$, $F=2.294$). Users who engage with mobile apps due to their useful content or information are more likely to have a positive attitude towards the use of mobile apps. Therefore, individuals who perceive mobile apps as valuable and suitable tools for daily activities are more inclined to develop a favourable attitude towards the mobile app usage.

The analysis shows a significant relationship between the reliability factor and users' attitudes towards the mobile app usage ($p<0.000$, $F=3.794$). This indicates that users who perceive mobile apps as reliable or dependable tools are more inclined to use them. Reliability appears to be a feature that can enhance positive attitudes towards the use of mobile apps. For these users, trustworthiness may serve a key motivator in adopting mobile apps as tools that meet their needs. In contrast, the results of the ANOVA to examine differences between the simplicity factor and attitudes towards the mobile app usage ($p<0.210$, $F=1.212$) indicate no significant differences. This suggests that simplicity does not significantly influence users' attitudes towards the mobile app usage. The results examining the relationship between the factors and attitudes towards mobile app privacy are shown in Table 6.

Table 6: Analysis of variance between factors and attitudes toward mobile app privacy

	Sum of squares	df	Mean square	F	Sig.
Usefulness factor	30.735	12	2.561	2.803	.001
Reliability factor	52.848	12	4.404	5.425	.000
Simplicity factor	21.483	12	1.790	1.872	.039

Source: Research findings (N=230)

The results revealed significant differences between the usefulness factor and attitudes towards mobile apps privacy ($p<0.001$, $F=2.803$). The findings indicate that users who engage with mobile apps for personalised and useful content are more willing to disclose private information. Mobile apps that cater to users' needs by offering valuable and exclusive information can foster a greater sense of privacy security. For these users, mobile apps that facilitate access to customised information and enable secure information transfer and transactions are perceived more positively, making users more comfortable sharing private data.

Further analysis was conducted to investigate the relationship between the second extracted factor, reliability, and attitudes towards privacy in mobile apps. The analysis showed significant differences between the reliability factor and mobile app privacy attitudes ($p<0.000$, $F=5.425$), as shown in Table 5. The results suggest that mobile apps providing credible and trustworthy information are perceived as safe platforms for sharing private or payment-related information. Reliability can be regarded as a key feature that enhances users' confidence in the mobile app usage, providing that the data they share remain secure and uncompromised.

The results for the simplicity factor in relation to attitudes towards mobile app privacy revealed significant differences ($p < 0.039$, $F=1.872$). The findings suggest that simplicity, or user-friendliness, may be an important factor influencing the willingness to share private information. Users who perceive mobile apps as simple and easy to navigate tend to have greater confidence in the app's reliability, particularly when providing sensitive information, such as credit card details. Table 7 shows the results of the ANOVA between the identified factors and users' attitudes towards recommending the use of mobile apps.

Table 7: Analysis of variance between the identified factors and users' attitudes toward recommending the use of mobile apps

	Sum of squares	df	Mean square	F	Sig.
Usefulness factor	27.089	4	6.772	7.547	.000
Reliability factor	54.676	4	13.669	17.642	.000
Simplicity factor	16.530	4	4.132	4.376	.002

Source: Research findings (N=230)

The results examining the differences within the factors in attitudes towards recommending the use of mobile apps ($p<0.000$, $F=7.547$) show significant differences for the usefulness factor. Mobile apps that provide information tailored to users' search and usage histories are more likely to be positively received, leading users to recommend these apps to others. Users are particularly inclined to recommend mobile apps that offer personalized or exclusive services and provide high-quality customer support. For the reliability factor, the analysis also revealed significant differences ($p<0.000$, $F=17.642$). The findings show that users who trust mobile apps are more willing to share private information. These users place a higher level of trust in mobile apps that provide credible and relevant information, particularly when it concerns the sharing of important personal data. Additionally, the analysis indicated statistically sig-

nificant differences for the simplicity factor in terms of attitudes towards recommending mobile apps ($p<0.002$, $F=4.376$). This suggests that users who find mobile apps simple and intuitive, requiring minimal effort to use, are more likely to recommend them to others. Mobile apps that streamline user interactions and enhance usability contribute to greater user satisfaction, thereby increasing the likelihood of recommendations. In summary, users who value personalised and reliable information tend to have a positive attitude towards the mobile app usage. Moreover, users who view mobile apps as efficient tools that provide necessary information with minimal effort are more willing to share private information and promote these apps through positive word-of-mouth recommendations.

RESULTS AND DISCUSSION

The findings indicate significant differences between the factor's usefulness and simplicity and users' attitudes towards using mobile apps. Users who engage with mobile apps because of personalised content or information tend to have a positive attitude towards using mobile apps. These users perceive mobile apps as valuable tools in their daily lives and have a positive attitude towards their use. This is in line with previous research that emphasises that usefulness and ease of use promote positive consumer attitudes towards mobile applications (Kim, S. C., Yoon, D. & Han, E. K., 2016b) (Stocchi, L., Pourazad, N. & Michaelidou, N., 2020). The analysis also reveals a significant relationship between the reliability factor and attitudes towards the use of mobile applications. Users who perceive mobile apps as reliable and dependable tools are more inclined not only to use them, but also to recommend them to others.

In addition, the analysis shows significant differences between the three factors and attitudes towards data protection in mobile apps. Users who access mobile apps to receive personalised and exclusive content are more willing to reveal private information via mobile apps. Additionally, mobile apps that provide high-quality and credible information are perceived as safer platforms for sharing sensitive data as they promote user trust. When mobile apps are perceived as user-friendly, users are more confident that these apps will protect their private data.

The results examining differences between the factors and users' attitudes towards recommending mobile apps show significant differences. Mobile apps that provide credible and relevant information enhance users' trust, increasing their willingness to share important personal information. When users find mobile apps simple and easy to navigate, they report greater satisfaction, which in turn makes them more likely to recommend the app to others. This is consistent with the findings of Xu et al. (2015), who confirmed that user satisfaction, intention to continue using the app and the hedonic benefit of app usage are direct predictors of the intention to recommend the app.

CONCLUSION

There are several limitations that should be mentioned. In terms of sample composition, the study primarily included users between the ages of 18 and 48, which may not represent the broader population of mobile app users, particularly older or younger demographics who may exhibit different behavioural patterns. Another limitation relates to the method of data collection. Data were gathered through online surveys distributed via social media platforms, which may lead to self-selection bias, as re-

spondents who are more active online may differ in their behaviour from less active users. Additionally, the research design does not consider changes in user behaviour or preferences over time, especially as users become more familiar with mobile apps. Finally, the study did not consider the scope of mobile app categories (e.g. social media, e-commerce, games), which may influence users' attitudes towards privacy, usage and recommendations differently.

Future studies could adopt a longitudinal approach to examine how users' attitudes and behaviours evolve over time, particularly in response to privacy breaches or the introduction of new mobile app features. Additionally, future research could consider a more diverse sample by expanding the demographic characteristics to include a wider range of age groups, geographic locations and cultural backgrounds to improve the generalizability of the results. Further research could also distinguish between various types of mobile apps (e.g. entertainment, health, etc.) to determine whether certain features influence user behaviour differently depending on the app category. In addition, future studies could investigate the privacy settings and design elements that promote user trust and increase their willingness to share personal data.

The results of this study could be interesting for app developers, marketers and policy makers. Mobile app developers should prioritize transparency and security features that increase user trust, such as clear privacy policies, opt-in options for data sharing and visible security certifications. In addition, personalised content and recommendations can increase user engagement, provided these features are balanced with user privacy. Simplifying app interfaces can also enhance user satisfaction, which, as the findings suggest, can increase the likelihood of app recommendations. Clear communication about privacy settings and data usage policies can improve user attitudes towards privacy. In this context, marketers can highlight privacy-friendly features as part of their value proposition to appeal to privacy-conscious users. Finally, policymakers can use these insights to refine regulations to promote ethical data collection and encourage developers to adopt privacy principles to foster an ecosystem that prioritizes user trust.

LITERATURE

Alalwan, A. A. (2020). Mobile food ordering apps: An empirical study of the factors affecting customer e-satisfaction and continued intention to reuse. *International Journal of Information Management*, 28–44.

Axcell, S. & Ellis, D. . (2023). Exploring the attitudes and behaviour of Gen Z students towards branded mobile apps in an emerging market: UTAUT2 model extension. *Young Consumers*, 184-202.

Aydin, G. (2023). Increasing mobile health application usage among Generation Z members: evidence from the UTAUT model. *International Journal of Pharmaceutical and Healthcare Marketing, 17(3)*, 353-379.

Binns, R., Veale, M., Van Kleek, M. & Shadbolt, N. (2018). It's reducing a human being to a single dataset: User perceptions of profiling. *Proceedings of the 2018 ACM Conference on Human Factors in Computing Systems*, (str. 1-12).

Bryman, A. & Cramer, D. . (2011). *Quantitative Data Analysis with IBM SPSS 17, 18 & 19: A Guide for Social Scientists.* London: Routledge.

Chen, J., Cao, B., Peng, Z., Xie, Z., Liu, S. & Peng, Q. (2024). TN-MR: topic-aware neural network-based mobile application recommendation. *nternational Journal of Web Informa-*

tion Systems, 159-175.

de Reuver, M., Sørensen, C., & Basole, R. C. (2018). The Digital Platform: A Research Agenda. *Journal of Information Technology*, 124-135.

Fang, Y. (2019). An app a day keeps a customer connected: Explicating loyalty to brands and branded applications through the lens of affordance and service-dominant logic. *Information & Management*, 377–391.

Gefen, D., Karahanna, E. & Straub, D. W. (2003). Trust and TAM In online shopping:An integrated model. *MIS Quarterly*, 51-90.

Hanjaya, S. M., Kenny, S. K. & Gunawan, S. F. (2019). . (2019). Understanding factors influencing consumers online purchase intention via mobile app: perceived ease of use, perceived usefulness, system quality, information quality, and service quality. *Marketing of Scientific and Re-search Organizations, 32(2)*, 175-205.

Kang, S. (2014). Factors influencing intention of mobile application use. *International Journal of Mobile Communications*, 360-379.

Kim, S. C., Yoon, D. & Han, E. K. (2016b). Antecedents of mobile app usage among smartphone users. *Journal of Marketing Communications, 22*, 653–670.

Kim, S., Baek, T. H., Kim, Y.-K. & Yoo, K. . (2016a). Factors affecting stickiness and word of mouth in mobile applications. *Journal of Research in Interactive Marketing, 10(3),* , 177-192.

Koenig-Lewis, N., Marquet, M., Palmer, A., & Zhao, A. L. (2015). Enjoyment and social in-fluence: Predicting mobile payment adoption. *The Service Industries Journal*, 537–554.

Liu, Y. (D)., Chung, H. F. L., Zhang, Z. (J). & Wu, M. . (2023). The dark side of mobile apps: when and how technical security matters for in-app purchases? . *Asia Pacific Journal of Mar-keting and Logistics, 35 (12)*, 2965-2982.

Luo, D., Ni, X., Aw, E. C.-X. & Tan, G. W.-H. . (2024). Willingness to disclose information in mobile banking apps: how to tackle privacy concerns? . *International Journal of Bank Marketing, Vol. ahead-of-print, No. ahead-of-print*.

Malgieri, G. & Custers, B. (2018). Pricing privacy- the right to know the value of your personal data. *Computer Law & Security Review, 34(2)*, 289-303.

Moon, E. & Domina, T. . (2015). Willingness to use fashion mobile applications to purchase fashion products: A comparison between the United States and South Korea. *Journal of Textile and Apparel, Technology and Management, 9(3)*, 1-15.

Morosan, C. & DeFranco, A. . (2015). Disclosing personal information via hotel apps: A privacy calculus perspective. *International Journal of Hospitality Management, 47*, 120-130.

Morosan, C. & DeFranco, A. . (2016). Modeling guests' intentions to use mobile apps in hotels: The roles of personalization, privacy, and involvement. *International Journal of Contemporary Hospitality Management, 28*, 1968–1991.

Najjar, M. S., Dahabiyeh, L. & Algharabat, R. S. (2021). Users' affect and satisfaction in privacy calculus context. *Online Information Review, 45(3)*, 577-598.

Natarajan, T., Balasubramanian, S.A. & Kasilingam, D.L. (2017). Understanding the intention to use mobile shopping applications and its influence on price sensitivity. *Journal of Retailing and Consumer Services*, 8-22.

Newman, C. L., Wachter, K. & White, A. (2018). Bricks or clicks? Understanding consumer usage of retail mobile apps. *Journal of Services Marketing*, 211-222.

Ravichandran, S., Osakwe, C. N., Elgammal, I. M. Y., Abbasi, G. A. & Cheah, J.-H. . (2024). Feeding trust: exploring key drivers, moderators and consequences related to food app usage. *Journal of Services Marketing, 38(7)*, 872-891.

Son, J. (2017). The impact of initial experience and user attachment on application downloads

Information-seeking and -sharing applications. I. *nternet Research, 27(2)*, 256-276.

Stocchi, L., Michaelidou, N. & Micevski, M. . (2019). Drivers and outcomes of branded mobile app usage intention. . *Journal of Product & Brand Management*, 28-49.

Stocchi, L., Pourazad, N. & Michaelidou, N. (2020). Identification of two decision-making paths underpinning the continued use of branded apps. *Psychology & Marketing*, 1362–1377.

Stocchi, L., Pourazad, N., Michaelidou, N., Tanusondjaja, A. & Harrigan, P. (2022). Marketing research on Mobile apps: past, present and future. *Journal of the Academy of Marketing Science*, 195–225.

Sung, E. (. (2020). Consumers' responses to mobile app advertisements during holiday pe-riods. *Journal of Consumer Marketing, 37(3)*, 341-352.

Tabachnick, B. G. & Fidell, L. S. . (2019). *Using multivariate statistics (7rd ed.).* New York: HarperCollins College Publishers.

Tak, P. & Panwar, S. . (2017). Using UTAUT 2 model to predict mobile app based shopping: evidences from India. *Journal of Indian Business Research, 9(3)*, 248-264.

Tang, J., Akram, U. & Shi, W. . (2021). Why people need privacy? The role of privacy fatigue in app users' intention to disclose privacy: based on personality traits. *Journal of Enterprise In-formation Management, 34(4)*, 1097-1120.

Taylor, G. D. & Levin, M. . (2014). Predicting mobile app usage for purchasing and informa-tion-sharing. *International Journal of Retail & Distribution Management, 42(8),* , 759-774.

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501099P
UDK: 005.35:658..8]:502.131.1
Datum prijema rada: 25. januar 2025.
Submission Date: January 25, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 99-112

ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

AUDITING GREENWASHING: THE ROLE OF AUDITORS IN DETECTING MISLEADING SUSTAINABILITY CLAIMS

Miloš Pavlović | PhD., professor of applied studies, Belgrade Business and Arts Academy of Applied Studies, Department of Business and Information Studies, Belgrade, Serbia; milospavlovic070@gmail.com; ORCID ID 0000-0003-4112-6905

Čedomir Gligorić | PhD., professor of applied studies, Belgrade Business and Arts Academy of Applied Studies, Department of Business and Information Studies, Belgrade, Serbia; cedomir.gligoric@bpa.edu.rs, ORCID ID 0000-0002-9847-0929

Danijela Pavlović | PhD., Assistant Professor, Academy for Business Economy, Čačak, Serbia, dany_pavlovic92@hotmail.com, ORCID ID 0000-0002-2897-8882

Abstract: *Greenwashing presents substantial challenges to the credibility of sustainability reporting, as it undermines stakeholder trust and hinders genuine environmental accountability. This study aims to explore the critical role of auditors in identifying and mitigating greenwashing practices across various industries. Employing a mixed-methods research design, data were collected through surveys and interviews with auditing professionals and sustainability experts from six countries. The findings reveal several persistent challenges, including the absence of standardized frameworks, limited transparency, and the complex nature of ESG data. The research emphasizes the potential of advanced technologies such as AI and blockchain to enhance the accuracy and reliability of audits. It further provides actionable recommendations for auditors, policymakers, and organizations to foster greater transparency and accountability in sustainability reporting. The study contributes to the ongoing discourse on promoting ethical corporate behaviour by proposing innovative strategies to combat greenwashing and improve the integrity of ESG disclosures. In conclusion, the role of auditors is underscored as pivotal in ensuring the authenticity of sustainability claims, thereby reinforcing stakeholder trust and fostering a culture of accountability.*

Keywords*: Greenwashing, Sustainability Reporting, Auditing, Transparency, Accountability.*

JEL Classification: *M42, Q56, G38, O16*

INTRODUCTION

The growing emphasis on sustainability in corporate practices has positioned sustainability reporting as an essential tool for communicating Environmental, Social, and Governance (ESG) initiatives. However, the prevalence of greenwashing—prac-

tices where companies misrepresent their environmental efforts to appear more sustainable—has raised significant concerns. This phenomenon undermines stakeholder trust, distorts market dynamics, and compromises the credibility of genuine sustainability initiatives (de Freitas Netto, Sobral, Ribeiro, & Soares, 2020). Despite the increasing demand for transparency and corporate accountability, exaggerated or false claims remain a persistent issue in sustainability reporting, highlighting the need for effective mechanisms to detect and address greenwashing (Seele & Gatti, 2015).

This research explores the role of auditors in identifying and mitigating greenwashing, focusing on their capacity to verify sustainability claims and ensure compliance with ethical reporting standards. The motivation for this study stems from the growing global demand for credible sustainability disclosures, the potential reputational risks posed by greenwashing, and the critical need for enhanced accountability in corporate reporting practices.

Three hypotheses guide this research:

- H0: The absence of standardized ESG reporting frameworks does not significantly impact auditors' ability to detect greenwashing.
- H1: Advanced technologies, such as artificial intelligence and blockchain, enhance audit accuracy and reliability.
- H2: Effective audit practices contribute to reducing greenwashing and promoting corporate accountability.

The paper provides a detailed analysis of these aspects. It begins by examining the conceptual and empirical background of greenwashing and its implications for stakeholders and auditors. This is followed by a description of the research methodology, encompassing both qualitative and quantitative approaches. The findings highlight key challenges and opportunities for auditors, while the conclusion offers actionable recommendations for fostering greater transparency and integrity in sustainability reporting.

LITERATURE REVIEW

This section explores the theoretical and empirical foundations of greenwashing, emphasizing its impact on stakeholder trust and the credibility of sustainability reporting. The review delves into key concepts such as transparency, accountability, and legitimacy, while also examining the theoretical frameworks that underpin the study of greenwashing. Empirical studies provide insights into the prevalence of greenwashing across industries and the role of auditors in mitigating misleading claims. Additionally, the review highlights persistent challenges in sustainability reporting and identifies critical gaps in current research, such as the limited application of advanced technologies like blockchain and AI. These gaps underscore the need for innovative strategies to enhance transparency and accountability in ESG disclosures.

Conceptual Foundations

Greenwashing, defined as the practice of misrepresenting sustainability efforts to appear more environmentally responsible, undermines genuine sustainability initiatives and erodes stakeholder trust (Testa, Miroshnychenko, Barontini, & Frey, 2018). Central to addressing greenwashing are the principles of **transparency** and **accountability**, which serve as the foundation of sustainability reporting. Transparency in-

volves the openness and clarity of disclosed information, while accountability requires organizations to justify their actions and claims to stakeholders ((GRI), 2022). However, greenwashing distorts these principles by creating an illusion of commitment to environmental and social responsibility.

Theoretical frameworks provide insights into greenwashing and its broader implications. **Signalling theory** posits that organizations use sustainability claims to reduce information asymmetry and influence stakeholder perceptions, but greenwashing distorts these signals, leading to diminished organizational credibility (Connelly, Certo, Ireland, & Reutzel, 2011). **Stakeholder theory** emphasizes the importance of addressing diverse stakeholder interests through sustainability reporting, yet greenwashing undermines this process by misrepresenting organizational performance (Freemman, 1984). Similarly, **legitimacy theory** highlights the role of aligning corporate actions with societal norms to maintain legitimacy; however, companies engaging in greenwashing exploit this alignment, prioritizing appearance over substantive action (Deegan, 2019).

Empirical Studies

Empirical research demonstrates the widespread prevalence of greenwashing across industries and its negative impact on stakeholders. For instance, Testa et al. (2018) found that greenwashing erodes stakeholder trust and adversely affects firm performance. In the fashion industry, Jestratijević, Uanhoro, & Creighton (2021) revealed that many brands avoid full disclosure of their sustainability practices, perpetuating misleading claims. Nygaard & Silkoset (2022) explored the role of blockchain technology in combating greenwashing, emphasizing its potential to improve transparency and empower stakeholders to verify sustainability claims.

The role of auditors in mitigating greenwashing has also been extensively studied. Parguel, Benoît-Moreau, & Larceneux (2011) argued that sustainability ratings serve as deterrents by holding companies accountable for their claims. Weber (2018) demonstrated that external assurance of corporate social responsibility (CSR) disclosures enhances stakeholder trust while reducing equity capital costs for firms. Recent research by Meutia (2023) highlighted the importance of governance structures, such as independent and expert audit committees, in improving the quality of sustainability reporting and mitigating greenwashing.

Challenges in Current Practices

Despite advancements, significant challenges remain in combating greenwashing through sustainability reporting and auditing practices. One key issue is the lack of standardized frameworks for ESG reporting, which leads to inconsistencies in assessing sustainability claims (GRI (2022); Roussy & Brivot (2016). Traditional audit methodologies often struggle to handle the qualitative and complex nature of ESG data, limiting their ability to detect misleading claims (McGowan, Chan, Yurova, Liu, & Wong, 2018).

Corporate culture and internal pressures further exacerbate these challenges. Sonjaya (2024) observed that organizational pressures often compromise auditors' ethical decision-making, allowing greenwashing to persist unchecked. Additionally, the reliance on self-reported data and vague ESG metrics contributes to the opacity of sustainability claims, making it difficult for auditors to provide effective assurance.

Addressing Gaps in Knowledge

While the existing literature provides valuable insights into the challenges and potential solutions for mitigating greenwashing, critical gaps remain. For example, there is limited research on the application of advanced technologies such as AI and blockchain in auditing sustainability claims. Moreover, cross-industry comparisons of greenwashing practices are scarce, leaving a knowledge gap regarding sector-specific challenges and best practices. This study aims to address these gaps by critically analyzing auditors' roles, examining innovative methodologies, and proposing actionable strategies to enhance transparency and accountability in sustainability reporting. Additionally, the inclusion of recent studies from 2023-2024 ensures the relevance of this review and aligns the research with current advancements in the field.

METHODOLOGY

This section outlines the research design, data collection methods, and analytical techniques used to explore the role of auditors in detecting greenwashing. Employing a mixed-methods approach, the study combines qualitative insights from interviews and case studies with quantitative analysis of survey data to ensure both depth and generalizability. The methodology is designed to capture diverse perspectives from professionals across multiple industries and countries, providing a comprehensive understanding of the challenges and opportunities in mitigating greenwashing. Ethical considerations were integral to the research process, ensuring participant confidentiality and adherence to institutional guidelines.

Research Design and Data Collection

This study utilizes a mixed-methods approach, combining both qualitative and quantitative techniques to explore the issue of greenwashing and the role of auditors in verifying sustainability claims. The qualitative aspect involves interviews and case studies to gather in-depth insights from professionals, while the quantitative component utilizes survey data to assess broader perceptions of greenwashing, audit effectiveness, and stakeholder trust. The mixed-methods design facilitates both depth and generalizability, addressing the research objectives comprehensively (Xu, L & Xu (2023); Petrov (2023).

Data were collected over the last quarter of 2024, from October to December, ensuring timely insights relevant to current practices. Participants from six countries—Serbia, Montenegro, Germany, Spain, Bulgaria, and Slovenia—were involved, providing diverse perspectives on greenwashing and auditing practices.

- **Qualitative Data:**
  - **Interviews:** Semi-structured interviews were conducted with 10 professionals, including auditors, ESG analysts, and sustainability officers. The interviews were designed to provide flexibility while ensuring consistency across participants. Participants were selected based on their professional experience and involvement in greenwashing-related practices. These professionals were drawn from industries such as fashion, energy, and manufacturing, ensuring a diverse set of experiences.
  - **Case Studies:** Five case studies of organizations accused of greenwashing were analyzed. These case studies were selected from publicly

available sustainability reports and regulatory documents. Industries such as fashion, energy, and manufacturing were included, offering insights into real-world applications of sustainability reporting and greenwashing practices.

- **Quantitative Data:**
  - A structured survey was distributed to 500 professionals across the six countries. The survey was disseminated via email and professional networks, ensuring broad participation from a diverse set of respondents. Out of the 500 surveys distributed, 350 responses were received, yielding a 70% response rate. A final count of 320 valid responses were analysed.

Interview and Survey Structure

The semi-structured interviews allowed participants to elaborate on their experiences, with each interview lasting 45–60 minutes. The interview structure included:

Table 1. Structure and Focus of Semi-Structured Interviews

Section	Focus	Example Questions
Introduction	Explanation of study purpose and participant's background	"Can you tell me about your role in the organization?"
Greenwashing Perceptions	Participant views on greenwashing in their industry	"How would you define greenwashing in your industry?"
Audit Practices	Effectiveness and challenges of audit interventions	"In your opinion, how effective are audits in detecting greenwashing?"
Case-Specific Insights	Contextual understanding of real-world practices	"Can you share an example of an audit that addressed sustainability claims?"
Recommendations	Suggestions for improving audit practices	"What measures do you think could enhance the effectiveness of audits in ensuring transparency?"
Conclusion	Wrap-up and final comments	"Is there anything else you would like to add regarding this topic?"

Source: Authors

The interviews were conducted via video conferencing to accommodate participants from different countries, specifically **Bulgaria, Serbia, and Spain**. These interviews were carried out in a **Metaverse environment**, as part of the project **"Metaversing – Civil Society in the Field of Youth,"** co-funded by the European Union under the **Citizens, Equality, Rights, and Values (CERV)** program. The project focuses on utilizing digital and virtual technologies to foster collaboration and innovation in addressing societal challenges, including sustainability and transparency. By leveraging the Metaverse, participants engaged in immersive and interactive discussions, transcending traditional geographical barriers. For more details about the project, visit: **https://eu4all.rs/metaversing-civil-society-in-the-field-of-youth-sga-2023/**.

All interviews were recorded with participants' consent.

Table 2. Structure and Content of Survey Questionnaire

Section	Focus	Example Question	Type of Question
Demographics	Participant background and professional experience	"How many years have you worked in your current field?"	Multiple-choice
Perceptions of Greenwashing	Stakeholder views on prevalence and impact of greenwashing	"To what extent do you believe greenwashing is prevalent in your industry?"	5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree)
Audit Practices	Effectiveness of auditing in addressing greenwashing	"Audits significantly improve the credibility of sustainability claims."	5-point Likert scale
Recommendations	Suggestions for improving audit practices	"What measures do you think could enhance the effectiveness of auditing practices?"	Open-ended

Source: Authors

The survey was pretested with 10 participants from different countries to ensure clarity, reliability, and cultural relevance before full-scale dissemination.

Sampling Strategy

A purposive sampling strategy was employed to ensure that the participants were relevant and diverse. This strategy enabled the selection of individuals with direct experience and expertise in the field of sustainability reporting, auditing, and greenwashing detection.

- **Interviews and Case Studies:**
  - Interview participants were selected based on their professional roles in auditing, sustainability reporting, or corporate governance, with a minimum of three years of relevant experience.
  - Case studies were chosen from a variety of industries to ensure a comprehensive understanding of sustainability reporting practices and greenwashing across different sectors.
- **Survey Participants:**
  - Survey respondents were auditors, ESG analysts, and corporate sustainability officers from the six countries. The diverse geographic and professional backgrounds of participants allowed the study to capture varied perspectives on greenwashing and auditing practices (Rahi, Johansson, & Blomkvist (2022); Wang et al. (2022).

Data Analysis Techniques

Data analysis was conducted in two phases:

- **Qualitative Analysis:**
  - Thematic analysis was applied to interview transcripts and case study data to identify recurring themes related to greenwashing and audit practices. This approach helped to uncover key challenges and insights from the qualitative data.
- **Quantitative Analysis:**
  - Survey data were analyzed using statistical methods, including:

- **Descriptive statistics** to summarize the survey responses.
- **Correlation analysis** to explore relationships between variables, such as the effectiveness of audit practices and the prevalence of greenwashing.
- **Regression analysis** to assess the impact of auditing practices on stakeholder trust and the effectiveness of sustainability reporting (Seele & Gatti (2015); Graafland & Smid (2016).

Ethical Considerations

Ethical compliance was a critical aspect of this research, ensuring the protection of participants and data integrity:

- **Informed Consent:** Participants were fully informed about the study's objectives, the voluntary nature of their participation, and their right to withdraw at any point. Written consent was obtained for both interviews and survey participation.
- **Confidentiality:** Data were anonymized to protect participant identities, and all research materials were securely stored.
- **Case Study Data:** Only publicly available data were used for case studies, ensuring transparency and avoiding any ethical conflicts.
- **Institutional Oversight:** The study adhered to ethical guidelines established by institutional review boards, maintaining integrity throughout the research process (Leonidou, Leonidou, Palihawadana, & Hultman, 2011).

EMPIRICAL DATA

This section presents the key findings, patterns, and statistical insights derived from the study, which highlight the challenges and trends in detecting and addressing greenwashing in sustainability reporting. By analysing survey data, interviews, and case studies, the research identifies critical issues such as the lack of standardized frameworks, the complexity of ESG data, limited transparency, and organizational resistance. Furthermore, specific examples illustrate the real-world implications of these challenges, providing a comprehensive understanding of greenwashing practices across industries. The findings aim to inform actionable strategies for improving audit practices and fostering transparency in ESG reporting.

Key Findings

The study identified several significant challenges and trends in detecting and addressing greenwashing. Each finding is supported by quantitative analysis, qualitative insights, and statistical tests to ensure robust conclusions.

a. Lack of Standardized Frameworks

- **Finding:** 67% of respondents identified the absence of universal sustainability reporting standards as a major challenge. This issue was consistent across industries, with no statistically significant differences ($\chi^2 = 3.12$, $p = 0.21$).
- **Analysis:** The lack of universal standards leads to inconsistent reporting practices. Frameworks like the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB) are widely used but re-

main voluntary, creating challenges for auditors in evaluating sustainability claims uniformly.

b. Complexity of ESG Data

- **Finding:** 62% of participants reported difficulties in assessing subjective and non-quantifiable ESG metrics, particularly in the fashion and energy sectors ($M = 4.2$, $SD = 0.6$) compared to manufacturing ($M = 3.8$, $SD = 0.7$). This difference was statistically significant ($t(318) = 2.89$, $p < 0.01$).
- **Analysis:** Qualitative metrics like community engagement and carbon offset programs often lack concrete benchmarks, especially in sectors with fragmented supply chains.

c. Limited Transparency

- **Finding:** 74% of respondents agreed or strongly agreed that companies engage in selective disclosure. A χ^2-test revealed significant differences by industry ($\chi^2 = 12.47$, $p < 0.05$), with energy (82%) and fashion (77%) industries reporting the highest levels of selective disclosure.
- **Analysis:** Selective disclosure complicates the audit process, particularly in sectors like energy and fashion, where companies often emphasize positive environmental practices while omitting negative impacts.

d. Organizational Resistance

- **Finding:** 58% of respondents reported encountering resistance from management when findings could negatively affect the company's reputation. Larger corporations reported this more frequently ($M = 4.1$, $SD = 0.5$) than smaller firms ($M = 3.6$, $SD = 0.6$), as confirmed by a t-test ($t(318) = 2.45$, $p < 0.05$).
- **Analysis:** Organizational resistance includes withholding critical data or downplaying audit recommendations, particularly in multinational corporations concerned about their public image.

Patterns and Insights

a. Common Practices in Greenwashing

- **Finding:** 80% of respondents in the fashion and energy sectors reported selective disclosures, particularly in renewable energy claims or sustainable material usage.
- **Analysis:** Companies overemphasize positive initiatives while downplaying less favourable aspects, creating a favourable public image while avoiding scrutiny on key issues.

b. Red Flags in Reporting

- **Finding:** 68% of respondents identified vague language, such as "committed to greener practices," as a key indicator of greenwashing. Additionally, 64% highlighted the lack of third-party verification as a concern.
- **Analysis:** Vague language and lack of third-party verification weaken sustainability claims, making it difficult for stakeholders to assess legitimacy.

c. Gaps in Current Practices

- **Finding:** 59% of respondents noted the underutilization of advanced tools like blockchain and data analytics in sustainability audits.
- **Analysis:** Barriers such as cost and technical expertise limit the adoption of tools like blockchain, which could significantly improve the transparency of sustainability audits.

Statistical Insights

The survey data provided key statistical insights into the challenges and patterns associated with detecting greenwashing in sustainability reporting. The findings highlight significant issues such as the lack of standardized frameworks, transparency challenges across industries, and organizational resistance to audit findings. Additionally, the prevalence of vague language in ESG reports further complicates the ability of stakeholders to assess the legitimacy of sustainability claims. The following table summarizes the key metrics and their associated statistical measures:

Table 3. Statistical Insights from Survey Data

Key Metric	Value	Statistical Measure
Total survey responses	320	Descriptive statistics
Lack of standardized frameworks	67% agreement	$\chi^2 = 3.12$, $p = 0.21$
Transparency issues by industry	Energy (82%), Fashion (77%)	$\chi^2 = 12.47$, $p < 0.05$
Organizational resistance	58% agreement	$t(318) = 2.45$, $p < 0.05$
Vague language in reporting	68% agreement	Mean = 4.1, SD = 0.5

Source: Author's research based on survey data

Case Examples

The following case examples illustrate real-world instances of both successful and unsuccessful efforts in addressing greenwashing. These examples highlight the diverse challenges faced by auditors and organizations in verifying sustainability claims. They also demonstrate the importance of thorough audits, holistic assessments, and independent verification in mitigating greenwashing practices across industries.

a. Successful Audit of Greenwashing Claims

An energy company's claim of 100% renewable energy was audited, revealing discrepancies in procurement records. Only 60% of energy came from renewable sources, leading to a revised sustainability report.

b. Greenwashing in the Fashion Industry

A fashion brand promoted sustainable manufacturing but excluded emissions from transportation. Auditors recommended supply chain-wide assessments for accurate reporting.

c. Failure to Detect Greenwashing

A multinational corporation's self-reported reductions in water usage were based on facility reclassification rather than actual improvements. The case highlighted the risks of relying on self-reported data without independent verification.

RESULTS AND DISCUSSION

The results of this study reveal critical insights into the systemic challenges and opportunities for addressing greenwashing in sustainability reporting. By synthesizing findings from survey data, interviews, and case studies, the research underscores the multifaceted nature of greenwashing and its implications for stakeholders. This section integrates key findings with broader implications, highlighting the interconnectedness of challenges such as the lack of standardized frameworks, the complexity of ESG data, and organizational resistance. The discussion further explores actionable recommendations to mitigate these issues, emphasizing the collaborative role of auditors, corporations, and policymakers in fostering transparency and accountability.

Synthesis of Findings

The findings emphasize systemic challenges in detecting greenwashing, which include the lack of standardized frameworks, complexity in evaluating ESG data, limited transparency, and organizational resistance. These challenges do not exist in isolation but are interconnected. For instance, the absence of universal frameworks contributes to inconsistencies in reporting, making it easier for organizations to exploit gaps in transparency. The complexity of ESG data further complicates efforts to audit sustainability claims effectively, particularly in industries like energy and fashion where selective disclosures are common.

Broader Implications

The findings of this study reveal critical areas that need to be addressed to improve the transparency and credibility of sustainability reporting. The broader implications extend beyond the challenges of greenwashing detection and emphasize systemic changes required at multiple levels—policy, organizational practices, and technological innovation. By addressing these areas, stakeholders can work towards fostering a more reliable and accountable ESG reporting environment. Below are three key focus areas that demonstrate the potential for significant impact:

a. The Role of Standardization

Standardized frameworks, such as GRI and SASB, are critical for enhancing the reliability and comparability of ESG data across industries. Their voluntary nature, however, limits widespread adoption, resulting in discrepancies in sustainability claims. Policymakers and industry leaders need to push for mandatory frameworks to ensure consistency. Industries that have embraced these standards, such as finance, provide a successful model for how universal adoption can improve the credibility of sustainability reporting.

b. Importance of Independent Verification

Third-party audits play an essential role in ensuring the integrity of ESG claims.

Many companies rely on self-reported data, which is often incomplete or misleading. Independent verification can address these gaps by cross-checking data against objective standards. This is particularly important in sectors with complex supply chains, such as fashion and energy, where selective disclosure of positive practices is prevalent. Independent certification mechanisms, such as renewable energy credits, serve as examples of effective verification processes.

c. Technology as a Solution

Emerging technologies like blockchain and AI provide transformative opportunities to address gaps in ESG reporting. Blockchain can ensure traceability and transparency by creating immutable records of sustainability claims. AI, on the other hand, can analyse large datasets for inconsistencies, helping auditors identify patterns of greenwashing. While these tools are underutilized due to cost and technical barriers, their potential to improve audit efficiency and accuracy is immense. Scaling the adoption of these technologies requires investment and collaboration among stakeholders.

Recommendations

To address the challenges of greenwashing and improve the credibility of sustainability reporting, tailored recommendations are provided for auditors, corporations, and policymakers. Each stakeholder plays a crucial role in fostering transparency, accountability, and the adoption of best practices. Below is a detailed outline of actionable strategies:

a. For Auditors:

- **Advocate for standardized frameworks:** Work closely with policymakers and organizations to implement globally recognized frameworks, such as GRI and SASB, to ensure consistency in reporting.
- **Utilize independent verification:** Conduct rigorous third-party audits to validate self-reported ESG data, reducing the risks of greenwashing and enhancing credibility.
- **Adopt advanced technologies:** Leverage tools like blockchain to improve traceability and AI-powered analytics to detect discrepancies in reported data efficiently.

b. For Corporations:

- **Adopt comprehensive reporting practices:** Provide detailed and holistic sustainability reports that include both achievements and shortcomings to build trust with stakeholders.
- **Strengthen internal controls:** Develop systems and processes for verifying sustainability data internally, including regular audits and cross-functional collaboration.
- **Avoid vague and misleading language:** Communicate sustainability goals and achievements clearly and back them with measurable, verifiable data.

c. For Policymakers:

- **Mandate standardized reporting:** Introduce legal requirements for companies to adopt frameworks like GRI or SASB to ensure transparent and comparable ESG reporting.
- **Introduce penalties for greenwashing:** Implement fines and other consequences for companies found guilty of misleading sustainability claims.
- **Promote independent audits:** Offer incentives for companies to engage third-party auditors, such as tax benefits or recognition programs, to encourage accurate reporting.

CONCLUSION

This study examines the role of auditors in identifying and mitigating greenwashing, providing valuable insights into the persistent challenges and opportunities within sustainability reporting. The research confirms the critical importance of auditors in enhancing the credibility and transparency of Environmental, Social, and Governance (ESG) claims. Findings validate the hypothesis that the lack of standardized frameworks, complexity in ESG data, and organizational resistance significantly impede efforts to combat greenwashing, emphasizing the need for global harmonization in reporting standards.

The study's results underscore the transformative potential of advanced technologies such as blockchain and AI in addressing these challenges, offering innovative solutions for ensuring data integrity and traceability. By leveraging these tools, auditors can enhance their ability to detect discrepancies and foster greater accountability in sustainability practices. Furthermore, recommendations for auditors, corporations, and policymakers emphasize the need for holistic reporting, independent verification, and stricter regulations to mitigate greenwashing and strengthen stakeholder trust.

Despite these contributions, the research acknowledges several limitations, including its reliance on self-reported data and the geographical scope of participants, which may not fully capture sector-specific nuances globally. Additionally, the underutilization of advanced auditing tools remains an area for further exploration.

Future research should focus on cross-industry and cross-regional comparisons of greenwashing practices, while exploring the integration of cutting-edge technologies in auditing. Policymakers must prioritize the development of universally accepted ESG reporting standards to reduce inconsistencies, while organizations should foster a culture of transparency and accountability by embracing comprehensive reporting mechanisms.

By addressing these challenges collaboratively, stakeholders can work toward building a robust and ethical framework for sustainability reporting. This will not only mitigate the risks associated with greenwashing but also contribute to genuine environmental and social progress, ensuring that corporate sustainability claims are both credible and impactful.

LITERATURE

(GRI), G. R. (2022). Auditing to save the planet: The battle against greenwashing. Retrieved from Retrieved from https://www.globalreporting.org/media/bzfa4jqg/gri_perspective_09_auditors.pdf

Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of Management, 37(1)*, 39-67. Retrieved from https://doi.org/10.1177/0149206310388419

de Freitas Netto, S. V., Sobral, M. F., Ribeiro, A. R., & Soares, G. R. (2020). Concepts and forms of greenwashing: A systematic review. *Environmental Sciences Europe, 32(1)*, 1-12. Retrieved from https://doi.org/10.1186/s12302-020-0300-3

Deegan, C. (2019). Legitimacy theory: Despite its enduring popularity and contribution, time is right for a necessary makeover. *Accounting, Auditing & Accountability Journal, 32(8)*, 2307-2329. Retrieved from https://doi.org/10.1108/AAAJ-08-2018-3638

Freemman, R. E. (1984). *Strategic management: A stakeholder approach.* Boston: Pitman.

Graafland, J., & Smid, H. (2016). (2016). Decoupling among CSR policies, programs, and impacts: An empirical study. *Business & Society, 58(2)*, 231-267. Retrieved from https://doi.org/10.1177/0007650316647951

Jestratijević, I., Uanhoro, J. O., & Creighton, R. (2021). To disclose or not to disclose? Fashion brands' strategies for transparency in sustainability reporting. *Journal of Fashion Marketing and Management, 26(1)*, 36-50. Retrieved from https://doi.org/10.1108/JFMM

Leonidou, L. C., Leonidou, C. N., Palihawadana, D., & Hultman, M. (2011). Evaluating the green advertising practices of international firms: A trend analysis. *International Marketing Review, 28(1)*, 6-33. Retrieved from https://doi.org/10.1108/02651331111107080

McGowan, M., Chan, S., Yurova, Y., Liu, C., & Wong, R. (2018). The influence of institutional regulatory pressure on nonprofit hospital audit quality. *Journal of Governmental & Nonprofit Accounting, 7(1)*, 1-23. Retrieved from https://doi.org/10.2308/ogna-52327

Meutia, I. (2023). Sustainability reporting and audit committee attributes: Evidence from banks in Indonesia. *Asian Academy of Management Journal, 28(2)*, 309-332. Retrieved from https://doi.org/10.21315/aamj2023.28.2.11

Nygaard, A., & Silkoset, R. (2022). Sustainable development and greenwashing: How blockchain technology information can empower green consumers. *Business Strategy and the Environment, 32(6)*, 3801–3813. Retrieved from https://doi.org/10.1002/bse.3338

Parguel, B., Benoît-Moreau, F., & Larceneux, F. (2011). How sustainability ratings might deter 'greenwashing': A closer look at ethical corporate communication. *Journal of Business Ethics, 102(1)*, 15-28. Retrieved from https://doi.org/10.1007/s10551-011-0901-2

Petrov, A. (2023). Possibilities of legal mechanisms to counteract greenwashing to achieve the principles of sustainable development . *Journal of Law and Sustainable Development, 11(12)*, e1630. Retrieved from https://doi.org/10.55908/sdgs.v11i12.1630

Rahi, A., Johansson, J. F., & Blomkvist, M. (2022). Sustainability reporting and management control system: A structured literature review. *Journal of Risk and Financial Management, 15(12)*, 562. Retrieved from https://doi.org/10.3390/jrfm15120562

Roussy, M., & Brivot, M. (2016). Internal audit quality: A polysemous notion? *Accounting, Auditing & Accountability Journal, 29(5)*, 714-738. Retrieved from https://doi.org/10.1108/AAAJ-10-2014-1843

Seele, P., & Gatti, L. (2015). Greenwashing revisited: In search of a typology and accusation-based definition incorporating legitimacy strategies. *Business Strategy and the Environment, 26(2)*, 239-252. Retrieved from https://doi.org/10.1002/bse.1912

Sonjaya, Y. (2024). The influence of corporate culture on audit practices and ethics. *Golden Ratio of Auditing Research, 4(2)*, 107-124. Retrieved from https://doi.org/10.52970/grar.v4i2.394

Testa, F., Miroshnychenko, I., Barontini, R., & Frey, M. (2018). Does it pay to be a greenwasher or a brownwasher? *Business Strategy and the Environment, 27(7)*, 1104-1116. Retrieved from https://doi.org/10.1002/bse.2058

Wang, W., Sun, Z., Zhu, W., Ma, L. D., & Wu, F. (2022). How does multi-agent governance corporate greenwashing? A stakeholder engagement perspective. *Corporate Social Responsibility and Environmental Management, 30(1)*, 291-307.

Weber, J. (2018). Corporate social responsibility disclosure level, external assurance and cost of equity capital. *Journal of Financial Reporting and Accounting, 16(4)*, 694-714. Retrieved from https://doi.org/10.1108/JFRA-12-2017-0112

Xu, W., Li, M., & Xu, S. (2023). Unveiling the "veil" of information disclosure: Sustainability reporting "greenwashing" and "shared value. *PLOS ONE, 18(1)*, e0279904. Retrieved from https://doi.org/10.1371/journal.pone.0279904

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501113G
UDK: 930.85(497.5):328.486.1.02(4-672EU)
Datum prijema rada: 11. februar 2025.
Submission Date: February 11, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 113-126

ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

THE ROLE OF CROATIAN CULTURAL HERITAGE IN CREATING A RECOGNIZABLE TOURIST BRAND – RESPONDENTS' ATTITUDES AND PREFERENCES

Marina Guzovski | Doc. dr. sc., Docent, Libertas International University, Croatia, mguzovski@libertas.hr; ORCID ID 0000-0002-2365-503X

Mara Gedžić | Univ.mag.oec., Student, Libertas International University, Croatia, maragedzic1702@gmail.com; ORCID ID 00009-0002-9314-3942

Abstract: *The aim of this paper is to understand branding and the role of cultural heritage in the recognition of a tourist brand and its impact on perception among tourists. By analysing the concept of destination branding and the role of culture in this process, the paper highlights the importance of cultural heritage as a key resource in forming the identity of a tourist destination. 200 respondents in the Republic of Croatia participated in the research conducted via a questionnaire in August and September 2024. The research questions related to the influence of Croatian cultural heritage on the perception of the tourist brand, its use in tourism promotion, determining the differences in perception between tangible and intangible cultural heritage, and is there a potential for developing recognition and how? In accordance with the theoretical and methodological approach, the following hypotheses were set: H1: Tourists recognize Croatian cultural heritage as a tourism brand; H2: Tangible cultural heritage is more recognizable than intangible cultural heritage as a tourism brand; H3: Promotional activities of cultural heritage influence the development of a tourism brand. The collected data were processed using the SPSS software tool. The research results showed a high degree of recognition of Croatian cultural heritage, especially tangible heritage, which includes historical buildings and sites inscribed on the UNESCO World Heritage List. Intangible heritage, although less well known, has significant potential for development and can contribute to the diversification of the tourist offer with promotional activities and integration into the tourist offer with an emphasis on authentic experiences and participation in cultural events, which confirmed all three hypotheses. One of the recommendations highlighted the need for an integrated marketing approach in promoting intangible heritage and integration into the tourist offer.*

Keywords: *branding, cultural heritage, marketing, promotional activities*

JEL classification: *M31, M39*

INTRODUCTION

Cultural heritage represents a significant part of the national identity of every country, including the Republic of Croatia. It consists of tangible and intangible assets that bear witness to the history, tradition, art and culture of a particular area. The role of cultural heritage in modern society is reflected not only in the preservation of the past, but also in its ability to contribute to the development of the community, especially through education, cultural identity and tourism. The development of the concept of cultural heritage is becoming increasingly important in the context of globalization and rapid social change, as it represents a key link between the past and the present. According to the Convention for the Protection of the World Cultural and Natural Heritage, heritage includes monuments, groups of buildings and sites that have historical, aesthetic, archaeological, scientific, ethnological or anthropological value (UNESCO, 1972). The main components of cultural heritage are: monuments, groups of buildings and sites. Heritage inherited from the past is unique and irreplaceable and is left to future generations who are responsible for its preservation. The role of cultural heritage as an active agent of social transformation is increasingly recognized (Richards, Cultural tourism: A review of recent research and trends, 2018.) as a means of sustainable social and economic development and an important element of tourism motivation. Cultural destinations must learn how to maintain, develop and use their distinctiveness, while maintaining authenticity and a local sense of identity. This is the only way for tourism assets to be culturally and economically sustainable (Bitusikova, 2021.) The concept of heritage has expanded beyond material assets to include intangible heritage and natural landscapes. Cultural heritage includes aspects of the past that society recognizes as important cultural values, representing the way of life of a community through customs, places, practices, artistic expressions and values (Dumbović Bilušić, 2013.)Croatia's cultural heritage is divided into two main groups: natural and cultural sites and intangible cultural heritage. Intangible heritage includes various values, such as traditional skills, technologies, performing arts, religious rituals and oral traditions. Material assets are inextricably linked to intangible aspects, and the aim of protecting both is to preserve all their elements. The Ministry of Culture of the Republic of Croatia maintains a database that includes all forms of cultural heritage, where cultural assets are classified according to type or level of importance. Heritage protection has become a topic of national legislation and international agreements, including various conventions and charters. Cultural heritage plays a significant role in the development of tourism, especially in destinations rich in historical and cultural heritage such as Croatia. Cultural heritage management in the context of tourism requires a careful balance between preserving authenticity and commercialization. Economic valuation of culture should enable its high-quality protection and revitalization, sustainability and further development of all forms of tangible and intangible culture that participate in the tourism offer of a particular tourist destination (Geić, 2011.) Cultural heritage protection is a key aspect of sustainable development, but it differs from the concept of sustainable development in the protection of natural resources. The preservation of intangible heritage is important for promoting cultural diversity and human creativity, and it also plays a significant role in international and national development (Bandarin & Van Oers, 2012.) Destination branding has become crucial in the modern tourism market, and culture plays a significant role in creating a recognizable identity. Culture,

whether tangible or intangible, contributes to building a destination's image and enables it to attract tourists through authentic and unique experiences.

Taking into account the importance of Croatian cultural heritage and its role in the recognition and promotion of Croatian tourism, the aim of this paper is to identify key factors that contribute to the branding of Croatian cultural heritage in the tourism context and to identify potentials for further development. The main contribution of this paper is reflected in a deeper understanding of the role of cultural heritage in the Croatian tourism sector and the importance of branding. The paper also identifies key factors motivating tourists to visit cultural heritage and analyses the ways in which they are informed about the cultural heritage they visit. The research conducted on the perceptions and preferences of respondents can be useful in forming a destination brand and creating policies, strategies and programs that will improve the promotion of Croatia's cultural heritage and encourage its tourism development with an emphasis on sustainability.

THEORETICAL FRAMEWORK - BRANDING OF CULTURAL HERITAGE AND THE ROLE OF CULTURE IN BRANDING

Cultural heritage is the stored identity of an individual and a community and emerges as a sense of curiosity and desire among tourists to experience it for themselves. The experience of positive value will determine current and future tourism outcomes, where high positive feedback contributes to the sustainability of tourism (Richards, 2021.) The process of heritage preservation is based on collective memory, whereby it is preserved so that it is preserved from oblivion and so that future generations can experience and appreciate it (Jelinčić, 2009.)The inherited culture of a community (tangible and intangible cultural heritage) should provide the community with a competitive advantage and uniqueness, which distinguishes it from all other communities. Inherited culture becomes transformed into new products for exchange in the growing global tourism market. Cultural resources, unlike natural ones, are limited and subject to decay. Once destroyed, cultural heritage can hardly be restored in its original form because it loses its authenticity and historical value. Even when cultural resources can be restored, they lose some of their original value because they are no longer authentic. It is therefore essential that protection measures are based on conservation principles that relate to the degree of value of cultural assets and their cultural significance. Sustainable use can prevent or minimize damage and enable the long-term preservation of the value of cultural assets. Cultural heritage, such as settlements and landscapes, can be most effectively protected through strategic and development programs, integrated into spatial and urban development plans (McKercher & du Cros, 2021.)

Seven Croatian properties have been inscribed on the Representative list of intangible heritage: the Feast of St. Blaise, the Procession of the Cross on the Island of Hvar, the annual spring procession of the Queen (Ljelje) from Gorjani, the annual carnival procession of bell ringers from the Kastav area, lacemaking, the art of making traditional wooden children's toys from the Croatian Zagorje area, and the two-part close-interval singing of Istria and the Croatian Littoral. At the session of the same committee held in Nairobi in 2010, the following were inscribed on the UNESCO list: Sinj's alka, the art of making licitar from northern Croatia, and Ojkanje from the Dal-

matian Zagora. The natural and cultural properties that have been selected to be on the UNESCO world heritage list as protected at the global level are: the Historic Complex of Split and Diocletian's Palace; the Old Town of Dubrovnik; the Plitvice Lakes National Park; the Euphrasian Basilica Complex; the historic town of Trogir; the Cathedral of St. James in Šibenik; the Stari Grad Field of Hvar; Stećci; The defense system of the Republic of Venice; Beech forests and native beech forests of the Carpathians.

The cultural function of tourism, which encompasses culture, art and history, is a key motive for many tourists when choosing a destination. People's growing desire to discover and learn about cultural values stimulates new patterns of tourist demand, which results in increasingly frequent trips to destinations rich in cultural content (Bartoluci, 2013.). Natural attractions and cultural and historical heritage are particularly attractive, because their uniqueness and value significantly contribute to the creation of a recognizable image of the destination. In addition to the preservation and promotion of existing cultural assets, an important aspect of the development of a tourist destination is the construction of new tourist attractions that attract visitors. Promotional activities and branding of the destination play a significant role in building the image and creating a recognizable identity, which affects the attraction of tourists through unique experiences and perception of the destination. Unlike consumer products, destinations are a more complex product and therefore represent a significant challenge for destination marketing experts (Balakrishnan, 2009.)Like the branding of products and services, in the branding of a destination, the name of the destination alone is not enough for its differentiation (Mihevc, 2015.) Sirgy and Su (2000.) identified two dimensions similar to those defined in the product branding literature: a functional (practical) dimension consisting of more tangible elements and an emotional (symbolic) function consisting of intangible elements. The creation of a positive image is linked to various elements of the offer such as history and heritage, the character of the local population, celebrities or the status of the capital city (Anholt, 2009.)Destinations use digital tools to showcase their cultural heritage and connect with tourists seeking authentic experiences (Sigala, 2015.) Modern tourists are experienced, informed, heterogeneous, spontaneous, unpredictable, independent, individuals who are looking for new experiences and other contents instead of just a passive vacation (Albert, Bandarin, & Pereira Roders, 2021.) Cultural assets cannot become tourist attractive by themselves, but with a planned strategy, cultural heritage can become a brand (Pančić Kombol, 2000.)

According to (Baker, 2007.) the process of marking a tourist destination with a market brand includes seven stages related to: assessment and monitoring, analysis and benefits, architecture and alignment, articulation, activation, adoption and maintenance. The assessment and monitoring phase is carried out by evaluating internal stakeholders, strengths and resources, performance, communication and marketing monitoring, external stakeholders, competitors, customers, experiences and trends. The creation of a realistic picture of the dimensions of the tourist destination is carried out in the second phase, which aims to highlight how the destination will be recognizable and positioned. In the architecture and coordination phase, the connections of the destination with individual localities, parts and experiences within the destination (sub-brand) are determined, and then a visual and verbal identity is created in the articulation phase. The instruments of integrated marketing communication aimed at increasing demand are determined in the activation phase. The importance of advoca-

cy, passion and support of individuals towards a destination in order to build loyalty and increase visitor numbers is defined in the adoption phase. Brand management and leadership, communicating the brand message, experience management and monitoring and evaluation are shaped in the final phase of adoption and maintenance. According to Loulanski (2006.), until cultural heritage becomes a brand, it does not enter the primary area of interest of tourists. The planned Cultural Heritage Strategy creates a brand that aims to motivate potential tourists to visit certain destinations as much as possible (Richards, 2021). Meskell (2020.) points out that in addition to cultural goods, accompanying tourist facilities such as accommodation, local public transport, souvenir shops, restaurants, bars and the like are still needed. Including cultural sector in the tourist offer is also of a great importance for the prosperity of this sector, concerning the chronic lack of financial resources intended for the maintenance of cultural heritage and the development of cultural creativity (Lončarić, Stanić, & Vretenar Cobović, 2024.)

Although a tourist destination has an attractive and interesting cultural heritage, but does not have a certain infrastructure in terms of developed accommodation capacities and public infrastructure, this is not enough for the development of a certain destination, because if visitors do not have a place to stay, buy souvenirs, have lunch, etc., the offer of a tourist destination is incomplete and failed (Zekan, Weismayer, Gunter, Schuh, & Sedlacek, 2022.) Therefore, the planned strategy does not only refer to the design and presentation of cultural heritage, but also to the development of the entire infrastructure that the destination should provide to meet the needs and demands of tourists. It is not enough to promote only the existing ones, but new tourist attractions based on the existing cultural heritage should be developed, such as street performances on historical themes, music and film festivals, cultural events, etc. (Vrtiprah, 2006.) In order to promote a destination through cultural heritage, specific cultural assets must be emphasized as the main symbols or products of that place. Promoting cultural elements within tourism initiatives can help preserve cultural values, while simultaneously creating a sustainable tourism product. Sustainable cultural tourism not only reduces the negative effects of tourism on local communities, but also promotes their long-term benefits (Timothy, 2011.)

RESEARCH METHODOLOGY

A survey on a sample of 200 respondents (N=200) was conducted in the period from August 19 to September 9, 2024 in the Republic of Croatia (Gedžić, 2024.). The survey questionnaire was created based on the results of a literature review and previous research, as well as research questions related to the influence of Croatian cultural heritage on the perception of the tourist brand, its use in tourism promotion, determining differences in perception between tangible and intangible cultural heritage, and whether there is potential for developing recognition and in what way? The questionnaire was structured in several parts. The first part contained demographic questions related to: age, gender, education and place of residence. The second part was aimed at researching the tourist habits of the respondents regarding the frequency of travel, motivation for visiting cultural destinations and the type of cultural content that attracts those most. The third part concerned the level of familiarity with Croatia's tangible and intangible cultural heritage, where respondents assessed their level of familiarity

with various cultural assets, as well as their importance in the context of Croatia's tourism branding. The last part of the questionnaire included questions on the perception of promotional activities related to cultural heritage, such as assessing the quality of promotional materials, visual attractiveness and availability of information, and their effectiveness in attracting tourists. The questionnaire was available in two forms: paper questionnaires distributed to tourists at cultural sites and digital questionnaires sent via email and social networks, with the aim of including a wider range of respondents. A five-point Likert scale was used, with respondents expressing their degree of agreement or disagreement with statements about various aspects of cultural heritage from 1 to 5, where 1 indicated complete disagreement and 5 – complete agreement with the stated statement. Data collected through the questionnaire were processed using the SPSS software tool.

In accordance with the theoretical-methodological approach, the following hypotheses were set:

H1: Tourists recognize Croatian cultural heritage as a tourism brand.

H2: Tangible cultural heritage is more recognizable than intangible cultural heritage as a tourism brand.

H3: Promotional activities of cultural heritage influence the development of a tourism brand.

The results of the conducted research were analysed using descriptive statistics and presented graphically and in tables, followed by an interpretation of the results and a discussion. After analysing the results, the conclusions of the work and limitations of the research were presented.

RESEARCH ANALYSIS AND DISCUSSION

The conducted research involved 200 respondents, of whom 47.5% were women, 45% were men. Two respondents (1%) identified themselves as "Other", indicating the presence of gender diversity within the sample. 6.5% of respondents did not disclose their gender, which may indicate the need for greater sensitivity in issues related to gender identity. The age structure of respondents shows a higher representation of younger groups, with the largest number of respondents coming from the age group of 25 to 34 (30%), while the second largest segment of respondents is between the ages of 18 and 24 (22.5%). These results indicate that younger adults, especially those aged 18 to 34, represent a significant share of the tourist population interested in Croatia's cultural heritage. Older age groups are less represented; for example, only 5% of respondents are 65 and older. In terms of place of residence, the vast majority of respondents (97.5%) live in Croatia, while only 2.5% come from outside the country. This result indicates that the majority of respondents are domestic, which may suggest that the results reflect the perceptions of domestic tourists' more than foreign tourists. The results show that the majority of respondents have occasional tourist habits, with 42.5% of respondents traveling between two and four times a year. Furthermore, 17.5% of respondents travel very often, more than five times a year, while 30% of respondents travel rarely, one to two times a year. Only 10% of respondents stated that they never or very rarely travel. The research also reveals that for 41.5% of respondents, visiting cultural heritage is the sole reason for their arrival at a tourist destination. The remaining 58.5% of respondents stated that visiting cultural heritage is not the sole reason for

their arrival, which means that cultural heritage may be only one factor in the broader tourist experience. Respondents rated their level of familiarity with the tangible cultural heritage of the Republic of Croatia on a Likert scale (1 = "I have never heard of it", and 5 = I am familiar with the following and have visited the following), and the results are shown in Table 1.

Table 1. Respondents' familiarity with the intangible cultural heritage of the Republic of Croatia

Intangible cultural heritage	1	2	3	4	5	Mean	Standard deviation
Collectively						3,82	
1. Lacemaking in Croatia	12	22	38	55	73	3.78	1,22
2. The close interval duet of Istria and the Croatian Littoral	15	25	40	60	60	363	1,24
3. The Feast of St. Blaise, the patron saint of Dubrovnik	7	12	22	55	104	4,19	1,07
4. Annual spring procession of the Queen or Ljelja from Gorjani	30	35	40	50	45	3.,23	1,37
5. Annual carnival procession of bell ringers from the Kastav region	10	25	45	60	60	368	1,17
6. Procession for the Cross on the island of Hvar	10	20	35	60	75	3,75	1,17
7. The art of making traditional wooden children's toys from the Zagorje region	8	18	35	65	74	3,88	1,12
8. Sinjska alka, a knight's tournament in Sinj	4	10	20	50	116	4.,33	0,98
9. Medićarski crafts in the area of Northern Croatia	12	22	35	60	71	3,83	1,21
10. Bećarac - vocal-instrumental tune from the areas of Slavonia, Baranja	8	16	32	65	79	3,95	1,11
11. Nijemo kolo from the area of Dalmatian Zagora	10	20	30	55	85	3,93	1,19
12. Klapa singing	5	10	20	50	115	4,35	1,00
13. Mediterranean food on the Croatian Adriatic, islands and hinterland	12	15	25	50	98	4,04	1,21
14. Međimurje popevka, a traditional tune of Međimurje	10	20	32	60	78	3,93	1,18
15. The art of dry-stone wall construction	7	12	25	50	106	4,18	1,09
16. The art of falconry	22	35	40	50	53	3,39	1,33
17. Tripunda festivities and the Kolo of St. Tripuna	25	30	40	45	60	3,43	1,38
18. Lipizzaner Breeding Traditions	20	30	40	50	60	3,50	1,32
19. Transhumance - Seasonal Migration of Livestock	18	25	35	45	77	3,69	1,33

Source: author's processing based on research results

The mean value for overall familiarity with intangible cultural heritage is 3.82, which shows that respondents are, on average, relatively well acquainted with the cultural heritage of Croatia and that they have a certain level of awareness of cultural heritage, with an emphasis on being familiar with or even having personally attended cultural events and manifestations. The standard deviation of 1.20 indicates relatively

uniform results, but there are variations among individual heritage elements, suggesting that some forms of intangible cultural heritage have greater recognition than others. When looking at individual elements of intangible cultural heritage, the highest mean value 4.35 was recorded for klapa singing. This indicates a high level of familiarity and recognition of this cultural asset among respondents, which is expected, given its popularity and frequent promotion within the framework of tourist activities. The standard deviation of 1.00 confirms that the perception of klapa singing is quite uniform among respondents, with small deviations. The Sinjska alka also has a high level of recognition, with a mean value of 4.33. This traditional knightly tournament from Sinj is one of the most famous symbols of Croatian cultural heritage, as confirmed by the relatively low standard deviation of 0.98, suggesting that most respondents have a similar level of familiarity with this event. The Festa of St. Blaise from Dubrovnik also has a high mean value (4.19), indicating a strong connection of this event with identity and cultural heritage, especially in southern Croatia. The relatively low standard deviation (1.07) further indicates a homogeneous level of awareness of this event among respondents. On the other hand, the Art of Falconry (mean value 3.39) and the Tripundan Festival and the St. Tripun Circle (3.43) show lower levels of recognition compared to other heritage elements. The standard deviations for these two elements are higher (1.33 and 1.38), indicating greater variability in perception, i.e. that some respondents are not sufficiently familiar with these forms of intangible heritage. Transhumance - seasonal migration of livestock also shows a lower level of recognition (mean value 3.69), with a standard deviation of 1.33, indicating that some respondents have limited awareness of this tradition, while some are familiar with it. Based on the data obtained, it is evident that the intangible cultural heritage of Croatia is generally well recognized among tourists and the local population, but there is some variability in the level of familiarity with individual elements. Traditional events and manifestations that have strong media promotion and tourist visibility achieve a high level of awareness and recognition. On the other hand, lesser-known heritage elements could benefit from additional promotional activities to increase awareness of their cultural significance. These results can serve as a basis for formulating strategies for the promotion of cultural goods, with the aim of more evenly distributing attention to different forms of intangible cultural heritage. Then, respondents assessed their level of familiarity with the tangible cultural heritage of the Republic of Croatia on a Likert scale, and the results are shown in Table 2.

Table 2. Respondents' familiarity with the tangible cultural heritage of the Republic of Croatia

Tangible cultural heritage	1	2	3	4	5	Mean	Standard deviation
Collectively						4,08	
1. Split Historic Complex and Diocletian's Palace	2	8	12	55	123	4,45	0,85
2. Dubrovnik Old Town	1	5	8	45	141	4,60	0,73
3. Plitvice Lakes National Park	3	10	12	50	125	4,42	0,92
4. Euphrasian Basilica Complex in the Historic Center of Poreč	5	10	20	55	110	4,28	1,00

5. Historic City of Trogir	5	12	25	50	108	4,22	1,04
6. Cathedral of St. James in Šibenik	6	15	30	50	99	4,11	1,10
7. Stari Grad Field, Hvar	8	20	35	50	87	3,94	1,17
8. Stećci	20	30	40	45	65	3,53	1,34
9. 16th and 17th Century Venetian Republic Defense Systems in Zadar and Šibenik	15	25	38	50	72	3,70	1,28
10. Primeval Beech Forests of the Carpathians and Other Regions of Europe	18	30	40	45	67	3,57	1,33

Source: author's processing based on research results

The overall mean value for overall awareness of tangible cultural heritage is 4.08, indicating a high level of familiarity of respondents with this segment of cultural heritage. The standard deviation of 1.09 suggests relatively uniform results, with minor variations in the level of awareness among respondents. The highest mean value was recorded for the Old Town of Dubrovnik (4.60), indicating an exceptionally high level of recognition and awareness of this world-famous cultural destination. The relatively low standard deviation of 0.73 indicates a homogeneous perception among respondents, with small deviations. This result can be attributed to the global recognition of Dubrovnik as a tourist destination, but also to its frequent presence in promotional materials and the media. High mean values are also recorded for the Historic Complex of Split and Diocletian's Palace (4.45) and the Plitvice Lakes National Park (4.42), indicating a similar level of recognition as for Dubrovnik. The standard deviations of 0.85 and 0.92 show low variability among respondents, meaning that their perceptions of these landmarks are fairly uniform. Given that both sites are UNESCO World Heritage Sites and are part of Croatia's key tourist attractions, these results are not surprising. The Euphrasian Basilica Complex in Poreč records a mean value of 4.28, which also indicates a high level of recognition, while the standard deviation of 1.00 is slightly higher compared to other destinations, which may indicate greater differences in the level of familiarity among respondents. The mean value for the Historic Town of Trogir is 4.22, indicating a solid level of familiarity, while the standard deviation of 1.04 indicates moderate differences in perception among respondents. On the other hand, Stećci (mean value 3.53) and the Primeval Beech Forests of the Carpathians and Other Regions of Europe (3.57) record lower levels of recognition compared to other sites. Higher standard deviations (1.34 and 1.33) indicate greater variations in the level of awareness among respondents. These results suggest that these elements of tangible heritage are less exposed or not as well integrated into tourism offers and promotion as other sites. From these results, we can conclude that Croatia's tangible cultural heritage is generally highly recognized among respondents, especially those sites that are best known and most promoted on the domestic and international markets. Although most sites record high mean values of awareness, some elements of tangible heritage, such as tombstones and beech forests, have lower levels of awareness among respondents, which indicates the need to strengthen promotional activities. Furthermore, respondents rated the frequency of using information sources when planning visits to cultural sites. A scale was also present where 1 represented "Never" and 5 "Always"

Table 3. Sources of information when planning visits to cultural sites in the Republic of Croatia

Source of information	1	2	3	4	5	Mean	Standard deviation
Collective						3,70	
1. Internet	1	2	8	30	159	4,72	0,63
2. Travel guides	10	25	55	60	50	3,58	1,14
3. Recommendations from friends and family	5	10	40	90	55	3,90	0,94
4. Social networks	7	18	40	55	80	3,92	1,13
5. Media (TV, newspapers)	15	25	45	70	45	3,53	1,18
6. Brochures and flyers	20	30	50	60	40	3,35	1,24
7. Hotel or accommodation information	25	45	60	40	30	3,03	1,23
8. Travel shows and documentaries	12	25	60	75	28	3,41	1,06
9. Travel apps and websites	5	10	25	60	100	4,20	1,00
10. Local travel agencies	18	35	45	55	47	3,39	1,26

Source: author's processing based on research results

The pooled mean for frequency of use of information sources is 3.70, indicating that respondents on average frequently use available information sources. The standard deviation of 1.10 suggests moderate variability. The Internet is the most frequently used information source with a very high mean of 4.72. The low standard deviation of 0.63 indicates homogeneous use of the Internet among respondents, which is expected given the wide availability and convenience of digital information. This data highlights the importance of digital presence and online promotional activities in modern tourism. Recommendations from friends and family and social networks are also important sources of information, with mean values of 3.90 and 3.92. This suggests that respondents often use social networks and recommendations as reliable sources of information about cultural attractions. The standard deviations of 0.94 and 1.13 indicate that there are minor deviations in the frequency of use of these sources, with certain respondents relying more on recommendations from their acquaintances or social networks compared to others. Tourist guides and media (TV, newspapers) have slightly lower mean values of 3.58 and 3.53. These results show that respondents occasionally use these sources of information, but not as often as the Internet or social networks. Standard deviations of 1.14 and 1.18 indicate slightly greater variability in the use of these sources. This may mean that while some tourists prefer traditional media and guides, others find them outdated or less useful compared to digital sources of information. Brochures and leaflets, as well as information from hotels or accommodation, show lower mean values (3.35 and 3.03), which means that respondents use them less often compared to other sources. The high standard deviations (1.24 and 1.23) indicate considerable variability in the use of these sources of information. Travel apps and websites are popular sources of information with a mean value of 4.20 which indicates the increasing importance of mobile and online travel applications in modern travel planning. The standard deviation of 1.00 indicates a relatively uniform

use among respondents, confirming that tourism apps have become widely accepted among different demographic groups. Local tourist agencies, with an average value of 3.39, are used slightly less than other sources. The standard deviation of 1.26 indicates greater variability in the use of these sources. Digital sources of information, such as the Internet, social networks and tourism apps, are the most frequently used tools when planning visits to cultural sites in Croatia. Traditional sources of information, such as brochures, guides and media, still have their role, but are less used compared to digital platforms. These data highlight the importance of digital promotion and presence on online platforms for tourist destinations and cultural sites. Furthermore, respondents rated the quality of elements of promotion of Croatian cultural heritage, where 1 represented "Very bad" and 5 "Very good" (Table 4).

Table 4. Quality assessment of elements of promotion of Croatian cultural heritage

Promotional element	1	2	3	4	5	Mean	Standard deviation
Total						3,88	
1. Informativeness	5	15	40	80	60	3,88	1,00
2. Visual appeal	8	20	35	75	62	3,82	1,10
3. Availability of information	10	18	50	70	52	3,68	110
4. Accuracy and timeliness of data	7	12	40	80	61	3,88	1,.02
5. Creativity and originality	5	20	45	75	55	3,78	1,04
6. Accessibility of language (clarity and comprehensibility)	3	18	40	85	54	3,85	0,97
7. Quality of photos and video materials	5	15	35	90	55	3,88	0,98
8. Usability of information for visitors	8	20	40	80	52	3,74	1,07
9. Ability to attract attention and retain interest	10	25	35	70	60	3,73	116
10. Adaptation to different target group	12	20	45	65	58	3.69	1,16

Source: author's processing based on research results

The overall mean value for the quality of the elements of the promotion of Croatian cultural heritage is 3.88, which means that on average, respondents rated the promotion of cultural heritage between "good" and "very good". The standard deviation of 1.00 indicates moderate variability in perceptions, suggesting that most respondents share similar views on the quality of promotional activities, although there are minor deviations. The results presented in Table 4 show that the general perception of the quality of the promotion of Croatian cultural heritage is positive, but there are certain elements that can be improved. The in formativeness and accuracy of the data were rated highly, but visual appeal, creativity and adaptation to different target groups may be key areas for improvement. Overall, the promotion of Croatian cultural heritage fulfils its purpose well, but additional investments in visual and creative aspects, as well as better adaptation of content to different groups of tourists, can significantly contribute to strengthening its influence on the market.

RESEARCH LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

When interpreting the research, the limitations of the research should be taken into account, given that the research included 200 respondents who completed a survey questionnaire. The research was conducted once and during the summer months (seasonality of the research). In order for the research to be representative, it is necessary to increase the sample of respondents, and conduct the research in more and longer time series so that certain changes can be correlated and further examined and analysed using more complex statistical methods. This research can be the basis for future repeated research using appropriate variables and appropriate statistical methods.

CONCLUSION

Cultural heritage (intangible and tangible) is a resource that contributes to the development of a unique and recognizable tourist identity. In the theoretical part, the importance of sustainable heritage management is emphasized in order to preserve authenticity, while at the same time it is used as a means of increasing tourist interest and attracting visitors. The theoretical part also highlighted the challenges in branding cultural assets, especially when it comes to balancing commercialization and preservation. In addition, the need for an integrated approach involving local communities, tourism stakeholders and the media was emphasized in order to ensure the long-term sustainability and visibility of cultural heritage. Successful branding of cultural heritage can significantly increase the attractiveness of a destination, but it requires strategically thought-out activities in the promotion, protection and management of cultural resources. The research part of the work brings important insights into the perception of Croatian cultural heritage among tourists, and the results show that tourists recognize cultural heritage as an important aspect of the tourist brand. When asked about the recognition of cultural heritage (IP1), the research results confirm that tourists perceive Croatian cultural heritage as a key element of the country's tourist identity. UNESCO's material goods were especially positively evaluated, which confirms the hypothesis H1 that tourists recognize Croatian cultural heritage as a tourist brand. Furthermore, in response to the question about the use of cultural heritage in tourism promotion (IP2), the research results show that promotional activities, such as cultural events and marketing, have a positive impact on the perception of Croatia as a destination rich in cultural heritage. This supports hypothesis H3, which speaks about the impact of promotional activities on the development of the tourism brand. Differences in the perception of tangible and intangible cultural heritage (IP3) have proven to be significant. Tangible heritage, especially which is on the UNESCO list, is more recognizable and popular among tourists than intangible heritage. This confirms hypothesis H2, which suggests that tangible cultural heritage is more recognizable as a tourism brand compared to intangible. The last research question (IP4) on the potential for further development of the recognisability of the cultural heritage of the Republic of Croatia shows that there is significant potential for development, especially through better integration of intangible cultural goods into the tourism offer. Tourists express interest in authentic experiences and participation in cultural events, which opens up space for further development of branding strategies that will more strongly include intangible heritage. Cultural heritage is a key resource for the development of Croatia's tourism brand. Further investment in promotion is needed to realize the full potential of intangible

assets, and to establish sustainable strategies that balance the preservation of heritage and its use for tourism purposes.

LITERATURE

Albert, M.-T., Bandarin, F., & Pereira Roders, A. (2021.). *Heritage and SustainableHeritage and the Sustainable Development Goals: Policy Guidance for Heritage and Development Actor.* Paris: UNESCO World Heritage Centre.

Anholt, S. (2009.). *Konkurentan identitet: novo upravljanje markama država, gradova i regija.* Zagreb: M PLUS.

Baker, B. (2007.). *Destination branding for small cities.* Portland: Creative Leap Books.

Balakrishnan, M. (2009.). Strategic branding of destinations: a framework. *European Journal of Marketing, 43*(5), str. 611-629. http://dx.doi.org/10.1108/03090560910946954.:

Bandarin, F., & Van Oers, R. (2012.). *he Historic Urban Landscape: Managing Heritage in an Urban Century.* Chichester, UK: Wiley-Blackwell.

Bartoluci, M. (2013.). *Upravljanje razvojem turizma i poduzetništva.* Zagreb: Školska knjiga.

Bitusikova, A. (2021.). Cultural heritage as a means of heritage tourism development. *Muzeológia a kultúrne dedičstvo*, str. 81-95. https://doi.org/10.46284/mkd.2021.9.1.5

Dumbović Bilušić, B. (2013.). Kulturna baština u Hrvatskoj pred novim izazovima. *Kronika povijesti umjetnosti u Hrvatskoj, 10*(1-2), str. 1-21. https://hrcak.srce.hr/175051

Gedžić, M. (2024.). Brendiranje hrvatske kulturne baštine i potencijali za razvoj. *Diplomski rad*. Zagreb: Libertas međunarodno sveučilište.

Geić, S. (2011.). *Menadžment selektivnih oblika turizma.* Split: Sveučilište u Splitu.

Jelinčić, D. A. (2009.). *Abeceda kulturnog turizma.* Zagreb: Meandar media.

Lončarić, B., Stanić, M., & Vretenar Cobović, M. (2024.). Economic aspects of the character and work of Ivana Brlić Mažuranić in the function of competitive cultural and tourist products of the tourist area "Slavonski brod - Posavina". *Economy and Market Communication Review, XIV*(II), str. 437-451. https://www.emc-review.com/emc-review-

Loulanski, T. (2006.). Revising the Concept of Cultural Heritage: The Argument for a Functional Approach. *Journal of Cultural Property, 13*(2), str. 207-233. https://doi.org/10.1017/S0940739106060085

McKercher, B., & du Cros, H. (2021.). Reframing cultural tourism in the post-COVID era. *Journal of Tourism Futures, 7*(2), str. 103-117. https://doi.org/10.1108/JTF-01-2021-0007

Meskell, L. (2020.). *A Future in Ruins: UNESCO, World Heritage, and the Dream of Peace.* New York: Oxford University Press.

Mihevc, Z. (2015.). Brendiranje gradova kao ekonomska nužnost. *Tehnički glasnik, 9*(2), str. 198-201. https://hrcak.srce.hr/140765

Pančić Kombol, T. (2000.). *Selektivni turizam.* Matulji: TMCP Sagena.

Richards, G. (2018.). Cultural tourism: A review of recent research and trends. *Journal of Hospitality and Tourism Management, 36 (22)*, str. 12-21. https://doi.org/10.1016/j.jhtm.2018.03.005

Richards, G. (2021.). *Cultural tourism: Research, policy and practice,.* Wallingford: CABI Publishing.

Sigala, M. (2015.). The application and impact of gamification funware on trip planning and experiences: The case of TripAdvisor's funware. *Electronic Markets, 25(3)*, str. 189-209. https://doi.org/10.1007/s12525-014-0162-5

Sirgy, J., & Su, C. (2000.). Destination image, selfcongruity, and travel behaviour: towards an integrative model. *Journal of Travel Research, 38(5)*, str. 340-352. https://doi.

org/10.1177/004728750003800402.

Timothy, D. J. (2011.). *Cultural heritage and tourism: An introduction.* Bristol: Channel View Publications.

UNESCO. (1972). Konvencija za zaštitu svjetske kulturne i prirodne baštine. Dohvaćeno iz Konvencija za zaštitu svjetske kulturne i prirodne baštine: https://whc.unesco.org/en/conventiontext

Vrtiprah, V. (2006.). Kulturni resursi kao činitelji turističke ponude u 21. stoljeću. *Ekonomska misao i praksa, 3(1)*, str. 279-296. https://hrcak.srce.hr/10683

Zekan, B., Weismayer, C., Gunter, U., Schuh, B., & Sedlacek, S. (2022.). Regional sustainability and tourism carrying capacities. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2022.130624

https://doi.org/ 10.7251/EMC2501127N
UDK: 007.52:336.747.5(497.11)
Datum prijema rada: 13. februar 2025.
Submission Date: February 13, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 127-143

ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

THE FUTURE OF WORK IN BANKING 5.0: EXAMINING THE IMPACT OF AUTOMATION AND ARTIFICIAL INTELLIGENCE ON EMPLOYEES IN SERBIAN BANKS

Jelena Lukić Nikolić | PhD in Economics Associate Professor, Head of Department for Management and Marketing, Modern Business School, Belgrade, Serbia, jelena.lukic@mbs.edu.rs; ORCID ID 0000-0003-0632-8974

Slađana Andrian Sredojević | PhD in Economics, research associate, Specialist for International Relations, International Financial Institutions and Education; Head of Bank Training Centre; Journal Bankarstvo (Editor), Association of Serbian Banks, Belgrade, Serbia, sladjana.sredojevic@ubs-asb.com; ORCID ID 0009-0007-9779-8950

Abstract: *The paper investigates the perceived impact of automation and artificial intelligence (AI) on Serbia's banking workforce, with an emphasis on how demographic and job-related factors impact employees' perceptions of these technological advances. Between September and mid-November 2024, 947 employees from Serbian banks participated in the study, completing a questionnaire that assessed their perceptions about automation and AI. The Kruskal-Wallis H-test and Mann-Whitney U-test results showed that age and education had a statistically significant impact on perceptions, with younger employees and those with higher levels of education favoring automation and AI. Gender did not have significant impact on perceptions indicating that other factors are more important. Employees in managerial positions had a more positive perception toward automation and AI, viewing them as tools for operational efficiency and innovation, but non-managerial employees, particularly those in repetitive tasks, expressed concerns about job displacement. Employee perceptions were not significantly influenced by the length of time or number of banks worked at, indicating a move toward digital literacy and adaptability as essential characteristics for career success in the developing banking business. The findings imply that banks should tailor training and digital transformation activities to different demographic groups to increase employee engagement and reduce resistance to change. These insights are essential for developing successful AI integration strategies in the banking sector.*

Keywords*: Future of Work, Banking 5.0, Automation, Artificial Intelligence, Banking Sector*

JEL classification*: J24, O33, G21*

INTRODUCTION

Digital transformation has become crucial in contemporary business environment for increasing competitiveness, enhancing operational efficiency, and maintaining flexibility in response to changing customer demands and market trends (Jerković, Gavrić, & Ćurak Ljubas, 2024). Even while the banking sector has historically been successful in implementing technology, the changing financial services environment requires a more significant change (Omarini, 2024). Artificial intelligence, advanced data analytics, big data, distributed ledger technology, blockchain, biometrics, remote user verification, cloud computing, Web3, and the metaverse are just a few of the cutting-edge technologies currently being used in the financial industry (Nowakowski, 2024). The banking sector is one of many that is progressively integrating automation and artificial intelligence (Rodrigues, Ferreira, Teixeira, & Zopounidis, 2022), (Villar & Khan, 2021).

The ability of computer systems to acquire and use knowledge on their own, without human assistance, is known as artificial intelligence (AI). AI systems examine their environment, independently interpret data, make conclusions, and act accordingly. These systems improve their effectiveness over time by gaining lessons from the past (Kaya, 2019). AI includes a range of technologies that allow robots to simulate human cognitive processes, including language comprehension, learning, reasoning, problem-solving, and perception (Ghandour, 2021). AI in banking refers to the application of computers and other devices to mimic human intelligence, particularly in the areas of event analysis and decision-making. AI systems can do tasks like pattern recognition, data learning, and making well-informed decisions and predictions that have historically required human intelligence (Boustani, 2022). A new wave of change, known as Banking 5.0, has been brought about by these technologies. Banking 5.0 emphasizes the coexistence of AI-driven solutions alongside human employees to maximize customer experiences and operational efficiencies, in contrast to earlier banking revolutions that were primarily focused on the digitalization of traditional banking procedures (Mehdiabadi, et al., 2022). This transformation signifies a fundamental shift in the way banks operate, with significant implications for the roles, competencies, and career paths of employees. Employees have been significantly impacted by the continuous integration of automation and AI in the workplace. These shifts are influencing how employees view their workplace, their responsibilities, and their career prospects in terms of the knowledge and skills they will need (Xu, Xue, & Zhao, 2023), (Selimović, Pilav Velić, & Krndžija, 2021). However, there are ongoing debates that prove lack of clarity and evidence regarding the impact of AI on work: from the optimistic view there is an assessment that AI will impact positively meaningful higher-order human work tasks, while more pessimistic views suggest that AI will reduce and eventually eliminate human work (Frey & Osborne, 2017). That is why many authors suggest calls for further research needed (Parker & Grote, 2022), (Bankins & Formosa, 2023).

This study aims to explore how various factors, such as gender, age, education, job role, organizational function, and work experience, influence bank employees' perceptions of the impact of automation and AI on their careers. As these technologies continue to reshape the workplace, it is crucial to understand how different demographic and professional characteristics influence employees' perceptions toward

these changes. This research provides valuable insights into the broader implications of digital transformation for the workforce. By identifying the factors that contribute to positive or negative perceptions of automation and AI, organizations can implement tailored measures to mitigate potential negative effects, such as job insecurity or resistance to change, while maximizing the potential benefits of these technologies, including increased efficiency, innovation, and career advancement opportunities.

The paper is organized as follows. The literature review and hypotheses development section establish a strong foundation for understanding the concept of Banking 5.0, exploring the significant transformations driven by the implementation of AI in the banking sector. Following this, the research methodology section outlines the design of the study, including a brief description of the questionnaire, the sampling technique used, and the research procedure followed. The subsequent section presents the research results, which are then discussed in the context of the broader implications of automation and AI in banking. Finally, the conclusion summarizes the key findings, followed by a discussion of the implications of the research, its limitations, and suggestions for future research regarding the evolving landscape of Banking 5.0.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Banking 5.0 represents one of the turning points in the banking sector's progress, driven by the groundbreaking capabilities of automation, AI, and other emerging technologies. These developments are transforming the sector's professional landscape by providing new roles, requiring employees to learn new skills, and disrupting old career paths. As banks continue to integrate these technologies, it is essential to understand how employees perceive these changes and explore the new job market. Banking 5.0 can provide a future in which technology and human employees work together to generate more efficient, innovative, and customer-centric banking services through ongoing training, planned reskilling, and fostering collaboration between humans and machines (Francis & Manjaly, 2024). The shift to Banking 5.0 necessitates that bank employees have a hybrid skill set that blends technical knowledge with human-centered qualities (Mehdiabadi, et al., 2022). For example, while technical skills like data analysis, programming, and machine learning are increasingly important, soft skills like empathy, problem-solving, and communication remain essential for effective customer interaction and strategic decision-making (Nicoletti, 2021). It is evident that AI will transform employee roles, open new career options, and pose substantial challenges in terms of job displacement and skills gaps (Lukić Nikolić & Labus, 2024). To retain employees, organizations must create a clear plan and provide assistance for their professional growth in accordance with Banking 5.0 requirements; this being particularly important within so called Industry 5.0 initiative of the European Union that emphasizes the power of industry to achieve goals beyond jobs and growth, by fostering societal goals and becoming a resilient provider of prosperity (European_Union, 2024).

The impact of AI is also the subject of research at the market and industry level, too. The Global Future Council of the World Economic Forum, while observing continuously the global trends in human resources, published the White paper on AI impact in October 2024, that among other trends and impacts, identifies „the concept of value alignment as a critical area of focus in AI. This concept revolves around

making sure that the behaviors, decisions and outcomes of AI systems are in harmony with human values, ethical principles, societal norms and fundamental human rights " (World_Economic_Forum_Global_Future_Councils, 2024, p. 5). From the policy level of the EU and regulatory point of view, the concept of Future of Work comprises policy, strategy, projects and according to some industry trends and initiatives – paradigm shift. Among many aspects of Future of Work paradigm shift, this paper aims to contribute to two of them – reskilling and upskilling, together with human-machine collaboration, new disruptive technologies, automation and algorithmic management (European_Union, 2024).

Development of business and organizational processes, based on new technologies, products and instruments, require continuous professional development leading to the acquisition of professional qualifications which are standardized, recognized as formal evidence of such a learning process, measurable and portable within the national qualifications' framework (Sredojević, 2018). These trends may be also seen rather as an evolution than revolution, considering that Serbian banking through its historical development has been continuously dedicated to the innovative approaches, technological development, information systems and its organizational aspects in banks, which reflected efforts to modernize and innovate within the banking sector starting with early 1970's (Sredojević & Aleksić, 2024, p. 193). In relation to that, early technological development of banking sector of Serbia was supported also by the early stage of introducing training for banks employees, by establishment of the Committee for Scientific and Research Work, selecting topics and training personnel particularly for the information technology area, as evidenced in the Report on the work of the Association of Banks of Yugoslavia for 1969-1970 (Sredojević & Aleksić, 2024, p. 191). Serbian banks are undergoing a transformation in which automation and AI technologies are being integrated to streamline processes, improve client experiences, and increase operational efficiency. However, these shifts have significant implications for employees, from their job tasks and responsibilities to their perceptions of job security and career development (Lukić Nikolić, 2024a).

The hypotheses in this study aim to explore how various demographic and professional factors influence employees' perceptions of technological shifts. Table 1 shows the hypotheses and key variables used in this study.

The hypotheses provided in this study aim to investigate relationships and contribute to a more comprehensive knowledge of how various employee characteristics influence their responses to technological change. As automation and AI continue to revolutionize banking processes, Serbian banks' success will be determined by how much they spend in employee training, develop hybrid skill sets, and implement policies to mitigate the negative effects of technological disruption. Serbian banks can guarantee that their employees are well-prepared for success in the ever-changing landscape of Banking 5.0 by nurturing an innovative and continuous learning culture.

Table 1. Hypotheses and key variables used in the study

Hypotheses	Key variables	Possible effects
Hypothesis 1: The perceived impact of automation and AI on the banking workforce varies according to gender, age, and educational level.	Gender	Gender can shape perceptions of automation and AI, as it is influenced by varying roles, opportunities, and cultural factors. Women and men may view automation and AI differently, shaped by their unique experiences and societal expectations.
	Age	Younger, tech-savvy employees may see automation and AI as opportunities, while older employees might view them as threats to job security, often due to lower digital literacy and fewer opportunities for reskilling.
	Education	Higher education tends to correlate with greater adaptability to technology and more positive attitudes toward automation and AI. In contrast, employees with lower education levels may view automation and AI as a threat to their jobs, often due to limited access to training and skill development opportunities.
Hypothesis 2: The perceived impact of automation and AI on the banking workforce varies according to job role and organizational function.	Job role	Employees in non-managerial roles may view automation and AI as a direct threat to their jobs or income, while managers may see these technologies as tools for improving efficiency and advancing their careers.
	Organizational function	In banks, different functions have varying levels of exposure to automation and AI. Employees in back-office roles may feel a greater impact from these technologies, as they are more likely to face automation of tasks. In contrast, front-office and customer-facing employees may view automation and AI as tools to enhance customer experience.
Hypothesis 3: The perceived impact of automation and AI on the banking workforce varies according to the length of banking experience and the number of banks in which individuals have worked throughout their careers.	Length of banking experience	Experienced employees may be more resistant to change, viewing automation and AI as threats to their roles. In contrast, those with less experience may be more adaptable, seeing technological advancements as opportunities for growth and development.
	Number of banks worked	Employees with experience at multiple banks may have encountered varying levels of technological integration, shaping their views on automation and AI. Those who have worked at more progressive institutions may have a positive outlook on AI, while those with experience in less technologically advanced banks may feel more skeptical or cautious.

Source: Authors

RESEARCH METHODS

An empirical study was conducted using a questionnaire technique for data collection. The first part of the questionnaire consisted of profile questions aimed at assessing the respondents' main characteristics: gender, age, education, job role, organizational function, length of experience, and the number of banks in which they had worked during their careers. The second part of the questionnaire included eight statements designed to measure the "Perceived impact of automation and artificial intelligence on the banking workforce." Respondents rated their agreement with each statement on a seven-point Likert scale, ranging from 1 (completely disagree) to 7 (completely agree). The statements in the scale were developed based on an extensive literature review of the potential impacts of automation and AI on the workforce

(Brynjolfsson & McAfee, 2014), (Daugherty & Wilson, 2018), (West, 2018). These sources provide a strong theoretical and empirical foundation for assessing the perceived impact of automation and AI on the workforce. Relying on these studies, the measurement scale efficiently captures the complex nature of respondents' perspectives, resulting in a comprehensive instrument for assessing perceptions about automation and AI's impact on banking careers.

A pilot study was conducted with a small group of employees from Serbian banks to ensure the clarity of the questionnaire and the validity of the measurement scale. Based on minor stylistic adjustments suggested by the respondents, the questionnaire was refined and finalized. The revised version confirmed the measurement scale's high reliability, with Cronbach's alpha coefficient greater than 0.7. The questionnaire was administered anonymously and online via Google Forms, with an average completion time of 15 minutes. The Association of Serbian Banks b.a. distributed the online questionnaire to all banks operating in Serbia, kindly instructing that it be forwarded to all bank employees, including management. Between September and mid-November 2024, a total of 947 employees from various Serbian banks completed the questionnaire. Given that the banking sector in Serbia comprised 20 banks of varying sizes, with a total of 22,253 employees in September 2024 (National-Bank-of-Serbia, 2024), the methodology for this research was carefully structured to ensure comprehensive coverage. The goal was to achieve participation from every bank operating in Serbia and to involve employees from a wide range of departments and positions (minimum 50 responses per bank or potentially 1000 participants at the sector level). That is why the methodology was structured to: a) include responses from every bank and department within each bank; and b) ensure at least 10 different job roles were represented both vertically and horizontally within each sector. Following these guidelines, banks participated by distributing the questionnaire to all departments, covering various positions, with coordination from the Human Resources department. As a result, the response rate reached 94.7%, which is considered more than acceptable in social sciences.

The collected data was processed and analyzed using Microsoft® Excel® 2019 and the Statistical Software for Social Sciences, SPSS, version 21.0. The Kolmogorov-Smirnov test was used to determine the normality of the data distribution, as well as histograms, skewness, kurtosis, the normal probability curve, and the box plot. The results for the scale "Perceived impact of automation and artificial intelligence on the banking workforce", with a significance (Sig.) of 0.000, indicated that the assumption of normal data distribution was not met. As a result, non-parametric statistical techniques were used for statistical analysis within the measurement scales. The Mann-Whitney U-test was used to compare differences between two groups, while the Kruskal-Wallis H-test was used to compare differences among three or more groups with a 95% confidence interval. Levene's test for equality of variances was applied in all tests comparing differences between groups, meeting the assumption of variance homogeneity in all cases ($p > 0.05$).

RESEARCH RESULTS

In total, 947 Serbian bank employees participated in the study. Table 2 shows the key characteristics of the respondents. In terms of gender distribution, most re-

spondents (69.5%) were female, which is not surprising given that women account for most employees in Serbian banking sector. In terms of age distribution, the largest percentage of respondents were between the ages of 45 and 54 (37.6%), followed by those aged 35 to 44 (33.8%). As a result, employees aged 35 to 54 comprise a large percentage of the sample (71.5%). Most respondents (64.1%) have completed university (bachelor's and master's degrees).

Table 2. Key characteristics about the respondents

Answers		**N**	**%**
Gender	Male	289	30.5
	Female	658	69.5
Age	Up to 24 years	13	1.4
	From 25 to 34 years	153	16.2
	From 35 to 44 years	320	33.8
	From 45 to 54 years	357	37.6
	Above 54 years	104	11.0
Education	Secondary school	144	15.2
	College	151	15.9
	University (bachelor's and master's degree)	607	64.1
	University (doctoral degree)	45	4.8

Source: Authors

Table 3 shows the key characteristics of the respondents' work experiences and organizational functions. Most respondents worked in the banking sector for more than ten years (70.4%), but there were also respondents who worked for fewer than five years (18.4%), and between five and ten years (11.2%). So far, a large percentage of respondents (45.1%) have worked for one to three banks, with 30.2% working for just one bank. In terms of job role, most respondents were non-managerial employees (68.7%), with more than 30% holding management positions. In terms of organizational function, the largest percentage of respondents (39.2%) worked in the front office, followed by slightly less than one-third (31.5%) in the middle office, and the remaining 29.3% in the back office.

Table 3. Key characteristics of the respondent's work experience and position

Answers		**N**	**%**
Duration of employment at the bank	Less than 5 years	174	18.4
	From 5 to 10 years	106	11.2
	Above 10 years	667	70.4

The number of banks in a career	Only one bank	381	40.2
	From 1 to 3 banks	427	45.1
	From 3 to 5 banks	126	13.3
	More than 5 banks	13	1.4
Job role	Employees	651	68.7
	Managers	296	31.3
Organizational function	Back office	277	29.3
	Middle office	299	31.5
	Front office	371	39.2

Source: Authors

Table 4 shows the Cronbach's alpha coefficient for the measurement scale used in the study. The "Perceived Impact of Automation and Artificial Intelligence on the Banking Workforce" scale achieved a coefficient of 0.864, indicating that the scale was both valid and reliable, as the coefficient exceeded the threshold of 0.7 (Taber, 2018).

Table 4. Cronbach's alpha coefficient value

Scale	N	Cronbach's alpha coefficient
„Perceived impact of automation and artificial intelligence on the banking workforce"	8	0.864

Source: Authors

Table 5 shows the number of respondents (N), percentages (%), mean values (M), and standard deviations (SD) for each statement on the „Perceived impact of automation and artificial intelligence on the banking workforce" scale. The statement that technology (AI) has already become an integral part of the work in the banking sector received the highest mean value (5.10). The statement that automation of business processes and activities allows respondents to focus on more complex and creative tasks had the second highest mean value (4.84). According to the mean value, the statement that to keep the job in the banking sector, respondents will undoubtedly have to continue learning throughout their careers ranked third place (4.66).

More than 60% of respondents answered that technology (AI) has become an integral component of their jobs, allowing them to spend more time on complex and creative tasks. Similarly, nearly 60% of respondents answered that bank employees must continually update their knowledge and skills in order to keep their jobs. Of the total number of respondents, 55% answered they would need to upgrade their current knowledge and skills, while 45% answered they would need to acquire entirely new knowledge and skills to keep their job. Regarding the statement that robots, or AI systems, would become a fundamental component of the workplace in the future, 50.1% of respondents disagreed, 34.3% agreed, and 17.1% remained neutral. A considerable proportion of respondents (42.2%) answered that in the future, more and more professionals from technological and natural sciences will be employed at banks, but there were also respondents who disagreed (39%), or who remained neutral (18.8%).

Table 5. Descriptive statistics for the „Perceived impact of automation and artificial intelligence on the banking workforce "scale

Answers		N	%	M	SD
After assessing my work, it is evident that technology, particularly artificial intelligence, has already become an integral part of it.	Disagree	235	24.8	5.10	2.037
	Neutral	95	10.0		
	Agree	617	65.2		
The automation of business processes and activities allows me to focus on more complex and creative tasks.	Disagree	271	28.6	4.84	2.056
	Neutral	92	9.7		
	Agree	584	61.7		
Given the continuous development of technology, I am convinced that robots or artificial intelligence systems will one day be my colleagues.	Disagree	474	50.1	3.63	2.100
	Neutral	148	15.6		
	Agree	325	34.3		
To keep my job in the banking sector, I will undoubtedly need to acquire completely new knowledge and skills.	Disagree	363	38.3	4.02	1.978
	Neutral	162	17.1		
	Agree	422	44.6		
To keep my job in the banking sector, I will undoubtedly need to upgrade my current knowledge and skills.	Disagree	302	31.9	4.49	1.961
	Neutral	125	13.2		
	Agree	520	54.9		
To keep the job in the banking sector, I will undoubtedly have to continue learning throughout my career.	Disagree	260	27.5	4.66	1.916
	Neutral	124	13.1		
	Agree	563	59.4		
It is certain that banks will employ more professionals from the fields of technology and natural sciences.	Disagree	369	39.0	3.99	1.989
	Neutral	178	18.8		
	Agree	400	42.2		

Source: Authors

Table 6 shows the results of the Mann-Whitney U-test for the „Perceived impact of automation and artificial intelligence on the banking workforce" scale. The results did not identify a statistically significant difference in the perceived impact of automation and AI in the answers of male (Md=4.25, N=289) and female respondents (Md=4.13, N=658), U=88576.500, Z=-1.679, p=0.093. However, the results revealed a statistically significant difference in the perceived impact of automation and AI among respondents who were not in managerial position (Md=4.00, N=651) and those who were on managerial positions (Md=4.38, N=296), U=77509.000, Z=-4.831, p=0.000.

Table 6. Mann-Whitney U-test results for the „Perceived impact of automation and artificial intelligence on the banking workforce "scale

Answers		N	M	Md	U	z	p
Gender	Male	289	3.97	4.25	88576.500	-1.679	0.093
	Female	658	3.78	4.13			
Job role	Employee	651	3.70	4.00	77509.000	-4.831	0.000*
	Manager	296	4.15	4.38			

Source: Authors

Table 7 shows the results of the Kruskal-Wallis H-test. The results identified statistically significant difference in responses based on educational level, with $\chi2(df=3, N=947) =26.815$, $p=0.000$. Compared to other educational levels, respondents with a university degree (bachelor's and master's degrees) had the highest median score (Md=4.25) and mean value (M=4.02). Furthermore, according to the age of respondents, results revealed statistically significant difference, with $\chi2(df=4, N=947) =20.938$, $p=0.000$. Employees under 24 years had the highest median score (Md=5.25) and mean value (M=4.45), followed by those aged 25 to 34 years (Md=4.38, M=4.10). The results identified statistically significant differences among employees in terms of organizational function ($\chi2(df=2, N=947) =8.188$, $p=0.017$). Employees in the middle and back offices had the highest median scores (Md=4.25), while those in the front office had lower median and mean value. On the other hand, the results did not identify statistically significant difference among respondents based on their working experience in banks ($\chi2(df=2, N=947) =4.873$, $p=0.087$), or number of banks in which they have worked ($\chi2(df=3, N=947) =4.252$, $p=0.236$).

Table 7. Kruskal-Wallis H-test results for the „Perceived impact of automation and artificial intelligence on the banking workforce "scale

Answers		N	M	Md	χ2	df	p
Education	Secondary school	144	3.52	3.75	26.815	3	0.000*
	College	151	3.48	3.63			
	University (bachelor's and master's degrees)	607	4.02	4.25			
	University (doctoral degree)	45	3.65	3.63			
Age	Up to 24 years	13	4.45	5.25	20.938	4	0.000*
	From 25 to 34 years	153	4.10	4.38			
	From 35 to 44 years	320	3.90	4.13			
	From 45 to 54 years	357	3.81	4.25			
	Above 54 years	104	3.33	3.50			

The number of banks in a career	Only one bank	381	3.87	4.13	4.252	3	0.236
	From 1 to 3 banks	427	3.87	4.25			
	From 3 to 5 banks	126	3.74	4.00			
	More than 5 banks	13	3.33	3.13			
Duration of employment at the bank	Less than 5 years	174	4.03	4.25	4.873	2	0.087
	From 5 to 10 years	106	3.94	4.19			
	Above 10 years	667	3.78	4.13			
Organizational function	Back office	277	3.90	4.25	8.188	2	0.017*
	Middle office	299	4.00	4.25			
	Front office	371	3.67	4.00			

Source: Authors

DISCUSSION OF THE RESEARCH FINDINGS

Table 8 shows the summary results of hypotheses testing.

Table 8. Results of hypothesis testing

Hypothesis	p-values	Decision
H1: The perceived impact of automation and AI on the banking workforce varies according to gender, age, and educational level.	0.093 (gender) 0.000* (age) 0.000* (education)	Partially supported
H2: The perceived impact of automation and AI on the banking workforce varies according to job role and organizational function.	0.000* (job role) 0.017* (organizational function)	Supported
H3: The perceived impact of automation and AI on the banking workforce varies according to the length of banking experience and the number of banks in which individuals have worked throughout their careers.	0.087 (length of banking experience) 0.236 (number of banks in which respondents worked)	Not supported

Source: Authors

Based on the research findings, *Hypothesis 1* is partially supported. The findings revealed that respondents' perceptions of the influence of automation and AI on the banking workforce differed by age and educational level, not gender. Gender variations in technology adoption and acceptance have been examined in a variety of circumstances. While some studies suggest that women may have lower levels of confidence in their technological abilities (Christensen M. A., 2023), (Venkatesh, Morris, Davis, & Davis, 2003), others have found that gender does not always play a role in how employees perceive technological advancements (Susskind & Susskind, 2015). Research suggests that younger employees are more adaptable to technological changes, due to their familiarity with digital tools and education on developing technologies (Lukić Nikolić, 2024b). This finding is consistent with the Theory of Planned Behavior (Ajzen, 1991) and the Technology Acceptance Model (Davis, 1989), which indicate

that younger individuals, who are more familiar with digital tools and technologies, have more positive attitudes toward technology adoption (Zirar, Ali, & Islam, 2023), (Brynjolfsson & McAfee, 2014) although that there is a concern that having the ability to properly use technology and devices does not automatically protect them when using digital payments on their phones, purchase mobile credit, in-app purchase and so on (Sredojević & Ziakou, 2020). Older employees, on the other hand, may see automation and AI as risks to their job security, according to Disruptive Innovation Theory (Christensen C. M., 1997), which states that technology innovations frequently present larger challenges to individuals with established, traditional expertise. Older employees may be more reluctant to change because they feel less prepared to adapt to new technologies, especially if they have more years of experience in traditional banking roles (Bessen, 2019). Employee perceptions of automation and AI are also heavily influenced by their level of education. Higher education levels tend to correspond to a more optimistic perceptions on automation, since individuals with more formal education may have better access to resources to adapt to new technology (Lukić Nikolić, 2024b), (Chui, Manyika, & Miremadi, 2016). This finding is consistent with Human Capital Theory (Becker, 1994), which argues that individuals with more education are better able to adapt to and use new technology. Individuals with lower levels of education, on the other hand, might consider automation as a threat to job security because they are less likely to possess the skills needed to adapt to changing technological demands (Brynjolfsson & McAfee, 2014).

Based on the findings, *Hypothesis 2*, that the perceived impact of automation and AI on the banking workforce differs depending on the job role and organizational function, is completely supported. Managers are often more involved in strategic decision-making, and they may see automation and AI as instruments for improving operational efficiency, making better decisions, and driving organizational innovation. This is consistent with the Job Characteristics Model (Hackman & Oldham, 1976), which states that job design and level of involvement in decision-making processes influence how employees perceive changes in their work environment. Managers are more likely to perceive automation and AI positively, while non-managers may see these advances as disruptive (Lukić Nikolić, 2024b). Employees in non-management positions may be concerned about job displacement when technology replaces monotonous tasks (Autor, 2015). Other authors found that, while automation and AI may improve the work of managers, they may also raise concerns about job security among lower-level employees (Chui, Manyika, & Miremadi, 2016). This finding is consistent with Automation Anxiety Theory (Frey & Osborne, 2017), which proposes that employees in lower-level positions may be more vulnerable to job displacement due to automation. Employee perceptions of automation and AI are influenced by the organizational function in which they work. Employees in the back office or middle office may consider automation as an advantage if it reduces their workload and makes their activities more efficient, resulting in increased organizational productivity and decreased operating expenses. Employees who do repetitive tasks may perceive automation as a threat to their job security (Lukić Nikolić, 2024b), (Brynjolfsson & McAfee, 2014). Employees in customer-facing roles (for example, front office) who engage in complex human interactions may see automation as an opportunity to focus more on personal connections and service quality, which are more difficult to automate. These

employees may have a more positive perceptions about automation and AI, viewing them as tools that enhance their capacity to engage with consumers and offer value, rather than substitutes for their jobs.

Hypothesis 3 has been rejected since there were no statistically significant differences among respondents based on their length of banking experience or the number of banks in which they had worked over their careers. The banking sector has seen major structural and technological shifts in recent years (Bueno, Sigahi, Rampasso, Filho, & Anholon, 2024), (Sia, Weill, & Zhang, 2021). As a result, traditional metrics of experience, such as years of bank experience and number of banks, may have lost their significance. Research suggests that digital literacy, financial technology, and regulatory understanding may be more important than traditional experience criteria in determining performance outcomes and employee perceptions (Selimović, Pilav Velić, & Krndžija, 2021), (Brynjolfsson & McAfee, 2014). This could explain why respondents with diverse levels of expertise or who have worked at multiple banks have equivalent results regarding their perceptions of automation and AI. Furthermore, this finding may indicate a shift in how banking professionals are evaluated. While experience is still crucial, modern banks may be focusing more on other attributes such as emotional intelligence, flexibility to changing technologies, and customer-centric skills, which are less related to career length or number of banks worked at. The findings are consistent with the growing importance of Adaptability Theory (Pulakos, Arad, Donovan, & Plamondon, 2000) and Emotional Intelligence (Goleman, 2009) in the workplace, indicating that modern banks prioritize abilities that enable staff to overcome technological changes.

CONCLUSION

This study aimed to explore the perceived impact of automation and AI on the banking workforce, with a particular emphasis on how demographic factors (gender, age, and education) and job-related factors (job role, organizational function, and working experience) shape employees' perceptions on these technological advancements. The study, which included 947 employees from Serbian banks, found that age and education have a significant influence on how employees perceive the impact of automation and AI, with younger employees and those with higher levels of education viewing these technologies more favorably. Gender was not found to have a significant role in shaping perceptions, implying that in this case, other variables could prevail over gender differences in deciding how employees respond to technological advances. In terms of job role and organizational function, the findings showed that managerial employees have a more positive attitude toward automation and AI, perceiving them as tools for improving operational efficiency and creativity. Employees in non-managerial positions, particularly those performing repetitive activities, were more concerned about job displacement, illustrating the disparity between the possible benefits of automation for certain employees and the perceived threats to others. While experience and the number of banks worked for had no statistically significant impact on perceptions, the findings suggested a shift in the application of traditional experience criteria. The growing relevance of digital literacy, adaptability, and other contemporary competencies over traditional career experience indicates that the nature of expertise in the banking sector is evolving. This trend indicates an emerging scenar-

io in which technical skill, rather than length of tenure, is becoming the most important predictor of success in the face of technological changes.

This paper has both theoretical and practical implications. The findings have important implications for theories about technology adoption and workforce change. The confirmation that age and education have a significant influence on perceptions of automation and AI provides support to the Technology Acceptance Model (TAM) and Theory of Planned Behavior (TPB), implying that familiarity with technology and access to educational resources are important in shaping attitudes toward automation. Furthermore, the study sheds light on the changing nature of expertise in the workplace, underlining that traditional metrics of experiences such as years of industry experience—are becoming less important as digital literacy and adaptability gain popularity. This insight adds to current research on Human Capital and Digital Literacy theory, which argues that modern expertise is more directly related to technology proficiency than traditional experience measurements. By combining these ideas with evidence from the banking sector, this study provides a theoretical foundation for future research into the changing nature of expertise in other businesses undergoing digital revolutions.

From a practical standpoint, the findings have several important implications for the banking sector, particularly how banks manage the integration of automation and AI into their workforces. The fact that younger employees and those with higher levels of education tend to have more positive views of automation and AI suggests that banks may need to tailor their training programs and digital transformation initiatives to different demographic groups. Highlighting opportunities for skill development and career advancement through automation can help promote engagement and reduce resistance to change across all age groups. Targeted training initiatives focused on alleviating concerns about job displacement and enhancing digital skills may also increase older employees' willingness to adopt new technologies. Additionally, the study underscores the importance of job position in shaping perceptions, with managerial employees viewing automation and AI as tools for innovation and efficiency, while non-managerial employees may perceive them as threats to job security.

The study's limitations include a geographical concentration on banking employees in Serbia, which may limit the findings' applicability to other locations or sectors. Furthermore, cross-sectional design limits the ability to draw causal conclusions, as data was collected at a single point in time. Additionally, the study relies on self-reported data from the questionnaire, which may introduce biases such as social desirability or response bias, potentially affecting the accuracy of respondents' perceptions.

Future research could focus on longitudinal studies to examine how employees' perceptions of automation and AI evolve over time, particularly as they gain more experience with these technologies. Additionally, expanding the scope of the study could offer valuable insights into how perceptions of automation and AI differ across industries with varying levels of technological adoption. Finally, future research could explore the role of organizational culture and management practices in shaping employees' perceptions of automation and AI. This would offer a deeper understanding of the organizational factors that influence how these technologies are perceived and adopted by employees.

LITERATURE

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211. doi:10.1016/0749-5978(91)90020-T

Autor, D. H. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of Economic Perspectives, 29*(3), 3-30. doi:10.1257/jep.29.3.3

Bankins, S., & Formosa, P. (2023). The Ethical Implications of Artificial Intelligence (AI) For Meaningful Work. *Journal of Business Ethics, 185*, 725-740. doi:10.1007/s10551-023-05339-7

Becker, G. S. (1994). *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education.* The University of Chicago Press.

Bessen, J. E. (2019). *AI and jobs: The role of demand. Working Paper 24235, Cambridge.* Retrieved from https://www.nber.org/papers/w24235

Boustani, N. M. (2022). Artificial intelligence impact on banks clients and employees in an Asian developing country. *Journal of Asia Business Studies, 16*(2), 267-278. doi:10.1108/JABS-09-2020-0376

Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies.* W.W. Norton & Company.

Bueno, L. A., Sigahi, T., Rampasso, I. S., Filho, W., & Anholon, R. (2024). Impacts of digitization on operational efficiency in the banking sector: Thematic analysis and research agenda proposal. *International Journal of Information Management Data Insights, 4*(1), 100230. doi:10.1016/j.jjimei.2024.100230

Christensen, C. M. (1997). The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail. Boston: Harvard Business School Press.

Christensen, M. A. (2023). Tracing the Gender Confidence Gap in Computing: A Cross-National Meta-Analysis of Gender Differences in Self-Assessed Technological Ability. *Social Science Research, 111*, 102853. doi:10.1016/j.ssresearch.2023.102853

Chui, M., Manyika, J., & Miremadi, M. (2016). *Where machines could replace humans—and where they can't (yet)*. Retrieved from McKinsey & Company: https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/where-machines-could-replace-humans-and-where-they-

Daugherty, P., & Wilson, H. (2018). *Human + machine: Reimagining work in the age of AI.* Massachusetts, United States: Harvard Business Review Press.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340. doi:10.2307/249008

European_Union. (2024). *The future of work*. Retrieved from https://research-and-innovation.ec.europa.eu/research-area/industrial-research-and-innovation/future-work_en

Francis, V., & Manjaly, N. (2024). Navigating the Transformation: HRM and Banking 5.0. *Journal of Business Management and Information Systems, 11*, 40-45. doi:10.48001/jbmis.2024.si1008

Frey, C., & Osborne, M. (2017). The future of employment: How susceptible are jobs to computerization? *Technological Forecasting and Social Change, 114*, 254-280. doi:10.1016/j.techfore.2016.08.019

Ghandour, A. (2021). Opportunities and challenges of artificial intelligence in banking: Systematic literature review. *TEM Journal, 10*(4), 1581-1587. doi:10.18421/TEM104-12

Goleman, D. (2009). *Emotional Intelligence: Why it Can Matter More Than IQ.* Boomsbury Publishing PLc.

Hackman, J., & Oldham, G. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance, 16*(2), 250-279. doi:10.1016/0030-

5073(76)90016-7

Jerković, D., Gavrić, T., & Ćurak Ljubas, J. (2024). Digital transformation in Bosnia and Herzegovina companies: analysis of the degree of integration and impact on business. *Economy and Market Communication Review, 14*(1), 116-139. doi:10.7251/EMC2401116J

Kaya, O. (2019). *Artificial intelligence in banking: A lever for profitability with limited implementation to date (EU Monitor).* Deutsche Bank Research.

Lukić Nikolić, J. (2024a). Managing artificial intelligence driven banking transformation: A case study of JPMorgan Chase. *Bankarstvo*, forthcoming.

Lukić Nikolić, J. (2024b). Perceived Effects of Robotic Process Automation on Work Tasks and Processes: A Study of an IT Company in the Republic of Serbia. *Journal of Scientific & Industrial Research (JSIR), 83*(11), 1236-1245. doi:10.56042/jsir.v83i11.5466

Lukić Nikolić, J., & Labus, P. (2024). The relationship between workplace robots, employee exhaustion and turnover intentions in the age of industry 5.0: Research from four southeastern European countries. *Southeast European Journal of Economics and Business, 19*(2), 103-118. doi:10.2478/jeb-2024-0018

Mehdiabadi, A., Shahabi, V., Shamsinejad, S., Amiri, M., Spulbar, C., & Birau, R. (2022). Investigating Industry 5.0 and Its Impact on the Banking Industry: Requirements, Approaches and Communications. *Applied Sciences, 12*(10), 5126. doi:10.3390/app12105126

National-Bank-of-Serbia. (2024). Retrieved from https://nbs.rs/sr/finansijske-institucije/banke/spisak-banaka/

Nicoletti, B. (2021). *Banking 5.0. How fintech will change traditional banks in the "new normal" post pandemic. Palgrave Studies in Financial Service Technology.* Switzerland: Palgrave MacMillan.

Nowakowski, M. (2024). Ethical FinTech: The importance of ethics in creating secure financial products and services. In P. Lasak, & J. Williams, *Digital transformation and the economics of banking. Economic, institutional and social dimensions* (pp. 81-98). London: Routledge, Taylor & Francis Group.

Omarini, A. (2024). From digital technologies to new economics in banking: How to drive the future of digital money and data information knowledge. In P. Lasak, & J. Williams, *Digital transformation and the economics of banking. Economic, institutional and social dimensions* (pp. 31-49). London and New York: Routgledge, Taylor & Francis.

Parker, S., & Grote, G. (2022). Automation, algorithms, and beyond: Why work design matters more than ever in a digital world. *Applied Psychology, 71*(4), 1171–1204. doi:10.1111/apps.12241

Pulakos, E., Arad, S., Donovan, M., & Plamondon, K. (2000). Adaptability in the workplace: Development of a taxonomy of adaptive performance. *Journal of Applied Psychology, 85*(4), 612–624. doi:10.1037/0021-9010.85.4.612

Rodrigues, A., Ferreira, F., Teixeira, F., & Zopounidis, C. (2022). Artificial intelligence, digital transformation and cybersecurity in the banking sector: A multi-stakeholder cognition-driven framework. *Research in International Business and Finance, 60*, 101616. doi:10.1016/j.ribaf.2022.101616

Selimović, J., Pilav Velić, A., & Krndžija, L. (2021). Digital workplace transformation in the financial service sector: Investigating the relationship between employees' expectations and intentions. *Technology in Society*, 101640. doi:10.1016/j.techsoc.2021.101640

Sia, S., Weill, P., & Zhang, N. (2021). Designing a Future-Ready Enterprise: The Digital Transformation of DBS Bank. *California Management Review, 63*(3), 35-57. doi:10.1177/0008125621992583

Sredojević, S. (2018). Contemporary role and importance of professional qualifications in the banking sector. *Bankarstvo, 47*(1), 82-97. doi:10.5937/bankarstvo1801082S

Sredojević, S., & Aleksić, V. (2024). Jugoslovensko bankarstvo Journal: Insights into the Banking Sector of Serbia and Yugoslavia (1971–1992). *Journal Currents of History, 3*, 183-215. doi:10.31212/tokovi.2024.3.sre.183-215

Sredojević, S., & Ziakou, S. (2020). Resilient digital financial education for youth – European Money Quiz Project. *People in the center of process automation* (pp. 131-136). Belgrade: Singidunum University.

Susskind, R., & Susskind, D. (2015). *The future of professions: How technology will transform the work of human experts.* Oxford University Press. https://doi.org/10.1093/oso/9780198713395.001.0001

Taber, K. S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research in Science Education, 48*, 1273–1296. doi:10.1007/s11165-016-9602-2

Venkatesh, V., Morris, M., Davis, G., & Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425-478. doi:10.2307/30036540

Villar, A., & Khan, N. (2021). Robotic process automation in banking industry: a case study on Deutsche Bank. *Journal of Banking and Financial Technology, 5*, 71-86. doi:10.1007/s42786-021-00030-9

West, D. M. (2018). *The future of work: robots, AI, and automation.* Brookings Institution Press.

World_Economic_Forum_Global_Future_Councils. (2024). *White Papers: AI Value Alignment: Guiding Artificial Intelligence Towards Shared Human Goals*. Retrieved from https://www3.weforum.org/docs/WEF_AI_Value_Alignment_2024.pdf

Xu, G., Xue, M., & Zhao, J. (2023). The Relationship of Artificial Intelligence Opportunity Perception and Employee Workplace Well-Being: A Moderated Mediation Model. *International Journal of Environmental Research and Public Health, 20*(3), 1974. doi:10.3390/ijerph20031974

Zirar, A., Ali, S., & Islam, N. (2023). Worker and workplace Artificial Intelligence (AI) coexistence: Emerging themes and research agenda. *Technovation*, 102747. doi:10.1016/j.technovation.2023.102747

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501144M
UDK: 336.747.5:336.76(100)
Datum prijema rada: 11. februar 2025.
Submission Date: February 11, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 144-158

ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

A COMPARATIVE ANALYSIS OF BRAND VALUATION: THE HIROSE METHOD VS. BRAND FINANCE

Çağatay Mirgen | Assistant Professor, Milli Savunma University, Department of Business Administration, 10185, Altıeylül, Balıkesir, Turkey, cmirgen@msu.edu.tr; ORCID: 0000-0002-0970-0121

Funda Bayrakdaroğlu | Associate Professor, Muğla Sıtkı Koçman University, Department of Business Administration, Kötekli Campus, 48000, Kötekli, Muğla, Turkey, fkaya@mu.edu.tr; ORCID: 0000-0003-4460-0473

Abstract: *Brands are not only assets that offer benefits and privileges to consumers but also among the most valuable financial assets of companies and even nations. Therefore, brand valuation has become an increasingly important concern, prompting companies across various industries to adopt different valuation methods to assess and manage their brand equity. In the literature, brand valuation methods are categorized into three groups: financial, consumer-based, and mixed approaches. Since each method follows distinct valuation principles and criteria, brand valuations may vary significantly for the same brand. This study primarily aims to evaluate the brand values of retail companies in Turkey using the Hirose method, which belongs to the financial valuation category. Additionally, the brand values calculated using the Hirose method are compared with those obtained from Brand Finance, a firm that employs a mixed-method approach to brand valuation both in Turkey and globally. According to the findings, the brand values of retail companies differ significantly between the Hirose and Brand Finance methods. The underlying reasons for these discrepancies are discussed in detail in the conclusion section.*

Keywords*: Brand valuation, Brand value, Hirose method, Brand Finance, Turkey*

JEL Classification: *M10*

INTRODUCTION

Establishing and managing a strong brand is essential for companies seeking to enhance their market position and financial performance. The American Marketing Association (2025) defines a brand as "any distinctive feature, such as a name, term, design, or symbol, that identifies goods or services." Accordingly, companies strive to cultivate a strong, positive, and unique brand image by leveraging these branding elements (Kotler & Keller, 2012)

A company's branding strategy involves both the development of a strong brand image and the enhancement of brand awareness. A brand also serves as a critical differentiator from competitors, making it an essential component of marketing strategies (Tasci, Gartner, & Cavusgil, 2007). Moreover, a strong brand reduces business risk, increases a company's borrowing capacity, and enables it to operate with lower cash reserves (Larkin, 2013).

A significant portion of a company's market value consists of intangible assets, particularly brands (Kotler & Keller, 2012). Consequently, brand management seeks to create mental associations in consumers' minds regarding goods and services. This process not only facilitates purchasing decisions but also enhances corporate value. As a result, defining the relationship between consumers and brands has led to the emergence of brand valuation as a research area (Wood, 2000).

Brand management also aims to maximize the value of a company's brand portfolio by designing, managing, and directing it (Budac & Baltador, 2013). Since brands are among the most valuable intangible assets, effective brand management can generate substantial financial and strategic benefits (Sinclair & Keller, 2014).

The value of a brand is assessed from different perspectives, either from a financial standpoint or a consumer-oriented marketing approach. Accordingly, various methods have been developed to calculate brand value, including financial, behavioural, and mixed-method approaches.

Financial methods such as cost-based, market value-based, income-based, and capital market-based brand valuation techniques focus on determining the monetary value of a brand. In contrast, behavioural methods, developed by Aaker (1991), Kapferer (1992) and Keller (1993), take a consumer-oriented approach, analysing the factors that constitute brand value without assigning a monetary figure. Mixed methods integrate both financial and consumer-based perspectives, with consulting firms such as Brand Finance and Interbrand employing hybrid valuation techniques.

However, the proprietary nature of these valuation models limits their transparency, as consulting firms often provide only partial disclosures of their methodologies. This lack of transparency can lead to trust issues among investors and stakeholders. Nevertheless, integrating financial and behavioural approaches allows for a more comprehensive and balanced brand valuation framework. Given its interdisciplinary nature, brand valuation requires collaboration between finance and marketing disciplines (Budac & Baltador, 2013).

Brand valuation is particularly crucial in the retail sector, where companies rely on strong brands to maintain market share and withstand competitive pressures. A high brand value strengthens a company's strategic positioning by increasing its resilience against competitive threats, thereby enhancing its market presence (Lynch & de Chernatony, 2004).

From this perspective, this study aims to calculate the brand values of retail companies operating in Turkey using the Hirose method, a widely recognised financial brand valuation approach. Additionally, the study analyses brand values reported by Brand Finance, which incorporates consumer perceptions into its assessment. By comparing these two methodologies, the study seeks to evaluate their implications for brand valuation in the retail sector.

LITERATURE OVERVIEW

Brand management has been a prominent research area for years, attracting considerable attention in the literature. Numerous studies have examined fundamental questions, such as how a brand is developed, how it is perceived, how it is valued, and ultimately, how it can be effectively managed.

Moreover, brand valuation is a crucial factor for businesses aiming to gain a competitive advantage, enhance customer loyalty, and assess financial performance. In the finance literature, various methods have been developed to determine brand value, with the Hirose method being one of the most frequently used approaches in this context. Several studies have explored the application of the Hirose method in brand valuation and its relationship with financial variables. A review of key studies is provided below.

Chen & Wang (2024) applied the Hirose method to calculate the brand value of X-step, a sports brand in China. They found that X-step's brand value was 9.47 billion yuan, closely aligning with estimates from leading brand research institutions such as WBL and GYBRAND. These results suggest that the Hirose model demonstrates a certain level of reliability and accuracy. Similarly, Ma (2024) highlighted that with the continuous expansion of China's market economy and increasing competition among brands, brand value has become an essential determinant of corporate success. He proposed the Hirose model as a more appropriate tool for assessing the value of China's national brands.

Kılıçarslan & Sucu (2022) applied the Hirose method to calculate the brand values of capital market intermediary institutions traded on Borsa İstanbul (BIST) and examined its relationship with financial performance. Using the Grey Relational Analysis (GRA) method, they analysed the correlation between brand values and financial performance indicators. Their findings revealed a negative relationship between borrowing ratio, liquidity ratio, and brand value, suggesting that brand value decreases as the net working capital ratio increases. Furthermore, the study concluded that financial performance has only a limited impact on brand value and that no significant relationship exists between brand value and market capitalisation.

Demirtaş & Orçun (2022) assessed the brand values of ten companies in the Paper, Paper Products, Printing, and Publishing sector in Turkey using the Hirose method. Their findings indicated that these companies' brand values were lower than their market values. They attributed this result to the companies' inability to fully reflect their brand values in the markets where they operate. Consequently, they emphasised the importance of brand-oriented investments and urged companies to adopt strategic initiatives to strengthen their brand equity.

Kaval (2021) applied the Hirose method to evaluate the brand values of beverage sector companies listed on BIST. The study examined the applicability of the Hirose method in sector-specific brand valuation and reported that beverage sector brand values were calculated in Turkish Lira.

In another study, Can & Sağlam (2021) calculated the brand values of Arçelik, Vestel, Ford Otosan, and Tofaş using the Hirose method and analysed their relationship with company value. In their calculations, they utilised Price/Earnings (P/E), Price/EBITDA (Earnings Before Interest, Tax, Depreciation, and Amortisation), Price/Net Sales, and Market Value/Book Value ratios. Their findings indicated that while the

brand values of Arçelik, Ford Otosan, and Tofaş declined over the years, the brand value of Vestel increased. Additionally, they observed that the brand values of Arçelik and Vestel exceeded their respective company values, whereas the brand values of Ford Otosan and Tofaş were lower than their company values. Regression analysis further revealed that brand value had no statistically significant effect on company value for Arçelik, while it had a significant impact on the other three companies.

Avşarlıgil (2021) applied the Hirose method to calculate brand values for nine companies in the BIST Technology Index. Specifically, the study compared the Hirose-calculated brand values of Aselsan with those determined by Brand Finance. The results demonstrated substantial differences between the two valuation methods.

Similarly, in a study conducted by İşseveroğlu (2020), the Hirose method was used to estimate the brand values of pension insurance companies in Turkey. Using financial data from 16 pension companies between 2014 and 2018, the study analysed trends in brand valuation and discussed the implications of the findings.

Ceylan (2019) investigated the causality relationship between brand value and return on assets (ROA) based on financial data. The study applied the Hirose method to evaluate food sector companies listed among Turkey's 100 most valuable brands according to Brand Finance. The panel causality analysis revealed a unidirectional relationship, indicating that brand value influences return on assets rather than the reverse.

Hsiao & Hsieh (2019) explored the relationship between brand value, management performance, and firm value, employing the Hirose method to quantify brand value.

Divanoğlu et al. (2019) conducted a comparative analysis of brand values in the BIST banking sector, using both the Hirose method and Brand Finance reports. Their findings revealed that different valuation approaches can yield varying brand value estimates.

Gerekan & Koçan (2018) examined fluctuations in brand values for food companies over time, applying the Hirose method and comparing their results with Brand Finance valuations. The study highlighted that the rate of brand value change was not always consistent across the two methods.

Alsu & Palta (2017) evaluated the brand values of food manufacturers in Turkey using the Hirose method. Analysing 10 companies from 2008 to 2016, they compared Brand Finance values with Hirose-based estimates. The findings indicated that the top three brands ranked differently depending on the valuation approach, suggesting that the Hirose method focuses solely on quantitative metrics, whereas the Brand Finance method incorporates both quantitative and qualitative factors.

Uygurtürk et al. (2017) calculated brand values for ceramic sector companies listed on BIST using the Hirose method. Their study confirmed that brand value serves as an essential long-term performance indicator for companies.

Majerova & Kliestik (2015) evaluated various brand valuation methods in the context of Slovak companies, concluding that the Hirose method was the most suitable approach for brand valuation in Slovakia.

Finally, Zengin & Güngördü (2015) calculated the financial brand values of food retailers in Turkey using the Hirose method and compared their results with consumer-based brand valuations. Their findings revealed significant differences between financial and consumer-based brand value estimates.

In summary, a single valuation method may not always be sufficient for accurately assessing brand value. Instead, integrating multiple valuation techniques can provide a more comprehensive perspective, capturing both financial and consumer-driven brand equity components.

METHODOLOGY

Hirose Method

The Hirose brand valuation method is a model developed by a committee chaired by Dr Yoshikuni Hirose and introduced in the "Brand Valuation Committee Report", published by the Ministry of Economy, Trade and Industry (METI) of Japan in 2002. This method utilises three key variables to determine the financial value of a brand. Accordingly, brand value (BV) is expressed as follows:

$$BV = f\,(PD, LD, ED, r) \tag{1}$$

The above function illustrates that brand value (BV) is a function of four variables:

- **Prestige Driver (PD):** Measures the price advantage of the brand relative to its competitors.
- **Loyalty Driver (LD):** Evaluates consumer loyalty to the brand and their tendency to repurchase.
- **Expansion Driver (ED):** Reflects the brand's capacity to expand into new markets.
- **Discount rate (r):** Represents the reference interest rate.

Using these variables and applying an appropriate discount rate (r), the net present value (NPV) of the brand is calculated. The Hirose method offers a comprehensive valuation approach, incorporating both financial performance and market dynamics (Chen & Wang, 2024; Ma, 2024; Hsiao & Hsieh, 2019; Majerova & Kliestik, 2015).

The method for calculating each variable and the respective formulas for brand valuation are explained below.

$$PD = \frac{1}{5}\sum_{t=4}^{0}\left\{\left(\frac{S_t}{C_t} - \frac{S^*_t}{C^*_t}\right) \times \frac{A_t}{OE_t}\right\} \times C_C \tag{2}$$

The explanations for the variables used in the above equation are provided in Table 1.

Table 1. Explanation of Prestige Driver Variables

Variable	Explanation
S (Sales)	It represents the total sales generated by the company within a specific period. It is a key financial metric that indicates the company's revenue-generating capacity.
C (Cost of sales)	It represents the cost of goods sold. This value includes the production or procurement costs incurred by a company to generate sales.

S* (Sales of a benchmark company)	It represents the sales of the compared company, enabling the assessment of its performance relative to other firms in the industry.
C* (Cost of sales of a benchmark company)	It represents the cost of goods sold of the compared company and is used to analyze its cost structure within the industry.
A (Advertising and promotion cost)	It refers to the expenditures incurred by the company for advertising and promotional activities.
OE (Operating cost)	It refers to the operating expenses incurred by the company to sustain its activities.

Source: Hirose et al., 2002.

The Loyalty Driver (LD) is calculated as follows:

$$LD = \frac{\mu_c - \sigma_c}{\mu_c} \quad (3)$$

where:

- μc represents the arithmetic mean of the cost of sales for the previous five periods.
- σc represents the standard deviation of cost of sales, reflecting fluctuations in costs over time.

The Expansion Driver (ED) is calculated using the following formula:

$$ED = \frac{1}{2}\left\{\frac{1}{2}\sum_{i=-1}^{0}\left(\frac{SO_i - SO_{i-1}}{SO_{i-1}} + 1\right) + \frac{1}{2}\sum_{i=-1}^{0}\left(\frac{SX_i - SX_{i-1}}{SX_{i-1}} + 1\right)\right\} \quad (4)$$

where:

- SO refers to overseas sales, representing international market penetration.
- SX represents non-core business segment sales, capturing revenues outside the company's primary operations.

Finally, brand value (BV) is computed as follows:

$$BV = \frac{PD}{r} \times LD \times ED \quad (5)$$

In the Brand Valuation Committee Report (2002), it is stated that different government bond yields can be used as reference points when determining the risk-free interest rate, depending on the time to maturity. In Japan, 20-year bond yields are typically used as a benchmark (Hirose et al., 2002).

For this study, the interest rate on 20-year USD-denominated Eurobonds for Turkey was considered, and this rate was determined to be 7.56% as of 29 December 2023.

Data Set

This study aims to calculate the brand values of retail companies operating in Turkey using the Hirose method. Given that the Hirose method is a financial valuation approach that excludes consumer perception, the brand values calculated using Brand Finance, which incorporates consumer insights, were also analysed.

To ensure a consistent comparison, only companies included in Brand Finance Turkey's Top 100 Brands list were considered. The list of retail companies analysed in

this study is provided in Table 2.

Table 2. Companies Operating in the BIST Retail Trade Sector

	Stock code	Company (short name)	Company (full name)
1*	**BIMAS**	BIM	Bim Birleşik Mağazalar A.Ş.
2	BIZIM	Bizim	Bizim Toptan Satış Mağazaları A.Ş.
3*	**CRFSA**	CarrefourSA	Carrefoursa Carrefour Sabancı Ticaret Merkezi A.Ş.
4	CASA	Casa	Casa Emtia Petrol Kimyevi ve Türevleri Sanayi Ticaret A.Ş.
5	EBEBK	Ebebek	Ebebek Mağazacılık A.Ş.
6	KIMMR	Ersan	Ersan Alışveriş Hizmetleri ve Gıda Sanayi Ticaret A.Ş.
7	GMTAS	Gimat	Gimat Mağazacılık Sanayi ve Ticaret A.Ş.
8	KOTON	Koton	Koton Mağazacılık Tekstil Sanayi ve Ticaret A.Ş.
9*	**MAVI**	Mavi	Mavi Giyim Sanayi ve Ticaret A.Ş.
10	MEPET	Mepet	Mepet Metro Petrol ve Tesisleri Sanayi Ticaret A.Ş.
11*	**MGROS**	Migros	Migros Ticaret A.Ş.
12	MOPAS	Mopaş	Mopaş Marketçilik Gıda Sanayi ve Ticaret A.Ş.
13	SUWEN	Suwen	Suwen Tekstil Sanayi Pazarlama A.Ş.
14*	**SOKM**	Şok	Şok Marketler Ticaret A.Ş.
15*	**TKNSA**	TeknoSA	Teknosa İç ve Dış Ticaret A.Ş.
16*	**VAKKO**	Vakko	Vakko Tekstil ve Hazır Giyim Sanayi İşletmeleri A.Ş.

* Companies marked in bold were included in the research sample

Source: www.kap.org.tr/tr/Sektorler

Data Collection and Processing

To calculate brand values and compare valuation methods, financial data were collected from the year-end consolidated financial statements of the selected companies for the period 2019-2023.

- Amounts from annual reports were converted into USD using the Central Bank of Turkey's indicative USD/TRY buying rate.
- Financial data, including revenue, cost of sales, marketing expenses, and general administrative expenses, were gathered to determine non-core business segment sales.
- Advertising expenses were sourced from financial footnotes.

Due to missing financial reports for Koton in 2020, its brand value was not calculated. Additionally, TeknoSA was designated as the benchmark firm in the Prestige Driver (PD) calculation, as it consistently had the lowest sales-to-cost ratio.

Furthermore, Table 3 outlines the variables used in the Hirose method and their corresponding financial report items.

Table 3. Variables Used in Hirose Method Calculation

Variable Name	Financial Report Item
Sales (S)	Revenue
Cost of Sales (CS)	Cost of Sales
Non-Core Business Segment Sales (SX)	Income from Investing Activities & Financing Income
Advertising and Promotion Cost (A)	Advertising Expenses
Operating Cost (OE)	Cost of Sales, Marketing & Sales Expenses, General Administrative Expenses
Overseas Sales (SO)	Not Provided Directly

Source: authors'

Variables such as sales, cost of goods sold, advertising and promotion expenses, and operating expenses were matched with the relevant annual report items. In addition, non-core business segment sales were derived from the total of investment and financing income. There is no direct reporting of overseas sales, as annual reports do not provide information on this. Accordingly, the expansion variable (ED) was calculated as follows. Divanoğlu et al. (2019) applied the expansion variable in a similar manner.

$$ED = \frac{1}{2}\sum_{i=-1}^{0}\left(\frac{SX_i - SX_{i-1}}{SX_{i-1}} + 1\right) \quad (6)$$

FINDINGS

The steps for calculating brand value using the Hirose method were applied in the following sequence, and the corresponding findings were obtained.

Calculation of the Prestige Driver (PD)

The first step in calculating brand value is determining the Prestige Driver (PD). In this process, a reference company is selected based on the lowest sales-to-cost of goods sold (S/COGS) ratio. The reference company used in this study was TeknoSA, which had the lowest S/COGS ratio in all years analysed. The ratios for each year are provided in Table 4.

Table 4. The Lowest Sales/Cost of Sales Ratios in the Research Scope

Company	Year	Si*/Ci*
TeknoSA	2023	1,1193
TeknoSA	2022	1,1998
TeknoSA	2021	1,2026
TeknoSA	2020	1,1990
TeknoSA	2019	1,2088

Source: authors' calculation

Given that TeknoSA consistently had the lowest ratio, it was selected as the benchmark for PD calculations. The Prestige Driver (PD) calculations for each year are presented in Table 5.

$$PD = \frac{1}{5}\sum_{t=4}^{0}\left\{\left(\frac{S_t}{C_t} - \frac{S^*_t}{C^*_t}\right) \times \frac{A_t}{OE_t}\right\} \times C_0 \qquad (7)$$

Table 5. Calculation of the Prestige Driver (PD)

Companies	Year	S_i / C_i	S_i^*/C_i^*	Advertising expenses (A)	Operating cost (OE)	C_0	Prestige driver for years
		1	2	3	4	5	(1-2)*(3/4)*5
BIM	2023	1.1867	1.1193	29.078.286	11.027.697.932	9.389.117.775	1.669.204
BIM	2022	1.1774	1.0954	29.495.460	14.643.232.653	9.389.117.775	1.550.831
BIM	2021	1.2352	1.2026	13.441.098	4.952.672.395	9.389.117.775	829.931
BIM	2020	1.2231	1.1990	16.902.449	6.969.323.216	9.389.117.775	546.979
BIM	2019	1.2102	1.2088	18.131.441	6.412.908.484	9.389.117.775	38.123
CarrefourSA	2023	1.2602	1.1193	12.620.502	1.543.908.227	1.193.653.406	1.374.994
CarrefourSA	2022	1.2382	1.0954	6.113.709	2.003.526.882	1.193.653.406	520.394
CarrefourSA	2021	1.3791	1.2026	4.327.029	668.975.559	1.193.653.406	1.363.093
CarrefourSA	2020	1.3628	1.1990	5.924.841	1.024.974.064	1.193.653.406	1.129.763
CarrefourSA	2019	1.3740	1.2088	6.849.548	1.038.737.835	1.193.653.406	1.300.423
Mavi	2023	1.9305	1.1193	10.569.155	837.717.621	449.270.858	4.598.188
Mavi	2022	1.9698	1.0954	15.480.528	1.061.068.209	449.270.858	5.731.808
Mavi	2021	2.0552	1.2026	5.803.538	282.487.304	449.270.858	7.869.367
Mavi	2020	1.9343	1.1990	6.073.407	343.969.561	449.270.858	5.832.456
Mavi	2019	1.9632	1.2088	7.051.261	401.989.150	449.270.858	5.945.187
Migros	2023	1.2303	1.1193	46.016.026	6.363.920.133	5.009.784.168	4.018.769
Migros	2022	1.2300	1.0954	38.761.257	7.481.261.747	5.009.784.168	3.494.669
Migros	2021	1.3181	1.2026	17.757.602	2.546.290.265	5.009.784.168	4.037.188
Migros	2020	1.3459	1.1990	18.723.224	3.651.283.086	5.009.784.168	3.772.251
Migros	2019	1.3654	1.2088	19.601.540	3.683.901.403	5.009.784.168	4.174.778
Şok	2023	1.2450	1.1193	17.050.251	4.535.766.841	3.623.454.052	1.711.978
Şok	2022	1.2538	1.0954	21.463.935	5.954.484.928	3.623.454.052	2.069.618
Şok	2021	1.3052	1.2026	9.275.625	1.998.338.338	3.623.454.052	1.726.338
Şok	2020	1.3086	1.1990	12.349.699	2.684.570.711	3.623.454.052	1.825.954
Şok	2019	1.3038	1.2088	9.687.238	2.944.322.089	3.623.454.052	1.132.790

Vakko	2023	2.3173	1.1193	4.671.020	285.406.333	144.385.233	2.830.920
Vakko	2022	2.0165	1.0954	4.664.902	376.119.629	144.385.233	1.649.591
Vakko	2021	2.3538	1.2026	2.440.011	103.307.159	144.385.233	3.925.870
Vakko	2023	2.0408	1.1990	2.957.866	126.794.986	144.385.233	2.835.374
Vakko	2022	2.0959	1.2088	4.302.349	182.916.959	144.385.233	3.012.569

Source: authors' calculation

After calculating the Prestige Driver (PD) for each year, the average value was taken to determine the final PD values for each company. The results are provided in Table 6.

Table 6. Prestige Drivers of the Companies

Companies	Prestige drive (PD)
BIM	927.014
CarrefourSA	1.137.733
Mavi	5.995.401
Migros	3.899.531
Şok	1.693.336
Vakko	2.850.865

Source: authors' calculation

Calculation of the Loyalty Driver (LD)

Following the PD calculation, the Loyalty Driver (LD) was determined using the following formula:

$$LD = \frac{\mu_c - \sigma_c}{\mu_c} \quad (8)$$

The results for LD are provided in Table 7.

Table 7. Calculation of the Loyalty Drivers

Companies	μ_c	σ_c	Loyalty drive (LD)
	1	2	(1-2)/1
BIM	7.614.108.150	3.402.681.809	0,5531
CarrefourSA	966.815.239	415.216.444	0,5705
Mavi	319.948.452	179.818.032	0,4380
Migros	3.776.254.503	1.704.923.659	0,5485
Şok	2.863.986.521	1.313.273.340	0,5415
Vakko	115.324.574	63.989.598	0,4451

Source: authors' calculation

Calculation of the Expansion Driver (ED)

The Expansion Driver (ED) was computed using non-core business revenues (SX factors). The formula for ED is:

$$ED = \frac{1}{2}\sum_{t=-1}^{0}\left(\frac{SX_t - SX_{t-1}}{SX_{t-1}} + 1\right) \quad (9)$$

The results for ED calculations are displayed in Table 8.

Table 8. Calculation of the Loyalty Drivers

Companies	Year	SX	SX Factor	Expansion driver (ED)
BIM	2023	52.652.410	1,605	1,081
BIM	2022	32.814.810	0,557	
BIM	2021	58.924.810		
CarrefourSA	2023	1.622.380	0,487	6,961
CarrefourSA	2022	3.333.940	13,436	
CarrefourSA	2021	248.130		
Mavi	2023	38.381.790	2,252	1,823
Mavi	2022	17.041.530	1,394	
Mavi	2021	12.228.710		
Migros	2023	146.808.380	3,557	2,338
Migros	2022	41.274.080	1,120	
Migros	2021	36.861.980		
Şok	2023	11.329.970	3,144	1,750
Şok	2022	3.603.290	0,356	
Şok	2021	10.135.330		
Vakko	2023	9.049.560	2,689	1,801
Vakko	2022	3.365.830	0,914	
Vakko	2021	3.684.270		

Source: authors' calculation

Calculation of Brand Values Using the Hirose Method

After calculating PD, LD, and ED, the final brand values were determined using the Hirose method formula:

$$BV = \frac{PD}{r} \times LD \times ED \quad (10)$$

The results are shown in Table 9.

Table 9. Hirose Method Brand Valuation

Companies	Prestige driver (PD)	Loyalty driver (LD)	Expansion driver (ED)	Discount rate (r)	Hirose brand value ($)
BIM	927.014	0,5531	1,0807	0,0756	7.329.673
CarrefourSA	1.137.733	0,5705	6,9614	0,0756	59.772.016
Mavi	5.995.401	0,4380	1,8229	0,0756	63.316.047
Migros	3.899.531	0,5485	2,3383	0,0756	66.157.592
Şok	1.693.336	0,5415	1,7499	0,0756	21.222.777
Vakko	2.850.865	0,4451	1,8011	0,0756	30.233.404

Source: authors' calculation

Comparison of Hirose and Brand Finance Valuations

A comparison of brand values from the Hirose method and Brand Finance is presented in Table 10.

Table 10. Comparison of Brand Valuations

Companies	Hirose method brand value 2023 (Million $)	Brand Finance 2023 brand value (Million $)
BIM	7,3	589
CarrefourSA	59,8	15
Mavi	63,3	175
Migros	66,2	345
Şok	21,2	117
Vakko	30,2	15

Source: Hirose method brand value 2023, authors' calculation

Source: Brand Finance 2023 brand value, Brand Finance

There are significant differences between the Hirose and Brand Finance brand valuations of the companies examined in this study. For instance, according to the Hirose method, BIM has a brand value of $7.3 million, whereas the Brand Finance method values it at $589 million. This substantial disparity can be attributed to BIM's strong brand perception among consumers while having a relatively lower value when assessed using financial methods. Similarly, Migros' brand value is estimated at $66.2 million using the Hirose method, whereas it is valued at $345 million by Brand Finance. This finding suggests that, like BIM, Migros is perceived as a strong brand by consumers but is assigned a relatively lower value in financial terms.

In contrast, while CarrefourSA's brand value is calculated as $59.8 million using the Hirose method, it is valued at only $15 million according to the Brand Finance method. This discrepancy may suggest that, despite its financial strength, CarrefourSA holds a lower-than-expected position in consumer perception. A similar situation

applies to Vakko, whose brand value is estimated at $30.2 million under the Hirose method but only $15 million according to Brand Finance. The evaluation conducted in the context of comparing brand values across the two methods aligns with the findings of Avşarlıgil (2021), Divanoğlu et al. (2019), Alsu & Palta (2017), Zengin & Güngördü (2015).

RESULTS AND DISCUSSION

Brands represent critical financial assets and a strategic priority for companies across various sectors. Effective brand management enhances customer loyalty, fostering a consumer base that is less sensitive to price fluctuations and more willing to pay premium prices, ultimately boosting long-term corporate value.

Moreover, brand value plays a pivotal role in shaping a company's financial strength and competitive advantage. However, significant discrepancies can emerge due to the varying methodologies employed in brand valuation. Therefore, it is essential not to rely solely on a single valuation method but instead to integrate multiple approaches for a more comprehensive assessment. In this context, the present study compared brand values derived from the Hirose method and Brand Finance.

The Hirose method primarily emphasises financial performance metrics, such as revenue, profitability, and related financial indicators. In contrast, the Brand Finance method takes a holistic approach, incorporating consumer perception into the valuation process. This broader perspective captures intangible brand strength elements that cannot be measured solely through financial data. This distinction was evident in the brands analysed in this study, including BIM, Mavi, Migros, and Şok Market.

Initially, it was anticipated that Brand Finance valuations would be consistently higher, given its inclusion of subjective, non-financial elements like consumer perception. However, this expectation was not met in the cases of CarrefourSA and Vakko. The Hirose method's exclusive reliance on financial performance indicators likely highlighted strong financial metrics for these brands, which did not fully align with consumer perception, leading to lower Brand Finance valuations.

Specifically, CarrefourSA exhibited substantial volatility in non-core revenues, declining approximately 15-fold in 2021, followed by a sharp rebound of around 13.5-fold the following year. These fluctuations significantly influenced the expansion variable (ED) in the Hirose calculation, potentially inflating CarrefourSA's brand valuation beyond realistic levels.

Future research applying the Hirose method to firms in different countries for international comparisons could yield more comprehensive insights into the method's applicability.

LITERATURE

Aaker, D. (1991). *Brand equity La gestione del valore della marca.* Milano: FrancoAngeli.

Alsu, E., & Palta, G. (2017). Marka değerinin belirlenmesi ve ölçülmesi üzerine finansal bir yaklaşım: ampirik bir çalışma. *Uluslararası Afro-Avrasya Araştırmaları Dergisi, 2*(4), 175-186.

Association American Marketing. (2024). *What is a Brand?* Retrieved 10 18, 2024, from Marketing, Association American: https://www.ama.org/topics/brand-and-branding

Avşarlıgil, N. (2021). Marka değeri: BIST teknoloji endeksi firmalari üzerine bir uygu-

lama. *Öneri Dergisi, 16*(56), 585-610. Retrieved from https://doi.org/10.14783/maruoneri.840194

Bloomberg (2024). *Türkiye 20-year Eurobond*. Retrieved 10 19, 2024, from Türkiye 20-year Eurobond: https://www.bloomberght.com/eurobond/tr-eurobond-20-yil

Brand Finance (2023). *Türkiye'nin en değerli ve en güçlü markaları raporu*. Retrieved 10 18, 2024, from https://static.brandirectory.com/reports/brand-finance-turkey-100-2023-full-report.pdf

Budac, C., & Baltador, L. (2013). The value of brand equity. *Procedia Economics and Finance, 6*(2013), 444-448.

Can, G., & Sağlam, M. (2021). Determining brand value with Hirose method and an investigation of the relationship between brand value and company value: a comparison of Arçelik - Vestel and Ford Otosan-Tofaş. *Journal of Current Researches on Business and Economics, 11*(1), 109-128.

Ceylan, I. E. (2019). A study on the brand value-profitability relationship: Hirose method and panel causality analysis. *Journal of Accounting & Finance*(Special Issue), 389-414.

Chen, W., & Wang, H. (2024). Sports brand value evaluation based on optimized Hirose model: a case study of X-Step company. *International Conference on Smart City and Information System*, (pp. 604-608). Kuala Lumpur.

Demirtaş, M. C., & Orçun, Ç. (2022). Hirose yöntemiyle marka değeri analizi: kağit ve kağit ürünleri, basim ve yayin sektöründe bir uygulama. *Akademik İzdüşüm Dergis, 7*(2), 101-116.

Divanoğlu, S. U., Bağcı, H., & Eroğlu, M. (2019). Hirose yöntemi ile finansal marka değerinin hesaplanması: Borsa İstanbul bankacılık sektörü uygulaması. *İşletme Araştırmaları Dergisi, 11*(4), 2566-2577.

Gerekan, B., & Koçan, M. (2018). Marka değerindeki değişimin incelenmesi üzerine bir araştırma. *İşletme Araştırmaları Dergisi, 10*(4), 210-228.

Hirose, Y. (2002). *The report of the committee on brand valuation.* Retrieved from The Ministry of Economy, Trade and Industry of the Government of Japan: https://dl.ndl.go.jp/view/download/digidepo_1285950_po_cbrandvalue.pdf?contentNo=1&al%20ternativeNo

Hsiao, C. Y., & Hsieh, M. W. (2019). How to interact brand and management strategy to create firm value. . *2nd International Conference on Information Management and Management Sciences* (pp. 38-42). Chengdu China: Association for Computing Machiner.

İşseveroğlu, G. (2020). Finans merkezli marka değeri ölçümü: sigorta şirketlerinin hirose metodu ile analizi. *İş Güç Endüstri İlişkileri ve İnsan kaynakları Dergisi, 22*(3), 107-120.

İşseveroğlu, G. (2020). Finans merkezli marka değeri ölçümü: sigorta şirketlerinin hirose metodu ile analizi. iş güç. *Endüstri İlişkileri ve İnsan Kaynakları Dergisi, 22*(3). Retrieved from http://www.isguc.org/?p=article&id=754&cilt=22&sayi=3&yil=2020

Kapferer, J. (1992). How global are global brands? . *ESOMAR Conference Proceedings: The Challenge of Branding*, (pp. 199-215).

Kaval, K. E. (2021). İçecek sektöründeki firmalarin Hirose yöntemiyle marka değerinin hesaplanması. *Pazarlama İçgörüsü Üzerine Çalışmalar, 5*(2), 59-70.

Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. *Journal of Marketing, 57*(1), 1–22. doi:10.1177/002224299305700101

Kılıçarslan, A., & Sucu, M. Ç. (2022). Marka değerinin Hirose yöntemiyle tespiti ve finansal performans analizi: Borsa İstanbul'da işlem gören aracı kurumlar üzerine bir uygulama. *İşletme Araştırmaları Dergisi, 14*(3), 1937-1952.

Kotler, P. K. (2012). *Marketing Management* (14th ed.). Essex: Pearson Education Limited.

Larkin, Y. (2013). Brand perception, cash flow stability and financial policy. *Journal of Finan-*

cial Economics, 110(1), 232-253. doi:10.1016/j.jfineco.2013.05.002

Lynch, J., & de Chernatony, L. (2004). The power of emotion: brand communication in business to business markets. *Journal of Brand Management, 11*(5), 403-419. doi:10.1057/palgrave.bm.2540185

Ma, L. (2024). Analysis of national wave brand value and new consumer class loyalty combined with the Hirose model. *Applied Mathematics and Nonlinear Sciences, 9*(1), 1-13.

Majerova, J., & Kliestik, T. (2015). Brand valuation as an immanent component of brand value building and managing. *Procedia economics and finance, 26*(2015), 546-552.

Sinclair, R. N., & Keller, L. K. (2014). A case for brands as assets: Acquired and internally developed. *Journal of Brand Management, 21*(4), 286-302.

Tasci, A., Gartner, W., & Cavusgil, S. (2007). Measurement of destination brand bias using a quasi-experimental design. *Tourism Management, 28*(6), 1529-1540. doi:10.1016/j.tourman.2007.02.009

Uygurtürk, H., Uygurtürk, H., & Korkmaz, T. (2017). Marka değerinin hirose yöntemi ile belirlenmesi: BIST'de işlem gören seramik sektörü firmalari üzerine bir araştırma. *Sosyal Bilimler Metinleri, 2017*(2), 10-21.

Wood, L. (2000). Brands and brand equity: definition and management. *Management Decision, 38*(9), 662-669. doi:10.1108/00251740010379100

Zengin, B., & Güngördü, A. (2015). Marka değerinin hesaplanmasi üzerine ampirik bir çalışma: finans ve pazarlama boyutu. *Gazi Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi,, 17*(2), 282-298.

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501159V
UDK: 330.342.14:338.124.4(100)
Datum prijema rada: 14. mart 2025.
Submission Date: March 14, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 159-175

ORIGINALNI NAUČNI RAD / ORIGINAL SCIENTIFIC PAPER

PHILLIPS CURVE AND OKUN'S LAW IN TRANSITION COUNTRIES WITH MODERATE AND INCREASED INFLATION

Selma Vidimlić | Doc. dr. sci., Sveučilište „Vitez" Travnik, Travnik, Bosna i Hercegovina, selmavidimlic@yahoo.com; ORCID: 0009-0002-8314-7421

Abstract: *In this research, the economic growth of individual national economies, price stability and the level of unemployment in transition countries were observed, using data from the official institutions of three countries (Bosnia and Herzegovina, Republic of Croatia and Republic of Serbia), before and after the sudden general increase in prices from 2021. and now, for the period 2015-2024, with the aim of searching for clear causalities between them. Fundamental research conducted in the world during the 60s of the last century, which resulted in the creation of macroeconomic postulates such as the Phillips curve and Okun's law, are subject to review - considering the many global changes that occurred after them. Using data from official state institutions, methods of statistical data processing in the SPSS package, methods of analysis and synthesis, induction and deduction, and the general method of cognition, it was observed that the Phillips curve obtained for each of the mentioned national economy does not show the existence of dependence of variables, and Okun's law did not show credibility. Greater causalities can be observed in more economically developed countries within the framework of transition countries, in this research in the Republic of Croatia. Also, the strong influence of external factors on national economies has weakened the management capabilities of states through monetary and fiscal measures.*

Keywords*: economic growth, Phillips curve, Okun's law, transition countries*

JEL classification: *C1, P24, E01*

INTRODUCTION

The connection between economic growth, unemployment and inflation has been in the focus of researchers for decades, and it is also the subject of this research. Search for exact causality between these variables has gained particular importance due to the strong rise in prices that we have witnessed with the declaration of the Covid-19 pandemic, and the war in Ukraine. As far back as 1962, the Canadian economic expert Arthur Phillips established a connection between the general rise in pric-

es, unemployment and economic growth. Trivariate dependence was used for the first time, and it is represented by the well-known Phillips curve: with higher new inflation, the employment rate and the total gross domestic product increase, but up to a certain point, when increased inflationary pressure leads to a decline in economic indicators. After Phillips, numerous scientists studied this economic dependence, and contributed their research to the aforementioned economic discipline. After decades of careful research of different national economies and internal and external factors that negate, reduce or emphasize the mentioned causality, researchers opted for subsequently formed economic schools - Keynesian or neoclassical. The followers of Keynes' teaching start from price rigidity. By increasing the amount of money in circulation, which leads to an increase in prices, unemployment is reduced. The neoclassical school also does not dispute that the monetary tools used by the state, which relate to the amount of money in the economy, lead to an increase in prices, however the increase is nominal, therefore, money is neutral, and there is no real economic growth. Today, the prevailing opinion among most economists is that the Keynesian school is right in the short term, but in the long term the neoclassical school is ahead. As the prices of various goods rise, the demand for them falls, but in the short term the existing contracts in the economy are in force, which leads to an increase in employment and an increase in economic activities. Only after the adjustment of the market, inflation leads to a decrease in the supply of the same goods, therefore, less production engagement, less employment, until the moment when a new equilibrium point is formed. The flexibility of prices and earnings is made possible by the aforementioned adjustments. However, Phillips himself quickly realized that the causality between the two variables is not always empirically confirmed, so the Phillips curve was expanded with the concepts of the natural rate of unemployment, which cannot be reduced by inflation, as well as the concept of rational expectations. The concept of the natural rate of unemployment in economic theory was first mentioned by the famous Milton Freeman in 1961. Later, by introducing new concepts into the theory, Phillips curve was modified. Economists realized that in the economy there are results of participant's expectations, which increase worker's wages at the same rate as expected inflationary pressures, not only simultaneously or subsequently, but also previously.

The aim of the research is to verify the existence of causality between inflation, unemployment and economic growth in transition countries. In this way, the academic community would gain new knowledge in the study of the macroeconomy of transitional economies. Governments of transition countries could use the research when creating macroeconomic policy.

The defined hypothesis for this research is as follows: The postulates of the Phillips curve and Okun's law cannot be applied in transition countries.

A concept closely related to the concept of the Phillips curve is Okun's law, which states that for every 2% drop in GDP, the unemployment rate, on the other hand, increases by 1%. So, in the event that the GDP amounts to 10 billion monetary units, and registered unemployment registers a rate of 6%, the reduction of GDP to 9.98 billion monetary units, unemployment would increase to 7%. (Samuelson, 2007). In practical life, Okun's law says that the economy should definitely experience continuous growth in order for the unemployment rate to remain approximately the same.

Philips curve and Okun's law were created in developed countries. However, there are different ways to conduct macroeconomic policy in transition countries. For this reason, it is necessary to examine the validity of established causalities in countries that are (still) in the transition between socialist and capitalist economic systems.

METHODOLOGY AND DATA

During the research, data published by the state agency for processing statistical data were used, namely the Bulletin of the National Bank of Serbia for the period 2015-2024, Annual Reports of the Croatian National Bank for the period 2015-2024, Reports of the Bureau of Statistics of Bosnia and Herzegovina for the period 2015-2024.

IBM SPSS Statistics v29.0.2 was used for data processing. The following statistical processing was used in the work:

1.Descriptive statistics for calculating the mean and standard deviation,
2.Shapiro-Wilk test for testing the normality of distributions,
3.Spearman's coefficient for correlation testing,
4.Bayesian regression for examining statistically significant relationships.
5.Augmented Dickey-Fuller (ADF) test
6.KPSS (Kwiatkowski-Phillips-Schmidt-Shin) test

Results of the research were reached by comparing the relationship between variables in developed countries with the results obtained in this research, using the methods of induction and deduction, analyses and syntheses and the general cognitive method. The observed period included not only a relatively stable economic environment, but also a crisis period from 2021 onwards.

PREVIOUS RESEARCH

Considering the constant need of national economies to increase economic growth and reduce unemployment, there are numerous authors who have contributed to researching the actuality of the Phillips curve with the aim of improving it.

Interesting research (Hooper, Mishkin, & Sufi, 2020)) was conducted on the United States market. Authors noticed that a large number of authors reject the postulates of the Phillips curve in their research, and they analyzed the macroeconomic data of states and cities within the USA. They came to the conclusion that the linearity of macroeconomic data weakens significantly after 1980, but significantly more in terms of changes in wage prices, and less so in product prices. They attribute the above to the state's strong regulatory anti-inflationary policies, but they emphasize that the use of the Phillips curve is still an important tool in managing unemployment in the country, and should not be ignored. Researchers in India (Bahera, Wahi, & Kapur, 2018) investigated the relationship between prices and employment, in a large growing economy, and noted that the Phillips curve in India has flattened, as a result of macroeconomic measures to curb inflation. The demand for all goods is stronger than the supply, which pushes product prices up, and the monetary instruments implemented by the Indian central bank give a distorted picture of the existence of the Phillips curve, which the authors claim is still relevant. In Eorozone, authors (Hidrayanto, Samarina, & Stange, 2019) have conducted a research on relationship between inflation and employment in Eurozone, focusing on Germany, France and The Netherlands. They have observed

three characteristics: first, the relationship between unemployment and inflation is negative and significant; second, the slope of Phillips curve is heterogenerous by countries; and third, the slope has not significantly changed since economic financial crisis. Also, for the period from 1990 to 2019, the authors (Azam, Rasheed, & Khan, 2022) studied the relationship between the inflation rate and the unemployment rate in the countries of the Middle East and North Africa. They found that there is no inverse relationship between them in the long run. In the short term, the relationship is negative, but insufficient to be used in macroeconomic policy, therefore without significance. A group of authors from Croatia (Recher, Marina, & Palić, 2017) studied the Phillips curve in the economy they reside in for the period from 2000 to 2016, and determined that in the long term there is neither positive nor negative causality between the unemployment rate and inflation. Lojanica and Obradović (2019) analyzed the relationship between unemployment and inflation for the countries Romania, Albania, Macedonia, Serbia and Montenegro in the period from 1995 to 2015, and concluded that the rules of the Phillips curve are not appropriate for the mentioned countries, but they concluded that there is slight positive dependence between the mentioned variables.

In the Northern Europe, among the Baltic countries, research was conducted on the relationship between the unemployment rate and real economic growth and inflation (Dabušinskas & Kulikov, 2007). The authors determined that the current inflation rate is determined not only by previous inflation rates, but by new marginal costs. Warsame at al. (2022)found a negative relationship between economic growth and unemployment in Somalia in the short and long term, and thereby confirmed the existence of Okun's law. They found a negative connection between inflation and unemployment, i.e. Phillips curve in the short term, with insignificant association of variables in the long term. In South Africa, a study was conducted (Buthelezi, 2023), which determined the existence of the Phillips curve conditioned by other macroeconomic factors, so for the observed countries, an increase in inflation by 1% led to an increase in unemployment by 2.26%, i.e. a decrease in unemployment by 0.06 %. The American authors McLey and Tenreyro (2019) investigated the factors that influence the existence of the Phillips curve and established the following: if monetary policy is aimed at minimizing welfare losses, represented as the sum of the deviation of inflation from the target and the output of inflation potential, the central bank will increase inflation, if the outcome is below potential. Research on forecasting inflation in the euro zone (Banbura & Bobeica, 2023) shows that it is possible to apply the Phillips curve of a newer generation with several time-varying factors. It is difficult to forecast inflation in the Euro area on the eve of the Economic and monetary union and after the sovereign debt crisis. Researchers from United States (Smith, Timmermann, & Wright, 2024) revisited the Phillips curve for the United States and the European Union, using Bayesian panel methods. They found that the Phillips curve still exists, and is relatively abrupt when the economy heats up. The evidence is weaker on the Phillips curve of wages. Molnar, Varga & Cziszarik-Koscir (2024) connected microeconomic behavior with macroeconomic theory, and determined through game theory that price adjustments, not increased demand, drive production in the long run and confirm the classic Phillips curve in the long run. However, in the short term, a gradual price adjustment is shown, after demand shocks.

On the other hand, there are authors who do not agree with the application of the classic Phillips curve. Researchers Benigno & Eggertson (2024) looked at data

from large industrialized economies of different countries, specifically data from 2009 to 2020. They found that the sloped-L Phillips curve has better prognostic possibilities than the classic Phillips curve. Authors Do and Spanos (2024) claim that the traditional approach to studying the relationship between inflation and unemployment rests on theoretical assumptions that are not reliable, so the most influential empirical works that confirmed the existence of the Phillips curve are also unreliable. In the American market, the relationship between inflation and unemployment was observed in the New Keynesian framework (Haschka, 2024). It was found that the Phillips curve weakened from the 1980s onwards, especially during the Covid-19 pandemic, due to the forces of globalization and better-formed inflationary expectations resulting from a more credible monetary policy.The research carried out in the ASEAN region (Wardhono, Nasir, Qori'ah, & Indrawati, 2021) shows that the neo-Keynesian Phillips curve can explain the dynamics of each country in this group, with the fact that changes in inflation are not completely influenced by inflation expectations, but also by the product gap, changes in the money supply and the exchange rate. The pattern of formation of inflation expectations is directed both forward and backward, but backward behavior is more dominant. Martins and Verona (2024) decomposed inflation time series into several frequency ranges, and made predictions for each frequency component of inflation. As follows they contributed to the New Keynesian view of the relationship between inflation and unemployment. In the countries of Central and Eastern Europe, on the example of small open countries, evidence supporting the neo-Keynesian approach regarding the use of survey inflation expectations was confirmed. Also, Crump Eusepi, Giannoni, & Şahin (2024) through his research through the challenges brought by the Covic-19 pandemic confirms the patterns that comprise the neo-Keynesian approach to inflation and unemployment. A contribution was also made by Lavoie (2023), who observed productivity growth, wage inflation and the possibility of a flat Phillips curve within the post-Keynesian model of conflicting claims.

Given that the economic relations have changed significantly if you compare the years when the Phillips theorem was formed with the years in which we live, many authors over the years have included variables that affect inflation, universal or specific to certain areas, in the theorem. Also, we are witnessing a sudden increase in inflation as a result of the Covid-19 pandemic as well as the war in Ukraine, which were a strong inflationary trigger, and all countries around the world recorded an increased rate of inflation during the past few years.

Empirical evidence

Below is an overview of macroeconomic indicators - quartal inflation rate, unemployment rate and gross domestic product (GDP) growth rate.

Bosnia and Herzegovina

Table 1 presents the annual inflation rate, the annual unemployment rate and the percentage change in the gross national product in the period 2015-2024. year. The observed period is particularly interesting because it represents a number of years with moderate inflation, but also a large increase in inflation during 2022 as a result of the previously mentioned destabilizing macroeconomic factors of the world economy.

Table 1: Quartal rates of inflation, unemployment and gross domestic product in the period 2015-2024. in Bosnia and Herzegovina

No	Year	Year inflation (%)	Unemployment (%)	GDP(%)
1	1st Q 2015	4,2	43,1	3,0
2	2nd Q 2015	3,9	43,1	3,2
3	3rd Q 2015	3,7	43,0	3,2
4	4th Q 2015	4,0	42,9	3,1
5	1st Q 2016	3,9	42,8	3,1
6	2nd Q 2016	3,2	42,1	3,3
7	3rd Q 2016	3,5	41,5	3,2
8	4th Q 2016	3,6	40,9	3,3
9	1st Q 2017	3,9	40,2	3,2
10	2nd Q 2017	3,7	39,5	3,4
11	3rd Q 2017	3,1	38,7	3,4
12	4th Q 2017	3.6	37,7	3,3
13	1st Q 2018	2,8	35,4	3,2
14	2nd Q 2018	2,2	32,7	3,9
15	3rd Q 2018	1,9	31,4	3,9
16	4th Q 2018	1.4	30,3	3,8
17	1st Q 2019	1,4	30,3	2,9
18	2nd Q 2019	1,3	30,5	2,6
19	3rd Q 2019	1,2	30,3	2,4
20	4th Q 2019	1.2	30,7	2,6
21	1st Q 2020	1,0	31,2	2,8
22	2nd Q 2020	-0,1	32,3	0,2
23	3rd Q 2020	0,3	33,1	-2,6
24	4th Q 2020	0,1	33,6	-3.2
25	1st Q 2021	1,5	33,9	-2,6
26	2nd Q 2021	1,9	32,9	3,4
27	3rd Q 2021	2,4	31,8	7,2
28	4th Q 2021	2,2	31,2	8,0
29	1st Q 2022	8,9	31,5	7,1
30	2nd Q 2022	21,3	31,1	4,5
31	3rd Q 2022	17,2	30,9	2,8
32	4th Q 2022	14.0	30,4	3,8
33	1st Q 2023	13,8	30,8	3,5
34	2nd Q 2023	7,8	29,2	3,4
35	3rd Q 2023	7,2	29,0	2,0
36	4th Q 2023	6,2	28,7	2,2
37	1st Q 2024	6,0	28,4	2,4
38	2nd Q 2024	5,4	28,3	2,8
39	3rd Q 2024	5,1	28,1	3,1
40	4th Q 2024	4,8	28,1	3,3

Source: Bureau of Statistics of Bosnia and Herzegovina (2015-2024)

From the overview in Table 1 it can be seen that during the period before the appearance of one of the sudden increase in inflation causes, meaning, in relatively stable macroeconomic conditions, annual inflation is not correlated with unemployment. We can make the same claim for the conditions of increased macroeconomic instability.

So, although the Phillips theorem claims that a rise in inflation could lead to a reduction in the unemployment rate, Table 1 shows that the inflation rate recorded a slight decline, and that the unemployment rate was also falling, but at a faster rate. The same observations can be made by looking at the causality of Okun's law, which states that for a 2% drop in GDP, the unemployment rate, on the other hand, increases, but by 1%. Except for the sixth year in one way and the seventh observed year in another way, within the observed period, the gross domestic product recorded a relatively stable growth, but unemployment recorded a decline. During the year 2020, during the Covid 19 pandemic, a drop in GDP by 3.2% was recorded, but also an increase in unemployment by 2.9%. If Okun's law was correct, unemployment growth would be 1.6%.

On the example of the economy of Bosnia and Herzegovina, the existence of the legality of the Phillips curve, but also of Okun's law, cannot be confirmed.

Republic of Serbia

Observing the annual rates of inflation, unemployment and gross domestic product in the Republic of Serbia, as shown in Table 2, similar conclusions were reached.

Table 2: Quartal rates of inflation, unemployment and gross domestic product in the period 2015-2024 in the Republic of Serbia

No	Year	Inflation(%)	Unemployment (%)	GDP (%)
1	1st Q 2015	1,9	19,0	0,1
2	2nd Q 2015	1,9	17,3	1,2
3	3rd Q 2015	1,4	16,7	2,2
4	4th Q 2015	1.5	17,9	1,8
5	1st Q 2016	0,6	18,0	2,6
6	2nd Q 2016	0,3	15,2	2,9
7	3rd Q 2016	0,6	13,8	3,7
8	4th Q 2016	1,2	13,0	3,3
9	1st Q 2017	3,6	14,8	2,4
10	2nd Q 2017	3,6	11,8	2,0
11	3rd Q 2017	3,2	12,9	2,4
12	4th Q 2017	3,0	14,7	2,1
13	1st Q 2018	1,4	14,8	5,1
14	2nd Q 2018	2,3	11,9	5,4
15	3rd Q 2018	2,1	11,3	4,5
16	4th Q 2018	2,0	12,9	4,5
17	1st Q 2019	2,8	12,0	2,9
18	2nd Q 2019	1,5	11,1	3,3

19	3rd Q 2019	1,1	10,3	5,5
20	4th Q 2019	1,9	10,4	4,3
21	1st Q 2020	1,3	10,5	5,7
22	2nd Q 2020	1,6	7,9	-7,0
23	3rd Q 2020	1,8	9,8	-1,3
24	4th Q 2020	1,6	9,7	-0.9
25	1st Q 2021	1,8	12,8	1,5
26	2nd Q 2021	3,3	11,2	14,8
27	3rd Q 2021	5,7	10,6	8,1
28	4th Q 2021	6,6	10,9	7,7
29	1st Q 2022	9,1	8,9	4,7
30	2nd Q 2022	11,9	9,0	4,2
31	3rd Q 2022	14,0	9,4	0,9
32	4th Q 2022	15,1	10,1	1,0
33	1st Q 2023	16,2	9,6	2,3
34	2nd Q 2023	13,7	9,0	3,0
35	3rd Q 2023	10,2	9,1	4,8
36	4th Q 2023	7,6	9,0	5,1
37	1st Q 2024	5,0	9,4	4,7
38	2nd Q 2024	3,8	8,9	4,2
39	3rd Q 2024	4,2	8,1	3,1
40	4th Q 2024	4,3	8,3	4,0

Source: Annual reports od National Bank of Serbia (2015-2024)

During the observed period, shown in Table 2, the unemployment rate in the Republic of Serbia continuously fell, while the inflation rate was at a low level, ranging from 1.5% to 3% maximum until 2021. Due to macroeconomic disturbances, the years 2021 and 2022 were marked by a significant increase in inflation and a slight increase in unemployment, which is in complete contradiction to the claims of Phillips' theorem.

Okun's law also does not apply in the short or long term in the observed period, even in moments of disruption on the world economic level. The data related to the year 2021 are interesting: inflation growth, unemployment growth, GDP growth , while in 2022 the increased inflationary pressure resulted in a renewed drop in the unemployment rate and moderate GDP growth, which is in great contrast to the postulates of the considered theorems.

Republic of Croatia

Table 3 shows data on the rates of inflation, unemployment and the gross domestic period for the same period as for the previous two analyzed countries.

Table 3. Quartal rates of inflation, unemployment and gross domestic product in the period 2015-2024. in the Republic of Croatia

No	Year	Inflation (%)	Unemployment (%)	GDP (%)
1	1st Q 2015	0,1	19,3	1,8
2	2nd Q 2015	0	15,8	1,5
3	3rd Q 2015	-0,8	15,9	4,1
4	4th Q 2015	-0.6	17,7	1,5
5	1st Q 2016	-1,7	16,5	4,5
6	2nd Q 2016	-1,6	13,0	3,0
7	3rd Q 2016	-0,9	12,6	2,2
8	4th Q 2016	-0,3	14,1	4,6
9	1st Q 2017	1,1	13,6	2,3
10	2nd Q 2017	0,7	10,1	3,2
11	3rd Q 2017	1,4	10,1	4,4
12	4th Q 2017	1,3	11,2	2,9
13	1st Q 2018	1,1	10,8	1,9
14	2nd Q 2018	2,4	8,2	3,5
15	3rd Q 2018	1,4	7,8	3,0
16	4th Q 2018	1,5	8,9	2,8
17	1st Q 2019	0,8	8,8	4,8
18	2nd Q 2019	0,9	6,6	3,1
19	3rd Q 2019	0,6	6,6	2,9
20	4th Q 2019	1,4	7,9	1,9
21	1st Q 2020	0,6	8,5	-1,3
22	2nd Q 2020	-0,2	9,0	-15,7
23	3rd Q 2020	0	8,7	-11,0
24	4th Q 2020	-0,7	9,3	-3,7
25	1st Q 2021	1,2	9,2	3,8
26	2nd Q 2021	2,0	7,4	19,7
27	3rd Q 2021	3,3	6,9	15,9
28	4th Q 2021	5,5	7,9	10,8
29	1st Q 2022	7,3	7,4	7,9
30	2nd Q 2022	12,1	6,1	9,9
31	3rd Q 2022	12,8	6,0	7,8
32	4th Q 2022	13,1	6,8	3,6
33	1st Q 2023	10,7	6,5	2,2
34	2nd Q 2023	7,6	5,5	3,9
35	3rd Q 2023	6,7	5,8	2,0
36	4th Q 2023	4,5	6,4	5,3
37	1st Q 2024	4,1	6,2	4,0
38	2nd Q 2024	2,4	4,7	3,5
39	3rd Q 2024	1,6	4,6	3,9
40	4th Q 2024	3,4	5,1	3,8

Source: Annual report of Croatia National Bank (2015-2024)

During the observed ten years, the Republic of Croatia recorded a continuous increase in the unemployment rate, while before the macroeconomic disturbances inflation was at an extremely low level: it ranged from a deflationary -0.6% to 1.5%. Although inflation in this observed country is observed already during the pandemic year of 2020, it leads to an increase in the unemployment rate by a full 1 percent but also to a drop in GDP by a high 8.6%, in the following year unemployment continues to fall, but also to a large increase in GDP. We can see the highest inflation rate in Croatia during 2022, but also a continuation of the unemployment rate and GDP growth. Taking the data from Table 4 into account, we can conclude that the laws of the Phillips curve and Okun's law cannot be applied to this transition country.

RESULTS OF DATA PROCESSING IN THE SPSS PACKAGE AND DISCUSSION

The Shapiro-Wilk test of normality of the distribution determined that there is a significant deviation from the assumptions of the normal distribution, that is, the distribution is asymmetric.

For this reason, non-parametric statistics Spearman's correlation and Bayesian statistics were applied.

Table 4: Results of checking the correlation between variables

Country N=40			Quartal	Inflation(%)	Unempoyment (%)	Growth GDP (%)
Bosna and Herzegovina	Quartal	rho	1,000	,330*	-,862**	-0,016
		p		0,038	0,000	0,921
	Inflation (%)	rho	,330*	1,000	-0,207	0,057
		p	0,038		0,199	0,727
	Unepoloyment (%)	rho	-,862**	-0,207	1,000	0,179
		p	0,000	0,199		0,268
	Growth GDP (%)	rho	-0,016	0,057	0,179	1,000
		p	0,921	0,727	0,268	
Republic of Croatia	Quartal	rho	1,000	,771**	-,922**	,319*
		p		0,000	0,000	0,045
	Inflation (%)	rho	,771**	1,000	-,785**	,471**
		p	0,000		0,000	0,002
	Unepoloyment (%)	rho	-,922**	-,785**	1,000	-,340*
		p	0,000	0,000		0,032
	Growth GDP (%)	rho	,319*	,471**	-,340*	1,000
		p	0,045	0,002	0,032	

Republic of Serbia	Quartal	rho	1,000	,710**	-,906**	0,290
		p		0,000	0,000	0,069
	Inflation (%)	rho	,710**	1,000	-,591**	0,111
		p	0,000		0,000	0,494
	Unepoloyment (%)	rho	-,906**	-,591**	1,000	-0,183
		p	0,000	0,000		0,257
	Growth GDP (%)	rho	0,290	0,111	-0,183	1,000
		p	0,069	0,494	0,257	

Source: Author's research

As seen in Table 4 in total or by phases, we do not have statistically significant correlations p>0.05, except for Croatia, where there is a weak connection between inflation and unemployment.

Below in Table 5, Table 6, Table 9 is an overview of the results processed by the Bayesian regression method for all three observed countries.

Table 5: Results obtained using Bayesian regression

Country	Bayes Factor[c]	R	R Square	Adjusted R Square	Std. Error of the Estimate
Bosna and Herzegovina	0,007	0,121	0,015	-0,067	1,719083
Republic of Croatia	0,047	0,337	0,114	0,040	5,516340
Republic of Serbia	0,030	0,300	0,090	0,014	3,149571

Source: Author's research

All Bayes factors are below 1, which means that there is no correlation between the variables.

Table 6: Bayesian Estimates of Coefficients

Country	Parameter	Posterior			95% Credible Interval	
		Mode	Mean	Variance	Lower Bound	Upper Bound
Bosna and Herzegovina	(Intercept)	-229,697	-229,697	236826,682	-1188,858	729,464
	Inflation (%)	0,015	0,015	0,005	-0,127	0,157
	Unemployment (%)	0,050	0,050	0,016	-0,201	0,301
	Quartal	0,115	0,115	0,057	-0,357	0,586
Republic of Croatia	(Intercept)	746,755	746,755	2187695,628	-2168,454	3661,964
	Inflation (%)	0,547	0,547	0,091	-0,049	1,142
	Unemployment (%)	-0,180	-0,180	0,274	-1,212	0,852
	Quartal	-0,368	-0,368	0,533	-1,807	1,072
Republic of Serbia	(Intercept)	-1497,870	-1497,870	738204,236	-3191,290	195,549
	Inflation (%)	-0,128	-0,128	0,024	-0,432	0,175
	Unemployment (%)	0,446	0,446	0,135	-0,279	1,172
	Quartal	0,741	0,741	0,180	-0,094	1,576

Source: Author's research

In Bosnia and Herzegovina, unemployment is not significantly related to GDP growth. This result indicates that Okun's law is not applicable in this context. Also, there is no relationship between the inflation rate and the unemployment rate. The results confirm that the Phillips curve and Okun's law are not valid for the period 2015–2023. Low values of correlation coefficients and high p-values indicate the absence of causal relationships between inflation, unemployment and GDP growth.

In the Republic of Serbia, there is also no significant connection between unemployment and GDP growth. There is no relationship between the inflation rate and the unemployment rate. That indicates the inapplicability of neither the Phillips curve nor Okun's law for Serbia.

The results ligthly support the Phillips curve in the Republic of Croatia, because there is a negative correlation between inflation and unemployment, but Okun's law is not confirmed, because there is no connection between unemployment and GDP.

Table 7: Results obtained using Bayesian regression ANOVA

Country	Source	Sum of Squares	Df	Mean Square	F	Sig.
Bosnia and Herzegovina	Regression	3,027	2	1,513	0,145	0,868
	Residual	62,709	6	10,452		
	Total	65,736	8			
Republic of Croatia	Regression	7,602	2	3,801	0,090	0,915
	Residual	254,498	6	42,416		
	Total	262,100	8			
Republic of Serbia	Regression	1,371	2	0,686	0,097	0,909
	Residual	42,609	6	7,101		
	Total	43,980	8			

Source: Author's research

Based on the results for Bosnia and Herzegovina, shown in Tables 5 - 7, we conclude that the Models are not statistically significant ($p > 0.05$), which means that the independent variables do not explain a significant amount of variation of the variables. The high residuals suggest that most of the variation in the dependent variable remain unexplained by the regression model. In the Republic of Serbia, the results showed, as well as for Bosnia and Herzegovina, that there is no statistical significance between the inflation, unemployment and GDP. The effects of independent variables are negligible. For the Republic of Croatia, the results from Table 5 show that the model is also not statistically significant ($p > 0.05$), which means that unemployment do not have a significant impact on GDP growth in Croatia, as well as in the previously observed countries. There is a weak conection between inflation and unempoyment, but high residual indicates a large number of variations in the dependent variable that cannot be explained by the model.

Table 8: Results obtained using ADF test

Country	Variable	ADF Statistic	p-value
Bosnia and Herzegovina	Inflation (%)	-2.28151	0.178
	Unempoyment (%)	-1.77772	0.392
	GDP growth (%)	-4.87855	0.000
Republic of Croatia	Inflation (%)	0.89424	0.993
	Unempoyment (%)	-2.08459	0.251
	GDP growth (%)	-3.40908	0.011
Republic of Serbia	Inflation (%)	-1.37992	0.592
	Unempoyment (%)	-2.48222	0.120
	GDP growth (%)	-5.12069	0.000

Source: Author

If all three variables are stationary (inflation, unemployment and GDP growth) in all countries, this means that their statistical properties (mean value, variance and autocorrelation) remain constant over time. In other words, the values of these economic variables do not show systematic trends or long-term changes, but return to some stable level.

Table 9: Results obtained KPSS test

Country	Variable	KPSS Statistic	p-value
Bosnia and Herzegovina	Inflation (%)	0.28333	0.100
	Unempoyment (%)	0.73925	0.010
	GDP growth (%)	0.05879	0.100
Republic of Croatia	Inflation (%)	0.47573	0.047
	Unempoyment (%)	0.79324	0.010
	GDP growth (%)	0.10591	0.100
Republic of Serbia	Inflation (%)	0.45936	0.052
	Unempoyment (%)	0.81683	0.010
	GDP growth (%)	0.12668	0.100

Source: Author

If inflation, unemployment or GDP growth is not stationary, this means that there is a long-term trend of growth or decline, which may indicate instability in the economy. If inflation is non-stationary, it may indicate hyperinflation or long-term deflation. If unemployment is non-stationary, this may mean that economic shocks permanently affect the labor market. If GDP growth is non-stationary, it may indicate that the economy is growing (or falling) in the long term, which requires an analysis of structural changes.

Transition countries have their own specificities that set them apart from developed and developing countries. The transition from socialist postulates to capitalist settings of the economy left its mark on the development and level of the domestic gross product, but also on other economic parameters. The effects of the war, especially in Bosnia and Herzegovina, which entered the transition period with a destroyed economy and high unemployment, were the basis for the mismatch of social and economic variables. Even decades after the abolition of socialist paradigms, they did not fully harmonize with those in developed countries.

As it is well known, national economies function according to the principles of a market economy or a planned or contractual economy, which operates on the basis of command. They are characterized by strong state interventionism. The developed countries of the world function on the basis of the confrontation of supply and demand for goods and services, with mild state interventionism. Transition countries fall between these two categories. The consequences of the incomplete transition are felt in all segments of the economy, and hence the common attitude that transition countries have their own specificities. High unemployment, management of the exchange rate in the hands of politics, which is in the case of Bosnia and Herzegovina strictly bound by the currency board, a cumbersome state administrative apparatus, a high level of corruption, government decisions that are used to influence social peace, a high level of the new gray economy and the like are just some of the characteristic of transition countries. According to the data published by the national statistical offices, in the past ten years, high unemployment still stands out as a feature of the observed national economies, but which, in general, tends to fall. In Bosnia and Herzegovina, unemployment in the period 2015-2020 was initially recorded as extremely high 42.9%, then fell in the following years, and in the observed period, a slight drop in inflation was recorded, from 4% to 1.2%, and a relatively even growth of the gross national product, of around 3.6% . Due to the worldwide macroeconomic disturbances caused by the Covid-19 pandemic and the war in Ukraine, the macroeconomic picture of this country has changed. In the short term, in the years 2020 and 2021, there was a fall in the inflation rate, and then growth, at the same time a fall in the gross domestic product, and growth that more than made up for the fall, and the unemployment rate rose slightly, and during 2023 returned to the downward trend. From the above, we conclude that Phillips curve and Okun's law are not recognized in the state of Bosnia and Herzegovina, although we emphasize that the gross domestic product in the short term showed an increase in economic activities compared to the previous trend. It should be emphasized that the decrease in unemployment stated in the data is a reflection of the economic recovery after the war, but also the reduction of the gray economy, which in Bosnia and Herzegovina, after the war, was at an extremely high level. In the Republic of Serbia, also in the period 2015-2020 a continuous decline in unemployment was registered, the inflation rate oscillated at a relatively low level, from 1.5-3%, and the gross domestic product was also moderate, until 2020, when additional anomalies can be observed. The inflation rate first increased, then it was balanced, a drop in GDP was registered, then a growth more than compensated for the previous decrease, and the rate increased first, and everything returned to its usual trend. From this, we conclude that the Phillips curve was not applied even in this transition country, nor was Okun's law. Also, this coun-

try recorded a first-rate momentum that strengthened the overall ten-year growth. In the Republic of Croatia, which is much stronger economically, a member of the European Union since 2013 and which has accepted the Euro as its national currency since 2023, unemployment was registered in the period 2015-2024 in constant decline, from 17.7% to 6.4%. In the observed period, the world's macroeconomic turmoil did not affect this indicator. On the other hand, inflation increased in 2020, then stabilized, then increased, but much more strongly in 2022. At the same time, the gross domestic product, which had a slight positive note, fell drastically in 2020. In the following year, it grew twice as much as compared to the earlier annual trend growth, but again not enough to not conclude that the decline slowed down the decade-long growth of the economy. The contours of the Phillips curve in the Republic of Croatia are, however, slightly noticeable. The Republic of Croatia is at a higher economic level compared to the previous two observed countries, economic reforms have been carried out on a larger scale, and this country is slowly losing the characteristics of a transition country. The same leads us to the conclusion that a higher degree of development and potential belonging to developing countries, with less state interventionism and more pronounced market postulates, the Phillips curve, can still be one of the tools for dealing with national economic variables, which should be the subject of another study. Observing the three national economies, in addition to the calculations mentioned in the research results, the following was observed:

1. During the period 2015-2020 in the conditions of moderate and stable inflation in the observed countries, the gross domestic product grew at a stable rate, and a drop in unemployment was registered;

2. In the conditions of the 2020 crisis caused by the Covid-19 pandemic, a decline in gross domestic product was registered, and inflationary tendencies fell in Bosnia and Herzegovina and the Republic of Serbia, and increased in the Republic of Croatia;

3. In the conditions of increased inflation in 2022, in the countries of Bosnia and Herzegovina and the Republic of Serbia, approximately the average growth rate of the gross domestic product is recorded, similar to the rates from the period without the crisis, and in the Republic of Croatia, a stronger economic momentum was recorded, but inflation took on rates of decline as in the period without crisis.

Also, in this research, we found that:

1. Inflation is stationary. This means that inflation in the analyzed countries does not have a long-term trend of growth or decline, rather it oscillates around an average value. Monetary policy can have efficient short-term effects, whether long-term inflationary pressures do not occur.

2. Unemployment is stationary. If the unemployment rate is stationary, it means that the market likes to adjust and return to an equilibrium level after economic shocks. Short-term changes in unemployment may be the result of temporary economic factors, or long-term unemployment does not show a permanent trend of growth or decline.

3. GDP growth is stationary. This means that economic growth oscillates around an average value, without long-term growth or decline. The economy does not have a permanent upward or downward trend, which may indicate low productivity or the absence of structural changes in the economy.

CONCLUSION

Although there are numerous studies that deal with finding clear legalities between the observed variables - inflation, unemployment and economic growth observed through the gross domestic product, the consensus of the researchers has not been reached. Each national economy has its own specificities that set it apart from the rest of the world, which certainly affects the establishment of economic laws that would apply to the entire world. We conclude that Phillips' curve and Okun's law could not be confirmed in the observed transition countries. Observing three macroeconomic parameters in three transition countries during the period 2015-2024, it was observed that the legalities that were pronounced through the Phillips curve and Okun's law were not confirmed. Greater interdependencies are observed in a country that is more on the path to a market economy. In the mentioned period, there were also global macroeconomic disturbances that affected this research, and it was possible to verify the existence of the above-mentioned laws both in the short and long term, i.e. in relatively stable situations, but also during world crises. In developed countries, as well as large emerging countries, researchers can find elements of established laws, but transition countries, due to their specificities, still cannot use macroeconomic tools to manage the level of the unemployment rate, inflation rate and gross national product in the way that the developed countries can. The knowledge gained in this research shows that in countries in transition, it is not possible to take only independent variables and simply compare them, but it is necessary to analyze the entire national economy, which has its own limitations, and it is necessary to observe other economic elements, which can be the subject of other researches. The obtained empirical knowledge can serve as a starting point for creating a different approach to the assessment and evaluation of macroeconomic indicators. The research confirmed the hypothesis - In transition countries, the interdependencies between economic growth, observed through the gross domestic product, unemployment and inflation have not been clearly established. The slight connection between observed macroeconomic parameters in the Republic of Croatia, which is more developed and already a member of the European Union, hints that with further development of the respective national economy, clearer connections between inflation, unemployment and GDP could be observed. After the implementation of reforms as a set of measures on the way to the accession of Bosnia and Herzegovina and the Republic of Serbia to the European Union, it would be interesting to repeat this research and determine whether there will be laws that justify the use of the Phillips curve and Okun's law as a macroeconomic tool.

LITERATURE

Azam, M., Rasheed, K., & Khan, S. (2022). Does the Phillips Curve Exist? *Journal of Central Banking Theory and Practice, Vol 3*, str. 59-78.

Bahera, H., Wahi, G., & Kapur, M. (2018). Phillips curve relationship in an emerging economy: Evidence from India. *Economic Analisies and Policies, Vol 59(C),* , str. 116-126.

Banbura, M., & Bobeica, E. (2023). Does the Phillips curve help to forecast euro area inflation? *International Journal of Forecasting, Vol 39, Issue 1*, str. 364-391.

Benigno, P., & Eggertsson, G. B. (2024). The Slanted-L Phillips Curve. *Understanding the return of inflation*, (str. 84-89).

Bereau of Statistics of Bosnia and Herzegovina. (2015-2024). *Annual Reports.*

Buthelezi, E. M. (January 2023). Impact of Inflation in Different States of Unemployment: Evidence with the Phillips Curve in South Africa from 2008 to 2022. *Economies, 11(1), 29*.

Croatia National Bank. (2015-2024). *Annual Reports.*

Crump, R. K., Eusepi, S., Giannoni, M., & Şahin, A. (2024). The unemployment–inflation tradeoff revisited: The Phillips curve in COVID times. *Journal of monetary Economics, Vol 145(S)*.

Dabušinskas, A., & Kulikov, D. (2007). New Keynesian Phillips curve for Estonia, Latvia and Lithuania. *Bank of Estonia, Working Paper*.

Do, H.-P., & Spanos, A. (2024). Revisiting the Phillips Curve: The Empirical Relationship Yet to be Validated. *Oxford Bulettin of Eonomics and Sstatistics, Department of Economics, University of Oxford, vol. 86(4)*, str. 761-793.

Haschka, R. E. (2024). Examining the New Keynesian Phillips Curve in the U.S.: Why has the relationship between inflation and unemployment weakened? *Reaserch in Economics, Vol 78, Issue 4*.

Hidrayanto, I., Samarina, A., & Stange, I. M. (2019). Is the Phillips curve still alive? Evidence from the euro area. *Economic Latters, Vol 174, issue C,*, str. 149-152.

Hooper, P., Mishkin, F. S., & Sufi, A. (2020). Prospects for inflation in a high pressure economy: Is the Phillips curve dead or is it just hibernating? *Research in Economics, Vol 74(1)*, str. 26-62.

Khan, A. Z. (2014). Quaid-I Azam Muhammad Ali Jinnah Correspondence (1936-1947). *Pakistan Historical Society. Journal of the Pakistan Historical Society, 62*(2), 123.

Lavoie, M. (2023). Conflictual Inflation and the Phillips Curve. *Review of Polotical Economy,* , 1397-1419.

Lojanica, N., & Obradović, S. (2019). Povezanost inflacije, nezaposlenosti i ekonomskog. *Ekonomija socijalizma i tranzicija*, str. 88-105.

Martins, M. M., & Verona, F. (2024). Forecasting Inflation with the New Keynesian Phillips Curve: Frequencies Matter. *Oxford Bulletin of Economics and Statistics, Department of Economics, University of Oxford, vol. 86(4)*, str. 811-832.

Mcleay, M., & Tenreyro, S. (2019). Optimal Inflation and the Identification of the Phillips Curve. *NBER, Macroeconomics Annual, Vol 34*.

Molnar, A., Varga, J., & Csiszárik-Kocsir, A. (2024). Deriving the Classical and New-Keynesian Phillips Curves using Machine Learning Simulations. *Decision Making: Applications in Management and Engineering, 7(1)*, str. 546-567.

National Bank of Serbia. (2015-2024). *Annual Reports.*

Recher, V., Marina, M., & Palić, P. (2017). Analysis of unemployment-inflation nexus in times of crisis: the case of croatia. *Ekonomski pregled, 68(1)*, str. 32-58.

Smith, S. C., Timmermann, A., & Wright, J. H. (2024). Breaks in the Phillips Curve: Evidence From Panel Data. *Journal of Applied Econometrics, Vol 40, Issue 2*, str. 131-148.

Wardhono, A., Nasir, M., Qori'ah, C. G., & Indrawati, Y. (2021). Movement of Inflation and New Keynesian Phillips Curve in ASEAN. *Economies 2021, 9(1), 34*.

Warsame, A. A., Ali, A. O., & Hassan, A. Y. (2022). Macroeconomic Determinants of Unemployment in Somalia: The Case of Okun's Law and the Phillips Curve. *Asian Economic and Financial Review Vol. 12, No. 11*, str. 938-949.

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501176D
UDK: 004.738.5:[005.6:338.486.22(497.5)
Datum prijema rada: 23. septembar 2024.
Submission Date: September 23, 2024
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 176-194

PREGLEDNI NAUČNI RAD / OVERVIEW SCIENTIFIC PAPER

REPREZENTATIVNOST KULTURNE BAŠTINE ISTRE I KVARNERA NA NAJČITANIJIM HRVATSKIM PORTALIMA I DRUŠTVENIM MREŽAMA TURISTIČKIH ZAJEDNICA

Krešimir Dabo | Dr. sc; Docent, Znanstveni suradnik; Institut za istraživanje migracije, Odjel za kulturne i otočke studije, Zagreb, Hrvatska, kresimir.dabo@imin.hr; ORCID ID: 0000-0001-9260-7384

Hrvoje Jakopović | Dr. sc.; Izvanredni profesor; Fakultet političkih znanosti Sveučilišta u Zagrebu, Zagreb, Hrvatska, hrvoje.jakopovic@fpzg.hr; ORCID ID: 0000-0002-9846-9952

Dejan Gluvačević | Dr. sc.; Docent; Veleučilište Edward Bernays, Zagreb, Hrvatska, dejan.gluvacevic@bernays.hr; ORCID ID: 0000-0002-4960-648X

Sažetak: *Kulturna baština može imati značajnu ulogu u predstavljanju, komuniciranju i brendiranju turističke destinacije. U tom procesu od velike pomoći mogu biti neki od alata odnosa s javnošću, konkretno odnosi s medijima i upravljanje društvenim mrežama. Da bi se uopće kreirale strateške komunikacijske smjernice za predstavljanje kulturne baštine u svrhu brendiranja destinacije koje će biti primjenjive u praksi, valjda determinirati početne, postojeće parametre. Stoga je glavni cilj ovoga rada utvrditi u kojoj mjeri, kako i na koji način hrvatski najčitaniji elektronički mediji izvještavaju o kulturnoj baštini Istre i Kvarnera te kako tu istu temu predstavljaju županijske turističke zajednice svojim javnostima. U tu svrhu, izrađena su dva nezavisna mjerna instrumenta prilagođena platformi i formatu sadržaja koji se analizirao. Konkretnije, jedna za analizu medijskog izvještavanja te druga matrica za analizu sadržaja službenih profila na Facebooku i Instagramu Turističkih zajednica Istre i Kvarnera. Rezultatima je utvrđeno kako i mediji i turističke zajednica iznimno malo pridaju pažnje kulturnoj baštini, što otvara prostor za daljnja istraživanja o strategiji brendiranja hrvatskih turističkih regija, odnosno utvrđivanja kako se odabrane destinacije predstavljaju i na čemu staviti naglasak u komunikacijskim strategijama.*[1]

Ključne riječi*: brendiranje destinacije, kulturna baština, društvene mreže, internetski portali, odnosi s javnošću*

JEL klasifikacija*: Z10; L80; M37*

1 Ovaj rad je nastao u sklopu znanstvenog projekta ″Kulturni identiteti i brendiranje turističkih destinacija Istre i Hrvatskog primorja″ (9-2024/2027) Instituta za istraživanje migracija, a financira se od Ministarstva znanosti, obrazovanja i mladih Republike Hrvatske, uz potporu *EU Next Generation.* Izneseni stavovi i mišljenja samo su autorova i ne odražavaju nužno službena stajališta Europske unije ili Europske komisije. Ni Europska unija ni Europska komisija ne mogu se smatrati odgovornima za njih.

UVOD

Nužnost brendiranja hrvatskih turističkih destinacija u vremenu snažne konkurentske i kompetitivne tržišne situacije u turizmu važnija je nego ikad. Ukoliko se uzme u obzir kako Hrvatska velik izvor prihoda temelji na turističkoj aktivnosti, od neophodne je važnosti odrediti jasnu komunikacijsku strategiju Hrvatske kao destinacije, ali i njezinih regija. Implementirajući kulturnu baštinu u komunikacijsku strategiju može se gotovo u potpunosti transformirati imidž destinacije ili je diferencirati od konkurencije. Upravo zato ovaj rad ima namjeru utvrditi kako i na koji način je kulturna baština implementirana u komunikaciju i predstavljanje Istre i Kvarnera na njihovim službenim Facebook i Instagram profilima te o kako o tim destinacijama u kontekstu kulture i baštine izvještavaju najčitaniji hrvatski internetski portali. Polazeći od temeljne hipoteze kako kulturna baština nije dominantno niti učestalo zastupljena na službenim profilima društvenih mreža turističkih zajednica Istre i Kvarnera, a niti na najčitanijim internetskim portalima u Hrvatskoj, otvara se pitanje kako se i na koji način ove dvije uspješne turističke regije digitalno predstavljaju svojim pratiteljima, ali i čitateljima portala, uzimajući pri tome u obzir snažan doprinos medija u stvaranju identiteta nekog lokaliteta. Rezultati ovog istraživanja, temeljenog na analizi sadržaja, doprinijet će jasnijem razumijevanju trenutne upotrebe kulturnih resursa u predstavljanju, komuniciranju i brendiranju turističkih destinacija Istre i Kvarnera te doprinosu kulturnog nasljeđa u kreiranju identiteta, a posljedično i imidža destinacije.

TEMELJNI KONCEPTI BRENDIRANJA U TURIZMU

Dok imidž turističke destinacije predstavlja način na koji turisti vide i doživljavaju destinaciju, identitet destinacije predstavlja drugu stranu medalje i način na koji destinacija želi da ju turisti percipiraju. Imidž je pasivan odnos koji počiva na kreiranju identiteta, aktivnog odnosa koji je u stalnom razvoju (Kärreman & Frandsen, 2020), (Mindrut, Manolica, & Roman, 2015), (Balmer & Podnar, 2021). Oba odnosa temelje se na točkama diferencijacije kroz autentične doživljaje koji su karakteristični za destinaciju, iskustva koja destinacija može ponuditi i njena jedinstvenost u usporedbi s ostalim destinacijama slične turističke ponude. Uspješno upravljanje svakom turističkom destinacijom direktno je povezano uspješnim upravljanjem njenim turističkim identitetom i imidžem, koji su temelji svakog brenda, pa tako i turističkog (Ruiz-Real, Uribe-Toril, & Gázquez-Abad, 2020), (Escobar-Farfán, Cervera-Taulet, & Schlesinger, 2024). Polazili se od samog početka, valjda utvrditi kako je brend kompleksni skup asocijacija i percepcija koje ljudi imaju o određenom proizvodu, usluzi, kompaniji ili organizaciji. Predstavlja emocionalnu i funkcionalnu vrijednost koju potrošači povezuju s određenim identitetom ili imenom. Brend je, dakle, puno više od fizičkog proizvoda ili usluge. On obuhvaća emocionalne veze, percepcije i vrijednosti koje čine jedinstven identitet na tržištu. Snažan brend može doprinijeti dugoročnom uspjehu organizacije (Blain, Levy, & Ritchie, 2005). Brendiranje je strategijski proces stvaranja, oblikovanja i upravljanja identitetom i percepcijom proizvoda, usluge, organizacije ili destinacije s ciljem diferencijacije od konkurencije i stvaranja pozitivnih asocijacija kod ciljne publike (Nešić, Šošić-Radenković, & Zubanov, 2021). Cilj brendiranja je izgradnja prepoznatljivosti, lojalnosti potrošača i stvaranje pozitivnog imidža. Brendiranje u turizmu odnosi se na stvaranje i upravljanje identitetom destinacije kako bi destinacija privukla turiste, formirala pozitivnu percepciju i gradila lojalnost posjetitelja.

Ova vrsta brendiranja uključuje niz elemenata s ciljem stvaranja prepoznatljivosti i privlačnosti turističke destinacije (Pike, 2005). Razvoj destinacijskih brendova, također, ima pozitivne diferencijalne marketinške učinke jer privlači povoljnije osobine i koristi percepcijama i ukupnim preferencijama. Također, može privući cjenovno snažnije turiste i može rezultirati time da potrošači obraćaju veću pozornost na komunikaciju, traže više informacija o destinaciji i reagiraju na pozitivniji način (Hoeffler & Keller, 2003). U osnovi, destinacija je kombinacija turističkih sadržaja i usluga proizvedenih u destinaciji (kao što su smještaj, prijevoz, ugostiteljstvo i zabava), kao i raznovrsne opće robe (krajolik, mora, jezera, socio-kulturno okruženje, atmosfera i tako dalje) (Buhalis, 1999). Upravo iz spleta tih opipljivih i neopipljivih elemenata proizlazi turistički proizvod destinacije. Brendiranje destinacije je proces koji se koristi za razvoj jedinstvenog identiteta i osobnosti koji se razlikuju od svih konkurentskih destinacija (Morrison & Anderson, 2002), dok prema Hogg i Vaughan brendiranje destinacije također se smatra sinonimom za (re)pozicioniranje, izgradnju imidža i rekonstrukciju imidža destinacije (Hogg & Vaughan, 2002). Ekspanzija turističke industrije diljem svijeta pridonijela je ključnom udjelu u razvoju brendiranja destinacije. Paralelno sa svim proizvodima i uslugama koje nude organizacije, važno je da se destinacije razlikuju od drugih destinacija koje su u istoj kategoriji ili imaju slične karakteristike. Budući da bi turistička destinacija mogla generirati profit i gospodarski rast zemlje, razvoj destinacijskog brendiranja je neophodan kako bi se privukla pozornost turista prema njihovoj destinaciji. Međutim, diversifikacija značajki koje posjeduje destinacija ili mjesto čini proces razvoja destinacijskog brenda kompleksnim. Štoviše, proces razvoja destinacijskog brenda ne bi se trebao tretirati korištenjem sličnih koncepata, modela ili okvira za druge uobičajene proizvode ili usluge (Anholt S. , 2006). U uspostavljanju brenda destinacije koncept iskustva posjetitelja potrebno je ugraditi u proces brendiranja (Gilmore, 2002). Uspjeh strategije brendiranja destinacije moguć je samo kada javne organizacije uspiju koordinirati sve dionike, uključujući one koji su uglavnom odgovorni za formuliranje politika, a svi oni su udruženi kroz učinkovito dugoročno upravljanje brendom. Ipak, najteži zadatak u procesu brendiranja mjesta je okupiti sve dionike i potaknuti ih da rade kao grupa (van Gelder, 2008). Pridobivanje dionika destinacije nije samo ključna platforma za uspješno brendiranje destinacije, već je i pokazatelj održivog pristupa u razvoju turizma. Uspješan razvoj brendiranja destinacije uključuje predanost i suradnju svih uključenih dionika, što je samo po sebi vrlo složen i dinamičan proces (Morgan, Pritchard, & Piggott, 2003). Iako je brendiranje destinacije koncept koji se sastoji od nematerijalnih proizvoda, uvriježeno je mišljenje da se destinacije mogu brendirati kao i druge usluge i proizvodi. Razne zemlje i gradovi započeli su proces brendiranja koji utječe na kupovne procese potrošača. Jedan od najvažnijih uvjeta da bi se turistička destinacija mogla promovirati kao proizvod je nužnost posjedovanja oznake brenda. Za uspješan marketinški proces potrebno je razviti strategije brendiranja, a tijekom razvoja strategija treba dobro ispitati značajke proizvoda (Cooper, 2008). Kao što je navedeno na početku, identitet i imidž osnovni su elementi u procesima brendiranja destinacija. Brend destinacije je najvažniji marketinški alat koji izdvaja destinaciju od ostalih konkurenata. Identitet brenda omogućuje kreiranje koncepata koji otkrivaju jedinstvena obilježja destinacije i njezinu najvažniju atrakciju koja se razlikuje od ostalih destinacija. Stvaranjem ovih koncepata zaokružuju se najvažniji elementi za imidž destinacije. Destinacije su mjesta koja se posjećuju i

imaju imidž. Vrednuju se usporedbom prethodno formirane predodžbe u svijesti ljudi koji će posjetiti destinaciju s neposrednim iskustvom koje doprinosi formiranju imidža turističke destinacije i nakon samog posjeta. Destinacije se ne mogu doživjeti i isprobati prije konzumacije. Brend destinacije definiran je kao naziv, simbol, logotip ili grafički/vizualni prikaz koji identificira i razlikuje destinaciju od drugih destinacija, ali također predstavlja i mnogo više od same vizualne prepoznatljivosti jer je u tome integrirana visoka kvaliteta i konzistentnost turističkog doživljaja. Turist svojim aktivnim sudjelovanjem i konzumiranjem turističke ponude doprinosi razvoju brenda turističke destinacije. Taj fenomen se može dodatno tumačiti i kao očekivanje nezaboravnog iskustva putovanja koje evocira odredište, kao i ispunjenje zadaće osnaživanja i jačanja ugodnog sjećanja na iskustvo odredišta (Hankinson, 2005).

Brendiranje destinacije je izgradnja imidža brenda sa strukturom koja razlikuje određenu destinaciju od ostalih i daje joj identitet stvaranjem kombinacije lokalnih i dosljednih elemenata i obilježja. Destinacije moraju razviti politiku diverzifikacije proizvoda koja će ih razlikovati od drugih destinacija. Brend destinacije kombinacija je percepcije o regiji, prošlih iskustava, vijesti, oglasa, cijena, informacija dobivenih s mrežnih stranica, ljudi koji žive u toj regiji, mišljenja prijatelja itd. Četiri su elementa u stvaranju konceptualnog modela vrijednosti brenda turističke destinacije temeljene na korisniku. To su svijest, imidž, lojalnost i percipirana kvaliteta. Ove četiri dimenzije svaki segment potrošača različito vrednuje (Olimpia, Luminita, & Simona, 2011). Sa stajališta potrošača, brend destinacije može se definirati kao skup percepcija koje se prodaju pod određenim nazivom brenda i temelje se na iskustvima. Ime brenda može utjecati na izbor potrošača smanjenjem broja alternativa prilikom odabira destinacije (Hanzaee & Saeedi, 2011). Imidž brenda se manifestira kroz emocije i asocijacije koje potrošači izražavaju prema određenom proizvodu, osobi ili destinaciji. Brend destinacije je razlog zašto se proizvod preferira. Najvažniji razlog zbog kojeg potrošači biraju turistički proizvod jest uklanjanje rizika. To olakšava sam proces kupnje jer se u moru izbora potrošači odlučuju za popularne proizvode prepoznatljive po kvaliteti. Prema tom istom načelu djeluju turističke destinacije kao brendovi, što je temeljni argument za pokretanje procesa brendiranja. Za kreiranje destinacija s jakim imidžom brenda potrebno je dobiti pomoć od profesionalnih tvrtki. Imidž brenda destinacije, umjesto davanja informacija o proizvodu, asocijacija je prethodnih iskustava o toj destinaciji (Son & Pearce, 2005). Imidž se formira logičkom i emocionalnom interpretacijom potrošača proizvoda ili usluge. Emocionalni i konceptualni čimbenici uzrokuju da se percepcija u osnovi svede na pozitivne i negativne sentimente. Svaki pojedinac na svoj način usvaja imidž koji mu je projicirana. Imidž destinacije može se definirati kao zbroj dojmova, informacija, predrasuda i emocionalnih misli koje pojedinci ili određena zajednica imaju o poznatom geografskom području. Ovu predodžbu nije moguće promatrati odvojeno od općeg imidža zemlje na koju djeluju gospodarski, društveni, politički, kulturni, prirodni i drugi čimbenici. Imidž se može definirati kao koncept formiran u svijesti potrošača. Prema ovoj definiciji imidž je dojam koji osoba ili ljudi imaju o određenoj destinaciji. Imidž destinacije utječe na proces odabira destinacije kao vanjska varijabla. Utječe na sudjelovanje, procjenu i buduće namjere ponašanja turista. Koncept spaja različite čimbenike pod elementima privlačnosti. Iz tog je razloga glavna svrha studija imidža destinacije otkriti način na koji ljudi vizualiziraju određena odredišta, svoje misli i osjećaje (Tasci, Gartner, & Cavusgil, 2007). Brendiranje,

promatrano kao holistički pristup, zahtjeva suglasje ne samo između dionika koji upravljaju promocijom destinacije već i lokalnog stanovništva, koje je jedan od ključnih nositelja identiteta destinacije. Sve dok izostaje suglasje na navedenoj relaciji, unatoč postojanju potencijala, turistički razvoj destinacije nije moguć (Gluvačević & Periša, 2022). S time se slaže i Karl Gigić, koja pojašnjava kako bi brend grada trebao dodati vrijednost gradu, a u procesu njegove izgradnje nužno je uzeti u obzir vrijednosti i percepcije unutarnjih i vanjskih dionika, posebice lokalnog stanovništva (Karl Gigić, 2022). Mnoge destinacije danas pokušavaju upravljati vlastitim identitetom i imidžom kako bi ostvarile veće prihode i druge pogodnosti. Za to je potreban konkurentski identitet, kako ga je nazvao Anholt, kao i turizam koji je po njemu ″najglasniji″ i najsnažniji kanal komunikacije (Anholt, Konkurentan identitet: novo upravljanje markama država, gradova i regija, 2009). Za stjecanje konkurentskog identiteta koji će se komunicirati kroz turizam obično se koristi moć kulture – bilo popularne kulture, bilo kulturne baštine. Kako sve destinacije imaju svoju povijest i specifično kulturno nasljeđe, kulturna baština može biti prednost za mnoge destinacije ako prepoznaju njezinu posebnost i prednosti u usporedbi s ostalim konkurentskim destinacijama (Gluvačević, The power of cultural heritage in tourism – example of the city of Zadar (Croatia), 2023). Kretanja na turističkom tržištu, razlike u proizvodima, konkurencija među destinacijama, promjene u zahtjevima i percepcijama turista čine ključni su da se turističke destinacije promatraju kao brend koji zahtijeva stratešku organizaciju i upravljanje. Imidž brenda stvoren s ovom perspektivom ima veliku ulogu u uspjehu turističke destinacije. Snažan, drugačiji, neproturječan i uočljiv imidž brenda koji stvara pozitivno mišljenje o destinacijskoj regiji je glavni element marketinških napora. Kreiranje imidža uključuje više od same kognitivne funkcije informacija. Slika, umjesto da je funkcija same informacije, rezultat je razumijevanja, usvajanja i djelovanja na temelju postojećih informacija Imidž odredišta sastoji od dvije dimenzije (Son & Pearce, 2005). Prva od njih je označni imidž koja je prostorna i orijentacijska komponenta. Ova dimenzija govori o tome da pojedinac zna gdje i što je oko njega. Druga dimenzija je percepcijski imidž. Ova se dimenzija dijeli na dvije dimenzije: evaluacijsku i emocionalnu. Evaluacijski imidž, koji se također definira kao kognitivni imidž u marketinškim i turističkim istraživanjima, odražava način na koji pojedinci ocjenjuju mjesta, a emocionalna slika uključuje kako se osjećaju u kontekstu tih mjesta (Son & Pearce, 2005). Kognitivna predodžba podrazumijeva ocjenjivanje poznatih svojstava proizvoda ili mentalno razumijevanje proizvoda. Kognitivna komponenta može se promatrati kao zbroj uvjerenja i stavova prema objektu koji omogućuje crtanje internalizirane percepcije o svojstvima tog objekta. Broj vanjskih podražaja koji se odnose na objekt važan je za formiranja kognitivnog imidža (Gartner, 1993). Pretpostavlja se da kognitivna dimenzija imidža pozitivno utječe na cjelokupni imidž. Učinkoviti čimbenici u formiranju imidža proizlaze iz individualnih čimbenika te čimbenika destinacije. Individualne karakteristike uključuju demografske karakteristike (spol, dob, obrazovni status, bračni status, prihod, nacionalnost) i motivacijske karakteristike koje potiču ljude na godišnji odmor. S druge strane čimbenici koji se temelje na destinaciji uključuju izvore informacija i karakteristike destinacije. Područja turizma i marketinga ispituju učinke individualnih karakteristika ljudi na zahtjeve potrošnje zbog zahtjeva različitih potrošača za različitim proizvodima te su uključeni u nastojanja na području segmentacije tržišta. Na imidž destinacije utječu ne samo vanjski izvori, već i karakteri-

stike pojedinaca (Gibson, Qi, & Zhang, 2008). Modeli uvedeni za objašnjenje formiranja imidža destinacije i odabira destinacije pokazuju da različite socio-demografske varijable poput spola, dobi, obrazovnog statusa, bračnog statusa, statusa prihoda, nacionalnost i dr. imaju učinak i na proces formiranja i selekcije. Navodi se da dob, obrazovni status, prihod, spol, profesija i bračni status utječu na imidž destinacije, no među tim varijablama dob i obrazovni status najvažniji su čimbenici. Također se u okviru individualnih karakteristika razmatra motiv koji pojedince pokreće na putovanje. Različiti motivi potiču ljude da putuju radi odmora. Dok je nastanak i motivacija potrebe za odlaskom na godišnji odmor temelj gotovo svih modela odlučivanja (Kotler, 2001), imidž destinacije također je važna varijabla u modelima formiranja. Međutim, motivacija svakog turista u fazi odluke je drugačija te je, također, motiv iste osobe u svakoj fazi odluke drugačiji. Čimbenici koji se temelje na odredištu uglavnom uključuju izvore informacija i karakteristike odredišta. Izvori informacija uključuju prethodno iskustvo osobe, prijatelje, rodbinu, turističke agencije, putopisne knjige, turističke urede, oglase, novine, časopise, internet, televiziju, radio, filmove itd., a karakteristike destinacije uključuju percepciju karakteristika destinacije od strane pojedinaca. Analiza i razumijevanje obrazaca ponašanja koje turisti slijede pri dobivanju informacija o odredištima na koja će putovati od velike je važnosti za turistički sektor (Fodness & Murray, 1997). Izvori kojima se turisti koriste za dobivanje informacija dijele se na komercijalne i nekomercijalne prema izvoru informacija kojima pristupaju, a prema vrsti se dijele na osobne i neosobne izvore informacija (Fodness & Murray, 1997). Prema ovoj klasifikaciji, brošure, putopisi, lokalni turistički uredi i turistički vodiči smatraju se neosobnim i komercijalnim izvorima informacija u okviru vrste informacija, dok su klubovi i putničke agencije uključeni u komercijalne, ali neosobne izvore informacije. Prema nekomercijalnom izvoru informacija klasifikacije novine i časopisi su u tipu neosobnih izvora informacija, a prijatelji, rodbina i osobno iskustvo osobni su izvori informacija. Najvažniji izvor informacija koji utječu na formiranje imidža destinacije je usmena predaja. Informacije dobivene od prijatelja i kolega najvažniji su izvor informacija (Hanlan & Kelly, 2005). Imidž destinacije razlikuje se između onih koji je nikad nisu posjetili i onih koji jesu. Razlog tome je što je imidž prethodnih posjetitelja složeniji od onih koji prvi puta dolaze u određenu destinaciju jer posjetitelji koji prvi puta dolaze imaju više stereotipnih misli od onih koji su već bili u određenoj destinaciji. Prethodni posjeti imaju važan učinak na želju za ponovnim posjetom. Također, imaju važan učinak na imidž destinacije. Učinak digitalnih informacija kreiranih na internetu postao je važno polazište za turističke istraživače i menadžere u stvaranju imidža destinacije. Učinci društvenih medija u destinacijskom marketingu posebno su u porastu.

ODNOSI S JAVNOŠĆU U TURIZMU

Odnosi s javnošću predstavljaju jedinstven način promocije organizacije, njezinih proizvoda ili usluga, izgradnjom veće vidljivosti u javnom prostoru. Odnosi s javnošću predstavljaju strateški oblik komunikacije koji se fokusira na stjecanje razumijevanja i prihvaćanja publike, kao i na proces izgradnje dobrog odnosa između organizacije i javnosti (Voinescu & Apostolou, 2011). U turističkom sektoru odnosi s javnošću više su od nužnosti te igraju ključnu ulogu u komuniciranju i izgradnji imidža turističkih destinacija u cilju privlačenja značajnog broja turista (Santoso & Negoro,

2019). Glavni izazov sastoji se u identificiranju najučinkovitijih načina promocije turističkih proizvoda, izgradnji pozitivnog imidža, povećanju vidljivosti turističkih destinacija, kako bi se privuklo što više turista. Odnosi s javnošću mogu predstavljati most prema promjenama, sredstvo prilagodbe novim stavovima izazvanim promjenama (Petrovici, 2014). Glavni ciljevi kampanja odnosa s javnošću u turističkom sektoru odnose se na stvaranje i prenošenje vijesti za javnost, stvaranje odnosa s masovnim medijima, odnosa s turoperatorima i putničkim agencijama te odnosa s drugim klijentima (Voinescu & Apostolou, 2011). Za promociju turističkog proizvoda koriste se različiti komunikacijski pristupi, a najpopularniji su marketing i odnosi s javnošću (Radjabov & Dushanova, 2021). Marketing omogućuje isporučiti turistički proizvod od proizvođača do potrošača kako bi se maksimizirao profit zadovoljavanjem ciljanih potreba turista, a marketinške aktivnosti omogućuju fleksibilnu prilagodbu turističkih aktivnosti poduzeća promjenjivoj gospodarskoj situaciji i zahtjevima potrošača na tržištu. Ipak, Radjabov & Dushanova (2021) pojašnjavaju kako se posljednjih godina turistički marketing ponešto promijenio zbog promjene ponašanja potrošača i dobne strukture turista, te se proširio krug potencijalnih potrošača. Glavna funkcija odnosa s javnošću u području turizma autorice definiraju kao uspostavljanje odnosa organizacije s masovnom javnošću kako bi poduzeće moglo ostvariti svoje interese i planove, uzimajući u obzir mišljenje javnosti. Neki autori, govoreći o odnosima s javnošću u turizmu, stavljaju snažan naglasak na odnose s lokalnom zajednicom (Sawir, i dr., 2024), pojašnjavajući kako je učinkovita komunikacija ključna za prihvaćanje novih politika, usklađivanje poslovanja s održivošću i informiranje svih dionika, ali i turista o održivom turizmu. Neki autori (Noer Fatati & Suyadnya, 2015) izdvajaju Instagram kao ključnu platformu u turizmu pa tako objašnjavaju da Instagram profili igraju važnu ulogu u društvenim mrežama, pa je stoga nužno da profesionalci u turizmu uvide da te platforme nisu samo alati za interakciju ili komunikaciju. Instagram treba shvatiti kao složen koncept, u kojemu su isprepleteni ekonomski, poslovni i društveni aspekti. Stavljaju li se odnosi s javnošću u kontekst marketinga destinacije, Jakovljević je, napravivši istraživanje na razini turističkih regija u Hrvatskoj, došao do zaključka da su odnosi s javnošću vodeća marketinška taktika u promociji regija (Jakovljević, 2011). Vrijednost objavljenih novinarskih priloga u tiskanim i elektroničkim medijima nekoliko puta premašuje ukupna sredstva kojima raspolažu regionalne destinacijske menadžment kompanije. Istovremeno, na odnose s javnošću prosječno se troši 62 % ukupnih sredstava namijenjenih funkcionalnom marketingu pa su i po toj osnovi odnosi s javnošću vodeća promocijska taktika. Uz odnose s javnošću, neki autori (Vukman & Drpić, 2014) naglašavaju ulogu internet marketinga. Jednosmjeran komunikacijski kanal destinacijskog brendiranja, prije razvoja internet marketinga, bio je sve prisutan kada su destinacijske menadžment organizacije stvarala i generirale svoje destinacijski brend (Vukman & Drpić, 2014). Međutim, pojavom internet marketinga, prvenstveno društvenih mreža, omogućila se dvosmjerna komunikaciju, gdje su potrošači u mogućnosti da participiraju u razvoju destinacijskog brenda. Percepcija destinacije stvorena indirektnim putem od strane potrošača, koji putem društvenih mreža dijeli svoj doživljaj destinacije, garancija su za uspješan razvoj branda destinacije, zaključuju (Vukman & Drpić, 2014).

DOPRINOS DRUŠTVENIH MREŽA ODNOSIMA S JAVNOŠĆU U TURIZMU

Uspjeh turističke destinacije teško je postići bez čestog i kvalitetnog korištenja društvenih mreža i digitalne prisutnosti (Dabo, Gavrilović, & Gluvačević, 2023), a održivi turizam može imati značajne koristi od adekvatne uporabe društvenih mreža, kako turističke organizacije, tako i sami turisti (Martí-Parreño & Gómez-Calvet, 2020). U suvremenom, informacijskom dobu, digitalni korisnici su u središtu pozornosti jer imaju veliku moć i mogu potencijalno utjecati na brojne pojedince i organizacije svojim *online* komentarima, recenzijama, ocjenama i mišljenjima (Jakopović, 2016). Neki autori pak ukazuju da su društvene mreže postale ključni alat za promicanje, usmjeravanje i razvoj turističkog sektora (Negussie, Umema, & Gota, 2023), a Cheng naglašava koliko su promijenile način interakcije između posjetitelja i prostora (Cheng, 2024). Društvene mreže igraju sve važniju ulogu u traženju informacija o putovanju i donošenju odluka (Islam, 2021), ali postoji ograničeno razumijevanje načina na koji određene vrste turista koriste društvene mreže za planiranje putovanja i razlika u praksi turista između zemalja. S time se slažu i drugi autori koji istražujući radove objavljene na tu temu zaključuju kako je odnos između sadržaja koji generiraju i dijele turističke organizacije i zadovoljstva potrošača, najviše je prisutan hotelskom sektoru (Sánchez, Gómez, & Moral, 2024). Neka novija istraživanja (Wengel, i dr., 2022) naglašavaju ulogu Tik Toka te upozoravaju kako je utjecaj TikToka na turističke destinacije nova i važna tema. Rezultati navedenog istraživanja naglašavaju koliko nenamjerna promocija putem Tik Toka utječe na manje poznate destinacije, ali i paralelno s tim nedostatke u upravljanju, sadržajima i održivošću takvih destinacija kada broj turista naglo krene rasti. Za razliku od drugih društvenih mreža i platformi, uključujući blogove, Instagram i Facebook, koje korisnicima s mnogo sljedbenika (*influenceri*) omogućuju oglašavanje proizvoda i promoviranje svojih ideja, TikTok ima drugačiji algoritam koji popularizira sadržaj na temelju interakcija korisnika. TikTok daje prednost objavama koje generiraju mnogo interakcija u prvom satu pa je stoga lokalnim turističkim organizacijama teže predvidjeti, kontrolirati i upravljati takvom komunikacijom, a onda i uskladiti destinaciju s brzorastućom popularnosti. Zanimljivo je kako Facebook, prema istraživanju iza 2012. godine tada ima posebno veliki utjecaj na izbor potrošača, posebno u sektoru putovanja (Waramontri, 2020). Rezultati navedenog istraživanja pokazali su da više od 90% potrošača iz cijelog svijeta kaže da vjeruje preporukama prijatelja, ali i da komentari i izjave na društvenim mrežama utječu na odluku o odabiru destinacije. Dakle, Waramontri (2020) zaključuje kako društvene mreže utječu na putovanja u različitim aspektima. Dok će pozitivni komentari na društvenim mrežama uključivati dobro iskustvo i zadovoljstvo kupaca, negativni komentari će uključivati razočaranja i loša iskustva. Stoga je važno analizirati učinak negativnih komentara na imidž destinacije i na odluke putnika (Waramontri, 2020). Također, ako su interakcije na društvenim mrežama negativne, a koje su vidljive u lajkovima, dijeljenjima i komentarima, to će rezultirati negativnim dojmom jer se negativne informacije neće se proširiti samo na pratitelje određene destinacije, već i na potencijalne nove posjetitelje. Jakopović (Jakopović, Korisnici kao sukreatori imidža turističkih destinacija, 2021.) ističe kako su korisnici sukreatori imidža turističkih destinacija zajedno s turističkim zajednicama, hotelijerima, ugostiteljima i drugim akterima zahvaljujući sve većem utjecaju korisnički generiranog sadržaja i specijaliziranih mrežnih stranica za puto-

vanja. Dakle, društveni mediji mogu imati značajan učinak u turističkom sektoru te značajno utjecati na odabir destinacije (Agyapong & Yuan, 2022) pa je stoga usvajanje promišljene strategije i dugoročno planiranje pravi način za rješavanje ovog problema (Koens, Postma, & Papp, 2018). Navedeno potvrđuje i istraživanje koje otkriva da društvene mreže stvaraju kružni tok sekvenca u različitim fazama putovanja. Iskustvo počinje od fotografija na društvenim mrežama i završava dijeljenjem vlastitog iskustva (obično fotografija, videa, dojmova), što zauzvrat postaje inspiracija za druge ljude da potraže isto iskustvo i na taj se način kružni tok zatvara. Rezultati ovoga istraživanja ukazuju da je uloga društvenih mreža u svim fazama *outdoor* putovanja različita i da informacije s društvenih mreža nisu jednako korisne kao izvor informacija za pripreme u svim fazama. Iako mrežno dijeljenje jedinstvenih, egzotičnih iskustava omogućuje povećanje prepoznatljivosti destinacije, također može negativno utjecati na razinu pripremljenosti novih posjetitelja, što može stvoriti probleme, ne samo posjetiteljima već i domaćima (Khasanova, 2018). Rezultati istraživanja (Berhanu & Raj, 2020) otkrili su da posjetitelji imaju pozitivan stav o vjerodostojnosti izvora informacija o putovanjima s društvenih mreža. Posjetitelji u dobi od 18 do 35 godina imaju višu razinu slaganja s vjerodostojnošću izvora informacija o putovanjima na društvenim mrežama. Kako dob posjetitelja raste, srednja vrijednost rezultata neznatno se smanjuje, gdje najniža srednja vrijednost jest zabilježena kod posjetitelja koji su stariji od 46 godina. Također rezultati ukazuju da ne postoji značajna razlika između muškaraca i žena u pogledu pouzdanosti izvora informacija o putovanjima s društvenih mreža. Istraživanje ukazuje da posjetitelji u dobi od 18 do 35 godina obično imaju višu razinu pozitivnih stavova o pouzdanosti informacija s društvenih mreža o putovanjima u odnosu na starije ispitanike. Uzimajući u obzir obrazovni status posjetitelja, prvostupnici i magistri imaju relativno višu razinu slaganja s vjerodostojnošću izvora putnih informacija na društvenim mrežama.

METODOLOŠKI OKVIR

Cilj je ovoga rada utvrditi učestalost i vrstu izvještavanja o kulturnoj baštini Istre i Kvarnera, a koje ima za svrhu educirati, informirati, ali i turistički privući lokalne (hrvatske) ciljane javnosti u te dvije regije. S tom namjerom formirana su istraživačka pitanja:

IP1: Koliko često najčitaniji hrvatski internetski portali izvještavaju o kulturnoj baštini Istre i Kvarnera?

IP2: Kakva je vrsta i ton izvještavanja najčitanijih hrvatskih internetskih portala o kulturnoj baštini Istre i Kvarnera?

IP3: Kako su oblikovani naslovi analiziranih medijskih tekstova i je li tema kulturne baštine glavna ili sporedna?

IP4: Koliko često Turističke zajednice Istre i Kvarnera objavljuju o lokalnoj kulturnoj baštini na svojim službenim Instagram i Facebook profilima?

IP5: Kakva je vrsta i tema objava o lokalnoj kulturnoj baštini službenih Instagram i Facebook profila turističkih zajednica Istre i Kvarnera?

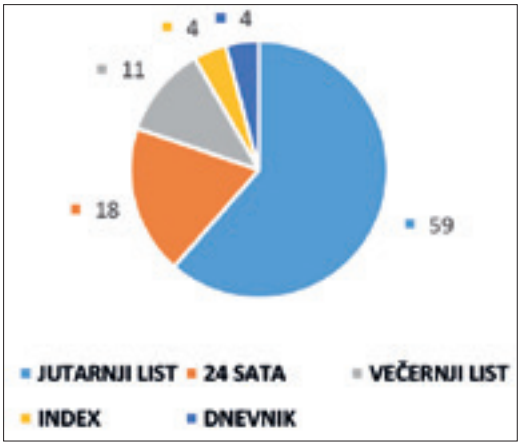
IP6: Kakva je vrsta i količina interakcije ispod objava o lokalnoj kulturnoj baštini na službenim profilima turističkih zajednica Istre i Kvarnera?

Kako bi se realizirao cilj istraživanja i dobili odgovori na istraživačka pitanja, provele su se dvije analiza sadržaja. Prva se odnosila na analizu cjelokupnog medijskog

izvještavanja u 2023. godini pet najčitanijih internetskih portala u Hrvatskoj: (Domains: Rating Gemius, 2024) Jutarnji.hr; 24sata.hr, Vecernji.hr, Index.hr i Dnevnik.hr, a sukladno unaprijed definiranim ključnim riječima: kulturna baština, baština, tradicijska kultura, tradicija, folklor, kultura. Medijski članci apstrahirani su putem baze podataka agencije za praćenje medija Briefing. Analiziralo se ukupno 1385 objava, iz kojih je apstrahirano 96 objava koje se usko odnose na kulturnu baštinu. Preostale objave ticale su se dominantno popularne kulture i s tim pojmom povezanim manifestacijama. Svaki se selektirani članak predstavlja jedinicu uzorka, a analizirao se putem unaprijed definirane matrice te kodirao radi jasnijeg prikaza.

Druga je analiza sadržaja obuhvaćala službene Facebook i Instagram profile Turističke zajednice Istre i Turističke zajednice Kvarnera, točnije sve objave u 2023. godini, a koje su tematizirale kulturnu baštinu (materijalna, nematerijalna). Na službenom Facebook profilu TZ Kvarner takvih je objava bilo 170, a na službenom Instagram profilu 83 objave. Na službenom Facebook profilu TZ Istre baštinskih objava je bilo 126, a na službenom Instagram profilu 79 objava. Svaka od selektiranih objava analizirane su prema unaprijed definiranoj matrici, a svaka se objava kodirala zbog jasnijeg prikaza.

PRIKAZ REZULTATA ISTRAŽIVANJA

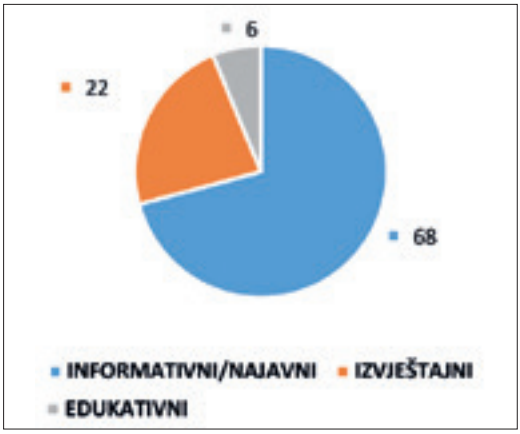


U ovom poglavlju donose se rezultati analiza sadržaja.

Graf 1. Količina objava o kulturnoj baštini prema internetskim portalima

Izvor: rad autora

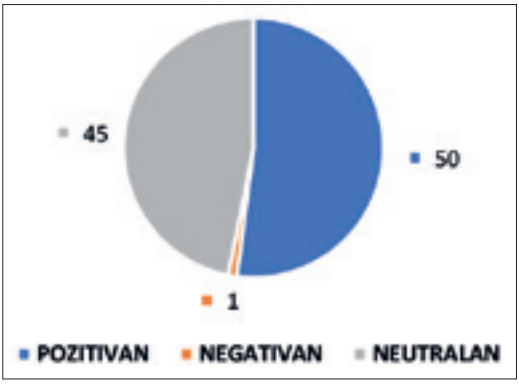
Kao što je vidljivo iz Grafa 1 najviše o kulturnoj baštini je izvještavao Jutarnji.hr s 59 članaka na tu temu, a slijedi ga 24sata.hr s 18 članaka, a zatim Vecernji.hr s 11 te Dnevnik.hr i Index.hr sa po četiri članka.



Graf 2. Vrsta izvještavanja najčitanijih hrvatskih internetskih portala o kulturnoj baštini Istre i Kvarnera

Izvor: rad autora

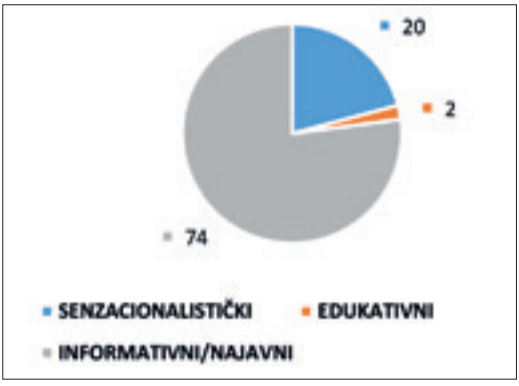
Na Grafu 2. vidljivo je da je većina medijskog izvještavanja o kulturnoj baštini informativno/najavne vrste (68 članaka), dok ostatak otpada na izvještajne (22) i edukativne (6) novinske priloge.



Graf 3. Ton izvještavanja najčitanijih hrvatskih internetskih portala o kulturnoj baštini Istre i Kvarnera

Izvor: rad autora

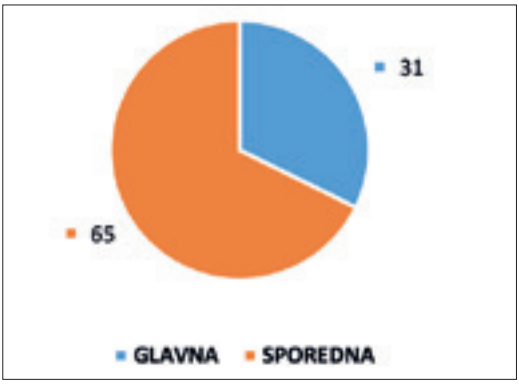
Ton izvještavanja o kulturnoj baštini uglavnom je pozitivan (50) ili neutralan (45).



Graf 4. Vrsta naslova analiziranih medijskih članaka

Izvor: rad autora

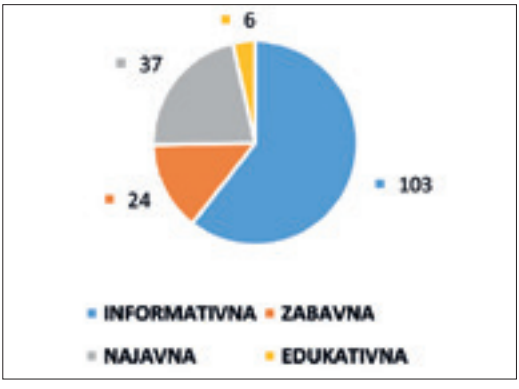
Naslovi analiziranih medijskh objava uglavnom su nformatvnog karaktera (75), a manj broj senzacionalistički (20) ili edukativni (2).



Graf 5. Kulturna baština kao glavna ili sporedna tema medijskog izvještavanja

Izvor: rad autora

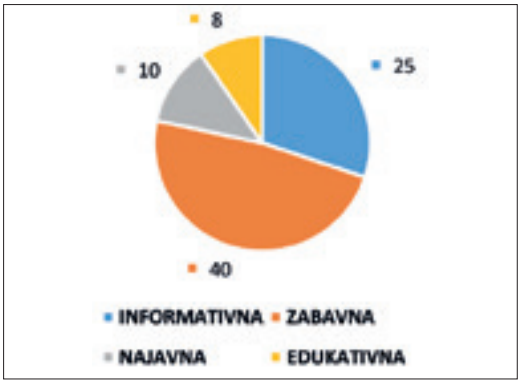
Graf 5. prikazuje kako je u većina medijskih tekstova kulturna baština bila sporedna tema (65), a tek u 31 objavi je bila glavna.



Graf 6. Vrsta baštinskih objava na službenom Facebook profilu TZ Kvarner

Izvor: rad autora

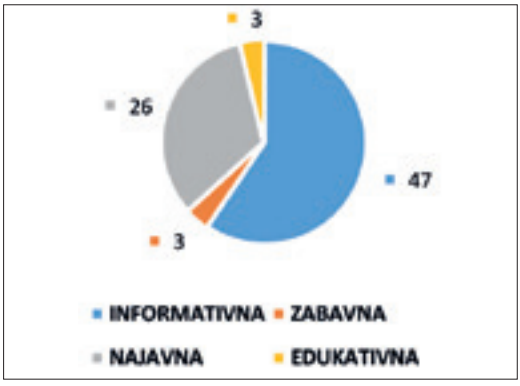
Na službenom Facebook profilu TZ Kvarnera većina objava koje se tiču kulturne baštine su informativnog karaktera (103), dok su u manjem broju zabavnog (24), najavnog (37) ili edukativnog (6) karaktera.



Graf 7. Vrsta baštinskih objava na službenom Instagram profilu TZ Kvarnera

Izvor: rad autora

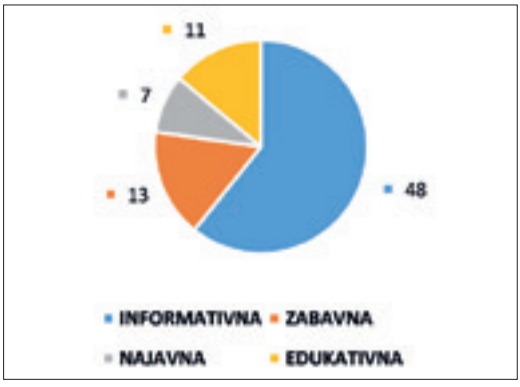
Na službenom Instagram profilu TZ Kvarner nešto je drukčije stanje. Objave su većinom zabavnog karaktera (40), a onda tek informativnog (25), najavnog (10) i edukativnog (8).



Graf 8. Vrsta baštinskih objava na službenom Facebook profilu TZ Istre

Izvor: rad autora

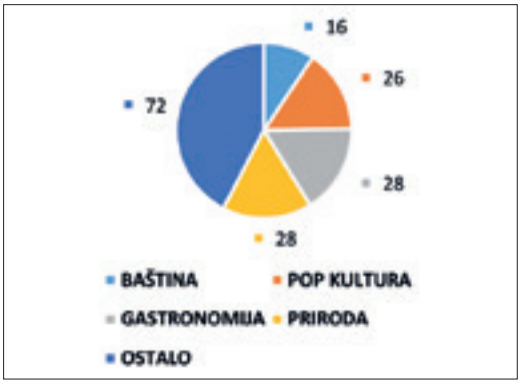
Vrsta baštinskih objava na službenom profilu TZ Istre dominantno su informativnog karaktera (47), zatim najavnog (26), te podjednako zabavnog (3) i edukativnog (3).



Graf 9. Vrsta baštinskih objava na službenom Instagram profilu TZ Istre

Izvor: rad autora

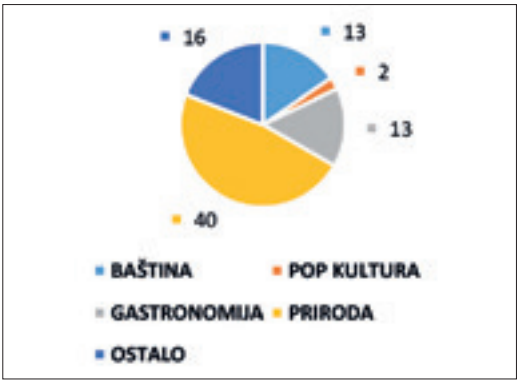
Vrsta baštinskih objava na službenom Instagram profilu TZ Istre većinom su objave informativnog karaktera (48), zatim zabavnog (13), edukativnog (11) te najavnog (7).



Graf 10. Teme objava na službenom Facebook profilu TZ Kvarnera

Izvor: rad autora

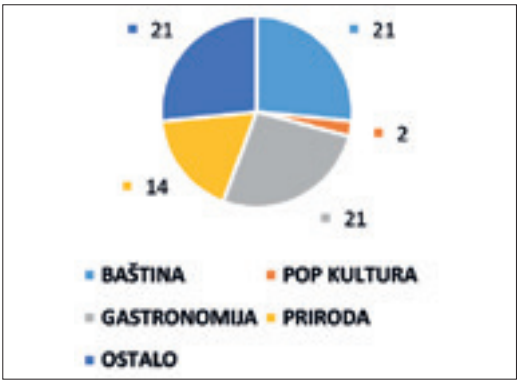
Teme na službenom profilu TZ Kvarnera dominantno su vezane uz baštinu (72), a slijede teme priroda (28), gastronomija (28), pop kultura (26) i ostalo (16).



Graf 11. Tema objava na službenom Instagram profilu TZ Kvarner

Izvor: rad autora

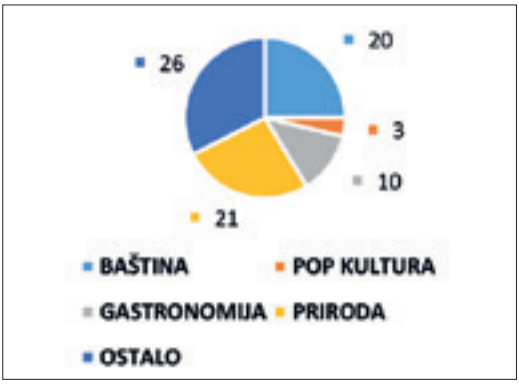
Teme na službenom Instagram profilu TZ Kvarnera dominantno su vezane uz prirodu (40), a slijede baština (16), gastronomija (13), pop kultura (2) i ostalo (13).



Graf 12. Tema objava na službenom Facebook profilu TZ Istre

Izvor: rad autora

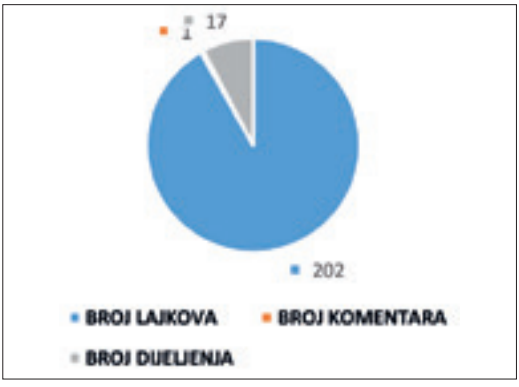
Teme na službenom Facebook profilu TZ Istre dominantno su vezane uz baštinu, gastronomiju i ostale teme (21), a zatim slijede priroda (14) pop kultura (2).



Graf 13. Tema objava na službenom Instagram profilu TZ Istre

Izvor: rad autora

Teme na službenom Instragram profilu TZ Istre dominantno su vezane uz baštinu (26), prirodu (21), ostalo (20), gastronomija (10) te pop kultura (3).



Graf 14. Količina i vrsta interakcije kod baštinskih objava na službenom Facebook profilu TZ Kvarnera

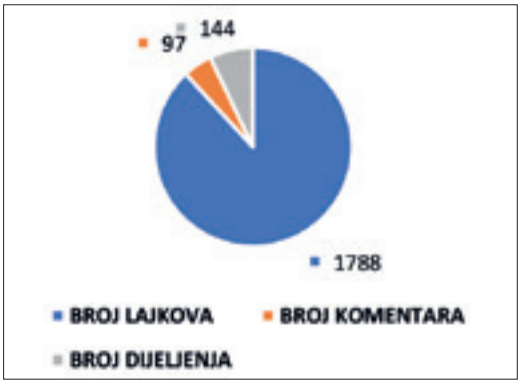
Izvor: rad autora

Na službenom Facebook profilu TZ Kvarnera lajkovi su dominantna vrsta interakcije (202) ispod baštinskih objava.

Graf 15. Količina i vrsta interakcije kod baštinskih objava na službenom Instagram profilu TZ Kvarnera

Izvor: rad autora

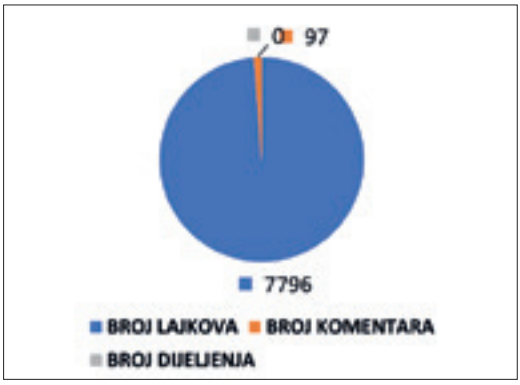
Na službenom Instagram profilu TZ Kvarnera lajkovi su dominantna vrsta interakcije (1165) ispod baštinskih objava



Graf 16. Količina i vrsta interakcije kod baštinskih objava na službenom Facebook profilu TZ Istre

Izvor: rad autora

Na službenom Facebook profilu TZ Istre lajkovi su dominantna vrsta interakcije (1788) ispod baštinskih objava



Graf 17. Količina i vrsta interakcije kod baštinskih objava na službenom Instagram profilu TZ Istre

Izvor: rad autora

Na službenom Instagram profilu TZ Istre lajkovi su dominantna vrsta interakcije (7796) ispod baštinskih objava

ZAKLJUČNA RAZMATRANJA

Nastavno na formiranu hipotezu s početka rada kako kulturna baština nije dominantno niti učestalo zastupljena na službenim profilima društvenih mreža turističkih zajednica Istre i Kvarnera, a niti na najčitanijim internetskim portalima u Hrvatskoj, može se reći da je ista potvrđena uzimaju li se u obzir dobiveni rezultati da od ukupno 1385 medijskih objava, svega je 96 objava se usko odnose na kulturnu baštinu. Kada se govori o objavama na službenim profilima društvenih mreža turističkih zajednica, na službenom Facebook profilu TZ Kvarner objava je bilo 170, od čega 72 baštinske objave, a na službenom Instagram profilu 83 objave, od čega 16 baštinskih. Na službenom Facebook profilu TZ Istre objava je bilo 126, od toga 21 baštinskih, a na službenom Instagram profilu 79 objava, od čega 26 baštinskih. Iz toga je razvidno da

baština ne zauzima dominantnu poziciju niti u medijskom izvještavanju, niti u digitalnoj komunikaciji turističkih zajednica. To ukazuje na činjenicu da nedostaje jasna komunikacijska smjernica oko toga što će biti glavna tema dviju značajnih hrvatskih turističkih regija te koji su to glavni elementi na temelju kojih će se graditi identitet i imidž Istre i Kvarnera. Rezultati također pokazuju kako turističke zajednice na društvenim mrežama pretežno objavljuju sadržaj informativnog karaktera kada je riječ o kulturnoj baštini, no s nešto drugačijim pristupom kada je riječ o drugim tipovima sadržaja pa tako TZ Kvarnera više koristi zabavni od najavnog sadržaja, a TZ Istra više najavni u odnosu na zabavni sadržaj. Edukativni sadržaj je u tom pogledu najmanje prisutan na službenim profilima turističkih zajednica, a ostaje za razmatranje kako uskladiti komunikacijski stil na društvenim mrežama i tip sadržaja s imidžom Istre i Kvarnera kao turističkih destinacija, koji bi se jednim dijelom temeljio na bogatoj kulturnoj baštini. Nalazi ovog rada otvaraju prostor za preciznije definiranje strateške komunikacije i učinkovito brendiranje hrvatskih turističkih destinacija.

LITERATURA

Agyapong, E. & Yuan, J. Q. (2022). Social Media Impact on Tourism Destination Decision: Evidence from International Students in China. *Open Journal of Applied Sciences*, str. 2055-2080. doi:https://doi.org/10.4236/ojapps.2022.1212143

Anholt, S. (2006). Public diplomacy and place branding: where's the link? *Place Branding, 4*, str. 271-275.

Anholt, S. (2009). *Konkurentan identitet: novo upravljanje markama država, gradova i regija.* Zagreb: M Plus d.o.o.

Balmer, J. M. & Podnar, K. (2021). Corporate brand orientation: Identity, internal images, and corporate identification matters. *Journal of Business Research*, str. 729-737.

Berhanu, K. & Raj, S. (2020). The trustworthiness of travel and tourism information sources of social media: perspectives of international tourists visiting Ethiopia. *Heliyon, 3*. doi:https://doi.org/10.1016/j.heliyon.2020.e03439

Blain, C., Levy, S. E. & Ritchie, J. R. (2005). Destination branding: insights and practices from destination management organisations. *Journal of Travel Research, 4*, str. 328-338.

Buhalis, D. (1999). Tourism on the Greek islands: Issues of Peripherality, Competitiveness and Development. *International Journal of Tourism Research*, str. 341–358.

Cheng, M. (2024). Social media and tourism geographies: mapping future research agenda. *Tourism Geographies*, str. 1-10. doi:https://doi.org/10.1080/14616688.2024.230478

Cooper, C. (2008). *Tourism Principles and Practice.* London: Prentice Hall.

Dabo, K., Gavrilović, I. & Gluvačević, D. (2023). The role of community management in the branding of the tourist destination Rijeka as the European Capital of Culture 2020. *Preserving, Evaluating and Developing the Mediterranean* (str. 317-326). Zagreb: Institut za društvena istraživanja Ivo Pilar, Sveučilište VERN', HAZU.

Domains: Rating Gemius. (28. kolovoz 2024). Dohvaćeno iz Rating.gemius: https://rating.gemius.com/hr/tree/8

Escobar-Farfán, M., Cervera-Taulet, A. & Schlesinger, W. (2024). Destination brand identity: challenges, opportunities, and future research agenda. *Cogent Social Sciences, 1*. doi:https://doi.org/10.1080/23311886.2024.2302803

Fodness, D. & Murray, B. (1997). Tourist Information Search. *Annals of Tourism Research, 3*, str. 503-523.

Gartner, W. C. (1993). Image Formation Process. Communication and Channel Systems in Tour-

ism Marketing. *Journal of Travel and Tourism Marketing*(2-3), str. 191-215.

Gibson, H., Qi, C. & Zhang, J. (2008). Destination İmage And İntent To Visit China And The 2008 Beijing Olympic Games. *Journal Of Sport Management, 1*, str. 427-450.

Gilmore, F. (2002). Branding for success. U N. Morgan, & a. al., *Destination branding: creating a unique destination proposition* (str. 57-65). London: Butterworth Heinemann.

Gluvačević, D. (2023). The power of cultural heritage in tourism – example of the city of Zadar (Croatia). *International Journal of Scientific Management and Tourism, 1*, str. 3-24.

Gluvačević, D. & Periša, H. (2022). Stavovi lokalnog stanovništva o kulturno-povijesnoj baštini kao nositelju identiteta destinacije – primjer Općine Nuštar. *Sociologija i prostor, 1*, str. 179-203. doi:https://doi.org/10.5673/sip.60.1.7

Hankinson, G. (2005). Destination Brand Images: A Business Tourism Perspective. *Journal of Services Marketing, 1*, str. 24-32.

Hanlan, J. & Kelly, S. (2005). Image Formation, Information Sources and An Iconic Australian Tourist Destination. *Journal of Vacational Marketing, 2*, str. 163-177. doi:https://doi.org/10.1177/1356766705052573

Hanzaee, K. H. & Saeedi, H. (2011). A Model of Destination Branding For Isfahan City: Integrating the Concepts of the Branding and Destination Image. *Interdisciplinary Journal of Research in Business, 4*, str. 12-28.

Hoeffler, S. & Keller, K. L. (2003). The marketing advantage of strong brands. *Journal of Brand Management, 6*, str. 421-445.

Hogg, M. A. & Vaughan, G. M. (2002). *Social Psychology.* London: Prentice Hall.

Islam, M. T. (2021). Applications of Social Media in the Tourism Industry: A Review. *SEI-SENSE Journal of Management, 1*, str. 59-68. doi:https://doi.org/10.33215/sjom.v4i1.556

Jakopović, H. (2016). Detecting the Online Image of "Average" Restaurants on TripAdvisor. *Medijske studije, 13*, str. 102-118. doi:https://doi.org/10.20901/ms.7.13.6

Jakopović, H. (2021.). Korisnici kao sukreatori imidža turističkih destinacija. U M. Zorko, *Komuniciranje o sigurnosti* (str. 77-95). Zagreb: Biblioteka Politička misao.

Jakovljević, M. (2011). Odnosi s javnošću – vodeća taktika u promociji turističkih regija. *Acta turistica nova, 1*, str. 119-138.

Karl Gigić, B. (2022). Population perception of creating the brand of the city of Osijek with an emphasis in the field of culture. *Časopis za ekonomiju i tržišne komunikacije, 1*, str. 86-99. doi:https://doi.org/10.7251/EMC2201070

Kärreman, D. & Frandsen, S. (2020). Identity, Image, and Brand. U A. D. Brown, *The Oxford Handbook of Identities in Organizations* (str. 408-423). Oxford: Oxford University Press. doi:https://doi.org/10.1093/oxfordhb/9780198827115.013.33

Khasanova, R. (2018). *The role of social media in creating a hot spot mountaineering destinations: The Trolltunga Case. Transcultural European Outdoor Studies.* Dohvaćeno iz Nih.brage.unit.no: https://nih.brage.unit.no/nih-xmlui/bitstream/handle/11250/2587058/Khazanova%20Roza%20v2018.pdf?sequence=1

Koens, K., Postma, A. & Papp, B. (2018). Is Overtourism Overused? Understanding the Impact of Tourism in a City Context. *Sustainability, 12*. doi:https://doi.org/10.3390/su10124384

Kotler, P. (2001). *Marketing Places Europe: Attracting Investements, Industries, Residents and Visitors to European Cities, Communities, Regions and Nations.* London: Pearson Education.

Martí-Parreño, J. & Gómez-Calvet, R. (2020). Social Media and Sustainable Tourism: A Literature Review. *3rd International Conference on Tourism Research-ICTR2020,*, (str. 148-153). Valencia. doi:https://doi.org/10.34190/IRT.20.067

Mindrut, S., Manolica, A. & Roman, C. T. (2015). Building Brands Identity. *Procedia Econom-*

ics and Finance, str. 393-403.

Morgan, N. J., Pritchard, A., & Piggott, R. (2003). Destination branding and the role of stakeholders: the case of New Zealand. *Journal of Vacation Marketing, 3*, str. 285-299.

Morrison, A. M. & Anderson, D. J. (2002). Destination Branding. *Missouri Association of Convention & Visitors Bureaus Annual Meeting.* Missouri: Rodrige.

Negussie, D., Umema, F. F. & Gota, G. G. (2023). Social Media and Tourism: A Systematic Lietarture Review. *GAP Interdisciplinarities – A Gloval Journal of Interdisciplinary Studies, 4*, str. 1-8. doi:https://doi.org/10.47968/gapin.640001

Nešić, M., Šošić-Radenković, B. & Zubanov, V. (2021). Sportski događaji u funkciji brendiranja gradova kao turističkih destinacija. *Časopis za ekonomiju i tržišne komunikacije, 2*, str. 446-461. doi:https://doi.org/10.7251/EMC2102446N

Noer Fatati, M. & Suyadnya, I. W. (2015). Beyond User Gaze: How Instagram Creates Tourism Destination Brand? *Procedia - Social and Behavioral Sciences*, str. 1089-1095. doi:https://doi.org/10.1016/j.sbspro.2015.11.145

Olimpia, B., Luminita, P. & Simona, S. (2011). The Brand Equity of Touristic Destiantions - The Meaning of the Value. *The Annals of the University of Oradea Economic Sciences, 1*, str. 193-199.

Petrovici, A. (2014). Public Relations in Tourism. A Research on The Perception of The Romanian Public Upon Responsible Tourism. *Procedia - Social and Behavioral Sciences*, str. 67-72. doi:https://doi.org/10.1016/j.sbspro.2014.12.287

Pike, S. (2005). Tourism destination branding complexity. *Journal of Product & Brand Management, 4*, str. 258-259.

Radjabov, O. & Dushanova, Y. (2021). Efficient Ways Of Using Public Relations Tools In Tourism. *The American Journal of Management and Economics Innovations, 5*, str. 137. doi:https://doi.org/10.37547/tajmei/Volume03Issue05-21

Ruiz-Real, J. L., Uribe-Toril, J. & Gázquez-Abad, J. C. (2020). Destination branding: Opportunities and new challenges. *Journal of Destination Marketing & Management*. doi:https://doi.org/10.1016/j.jdmm.2020.100453

Sánchez, J. M., Gómez, C. D. & Moral, M. M. (2024). Evolution of the impact of social media in hospitality: A bibliometric analysis. *Journal of Destination Marketing & Management*. doi:https://doi.org/10.1016/j.jdmm.2024.100868

Santoso, N. R. & Negoro, S. H. (2019). Public relations and tourism: finding public relations' role in communicating tourist destination. *Komunikasi Jurnal, 2*, str. 138. doi:https://doi.org/10.25139/jsk.3i2.1532

Sawir, M., Mastika, I. K., Prayitno, H., Lestari, A., Nur'aini, A. & Arsyad, D. H. (2024). Public relations strategies and sustainable tourism in Tolitoli Regency: a case study in the Indonesian context. *Cogent Social Sciences, 1*. doi:https://doi.org/10.1080/23311886.2024.2376163

Son, A. & Pearce, P. (2005). Multi-faceted image assessment: International students' views of Australia as a tourist destination. *Journal of Travel and Tourism Marketing, 4*, str. 21-35.

Tasci, A. D., Gartner, W. C. & Cavusgil, S. (2007). Measurement of destination brand bias using a quasi-experimental design. *Tourism Management, 6*, str. 1529-1540.

van Gelder, S. (1. kolovoz 2008). *How to improve the chances of successfully developing and implementing a place brand strategy.* Dohvaćeno iz Medinge.org: https://medinge.org/how-to-improve-the-chances-of-successfully-developing-and-implementing-a-place-brand-strategy/

Voinescu, C. & Apostolou, A. (2011). The Contribution Of Public Relations In Tourism Enterprises. *Annals of University of Craiova - Economic Sciences Series, 39*, str. 253-260.

Vukman, M. & Drpić, K. (2014). Utjecaj internet marketinga na razvoj brenda turističke destinacije. *Praktični menadžment, 1*, str. 141-145.

Waramontri, R. (2020). Impact of social media on tourism education. *Innovative Technologies in Science and Education*. doi:https://doi.org/10.1051/e3sconf/202021022008

Wengel, Y., Ma, L., Ma, Y., Apollo, M., Maciuk, K. & Ashton, A. (2022). The TikTok effect on destination development: Famous overnight, now what? *Journal of Outdoor Recreation and Tourism*. doi:https://doi.org/10.1016/j.jort.2021.100458

REPRESENTATION OF THE CULTURAL HERITAGE OF ISTRIA AND KVARNER ON THE MOST READ CROATIAN NEWS WEBSITES AND IN THE SOCIAL MEDIA OF TOURIST BOARDS

Krešimir Dabo

Dr. Sci.; Assistant Professor, Research Fellow; Institute for Migration Research, Department of Cultural and Island Studies, Zagreb; Croatia, kresimir.dabo@imin.hr; ORCID ID: 0000-0001-9260-7384

Hrvoje Jakopović

Dr. Sci.; Associate Professor; Faculty of Political Science, University of Zagreb, Zagreb, Croatia; hrvoje.jakopovic@fpzg.hr; ORCID ID: 0000-0002-9846-9952

Dejan Gluvačević

Dr. Sci.; Assistant Professor; Edward Bernays University of Applied Sciences, Zagreb, Croatia, dejan.gluvacevic@bernays.hr; ORCID ID: 0000-0002-4960-648X

***Summary**: Along with various other resources, cultural heritage can play a significant role in the presentation, communication and branding of a tourist destination, especially if we take into account the successful Croatian destinations of Istria and Kvarner, which are the focus of this work, and which are abundant in tangible and intangible cultural assets. Various public relations tools, especially media relations and social media management, can be very helpful in this process. In order to create strategic communication guidelines for the presentation and interpretation of cultural heritage for the purpose of branding a tourist destination, which would be applicable in practice, it is necessary to determine the initial, existing communication parameters, i.e. to determine how much selected destinations use cultural resources for communication purposes and to what extent way. Therefore, the main goal of this paper is twofold. On the one hand, to determine to what extent, how and in what manner the most widely read Croatian electronic media report on the cultural heritage of Istria and Kvarner, given that the influence of the media on the public is significant. And on the other hand, how the same topic is used and shaped by county tourist boards in communication with target audiences on their official social media profiles. For this purpose, two independent measurement instruments adapted to the platform and format of the analyzed content were developed. More specifically, one for the analysis of media reporting on culture of selected electronic media, and the second matrix for content analysis of the official Facebook and Instagram profiles of the Tourist Boards of Istria and Kvarner. The results determined that both the media and the tourist boards*

pay extremely little attention to cultural heritage, which opens up space for further research into the branding strategy of Croatian tourist regions, i.e. determining how selected destinations are presented and what should be emphasized in future communication strategies. The results of this research can be useful both for local tourism communities and as an incentive for the media to report more intensively on culture and cultural heritage. In addition, the results indicate the lack of a clearer strategy on how to brand Croatian tourist destinations and how to implement cultural resources in communication plans and build the image and brand of a tourist destination through culture, that is, the cultural resources that abound in Istria and Kvarner, which often impose tourism trends as prominent regions in Croatia.[2]

Keywords*: destination branding, cultural heritage, social networks, electronic publications, public relations*

JEL classification*: Z10; L80; M37*

2 This paper was created as preliminary research within the scientific project "Cultural identities and branding of tourist destinations of Istria and Hrvatsko Primorje" (9-2024/2027) of the Migration Research Institute, and is financed by the Ministry of Science, Education and Youth of the Republic of Croatia, with the support of the EU Next Generation. The views and opinions expressed are solely those of the author and do not necessarily reflect the official views of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501195G
UDK: 001.891:[005.6:338.486.22
Datum prijema rada: 29. septembar 2024.
Submission Date: September 29, 2024
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 195-204

PREGLEDNI NAUČNI RAD / OVERVIEW SCIENTIFIC PAPER

TECHNICAL PROGRESS AS A FACTOR OF ECONOMIC GROWTH

Dejan Gligović | Associate professor Ph.D, Modern business school, Belgrade, Serbia, dejan.gligovic@mbs.edu.rs; ORCID ID: 0000-0003-2698-7387

Abstract: *Economic growth means an increase in the volume of production and services in a certain time as a result of new investments in production capacities and their more efficient use, as well as new employment and an increase in labor productivity. Technological changes should be understood as the process of improving existing and finding qualitatively new means of production, the process of continuous improvement of existing and finding qualitatively new items of work, finding new sources of energy and improving existing methods of energy use, as well as the continuous process of improving the forms and methods of organization and production management. Technological changes are undoubtedly the most important factor in economic growth. Moreover, it is possible to talk about quality economic growth only if the complex of technological changes is its most important generator. That is why the question of the key mechanism for initiating technological changes is of particular importance in economic theory. Depending on the essence of the answer to it, the type of specific activities that are most expedient to undertake at the level of the national economy or individual companies in order to generate technological development depends a lot.*

Keywords*: economic growth, analysis, technological changes, social product*

JEL classification*: F43, O40*

INTRODUCTION

Analysis of the quality of economic development is a method of examining the quality characteristics of the development process as an economic phenomenon. Economic development represents an economic phenomenon, which consists of a large number of economic processes - some of which are marked by social and political factors that they differ from each other. In this sense, the concept of the quality of economic development is defined as a set of common features that distinguishes the corresponding economic process from other processes. Hence, the essential characteristics of the quality of the development process are: homogeneity (similarity) and comprehensiveness (in the sense that the category of quality is closely related (identical) to the essence of a certain phenomenon).

The analysis of the quality of economic development cannot be separated from its quantitative component, that is, the size with which some defined feature of the (economic) process is measured, such as, for example: labor, capital, income. However, due to the characteristics of economic processes, there is no unified opinion as to whether all quantitative elements are measurable and mutually comparable. This especially applies to the complex of categories of individual economy, such as: utility, consumer preferences and the like. In this sense, the analysis of the quality of economic development is based on the methodology of structural analysis in which, on the basis of empirical material and previous inductive conclusions, hypotheses, deductions, reductions and verifications, an attempt is made to determine the essence of certain economic processes and their mutual dependencies.

Current economic theory extends the position according to which the decisive material impact on economic development has a complex of technological changes, which is denoted by the common denominator as technical progress. Technical progress, due to its extreme complexity, belongs to a category that cannot be directly measured or compared. The size itself is determined as a derived economic category that is determined as a residual from a qualitative-quantitative analysis of the role of capital and labor in production and economic development. Economic development means greater and more effective involvement of the economy of a country in the international economy (Ivić, 2015)

Economic growth represents the expansion of GDP, that is, an increase in the production of a country. It occurs when the production frontier of a country moves up. A close concept is the value of gross domestic product per capita, which determines the standard of living of a country. There is a general agreement on the desirability of economic growth, but opinions differ significantly on how it can be achieved. The question of the relative importance of factors that influence the height of growth is the central point around which theoretical concepts have been developed that indicate the factors that stimulate economic growth. Economic growth is a complex and long-term process, which can be observed from a quantitative and qualitative aspect. Both sides of economic growth are equally important and closely interconnected. The quantitative side of economic growth is most often reduced to the pace of production increase, that is, the intensity of growth expressed through the corresponding growth rate, which is motivated by the availability of data and the simplicity of analysis. However, this indicator is flawed and does not properly reflect the quantitative dimension of growth. In addition to the pace of growth, its stability over time, i.e., resistance to various shocks and uncertainty. Together, those two components - the intensity of growth and its stability, fully and comprehensively characterize the quantitative side of economic growth, and are denoted by the term growth dynamics (Gligorić Matić, 2022)

LITERATURE OVERVIEW

Economic growth, as a value quantification of the development of any economy, depends primarily on the availability and efficiency of the application of production factors (Vasiljević, 1996). It is known that the production function indicates that a higher potential product can only be realized by a higher investment of production factors. Four components affect the physical possibilities of economic expansion, i.e. economic growth, namely (Zdravković, 2010):

1. Increasing the quantity and quality of human resources (labor),
2. Increasing the quantity and quality of natural resources (land),
3. Increasing the supply of capital goods (capital)
4. Improving technology.

The advantage in analyzing the influence of these factors is the possibility of their exact quantification and, based on that, determining the contribution of each of the four mentioned factors in economic growth, as well as forecasting future development and formulating macroeconomic policy measures. With the increase in the level of economic development, the efficiency of the application of production factors becomes the main generator of development potential. In this way, the human factor (entrepreneurship - organization - knowledge) is a key factor in economic development. In order to show the change in the population rate, it is important to point out that during the 19th century, the average population growth rate was below 1%, and that during the first 70 years of the 20th century, it was around 2%. After that, the population growth rate declines, with the growth rate forecast to be 0 in 2100. 1% (Ortiz-Ospina, 2016). The main problem in considering the impact of this factor on economic growth is the impossibility of value expression, and therefore not the exact determination of the basic relationships that determine the overall development potential. According to the classical interpretation, the total social product (P) depends on the volume of employment (L) and average labor productivity (pr) in the observed year (t), that is:

Formula 1.

$$P_t = L_t \cdot p_{rt}$$

Source : Romer, 2006

The number of employees in the economy and their productivity is determined by the amount of available means for work (basic production funds, denoted as K). Hence, the social product depends on the size of the basic production funds and their average efficiency of use in the observed year (ek), which can be expressed by the relation:

Formula 2.

$$P = e_k \cdot K$$

Source : Romer, 2006

The coefficient of efficiency of basic funds arranged in this way $\left(e_k = \frac{P}{K} \right)$ shows how much social product is realized per one accounting unit of basic funds. Extensive economic growth is associated with economies in the initial stages of development, which have large labor force reserves, low per capita social product, scarce accumulation and a modest volume of production funds. The transition of the economy into several stages of development means a reduction in the participation of employment growth in the creation of development potential. However, in very high stages of economic development, due to the decline in the participation of the primary and secondary sectors in production and employment, as well as the very low growth of

productivity in the tertiary sector, the impact of employment on the growth of the social product strengthens again, and economic growth takes on extensive characteristics. Differences in average growth rates between countries have made significant differences in the average living standards of the population of those countries. The standard of living in industrialized countries is reaching a higher level (Romer, 2006).

After a strong first half of the year, the EU economy has now entered a much more challenging phase. Shocks caused by Russia's war of aggression against Ukraine are dampening global demand and increasing global inflationary pressures. The EU is among the most exposed advanced economies, due to its geographical proximity to the war and its heavy reliance on gas imports from Russia. The energy crisis affects the purchasing power of households and affects production. Economic sentiment has dropped significantly. As a result, while growth in 2022 is forecast to be better than previously forecast, the outlook for 2023 is significantly weaker for growth and higher for inflation compared to the European Commission's summer interim forecast. In conditions of increased uncertainty, high pressure on energy prices, erosion of household purchasing power, weaker external environment and strict financing conditions, it is expected that the EU, the Eurozone and most of the member states will enter into recession in the last quarter of the year.

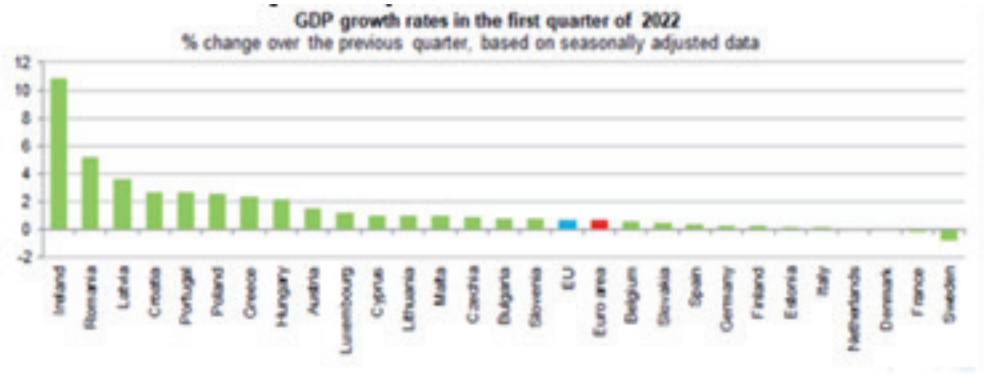
GDP within the Eurozone grew by an average of 0.6% in the first three months of 2022 and employment rose by 0.5%, according to statistics published by Eurostat, the EU statistics agency.

Across the bloc, GDP grew by 0.7% compared to the previous quarter. At the end of last year, growth was considerably slower. GDP grew just 0.2% in the Eurozone and 0.5% across the whole EU.

GDP growth was driven by a strong Irish economic performance. Compared to the end of last year, Irish GDP rebounded by a staggering 10.8%. Other nations, such as Romania (+5.2%) and Latvia (+3.6%) also weighed positively on the average.

The next graph (Graph No. 1) shows the GDP growth rate of the countries in the Eurozone for the year 2022.

Graph 1. GDP growth rates of the Eurozone in 2022.



Source: The Brussels Times Magazine, July, 2022.

Some slight contractions in GDP were observed in Sweden (-0.8%), France (-0.2%), and Denmark (-0.1%). In Belgium, GDP growth was behind the EU and Eurozone averages at 0.5%.

The dynamics behind GDP growth have radically altered since last year. The European energy crisis, made worse by Russia's conflict of Ukraine, has raised inflation and heavily hit consumer spending.

In 2023, however, the aggregate government deficit has increased (to 3.6% in the EU and 3.7% in the eurozone) as economic activity weakens, interest expenses rise and governments extend or introduce new discretionary measures to mitigate the impact of high energy prices . Their planned retirement in 2023 and continued growth should reduce pressure on public coffers thereafter. As a result, the deficit is projected at 3.2% of GDP in the EU and 3.3% in the Eurozone in 2024.

The concept of the quality of economic development is closely related to technical progress, which is treated as a key factor in economic development. Technical progress means the process of:

1. Improving existing and finding qualitatively new tools for work and subjects of work,
2. Finding new and improving existing methods of energy use,
3. Improvements in the forms and methods of organization and management of production and overall operations, as well as
4. Their diffusion from the most advanced to less advanced branches and enterprises.

The basic social, economic and technical effects of applying the results of technical progress are: a) high level of automation of work and intellectual processes; b) rapid progress in the production and introduction of new materials; c) reduction of specific energy consumption and reduction of application of atomic energy; d) the introduction of new forms of transport and communications enable a greater degree of internationalization of the production process and a significant reduction in the importance of the disposal of natural resources in economic development; e) great progress in the control of biological resources; f) qualitative changes in structure, organization and management in all areas of human activities; g) turning information into a key factor of production and economic development; h) major changes in the internal and external structure of employment; i) changes in technology and methods of action on nature in order to neutralize negative environmental effects and waste.

Factors affecting the improvement and economic valorization of technical progress, in order of priority:

1. Socio-economic relations,
2. Structure and degree of organization of the economy
3. The size of the market in which the basic economic segments operate,
4. Organization of research and development,
5. Material possibilities,
6. Level of education and upbringing, as well as
7. Non-economic factors, which in certain partial areas, can have absolute priority.

Numerous studies have shown that technical progress, as a determinant of growth, is incomparably more significant than a simple increase in the amount of avail-

able production factors (Mosurović Ružičić, 2021). The extremely large influence of the results of technical progress on the creation of a development stimulus caused science and technology to become the basic means of domination (the so-called technological colonialism).

The application of new technologies as an economic phenomenon has certain common characteristics, which we list according to their importance for the evaluation of the overall economic efficiency of economic development. The highest level of technology is economically the most expedient because it has the lowest costs per unit of goods and enables the highest growth of total production. However, equating the highest technology with the highest economic efficiency is methodologically not entirely correct, because empirical findings show that certain deviations are possible in the short and medium term. Thus, in the conditions of underdeveloped countries, the main limiting factors for the application of modern technology are cited as: lack of accumulation, first of all, of foreign exchange funds for the purchase of foreign equipment, the small number of qualified labor force, etc. For (post) socialist countries and developing countries that provided significant financial resources through the export of raw materials, the appearance of companies equipped with the most modern technology, which had a devastating effect on the development performance of their economies, is characteristic. However, on the other hand, examples of newly industrialized countries in the Pacific region negate these assumptions.

The mass application of new technologies improves the organic composition of capital because the value of the means of production in relation to labor increases. And this setting should be accepted only conditionally, considering that some types of technology can be introduced with the same, even with a lower organic composition of capital. Namely, technical progress relatively reduces the price of labor resources, that is, the technical composition grows faster than the value one. This means that the natural relationship between the means of labor and the labor force changes faster in favor of the means of labor than is expressed in terms of value. The development of technology is directly related to the increase in social well-being and affects the satisfaction of people's constantly growing needs (Dimitrijević, 2012)

In the conditions of intensive technical progress, the growth of basic funds is faster than that of revolving funds. On the other hand, the effect of moral consumption also increases, which all results in a significant increase in the transferred value (amortization) in relation to the newly created value. Changes in the organic composition of capital also affect the (average) capital ratio, i.e., the value of the basic assets that should be invested in the unit of social product production changes.

METHODOLOGY

Qualitative methodology is the conceptual determination and description of basic elements within the observed problem, using descriptive analysis. By using foreign and available domestic literature that tackles this issue, applying methods of analysis and synthesis, the basic assumptions and models of economic growth will be defined, as well as possible directions of economic policy action, with the aim of increasing economic activity. Also, the method of comparison will be used, both on the theoretical level (comparing the positions of different economic schools on issues related to economic growth). By applying induction methods, starting from the premise of the

effects of individual measures on an individual country, an effort will be made to reach broader conclusions about the observed problem. In addition to the inductive method, the deduction method will be used, in order to examine the correctness of the formulated broader conclusions by applying them to individual national economies.

DISCUSSION

The neoclassical growth model showed that the long-term rate of economic growth depends on the rate of technological change. However, it did not provide an explanation of the determinants of technology. According to that model, differences in growth rates are the result of differences in the accumulation of physical and human capital in the transition phase. To improve such a model, the possibility that different countries have different rates of technical progress and therefore different rates of long-term growth was analyzed. Endogenous growth theory, in this way, focused on explaining the economic forces that influence technical progress. Technical progress occurs as companies or individual inventors, seeking to maximize profits, search for new and better inventions. The ability to make a profit is what makes a company want to innovate. Improvements in technology and economic growth are endogenous results. This theory was developed by Romer (1986, 1990). The condition for the existence of endogenous growth boils down to the fact that the marginal product of capital stops falling. Alfred Marshall hypothesized that the realized aggregate outcome can be significantly different from the sum of effects seen by individuals.

While each individual has diminishing marginal returns on investment in his own factor of production, it can easily happen that with the inclusion of all others, effective productivity does not decrease at all, but remains the same. This type of positive externality is also called Marshallian externality. Externalities can also have negative effects, in the event that the behavior of one person causes costs for everyone else. Innovations and knowledge are a clear example of positive externalities. The property of knowledge is that it is a public good. Public goods have two properties (Erken, Donselaar, & Thurik, 2018). First, there is no possibility of exclusion, that is, the consumer of a public good cannot physically or legally prevent anyone from consuming that public good with him. Secondly, there is no rivalry in consumption, that is, the consumption of some does not reduce the possibility of consuming it, and enjoying it for others. Societies encourage this engine of growth by establishing property rights to ideas, providing judicial protection, and thus, encouraging innovative activities.

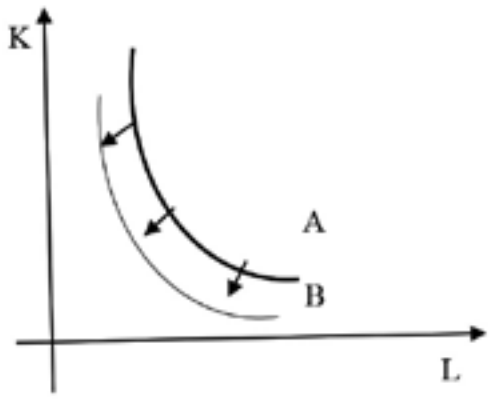
Economic growth in the Western Hemisphere (developed economies) is based on a continuous change in parameter values, i.e. a gradual increase in the participation of the research sector. Qualitatively, the hemi endogenic model does not differ significantly from the basic Solow model, if investments grow gradually. The difference is that the hemiendogenic model implies an initially low participation of the research sector, but its growth has a very strong and long-term impact on economic growth. A constant and low rate of growth in the share of research causes long-term effects on the growth of the economy in the long term (Tomić, 2012). However, this model indicates that economic growth does not last forever.

The hemi endogenic model assumes that the growth of the gross domestic product per capita can be ensured in the coming years by doubling the share of the research and development sector every hundred years, but at some point the growth will stop,

and that at the moment when the income per capita is at a high level (Schmidt, 1997). The idea of the cessation of growth is known in economic theory from the time of the classical economic school.

The application of new technologies makes sense, from an economic point of view, only if the increase in the volume of the social product can be achieved with the same volume of consumption of the factors of production (capital (K) and labor (L)), i.e. if the same volume of the social product can be achieved by reducing the consumption of the factors of production . Technical progress or knowledge is achieved through invention, creation of new knowledge and through innovation, that is, by incorporating new knowledge into current production techniques. Technical progress it includes not only innovative production techniques, but also new managerial methods and new forms business organizations.

Graph 1. Technical progress and economies of scale



A = representative isoquant before the effect of technical progress factors

B = representative isoquant after the effect of technical progress

Technical progress is the achievement of a unit of production of a social product using a smaller amount of factors of production (capital (K) and labor (L)).

Production curves A and B (called isoquants) represent the identical volume of the social product production equation, but based on a different combination of unit consumption of production factors.

The production curve (isoquant) of B unit production of the social product, after changes under the effects of technical progress. It is characterized by a relatively lower unit consumption of production factors.

Source: Author's presentation

Once discovered and implemented, new knowledge soon becomes available entrepreneurs and businesses at a relatively low price. Technological progress thus spreads to the whole economy. Recently, technical progress has exploded especially in the field of information technology: electronic computers, wireless communication, the Internet, mobile phones, etc. Significant technological progress has also been achieved in the field of innovation in medicine and biotechnology (Grant, 2017).

Measuring the level and speed of diffusion of the results of technical progress does not have a single methodology for now, because not a single modern and tested method has shown satisfactory results. The best synthetic indicator for measuring technical progress, in an international comparison, is considered to be the indicator of global productivity.

However, aggregate partial indicators can also be used, among which the following stand out:

- Growth rate and level of productivity;
- Speed and degree of diffusion of new modern technologies;
- Electricity consumption per employee and in total;
- Degree of chemicalization of production processes;
- Development of scientific research infrastructure and its allocation:
- Number of applied for and registered patents. (Simeunović, 2015) A global idea of technical progress can also be obtained indirectly, by analyzing the intensity and structure of investments, the technological equipment of work, the age structure and the level of automation of installed equipment, i.e. import and export prices, regional export destinations, the participation of individual activities in total production and employment.

CONCLUSION

Technological changes are undoubtedly the most important factor in economic growth. Moreover, about quality it is possible to talk about economic growth only if the complex of technological changes is his the most important generator. That is why the question of the key is of particular importance in economic theory the mechanism of initiating technological changes. Depending on the essence of the answer to it the type of specific activities that are most expedient to undertake at the level of the national economy or individual companies in order to generate technological development depends a lot. Two key explanations for the origin of technological changes are: a) technological changes by supply, that is, technological changes made possible by the autonomous development of science and research and development activities, and b) technological changes conditioned by demand. The first explanation can be found under the name of science and technology push theory of technological changes, and the second direction under the name of demand pull theory of technological changes, i.e. technological changes that drive the needs, i.e. demand.

In the economic literature, there has long been a tendency to oppose the aforementioned two theories of generation of technological changes. However, an acceptable explanation of the underlying generators of technological change must include both supply-side and demand-side factors. In this sense, a number of researchers rightly note that neither of the mentioned two interpretations taken autonomously explains the logic of generating technological development to a satisfactory degree, but taken together they are valid as a solid basis in determining the basic generators of modern technological changes.

LITERATURE

Dimitrijević, B. (2012). Kako ekonomisati vremenom – ključni problem ekonomije. *Poslovna ekonomija, Vol. 6.*, pp. 489–505.

Erken, H., Donselaar, P., & Thurik, R. (2018). Total factor productivity and the role of entrepreneurship. *Journal Technol Transf*, pp.1493–1521.

Gligorić Matić, M. ,. (2022). Mjerenje i analiza dinamike privrednog rasta u evropskim zemljama. *Ekonomski horizonti, Vol. 24*.

Grant, C. (2017). *he Contribution of Education to Economic Growth. K4D Helpdesk Report.*

Brighton, UK.: Institute of Development Studies.

Ivić, M. (2015). Economic Growth and Development, Journal of Process Management. *New Technologies International Vol. 3, No.1*, pp. 55-62.

Mosurović Ružičić, M. F. (2021). Istraživanje i razvoj u modelima, Ekonomskog rasta i strukturnih promena. *Poslovna ekonomija, Vol. 2*, pp. 55-72.

Ortiz-Ospina, E. R. (2016). *World Population Growt.* OurWorldInData.org.

Romer, D. (2006). *Advanced Macroeconomics.* New York: McGraw-Hill.

Schmidt, G. (1997). Dynamic analysis of a Solow-Romer model of endogenous economi growth. *Working paper no.68*, pp. 10-17.

Simeunović, B. (2015). *Razvoj modela za merenje performansi procesa.* Beograd: FON.

Tomić, D. (2012). Relationship between technological progress and economic growth; Historical over- view. *Quality. Innovation. Future* (pp. pp.1290-1299). Maribor: Univerza v Mariboru -Fakulteta za organizacijske vede, Maribor.

Vasiljević, V. (1996). *Naučni i tehnološki progres – Osnovne koncepcije i metodi merenja.* Beograd.: Ekonomski fakultet,.

Zdravković, D. &. (2010). *Osnovi ekonomije.* Kruševac: FIM.

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501205G
UDK: 331.5.024.52:331.47(4.672EU)
Datum prijema rada: 23. septembar 2024.
Submission Date: September 23, 2024
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 205-213

PREGLEDNI NAUČNI RAD / OVERVIEW SCIENTIFIC PAPER

OBJECTIVES OF MONITORING AND EVALUATING WORK PERFORMANCE

Dejan Gligović | Associate professor Ph.D, Modern business school, Belgrade, Serbia, dejan.gligovic@mbs.edu.rs; ORCID ID: 0000-0003-2698-7387

Abstract: *Performance evaluation, i.e. evaluation of employees' work performance, i.e. evaluation of work performance, represents a series of complex operations on the basis of which the contribution of each individual (individual contribution) to the company's aspirations in a specific time frame is evaluated and then valorized. The process includes all employed company workers, including managers at all levels of the organization. The complex process of performance evaluation is based on systematic and continuous observation, valorization, referral and adaptability of employees, the effects of their work and behavior so that the company achieves the best possible business result. The performance evaluation process is based on adequate criteria, ways and systematicity of performance valorization. The overall treatment includes the submission of data related to employees after performance evaluation. More precisely, about how he worked compared to the defined principles.In addition, this process is allowed to be treated as a strategic part of the business system intended for valorization, evaluation and overall treatment of employees in hotels. Then it can also be qualified as exerting influence, mainly by managers, on the characteristics, behavior and results of individual workers related to the job in the specific case. Performance or output (result) which is a measurable effect of performing tasks and work tasks and which results from behavior and personal characteristics that are very important in performing specific actions in a certain time frame. Therefore, attention is directed only to the relevant dimensions of the job and the presented work task.*

Keywords*: work performance, performance evaluation, employee valorization, job dimension*

JEL classification*: J24, O15*

INTRODUCTION

Understanding the level of performance of employees as well as their evaluation is of particular importance for various activities within the framework of national economies, and such activities are most often carried out by human resources management in the company. The starting point in the scientific contribution should be

the construction of a new corporate culture based on the "behavior level above the expected" and the issue is raising the level of quality as a dynamic category. Processes and procedures must be constantly improved, as well as the process of evaluating the performance of employees. In this sense, in order for managers to understand the attitude of employees towards work tasks, it is necessary to raise the level of their performance by respecting their needs and motives with the aim of raising the level of behavior above the expected. Managers, therefore, should respect the fact that employees in the company are bound by certain needs and strong motivation that should encourage them to a better and more responsible approach to work. At the same time, it is very important that they know those external and internal factors that are the drivers of human potential and that have a decisive influence on the efficient implementation of jobs in accordance with performance, intellectual and physical capabilities. Looking at the achieved level of knowledge and practicality in the field of employee performance and their evaluation, i.e. evaluation of individuals in companies, it can be concluded that the theory of determination alone has not been used in Serbian companies so far. In the procedure and evaluation process, it is first of all necessary to determine general, team and individual tasks and key activities, which are based on ascertaining the basic mission of work duties, as well as specific requirements that are required in order to perform a specific job satisfactorily. The goal is to implement employee work discipline, to encourage employees to be willing and ready to follow various standards or rules that apply in the company, so that labor abuses can be overcome (Arnefoski, 2017). The basic part of work engagement is understood to be those jobs that have been successfully completed and that contribute to the positive business of the company and its success on the market. Overall activities indicate a roadmap for workers in the direction of changing their approach to work, what type of change they should implement, what their strengths and weaknesses are in performing business duties, and other aspects of work. By looking at and evaluating the performance of employees, the effectiveness of the work (recognized by the market) and efficiency (whether business costs have been reduced and higher productivity of living work has been achieved) can be realized. In the process of evaluating the performance of both companies and individuals employed in them, dozens of possible indicators of their success were recognized. Precisely these indicators (performance indicators) can be a powerful lever and a means of insight into the justification of business in the direction the company has chosen. They can also help in identifying and solving business problems, so the management treats them especially, as they are respected in the company professional practice. Effective management, with the intention of properly and timely evaluating performance, should first quantify its goals and tasks in the possibility of measuring performance indicators (Jeston & Nelis, (2008)).

LITERATURA OVERVIEW

Management is an art science that regulates the process of utilizing human resources and other resources effectively and efficiently to achieve a particular goal. Management develops into one area of science called Human Resource Management. Work efficiency management is directly interdependent with effective human resource management. In modern conditions, in order to evaluate the level of efficiency of human resources, many companies use a model known as 4C (competence, commitment,

congruence, cost effectiveness), that means: competence, commitment, alignment between the goals of the company and employees, and profitability (Šekarić, Milovanović, Kostić, & Šekarić-Sotirovski, 2015)

The process of managing work efficiency consists of three basic activities (Kulić, 2005):

a) determination of basic criteria,

b) observation process and direct assessment of success; and

c) agreement on efficiency, which is an integral and mandatory part of the overall process of evaluation of success, actually the final result of that activity.

It is indisputable that it is in the interest of both the employees and the company to monitor and evaluate the work success, i.e. the performance of the employees in more detail. It is especially in the interest of every employee to get information about their work, first of all, because of the realization to what extent they have responded to the expectations of the management, that is, the organization (Rubtsov, 2020). In a situation where the company's business hopes are met, employees can expect certain compensations, but also numerous forms of personal development and improvement. The performance evaluation process can be defined in several ways and from different aspects, that is, by applying different criteria. However, all definitions have their origins in how performance affects the work effects of individuals, teams and collectives. The final outcome refers to the realized turnover and profit of the company, on the one hand, and the satisfaction of end consumers, on the other hand. Therefore, it is a continuous work activity in which the share of workers in the realization of numerous obligations of the company in the short or long term, foreseen by the business strategy, which is aligned with the mission and vision of the company itself, is valued. Evaluation of job and work tasks in the company can also be defined in a formal way, which characterizes that process as a structured system for measuring, evaluating and influencing the attributes of employees, their behavior and the effects of the work of individuals in cooperation with other employees of the company (Hammer, 2004). Performance or output can be any result that is achieved can be measured, whether the subject is behavior or personal characteristics necessary to perform a certain activity in a certain time frame (Bader & Dickmann, 2019).

Performance management includes many roles of communicator, leader, role model and collaborator. Each individual should properly understand what their responsibilities are and what is expected of them, and managers should help them achieve those goals (Patton, 2018). Some people find change management a difficult role, others have problems when it comes to performance evaluation. (Bohlander, at al., 2001). However, when done right, performance management is all about partnership and motivation. From that perspective, it is a powerful tool that helps an organization (individuals, teams) become more successful. The benefits of performance management are obvious: motivation increases, when expectations are clear, employees are more likely to be committed to the expected outcomes (results), when goals are clear - employees contribute to greater efficiency, conditions are created for individual employee development, which has repercussions on the entire organization, a well-designed and structured performance management process is a powerful tool when dealing with poor performance, etc. (G., S., & A., 2001)

Table 1. The most important functions of evaluation and its specific uses

Functions / scope of work	Specific needs
DEVELOPMENT function	(1) Discovering the strengths and weaknesses of individuals (2) Creating a plan for further growth and development (3) Detecting requirements for training and coaching (4) Changing workplaces in the company (5) Managing talented employees
ADMINISTRATIVE function	(1) Wages - salaries (2) Approval and benefits program (3) Adoption of decisions on promotion or dismissal (4) Recognition of employees with insufficient performance
STABILIZER function	(1) Viewing scales of task satisfaction (2) Creating new tasks for employees (3) Creating directions for employee development (4) Forecasting human resource needs
DOCUMENTARY function	(1) Acts for compliance with prescribed laws (2) Acts required for the adoption of decisions and solutions (3) Overview and comparison of effects through several cyclical periods;

Source: (Cascio, 2003)

A very important factor for evaluating the performance of employees is the evaluation standards used. Therefore, careful selection of criteria is extremely important. According to suggestions from the literature, performance can be evaluated in relation to: standard, goals and knowledge (along with skills and responsibilities); An identical approach, sometimes formulated slightly differently, is also used by different quality standards, and they require a more detailed evaluation through their requirements. Therefore, the organization must:

- determine the necessary training of the workforce, which performs tasks that affect compliance with aspirations for a higher level of quality;
- in situations of possible applicability, enable training or activate other measures to reach the required competence;
- assesses the effectiveness of the measures used;
- determines that individuals are aware of the relevance and importance of undertaken activities and ways of contributing to the realization of quality tasks,
- reflects the given documents on education, training, knowledge and experience;
- employs the necessary amount of personnel who have the necessary education, training, technical knowledge with experience in the implementation of certification functions related to the type, scope and scope of the work performed, under the direction of the superior executive manager; (Dessler, 2007)

The management, in addition to these requirements, determines the degree of acquired practice, the level of competence and the scope of training necessary to ensure the ability of engaged workers, especially those who carry out specialized tasks of managing environmental protection. The attitude towards work, the awareness of

belonging to the organization, the required level of knowledge, understanding and professional competence can be realized or perfected through additional training, education and through the experience gained from work (Sim & Huegerich, 2018). Human resource management today is a much more complex activity than in the past (Sims, 2007). Therefore, organizations use their human resource management sectors to select and hire individuals who are expected to succeed at work, and this should be non-discriminatory (Thornton & Rupp, 2006). The human resources department implements training programs, generates management programs and contracts training with external organizations.

The most important question of any performance management system is how seriously it is taken and how dedicatedly it is used (Pulakos, 2009) . The scope of performance management is very broad, which is why it is considered a means to improve employee motivation for achieving high performance. Effective performance management requires a thorough understanding of the performance domain, i.e. duties and tasks that fall within the job description in the organization. When one has adequate insight into what the job requires, there is a basis for evaluating and improving the organization's performance. When there is no such thing, it is obvious that there is a lack of connection to evaluate the performance of employees and the possibility of their improvement. In addition, there is a lack of connection to evaluate the performance of one employee in relation to other employees with the same job description (Robert, 2011). Performance measurement involves regularly measuring progress toward a precise outcome, which is a fundamental component of any results management effort. Performance measurement provides general information that can be used to make decisions and manage employees at all levels. In this sense, the performance measurement system can be graphically viewed as the instrument panel of a car, which is used for strategic maneuvering, daily planning, implementation of improvements and changes. Performance is understood as the achievement of the organization in relation to the set goals, which includes the achieved results or the realized contribution of individuals (teams) to the strategic goals of the organization.

Armstrong (2002) defines performance management as a strategic and integrated approach to achieving lasting organizational success by improving people's performance and developing the capabilities of individuals and teams. He considers performance management a strategic tool, because it is responsible for achieving long-term goals and the efficient functioning of the organization in the external environment. Performance management affects four types of integration - vertical, functional, human resources and goals. Vertical integration represents the alignment of goals at the organizational, individual and team level and their integration for efficient performance. Functional integration deals with focusing on multiple functional plans, policies and strategies on tasks at different levels and parts of the organization. Human resource integration ensures the efficient integration of various human resource management subsystems in achieving the organization's goals with optimal performance. Goal integration focuses on the congruence between an organization's needs, aspirations, and goals.

It is a very common case that the evaluation of work performance is limited only to the annual level. However, companies should approach this activity responsibly and, as an ongoing process, use it to improve the system. When done correctly, performance evaluation follows four general phases, namely: (Grote, 2002)

PHASE 1 – Planning. At the beginning of the working year, the manager organizes a meeting with the employee with the aim of determining the target performance that will be required of the employee during the year. During the meeting, they discuss the goals and projects that the employee will work on and the ways in which the employee will perform his job (attitudes and behaviors that the company expects from the employee). Also, in this phase, the employee's development plan is considered.

PHASE 2 – Follow-up. During the year, the employee is committed to the goals, norms and responsibilities entrusted to him. In order for the employee to be encouraged to succeed, the manager organizes trainings that will help the employee achieve his goal. The manager creates an atmosphere that motivates employees and solves potential problems. And at this stage, a meeting is mandatory to determine the current level of success of the employee.

PHASE 3 – Evaluation. As the time for the formal evaluation approaches, the manager summarizes all the data on the employees' performance and fills out the official documentation for the evaluation. There are other evaluation methods, where the manager is not the only one who evaluates the performance of employees. The manager should evaluate the employee on the basis of his results, if the specific standards set for him are taken into account. Employees should have information on how and on what basis they will be evaluated. Based on the results of the evaluation, a decision is made on the further development plan of the employee and on the eventual change of the employee's position in the company.

PHASE 4 – Report. At the end of the year, the manager organizes another meeting and informs the employee about the results of the evaluation and the further development plan. The goal is to eliminate the shortcomings from the previous year through training and professional development that the manager proposes for the employee. At the end, the business goals and responsibilities of the employee for the next working year are determined.

Of course, there are variations, but practice has shown that following these four general stages has proven successful. What is important is that employees during the year (regardless of how many phases it is organized in) must have feedback on personal performance, so that they can react and correct deficiencies in time. If the manager does not sufficiently communicate with the employee, it can easily happen that the employee develops the feeling that he is doing the job well, even though the situation is the opposite. All issues related to employees can be clearly seen through the evaluation results. Job performance evaluation provides relevant information about the gap between existing skills and those needed in the future.

METHODOLOGY

The methodology of this scientific work is based on many research studies as well as on experiential and theoretical knowledge. There was no empirical or theoretical research that was not carried out in some way, that some conception of research was not used, that data was not collected in some way, that it was not processed and that no scientific conclusions were formed based on it. In this work, the theoretical-epistemological method, which is often called the general theoretical-methodological approach, is used, and it includes previous theoretical knowledge (theoretical paradigms) about the subject being investigated, as well as the scientific method, which includes, first of

all, methods, procedures and instruments that the collection of experiential material, its arrangement, comparison, and partly explication is carried out.

DISUSSCION

The objectives of monitoring work performance are usually determined in agreement with the one who should perform the tasks. In parallel, as with the standards, in this case it is also necessary and desirable to determine concrete relationships in the evaluation that could be identical to those determined in the standards. Therefore, the evaluation of the work performance of individuals employed in the company means a complex process of carefully planned and continuous observation, assessment, guidance and adaptation of the effects of the work of employees and their responsible relationship during work, all with the aim of achieving a higher level of quality of the company's overall operations. Namely, one should always strive to apply an adequate approach to designing this process and accept evolutionary changes. It is necessary to determine what the goals of this complex process are, because precisely the projected goals have a decisive influence on what methods will be applied. Then, it is very important that the conducted evaluation is carried out publicly and presented publicly to all employees in the company. This means that the criteria and subjects of the assessment process are presented very clearly to them.

The assessment process always begins with an assessment of professional training for the intended, specific workplace (jobs and tasks), work experience and work routine, high training and an initial assessment of the employees' personal capabilities and desire for success. The process is continuous, but it is realized at certain time intervals, usually quarterly and annually, and it also includes the publication of feedback information. Therefore, this process is structured periodically and is therefore easier to implement. However, before the evaluation process itself, the performance for specific positions is determined and they are under constant supervision and constant review, as is the process of employee performance evaluation itself. It is precisely the possibility of feedback on evaluation that allows individuals to have insight into the quality and timeliness of performing work according to previously known standards.

Over time, for many different reasons, errors in employee performance evaluation cannot be avoided, that is, one should always count on the occurrence of such situations, although there is a constant effort to eliminate them or reduce them to the smallest possible extent. Therefore, evaluators, at any level, should always strive to reduce errors to a reasonable level that top management can tolerate. This means that errors up to the level of tolerance can be reached by implementing certain corrective factors, activities and measures, which aim to improve the performance evaluation. Evaluating the performance of employees is a very important process not only from the aspect of human resources management, but also for the successful operation of every company and every employee in his professional development and career. Performance or performance result, which is a measurable effect of performing work and work tasks, derives from behavior and personal characteristics that are very important in performing specific actions in a certain time frame. Therefore, monitoring and evaluating the performance of employees in companies, as well as rewarding them, has many goals. However, the main goal is efficient business and further development of each company.

In conditions of very strong market competition, companies are forced to maximize the quality of all the resources they possess. The human factor stands out as a very important resource that requires significant investments. Most experts believe that human resource management is one of the crucial functions in companies, to which managers must have a serious and responsible approach. Human resources management, in addition to administrative activities, includes a very wide range of activities related to the development of employees, where work effectiveness management stands out as the most important one. Since the management of work effectiveness is a very complex process, we emphasized the importance of evaluation, because the information it provides is essential both for directing the career development of employees and for achieving the company's collective goals. As the primary condition for success, knowledge is set as a factor that creates a gap between the successful and the unsuccessful. In a highly uncertain market environment, knowledge is an element whose absence cannot be tolerated. Based on the research, we concluded that the knowledge and skills of the employees are a vital part without which the organization cannot achieve and maintain its competitive position on the market. Very fast technological development has forced organizations to introduce training programs with which these rapid changes in technology will be followed, but not only followed, but the focus began to be placed on the development of new technologies and process innovation.

Today, the role of employees in achieving competitive advantage is particularly emphasized, so the view that the human factor is crucial for the success or failure of organizations is increasingly being confirmed. Designing an effective employee development program becomes a strategic task for organizations. Leaders on the market are almost always organizations that learn and believe that people and knowledge are the most valuable resources, that is, the potential for the progress of the organization that is realized through the development of the people employed in them. Communication is necessary for establishing and implementing company goals, developing plans for their realization, organizing human and other resources in the most successful and effective way, then for selecting, developing and evaluating members of the organization, as well as for leading, directing, motivating and creating a climate in which people are willing to contribute to the goals.

CONCLUSION

Therefore, performance evaluation and thus (interdependent) rewarding of employees in companies is one of the most important areas of observation, analysis, planning and improvement of human resources in every economic branch. The results of assessment and evaluation of performance, in addition to having a direct effect on the effects and results of operations, also affect the satisfaction of end users and especially the education of employees. This also means that performance evaluation is the best guide and guide for managers in companies in the direction of greater efficiency and effectiveness of the company's operations. In those companies, if the implementation of jobs and work tasks is unsatisfactory or even average, as a consequence of the insufficient level of expertise or competence of employees, it has affected unfavorable business results, and thus contributed to worse business compared to competitors, and these are critical areas of human resources management resources and it is necessary to take appropriate measures. Realistic training and training programs should be designed

for employees, as well as participation in appropriate seminars and symposiums. The level of knowledge reached is the most important factor that creates the difference between those who are successful and those employed with insufficient success in business, especially in times of crisis. The total contingent of knowledge and the achieved level of skills is a very important element on the basis of which companies achieve (and maintain) a competitive position in an increasingly turbulent but also discerning market.

LITERATURE

Arnefoski, J. (2017). Work-life balance. *Journal of Business Research,* , str. pp. 211-223.

Bader, B. S., & Dickmann, M. (2019). Managing people in hostile environments: lessons learned and new grounds in HR research. *The International Journal of Human Resource Management, Volume 30, Issue 20,* , str. pp. 2809-2830.

Cascio, W. (2003). *Human Resource Management.* McGraw-Hill.

Dessler, G. (2007). *Osnovi menadžmenta ljudskih resursa.* Beograd.: Data status.

G., B., S., S., & A., S. (2001). *Managing Human Resources.* South-Western College Publishing.

Grote, D. (2002). *The performance appraisal question and answer book: survival guide for managers.* New York: AMACOM.

Hammer, M. (2004). How operational innovation can transform your company. *Harvard Business Review 82(4*, str. pp. 84-93.

Jeston, J., & Nelis, J. ((2008)). *Management by process: A roadmap to sustainable Business Process Management.* Oxford: Butter- Heinemann, Elsevier Ltd.

Kulić, Ž. (2005). *Upravljanje ljudskim potencijalima.* Beograd: Radnička štampa.

Patton, M. Q. (2018). *Facilitating Evaluation, Principles in Practice.* Sage Publications, Inc.

Pulakos, E. (2009). *Performance Management: A New Approach for Driving Business Results.* New YORK: Wiley-Blackwell.

Robert, C. (2011). *Performance Management: Concepts, Skills, and Exercises.* New York: M.E. Sharpe.

Rubtsov, V. (2020). Two approaches to the problem of development in the context of social interactions: LS Vygotsky vs J. Piaget. *Cultural-Historical Psychology, 16(3)*, str. 5-14.

Sim, S., & Huegerich, .. T. (2018). Employer incentives for providing informal on-the-job training in the presence of on-the-job search. *Journal of Labor Research*, str. 22-40.

Sims, R. (2007). *Human resource management: contemporary issues, challenges, and opportunities.* New York:: International Age Publishing,.

Šekarić, M., Milovanović, M., Kostić, M., & Šekarić-Sotirovski, J. (2015). *Značaj obrazovanja ljudskih resursa u hotelijerstvu.* Siticon.

Thornton, G., & Rupp, D. (2006). *Assessment centers in human resource management: strategies for prediction.* London: Routledge.

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501214I
UDK: 629.7.014.9(497.6):623.743(4-672EU)
Datum prijema rada: 22. januar 2025.
Submission Date: January 22, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 214-229

PREGLEDNI NAUČNI RAD / OVERVIEW SCIENTIFIC PAPER

UPOTREBA SISTEMA BESPILOTNIH VAZDUHOPLOVA (DRONOVA), POREĐENJE: BOSNA I HERCEGOVINA SA OSTALIM ZEMLJAMA

Zoran Injac Docent, Panevropski univerzitet Apeiron, Banja Luka, Republika Srpska, Bosna i Hercegovina; zoran.dj.injac@apeiron-edu.eu; ORCID ID 0009-0001-4692-3307

Danislav Drašković Redovni profesor, Panevropski univerzitet Apeiron, Banja Luka, Republika Srpska, Bosna i Hercegovina; danislav.m.draskovic@ apeiron-edu.eu; ORCID ID 0000-0002-7809-3775

Boris Mikanović Viši asistent, Panevropski univerzitet Apeiron, Banja Luka, Republika Srpska, Bosna i Hercegovina; boris.r.mikanovic@ apeiron-edu.eu

Sažetak: *Bespilotni vazduhoplovi se danas sve više upotrebljavaju u svakodnevnom životu i u narednih nekoliko decenija biće nezamislivo funcionisati bez njihove upotrebe. Da bi se obezbjedila njihova adekvatna integracija u civilni vazdušni saobraćaj, neophodno je istražiti njihov bezbjednosni askpekt. Regulisanje upotrebe bespilotnih vazduhoplova je uobičajena politika širom svijeta i dio je modela propisa Međunarodne organizacije civilnog vazduhoplovstva za bespilotne vazduhoplove. Vazduhoplovne aktivnosti u vazdušnom prostoru iznad neke teritorije mogu se provoditi samo prema uslovima koji su određeni zakonom. Bespilotni vazduhoplovi su brzo rastuća tehnologija, čije se karakteristike leta u određenom nivou razlikuju od tradicionalnih vazduhoplova što zahtjeva pristup kojim će se omogućiti bezbjedna integracija bespilotnih vazduhoplova u postojeći vazdušni prostor. Međunarodne organizacije civilnog vazduhoplovstva na globalnom niovu donose standarde i preporučenu praksu, dok svaka država može dodatno utvrditi svoj važeći pravni okvir. Ovim istraživanjem izvršeno je poređenje važećeg pravnog okvira za upotrebu bespilotnih vazduhoplova u Bosni i Hercegovini sa ostalim politikama regulisanja upotrebe bespilotnih vazduhoplova u naprednim ekonomijama različitih zemljama, kako bi se istražila i adekvatno utvrdila odstupanja u odnosu na slučaj Bosne i Hercegovine.*

Ključne riječi*: bespilotni vazduhoplov; dron; tehnologija; pravni okvir; transportna politika*

JEL klasifikacija*: L50, R41, R48*

UVOD

Pojava bespilotnih vazduhoplova se dešava znatno ranije, čak i prije nastanka modernog konvencionalnog vazduhoplovstva kakvog danas poznajemo, s tim da mali broj korisnika vazdušnog prostora i nekomercijalnost operacija nisu zahtijevali donošenje pravnog okvira kojim bi se definisao način upotrebe bespilotnih vazduhoplova. Rast broja korisnika i smanjenje kapaciteta vazdušnog prostora, kao i veći broj nezgoda, skrenuli su pažnju na problematiku bezbjednosti i potrebu za uređivanjem oblasti upotrebe bespilotnih vazduhoplova kojom se ograničava, obavezuje ali i štite svi korisnici u vazdušnom prostoru, kao i okolina na koju mogu uticati operacije bespilotnim vazduhoplovima.

Bespilotni vazduhoplovi su kao što i samo ime kaže zapravo vazduhoplovi, ali se njihove osobine i performanse leta jednim dijelom razlikuju od tradicionalnih vazduhoplova, što zahtijeva određene izmjene u odnosu na postojeću vazduhoplovnu regulativu kako bi se ostvario i održao nivo bezbjednosti koji je danas prisutan u vazdušnom saobraćaju. Trenutno, većina država ima važeće propise kojima su uređene operacije bespilotnih vazduhoplova na sopstvenoj teritoriji, a nastali su na osnovu pravnog okvira predloženog od strane međunarodnih vazduhoplovnih organizacija.

Cilj ovog istraživanja je analizirati postojeći pravni okvir kojim se definiše upotreba bespilotnih vazduhoplova (dronova), te naglasiti i uporediti najvažnije dijelove važeće regulative koja se primjenjuje u Bosni i Hercegovini sa zemljama Evropske unije i ostatku svijeta, kao i ukazati na određene razlike sa naučno-istraživačkog pristupa.

BESPILOTNE LETJELICE

Mada je u upotrebi nekoliko naziva za bespilotni vazduhoplov, odnosno dron, njega čine skoro uvijek jednaki elementi, koji se, generalno, mogu podijeliti zavisno od izvedbe, odnosno vrste upotrebe, a svrha za koju se koriste može biti od vojne do civilne. Bespilotni vazduhoplovi (dronovi) se konstruišu na različite načine i imaju različite konstrukcije (O. Tatale, Anekar, Phatak, & Sarkale, 2018). Opšte prihvaćena

Slika 1: Elementi bespilotne letjelice

Izvor: (Barnhart, Hottman, Marshall,, & Shappee, 2016)

konstrukcija dronova, najčešća u praksi, je četvorokraki dron sa motorom na svakom kraku, odnosno kvadkopter (Fahlstorm & Gleason, 2012) (Unmanned Aerial Vehicle Team, 2023).

Uglavnom, civilni dronovi se sastoje od bespilotnog, odnosno daljinski upravljanog vazduhoplova, upravljačkih elemenata, korisnog tereta, te arhitekture komunikacije za razmjenu podataka. Pored navedenog, dronovi za vojnu upotrebu mogu imati i platforme sa sistemom oružja. Na slici 1 prikazan je uobičajeni sistem bespilotnog vazduhoplova, te odnos elemenata koji ga sačinjavaju.

Istorijat razvoja bespilotnih letjelica

Istorija razvoja bespilotnih vazduhoplova je poznata od davnina i seže u najranije dane vazduhoplovne istorije. Ova vrsta letjelica se pojavljivala vijekovima ranije, od vremena tzv. zmajeva i vazdušnih balona u Kini, znatno prije nego što se uopšte pojavio prevoz članova posade ili putnika vazduhoplovima.

Među prve slučajeve korištenja bespilotnih vazduhoplova ubraja se upotreba vazdušnih balona od strane kineske vojske koji su u sebi imali lampe s uljem, a koje su zagrijavale vazduh u balonu. Podižući te balone u vazduh da lete iznad neprijatelja tokom noći, ostavljali su utisak da misle kako se radi o božanskim silama (Barnhart, Hottman, Marshall,, & Shappee, 2016).

U današnje vrijeme, bespilotni vazduhoplovi predstavljaju autonomno ili daljinski upravljano sredstvo koje oponaša tradicionalni manevar vazduhoplova sa posadom. Čak se i sam naziv „nezauzet“ (engl. *Unoccupied*) promijenio tokom godina jer su vazduhoplovna industrija, proizvođači, civilne vlasti i vojska shvatili da su načini korištenja tih vazduhoplova dobili drugačije značenje.

Postoji nekoliko termina koji se koriste za opis letećeg objekta u kojem nema ljudi, a to su: vazdušni torpedo, bežično kontrolisana, daljinski upravljan, te autonomno upravljan vazduhoplov, bespilotni vazduhoplov (engl. *Unmanned Aerial Vehicle* – UAV) kao i naziv dron (Barnhart, Hottman, Marshall,, & Shappee, 2016).

U početku, sama ideja o letenju vazduhoplova bez pilota i posade se smatrala velikom prednošću jer se tim izbjegavao gubitak ljudskih života. Tokom prvog svjetskog rata uviđena je neophodnost za postizanje efikasne kontrole upravljanja vazduhoplovom. Nikola Tesla je čak prije prvog leta braće Wright iz 1903. godine promovisao ideju o udaljeno upravljanom vazduhoplovu.

Početkom prvog svjetskog rata i borbe protiv njemačkih ratnih brodova, ujedinili su se pronalasci radija, vazduhoplova i mehaničkog auto pilota, te je nastao prvi praktični bespilotni vazduhoplov u obliku vazdušnog torpeda (Barnhart, Hottman, Marshall,, & Shappee, 2016).

Sistem bespilotnih vazduhoplova

Bez obzira da li se radi o fiksnom krilu, krilu sa rotorom ili vazduhoplovu koji je lakši od vazduha, zajednička karakteristika konstrukcije ovih vazduhoplova je da nemaju ljudsku posadu.

Posljednjih godina dolazi do podstrekivanja da se naziv bespilotni vazduhoplov (engl. *Unmanned Aircraft* – UA) promijeni u daljinski upravljani vazduhoplov (engl. *Remotely Piloted Aircraft* – RPA) ili daljinski upravljano vozilo (engl. *Remotely Piloted Vehicle* – RPV). Postaje opravdano da se kaže da je naziv bespilotni vazduhoplov

zaista pogrešan termin, s obzirom koliko je potrebno ljudskog angažmana za izvođenje operacije bespilotnim vazduhoplovima (Barnhart, Hottman, Marshall,, & Shappee, 2016).

UPOTREBA BESPILOTNIH VAZDUHOPLOVA U SVIJETU

Međunarodna organizacija za civilno vazduhoplovstvo (International Civil Aviation Organisation – ICAO) postoji kao regulatorno tijelo koje daje osnovu i smjernice za međunarodni pravni okvir kojim treba regulisati operacije putem prihvaćenih standarda i preporučene prakse (ICAO - Doc 7300, 2006), te procedura za usluge vazduhoplovne navigacije (engl. *Procedures for Air Navigation Services* – PANS).

Cilj je da se osigura rutinsko djelovanje bespilotnih vazduhoplova u cijelom svijetu na bezbjedan i usklađen način kao što je to slučaj u konvencionalnom vazduhoplovstvu. Bespilotni vazduhoplovi su predmet pravnog regulisanja međunarodnog i nacionalnog zakonodavstva. ICAO dokument Manual of RPAS (Remotly Piloted Aircraft Systems) je obuhvatio i sistematizovao svu regulativu koja se odnosi na bespilotne vazduhoplove (ICAO - Doc 10019, 2015).

Dokument pod nazivom Bespilotni vazduhoplovni sistemi je prvi iskorak ICAO u postizanju tog cilja. Na osnovu tehnologije i prirode operacija bespilotnih vazduhoplova, propisana su pravila ponašanja u vazdušnom prostoru, načini izbjegavanja sudara, kao i potrebna oprema, aerodromi, način komunikacije i pružanje meteoroloških usluga. Isto tako, definisana je bezbjednost, transport tereta i opasne robe, istraživanje vazduhoplovnih nezgoda, te traganje i spašavanje. Osim toga, date su preporuke za potrebne uslove prilikom podnošenja zahtjeva za registraciju bespilotnih vazduhoplova, zahtjevi za osoblje koje upravlja i/ili je na bilo koji način povezano sa operacijom, te zahtjeve za plovidbenost bespilotnih vazduhoplova (ICAO, 2025).

Međutim, na međunarodnom planu, još uvijek postoje značajne razlike vezane za regulisanje upotrebe bespilotnih vazduhoplova (Clarke, 2016) (Bauranov & Rakas, 2021), posebno u pogledu toga kako uspostaviti sistem registracije bespilotnog vazduhoplova i korisnika (Henderson, 2022) (Tsiamis, Efthymiou, & Tsagarakis, 2019).

UPOTREBA BESPILOTNIH VAZDUHOPLOVA U EVROPSKOJ UNIJI

Evropska unija (European Union – EU) je politička, odnosno međuvladina i nacionalna zajednica većine država u Evropi, za razliku od ostalih država u svijetu i u kontekstu tematike pravnog regulisanja, ima svoje specifičnosti prilikom definisanja prijedloga dokumenata i direktiva koje svaka država članica implementira u svoje zakonodavstvo (EASA, 2023).

Bez obzira što Sjedinjene Američke Države (United States of America – USA) imaju daleko najfrekventniji domaći saobraćaj, evropsko nebo je svakodnevno poprilično zagušeno.

Nadležne organizacije i agencije rade na pripremi i usvajanju odgovarajućih prijedloga direktiva, procedura, standarda i pravila s ciljem uređivanja odvijanja vazdušnog saobraćaja u Evropi, a koji se manifestuje povećanjem bezbjednosti, ekonomičnosti i njegove efikasnosti. Agencija Evropske unije za bezbjednost vazduhoplovstva (European Aviation Safety Agency – EASA) je jedno od dva postojeća subjekta EU kad je u pitanju uspostavljanje pravnog okvira za vazduhoplovstvo, a samim tim

i za upotrebu dronova u Evropi. Drugo važno tijelo je Evropska organizacija za bezbjednost vazdušne plovidbe (European Organisation for the Safety of Air Navigation – EUROCONTROL).

EASA

EASA je 11. juna 2019. godine, publikovala zajednička pravila o bespilotnim vazduhoplovima, koja su objavljena u dva odvojena dokumenta, prvi pod nazivom Delegirana uredba Komisije (EU) 2019/945, a drugi je Provedbena uredba Komisije (EU) 2019/947.

Dana 11. juna 2019. godine, EASA je publikovala zajednička evropska pravila o bespilotnim letjelicama, odnosno dva dokumenta pod nazivom Delegirana uredba Komisije (EU) 2019/945, te Provedbena uredba Komisije (EU) 2019/947. Cilj tih dokumenata je provođenje bezbjednih operacija dronovima u Evropi.

Osnovni cilj donošenja ovih dokumenata je provođenje bezbjednih operacija bespilotnim vazduhoplovima u Evropi. Odredbe koje su navedene u toj dokumentaciji će pored ostalog, omogućiti da se ostvari zaštita privatnosti i bezbjednosti svih građana EU, a u isto vrijeme će dozvoliti slobodno odvijanje saobraćaja i operacija bespilotnim vazduhoplovima, uz jednake uslove na cijeloj teritoriji EU (EASA, 2025). EASA radi na tome da Evropa bude predvodnik u svijetu sa sveobuhvatnim skupom pravila, omogućavajući održive operacije dronova osiguravajući njihovu bezbjednost, koja uključuje poslovne i slobodne aktivnosti. Ova pravila imaju značaj i kroz pomoć u podstrekivanju kapitalnih ulaganja, kroz inovacije kao i sveukupni rasta industrije dronova ali i vazduhoplovstva uopšteno (EASA, 2025).

Odgovornost operacija civilnih dronova maksimalne mase prilikom polijetanja (*Maximum Take Off Mass – MTOM*) manje od 150 kg je dana 7. novembra 2018. godine je preuzeta od vazduhoplovnih uprava država članica i prenesena na Evropsku komisiju.

Operacije sa civilnim dronovima u EU podrazumijevaju svaku vrstu upotrebe, osim od strane vojske, policije ili spasilačkih službi, a mogu se razlikovati od dronova za hobi do velikih dronova za prevoz tereta. Stoga, Evropski parlament je ovlastio EASA-u kao tehnički osposobljenu agenciju da uredi način obavljanja operacija dronova MTOM ispod 150 kg (TerraDron, 2025). Predložene propise je 28. februara 2019. godine prihvatila Evropska komisija, te ih nazivala provedbenim zakonom koji je propraćen delegiranim zakonom, usvojenim 12. marta 2019. godine od strane Evropske komisije.

Provedbeni zakon se sastoji od dva dokumenta, odnosno provedbenih propisa Komisije, te dodatka regulative. Pored ostalog, u tim dokumentima se utvrđuju različite kategorije i podkategorije operacija dronova, pravila, procedure, te kompetencije i minimalnu starost pilota, zahtjevi za plovidbenost, registraciju operatora, prekogranične operacije, te zadatke i imenovanje nadležnih tijela.

Delegirani akt, takođe, dolazi u dva dokumenta koji se sastoje od delegirane uredbe Komisije, te dodatka regulative. Delegiranim aktom se uređuju tehnički zahtjevi po različitim kategorijama dronova, zatim obaveze proizvođača, uvoznika, te distributera dronova, kao i zahtjevi za operatore koji nisu iz EU, te daljinsku identifikaciju (TerraDron, 2025).

Mada je odgovornost preusmjerena na Evropsku komisiju, nacionalne vazduhoplovne uprave i dalje moraju implementirati svu novu regulativu. Podrazumijeva se da

regulativa važi na području EASA vazdušnog prostora, ali nacionalne vazduhoplovne uprave moraju odrediti određene detalje kao što je specifični vazdušni prostor na kojem dronovi ne smiju letjeti, odnosno prostor namijenjen za trening i kvalifikaciju, itd. (TerraDron, 2025).

Nakon publikovanja zajedničkih pravila u junu 2019. godine, nacionalna tijela civilnog vazduhoplovstva svake zemlje (Civil Aviation Authority – CAA) imala su rok od godinu dana za implementaciju, prije punog stupanja na snagu. Do tada, operacije se sprovode na osnovu postojećih pravila, uključujući prijavu za dozvolu, odnosno izuzeće. Nakon stupanja nove regulative na snagu, postojeće dozvole vrijede u periodu od dvije godine. Iako novi zakoni nude veću fleksibilnost korisnicima, prednosti se primjenjuju od jula 2020. godine.

Nova regulativa EU je donijela novine za cijelu industriju bespilotnih vazduhoplova. Glavni cilj je stvaranje široke evropske strukture i jednoobraznosti za razliku od rasparčane i nerazumljive regulative koja se razlikovala od zemlje do zemlje. Pored toga, nova regulativa omogućava znatno više prednosti za pilote dronova. Lokalna CAA i dalje zadržava pravo glasa kada se definišu zone vazdušnog prostora u kojem je zabranjeno letenje ili kada se kreiraju lokacije kao posebne zone sa specifičnim uslovima. Međutim, provedbeni akt prevladava nad lokalnom regulativom, što znači da lokalne CAA ne mogu pooštriti utvrđena zajednička pravila. Najveća promjena nove regulative je činjenica da se temelji na procjeni rizika, što znači da se prilikom izvođenja procjenjuje rizik svake operacije uključujući sve vrste bespilotnih vazduhoplova.

Glavni principi donesenog pravnog okvira su pravila sačinjena na evropskom nivou, implementacija na nacionalnom nivou, ravnopravnost između komercijalnih i rekreativnih operacija, regulativa je sačinjena na bazi tehničkih specifikacija proizvođača i vazduhoplovnih propisa, dronovi u otvorenoj kategoriji moraju biti sertifikovani, u većini zemalja dronovi su izuzeti iz strogih vazduhoplovnih propisa, operatori mogu biti fizičke i pravne osobe, te ne postoji zahtjev za osiguranje drona od krađe i otmice u otvorenoj kategoriji, osim izuzetno (TerraDron, 2025).

S obzirom da je u prethodnim godinama došlo do ubrzanog razvoja tehnologije dronova, regulativa je imala potrebu da prati trendove i da bude u toku svih dešavanja, utičući na smanjenje neovlaštenih slučajeva upotrebe drona ili nemarnosti (Pentz & Tang, 2017). Takođe, dolazilo je i do pojavljivanja većeg broja neregistrovanih dronova u vazdušnom prostoru (Pitcher, 2022). Postoje i drugi istraživači koji su pisali o problemima sa registracijom (Cracknell, 2017)i upotrebom dronova u određenim zonama (Rule, 2016)Trenutno se u prosjeku svakih devet mjeseci pojavi nova verzija drona koji zamjenjuje prethodni, dok u konvencionalnom vazduhoplovstvu vrijeme tog ciklusa iznosi sedam do devet godina (TerraDron, 2025).

Prema donesenoj regulativi, sve operacije dronova u Evropi su podijeljene u tri kategorije, a nazvane su otvorena, specifična i sertifikovana kategorija (Ariante & Del Core, 2025).

U otvorenoj kategoriji je predviđeno da se odvijaju operacije dronovima koje se smatraju nisko rizičnim i za koje nije potrebno prethodno odobrenje.

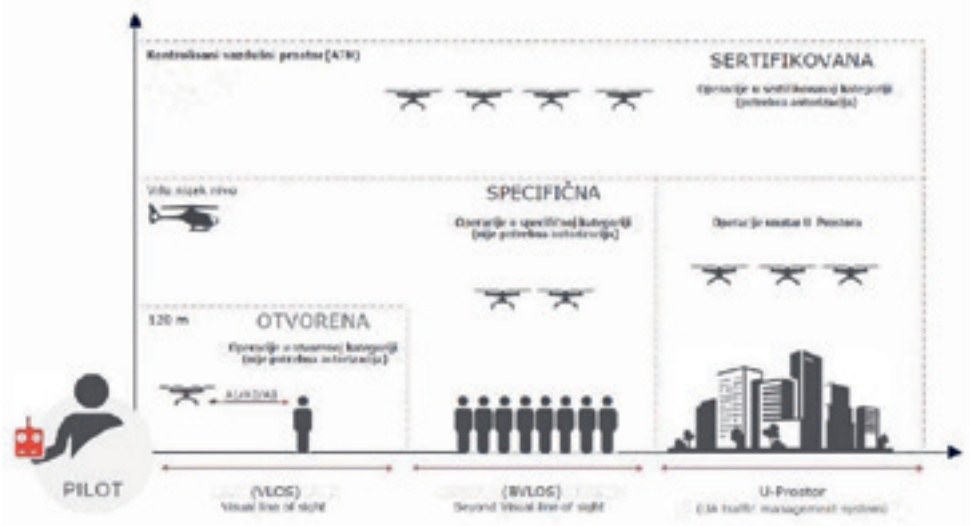
Specifična kategorija obuhvata operacije čiji stepen rizika zahtjeva odobrenje od strane nadležne uprave. U ovoj kategoriji se sprovodi procjena rizika, te je potrebno utvrditi mjere ublažavanja tih rizika, osim kada se radi o operacija koje su veoma učestale.

U tom slučaju, procjena rizika i mjere ublažavanja su prethodno utvrđeni i odobreni od strane EASA-e, te su dio tzv. standardnog scenarija.

U sertifikovanoj kategoriji se vrše operacije dronova čiji nivo rizika zahtjeva sertifikovani dron, licenciranog pilota, te organizaciju odobrenu od strane nadležne vazduhoplovne uprave kako bi se osigurao zadovoljavajući nivo bezbjednosti. Iako ugrožena područja nisu detaljno specificirana, jasno je definisano da letovi iznad i u blizini ljudi predstavljaju glavni identifikovani rizik što i dalje omogućava određen nivo izvršavanja operacija u urbanim područjima, a pogotovo ukoliko postoji mogućnost kontrolisanja kretanja ljudi na području iznad kojeg se vrše operacije dronom (TerraDron, 2025).

Trenutno, predloženi propisi ne pokrivaju sertifikovanu kategoriju, pa se podrazumijeva za operacije bespilotnim vazduhoplovima da su u skladu sa standardnim zahtjevima vazduhoplovstva i operativnim pravilima kao kod konvencionalnog vazduhoplovstva.

Na slici 2 prikazan je šematski prikaz i poređenje kategorija.



Slika 2: Šematski prikaz i poređenje kategorija

Izvor: (EASA, 2025)

Može se eventualno postaviti pitanje određivanja kojoj kategoriji operacija treba pripadati, a najjednostavniji odgovor bi bio da bilo koja operacija za koju se ne smatra da je otvorena kategorija, spada u specifičnu kategoriju. Ako se čak i specifična kategorija ne može primijeniti, kao npr. kod dronova sa MTOM manjom od 25 kg, takve operacije bi spadale u specifičnu kategoriju (TerraDron, 2025).

Zanimljivo je istaknuti da pravni okvir pruža određeni stepen slobode za operatore, dok određeni aspekti nisu posebno navedeni u novoj regulativi. U većini evropskih zemalja je definisana tzv. linija vidnog polja (*Visual Line of Sight – VLOS*), kao udaljenost do koje dron može biti vidljiv golim okom, do maksimalno 500 m.

Isto tako, definisana je maksimalna udaljenost između pilota i drona, ali ta karakteristična udaljenost nije navedena u novoj regulativi. Ukoliko je dron opremljen

osvjetljenjem da može biti primjećen na udaljenost od 1.500 m, zakonom nije zabranjeno da tako i bude.

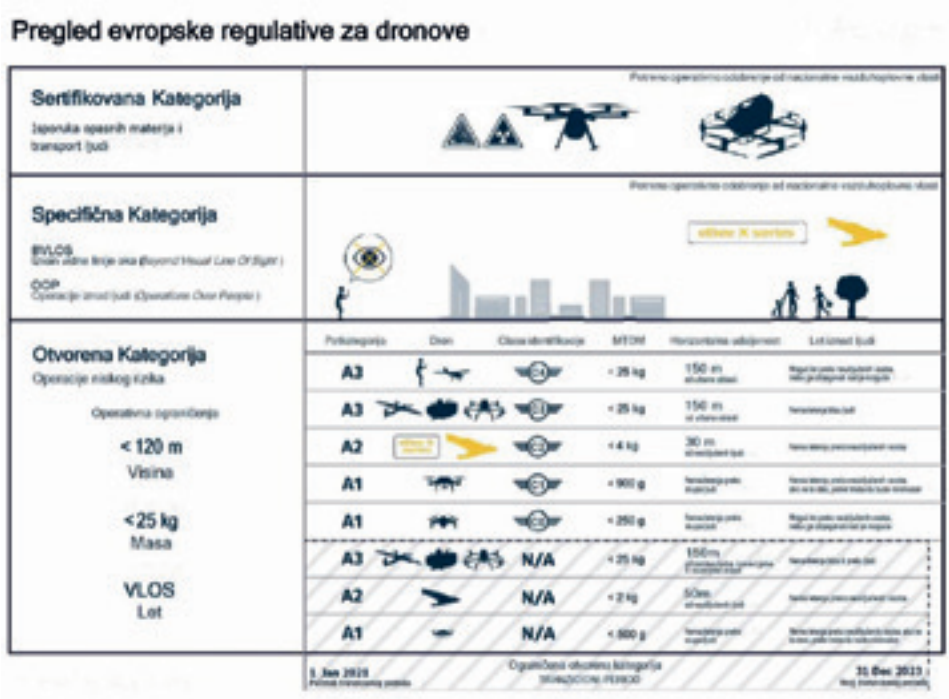
Druga zanimljivost je terminološka jer se ne koristi naziv udaljeno upravljan vazduhoplov, već isključivo bespilotno upravljan vazduhoplov. Mada zvuči trivijalno, to znači da autonomni let podrazumijeva dron koji nije upravljan sa udaljenosti, osim izuzetka podkategorije C4 u otvorenoj kategoriji. Nedostatak je, takođe, izostanak operacija sa više dronova kojima upravlja jedan pilot (TerraDron, 2025).

Otvorena kategorija

Otvorenom kategorijom se smatraju nisko rizične operacije za koje nije potrebna prethodno odobrenje, a obuhvata korisnike od rekreativaca do komercijalnih korisnika.

Kategorija je razvrstana u ukupno tri podkategorije kojima se utvrđuje upotreba specifične vrste drona, bilo da je faza registracije, zahtjevana elektronska identifikacija ili prema zahtjevanim uslovima za pilota (TerraDron, 2025).

Slika 3 šematski prikazuje pojednostavljene verzije otvorene podkategorije.



Slika 3: Šematski prikaz potkategorija

Izvor: (AgEagle Aerial Systems Inc., 2025)

Prilikom izvođenja operacija potrebno je održavati bespilotni vazduhoplov na sigurnoj udaljenosti od osoba koje nisu uključene u operacije. Osobom koja nije uključena u operacije bespilotnog vazduhoplova se smatra osoba koja ne učestvuje, direktno ili indirektno, a na koju bi operacije bespilotnog vazduhoplova mogle potencijalno uticati.

Ako je letenje u podkategoriji A1 otvorene kategorije, bespilotnim vazduhoplovom klase C0 (mase < 250 g, brzine ≤ 19 m/s), dozvoljeno je prelijetati pojedince neuključene u operacije, ali ne i grupe ljudi. Letenje u podkategoriji A1 otvorene kategorije bespilotnim vazduhoplovom klase C1 (m < 900 g, v ≤ 19 m/s), ne dozvoljava prelijetanje pojedinaca neuključenih u operacije, a ni grupe ljudi. Grupa ljudi, za razliku od pojedinaca koji nisu uključeni u operacije, je grupa u kojoj se okupljene osobe ne mogu razmaknuti zbog velike koncentracije ljudi na prostoru na kojem se nalaze.

Kada govorimo o letenju u podkategoriji A2 otvorene kategorije, tada je dozvoljeno letenje samo bespilotnim vazduhoplovima iz klase C2 (m < 4 kg) i sa njima nije dozvoljeno da se vrši prelijetanje pojedinaca koji nisu uključeni u operacije, niti grupe ljudi. Pored toga, u podkategoriji A2 najmanja dozvoljena horizontalna udaljenost bespilotnog vazduhoplova od osoba koje nisu uključene u operacije iznosi 30 m.

Ukoliko bespilotni vazduhoplov radi sa uključenom funkcijom rada na maloj brzini (najveća moguća brzina ograničena na 3 m/s), tada se udaljenost može smanjiti do 5 m, uz uslov da visina leta nikada nije veća od udaljenosti bespilotnog vazduhoplova od osoba koje nisu uključene u operacije.

Letenje u podkategoriji A3 otvorene kategorije dozvoljeno je isključivo u području gdje se ne očekuje prisustvo osoba koje nisu uključene u operacije i na najmanjoj dozvoljenoj horizontalnoj udaljenosti od 150 m od područja namijenjenog stanovanju, trgovini, proizvodnji ili rekreaciji.

Obavezno je prije započinjanja oparacije, obavijestiti sve osobe uključene u operacije o rizicima operacija i potreban je njihov lični pristanak za učestvovanje u operacijama.

Operacije dronom nad grupom ljudi (npr. sportske aktivnosti ili druga masovna javna događanja) nisu dozvoljene u otvorenoj kategoriji. S druge strane, ako operator želi letjeli iznad ljudi sa dronom čija masa premašuje 7 kg, takva operacija spada u specifičnu kategoriju.

Kada se let izvodi u specifičnoj kategoriji operacija, neophodno je pridržavati se minimalnih dozvoljenih udaljenosti od osoba koje nisu uključene u operacije, životinja, imovine, vozila i ostalih korisnika vazdušnog prostora propisanih u standardnom scenariju prema kojem se izvode operacije, odobrenju za rad ili sertifikatu operatora lakog drona.

Određeni detalji koji se odnose na trening pilota, osobe ovlaštene za provjeru znanja ili pitanja oko registracije još nisu potpuno jasno definisane (Yao, Xia, Huang, & Wang, 2017), dok su neka operativna pravila konkretno utvrđena, kao npr. maksimalna visina leta od 120 m, minimalna starost operatora od 16 godina, te sigurna udaljenost između drona i ljudi od 5 m, ukoliko se radi o sporohodnom dronu, te 30 m ukoliko je riječ o normalnoj brzini (TerraDron, 2025).

Specifična kategorija

Specifična kategorija se odnosi na sve operacije dronova koje zapravo nisu u okviru ograničenja definisanih otvorenom kategorijom. Ovde treba napomenuti da procjena rizika mora biti urađena za svaku takvu operaciju, a da mjere za ublažavanje rizika moraju biti identifikovane i usvojene. Rezultat procjene rizika mora biti odobren od strane vazduhoplovne uprave (Civil Aviation Authority – CAA) u svakoj državi članici.

Za procjenu rizika razvijena je standardna metodologija od strane Zajedničkog tijela za donošenje pravila o bespilotnim sistemima (Joint Authority for Rulemaking of Unmanned Systems – JARUS). JARUS je grupa stručnjaka iz nacionalnih vazduhoplovnih uprava širom svijeta koji su usvojili preporuke za tehničke, operativne i bezbjednosne zahtjeve zbog bezbjedne integracije dronova u ostatak vazdušnog prostora. Metodologija koristi naziv Procjena rizika specifičnih operacija (Specific Operations Risk Assessment – SORA) (TerraDron, 2025).

Po SORA metodologiji rizik operacije dronova je podijeljen u dva distinktivna razreda. Vazduhoplovni rizik je rizik sudara drona i drugog korisnika vazdušnog prostora, a zemaljski rizik je rizik sudara drona i ljudi, životinja ili objekata na zemlji. Svaka operacija dronova koja nije pokrivena u standardnom scenariju, podrazumijeva da operator mora izvršiti punu SORA procjenu rizika, te pribaviti odobrenje od nacionalne vazduhoplovne uprave kako bi mogao nastaviti operaciju.

To se u praksi pokazalo kako veliko radno opterećenje za same operatore i vazdoplovnu upravu (CAA). S ciljem prevazilaženja tog problema, uspostavljen je koncept standardnih scenarija (Standard Scenarios – STS), kojima su opisane tipične operacije dronova u kombinaciji sa procjenom rizika i mjerama ublažavanja istih. Mjere ublažavanja rizika su određene radnje koje operator namjerava preduzeti sa ciljem sprječavanja nezgode ili barem ublažavanja nastalih posljedica. Ovi standardni scenariji su vrlo slični, ako ne i identični od države do države, a samim njihovim korištenjem se omogućava operatoru provođenje operacije bez provođenja procjene rizika.

Nakon jula 2020. godine, CAA više nije u mogućnosti odobravati standardne scenarije za državu u kojoj je nadležna. Očekivano bi EASA trebala izdati dva standardna scenarija, a oni izdati prije toga će vrijediti dvije godine od nastajanja. Mada je jasano koji cilj EASA želi postići sa izdavanjem vlastitih standardnih scenarija usklađenih sa novim propisima, ipak nedostajaće harmonizacija između EASA-e i CAA u svakoj državi članici, te će biti neophodno da se CAA uključe u stvaranje standardnih STS za cijelu EU (TerraDron, 2025).

Osim SORA metodologije i standardnih scenarija, postoji treći način na koji se operator može kvalifikovati za provođenje operacije u specifičnoj kategoriji. Misli se na postupak dobivanja sertifikata tzv. operatora lakog drona (Light UAS Operator Certificate – LUC). Operator koji posjeduje LUC sertifikat, zapravo raspolaže sa mogućnošću za samostalno provođenja rizika i implementacije sopstvenih mjera za njegovo ublažavanje. Dobivanje LUC-a neće biti lako i ne može se uporediti sa bilo kojom postojećom dozvolom u Evropi (TerraDron, 2025).

Sertifikovana kategorija

Sertifikovana kategorija obuhvata visoko rizične operacije dronovima koje uključuju velike dronove u kontrolisanom vazdušnom prostoru. S obzirom na to, primjenjuju se pravila kao i za konvencionalne vazduhoplove.

Dronovi koji obavljaju operacije u sertifikovanoj kategoriji moraju posjedovati sertifikat plovidbenosti, a piloti moraju biti licencirani. EASA trenutno radi na potrebnim izmjenama postojećih propisa. Dokumentacija za operacije visokog rizika obuhvata odobrenje organizacije za dizajn, projektovanje i proizvodnju takvih dronova, sertifikat vazduhoplovnog prevoznika, te licence za osoblje (EASA, 2025).

EUROCONTROL

S obzirom na čitav koncept Jedinstvenog evropskog neba (Single European Sky – SES), sigurna i efikasna integracija dronova u ATM predstavlja svakako jedan od najvećih izazova vazduhoplovstva na početku 21. vijeka. Problem terminologije koji smo ranije spominjali postaje vidljiv i ovdje jer EUROCONTROL, u odnosu na EASA-u, koristi druga dva naziva.

Bespilotne vazduhoplovne sisteme su terminološki podijeljeni na daljinsko pilotirane vazduhoplove (Remotely Piloted Aircraft Systems – RPAS), automatizovana vazdušna vozila, te lična vazdušna vozila bez vozača (Driverless Personal Air Vehicles – DPAV).

Mada je veći dio regulative kojom se uređuju operacije dronovima, nastajala kao reakcija na razvoj tržišta i rizika u nastajanju, stvarna harmonizacija propisa nikad nije ostvarena, što uveliko ugrožava ATM perspektivu.

Evropski eko sistem koji obuhvata pružanje usluga i funkcionalnost vazdušnog prostora sa ciljem izvođenja operacija dronova se naziva „U“ prostorom. Kompletna primjena ideje omogućava širok raspon vazduhoplovnih operacija u tom prostoru, a za koje trenutno postoje ograničenja. Prije svega toga, potrebno je razviti sistem upravljanja saobraćajem dronova, te definisati način na koji sistem treba funkcionisati, gledano sa tehničkog i institucionalnog aspekta.

Svjesni uloge u razvoju globalnog i evropskog koncepta upravljanja vazdušnim prostorom, te pružanju institucionalne podrške razvoju regulative koja integriše dronove u već postojeći vazdušni prostor, EUROCONTROL je razvio Operativni koncept dronova u ATM-u koji obuhvata operacije dronova u vazdušnom prostoru Evrope i način ispunjavanja zahtjeva koji su definisani za svaku klasu vazdušnog prostora. Osnova ovakvog koncepta su bezbjednosne studije i praktične simulacije u kojima se procjenjuje bezbjednost dronova, uz određivanje i same kompleksnosti integracije. Treba napomenuti da je sadašnji koncept u potpunosti komplementaran sa prvobitnim EASA Konceptom operacija dronova (Concept of Operations for Drones – CONOPS) (EUROCONTROL, 2025).

Takođe, poznato je da postoji nekoliko tehničkih i ekonomskih prednosti i mana za sve sisteme mjerenja visine koji su trenutno dostupni. S toga, predloženo rješenje podrazumijeva sistem koji bi omogućio upotrebu dva različita sistema koji mogu usklađeno funkcionisati (EUROCONTROL, 2025).

Budućnost EU regulative

Regulativa svake države članice Evropske Unije je utemeljena na zakonima Evropske komisije, EASA-e i EUROCONTROL-a, pa se slobodno može tvrditi da većina država ima vrlo sličan pravni okvir koji je prilagođen potrebama i mogućnostima svake države. Usvojenom novom regulativom postignuta je vrlo jasna situacija u otvorenoj kategoriji, i kao takva lako može biti implementirana u svim zemljama bez obzira na nedostatak nekih detalja kao što su kvalifikacioni i sertifikacioni zahtjevi za pilota drona. S druge strane, situacija u specifičnoj kategoriji je drugačija i nedostaje puno detalja, uključujući već spomenute standardne scenarije. Na EASA-i je odgovornost da razradi sve nedostajuće detalje kako bi se omogućilo potpuno sprovođenje donesene regulative, te ostvarila puna harmonizacija između država u smislu primjene standardnih scenarija (TerraDron, 2025).

Stvarna prednost za sve korisnike se ogleda u tome što većina operacija dronom, za koje su bile potrebne dozvole, donošenjem nove regulative svrstava se u otvorenu kategoriju. Takođe, veći broj organizacija ulazi na tržište, a koje nije bazirano isključivo na upotrebi dronova.

PRAVNI OKVIR ZA BESPILOTNE VAZDUHOPLOVE U BOSNI I HERCEGOVINI

Kao što je već prethodno razmatrano, regulativa se može sagledavati na globalnom, regionalnom i lokalnom nivou, pri čemu se ICAO smatra kao tijelo koje donosi standarde i preporuke na svjetskom nivou, dok Evropska unija kao regionalni regulator, uz pomoć svojih agencija i organizacija, određuje pravni okvir za cijelu Evropu. U Bosni i Hercegovini, kao lokalni nivo, djeluje Savjet ministara i Ministarstvo komunikacija i transporta, putem Direkcije za civilno vazduhoplovstvo kao upravne organizacije (engl. B&H Directorate of Civil Aviation – BHDCA).

Pravni okvir kojim je regulisano letenje dronova u Bosni i Hercegovini je Pravilnik o uslovima za izvođenje letačkih operacija dronovima (*Sl. glasnik br. 51/20*), kojim su propisani opšti, tehnički i operativni zahtjevi za operatora vazduhoplovnih modela i vazduhoplova na daljinsko upravljanje ili vazduhoplovnog sistema na daljinsko upravljanje (dronovi), a radi izvođenja letačkih operacija (BHDCA, 2025).

Pravilnik o uslovima za izvođenje letačkih operacija dronovima kojim se uređuju letačke operacije dronovima i letenje vazduhoplova u Bosni i Hercegovini propisuje uslove za bezbjednu upotrebu bespilotnih vazduhoplova operativne mase do i uključujući 25 kg, te uslove koje moraju ispuniti osobe koje učestvuju u izvođenju letova s tim vazduhoplovima. Odredbe iz ovog Pravilnika se ne primjenjuju na dronove koji se koriste za potrebe državnih organa (vojska, policija, carina, služba traganja i spašavanja, bezbjednosno-obavještajne službe i sl.).

Takođe, neprimjenjivost Pravilnika se odnosi i na dronove čija je maksimalna masa pri polijetanju manja ili jednaka 248 g, kao i na letenje dronova u zatvorenom prostoru. Osim toga, Pravilnikom su definisane kategorije operacija, na nekomercijalne, komercijalne i radove iz vazduha. Pravilnik utvrđuje dužnosti i odgovornosti vlasnika, kao i operatora drona, vođenje evidencije, a predviđa se i posjedovanje polise osiguranja za dron, koja pokriva eventualnu štetu pričinjenu trećim licima.

Ovde treba naglasiti da postoje suštinska odstupanja u Pravilniku o uslovima za izvođenje letačkih operacija dronovima (*Sl. glasnik br. 51/20*), u odnosu na dokumente višeg regionalnog nivoa, poput Delegirane Uredbe (EU) broj 2019/945 i Sprovedbene Uredbe (EU) broj 2019/947.

Ova neusklađenost nije prihvatljiva s obzirom da su Uredbe EU stupile na snagu više od godinu dana prije donošenja Pravilnika kojim se reguliše pitanje letenja dronovima u Bosni i Hercegovini. (BiH ima potpisan radni aranžman sa EASA čime se obavezala na punu primjenu propisa EU u oblasti civilnog vazduhoplovstva).

ZAKLJUČAK

Opšte je poznato da svaka nova tehnologija koja se pojavi na tržištu, donosi mnoga unapređenja ali i određene nedostatke. Mada je takav pristup prepoznat i u vazduhoplovstvu, bespilotni vazduhoplovi se baš ne mogu u potpunosti zvati inovacijom s obzirom na njihovo prisustvo koje seže još u daleku prošlost.

Upotreba bespilotnih vazduhoplova doživljava kontinuirani rast, vođen njihovom svestranošću, operativnom fleksibilnošću, ekonomičnošću i višestrukim korištenjem, čak i u opasnim situacijama ili neprijateljskim okruženjima neprikladnim za ljude.

S druge strane, način upotrebe, mogućnosti i pristupačnost bespilotnih vazduhoplova, koji su rezultat vrlo brze komercijalizacije i to u kratkom vremenskom periodu, donose razne pogodnosti i nedostatke.

Komercijalizacija se manifestovala porastom broja korisnika bespilotnih vazduhoplova, a koji su na taj način postali korisnici vazdušnog prostora koji se ionako već bori sa problemom zagušenja i protokom u vazdušnom prostoru.

Kao što je već prethodno napomenuto, operacije dronova, same po sebi, nisu opasne sve dok ne utiču na druge osobe, imovinu i okolinu u opštem smislu, ali s obzirom na gustinu vazdušnog prostora danas, potreba za pravnim okvirom kojim se uređuje takva vrsta operacija je neophodna.

Međunarodne organizacije su odgovorne za kreiranje koncepta pravnog okvira, raznih standarda i preporučene prakse, te priručnika koji služe državama kao polazna tačka kod uspostavljanja sopstvene regulative. Mada je prepoznata sličnost u regulativama država i to pogotovo u onim manje razvijenim koje su slijedile primjer više razvijenijih država u kojima se komercijalizacija pojavila ranije, pa je samim tim već bila uspostavljena regulativa kojom su uređene operacije dronova, određeni nivo razlika mora postojati, s obzirom na potrebe i mogućnosti pojedinačne države u kojoj se ta regulativa primjenjuje.

Zadatak donošenja pravnog okvira je omogućavanje bezbjedne integracije bespilotnih vazduhoplova u postojeći vazdušni prostor, što se omogućuje pravilnom klasifikacijom dronova i ograničenjem operacija u dovoljnoj mjeri kako bi se održao nivo bezbjednosti. Svakodnevna unapređenja i proširenje mogućnosti korištenja dronova povećavaju broj korisnika i njihovu mogućnost primjene u vojne i civilne komercijalne svrhe. S obzirom na to, zakonodavstvo mora konstantno biti u toku i usklađivati regulativu na osnovu nastalih dešavanja. Preporučuje se međusobna saradnja regulatora, industrije, proizvođača, ali i samih korisnika dronova.

S druge strane, poredeći stanje u Bosni i Hercegovini sa ostalim državama treba konstatovati da postoje suštinska odstupanja u Pravilniku kojim se reguliše pitanje letenja dronovima u Bosni i Hercegovini u odnosu na dokumente višeg regionalnog nivoa, poput Delegirane Uredbe (EU) broj 2019/945 i Sprovedbene Uredbe (EU) broj 2019/947.

Očekuje se dalji razvoj i inovacije koje će omogućiti još više načina upotrebe dronova i povećanje broja korisnika, što će zahtjevati da regulativa treba da podstiče prednosti koje dronovi donose, a nedostaci da se otklone ili umanje, te zadržati nivo bezbjednosti vazdušnog saobraćaja koji je uspostavljen na današnjem nivou.

Sa sve većom integracijom bespilotnih vazduhoplova u transportne sisteme, istraživanja su se pomjerila ka predviđanju njihove uloge u budućnosti transporta tereta i putnika, utičući na ekonomiju i privredni napredak u cijelom svijetu ali i svake zemlje pojedinačno, podržavajući viziju inovativnih i efikasnih transportnih mreža u godinama koje dolaze.

LITERATURA

AgEagle Aerial Systems Inc. (2025). *AgEagle*. Preuzeto sa https://ageagle.com/blog/european-union-drone-regulations-explained

Ariante, G., & Del Core, G. (2025). Unmanned Aircraft Systems (UASs): Current State, Emerging Technologies, and Future Trends. *Drones, 9*(1).

Barnhart, K. R., Hottman, B. S., M. M., & Shappee, E. (2016). Introduction to Unmanned Aircraft Systems. *Taylor & Francis Group*.

Bauranov, A., & Rakas, J. (2021). Designing airspace for urban air mobility: A review of concepts and approaches. *Progres in Aerospace Sciences, 125*.

BHDCA. (2025). *BHDCA*. Preuzeto sa https://www.bhdca.gov.ba/index.php/sr/homes/vazduhoplovnipropisi/podzakonski-akti

Clarke, R. (2016). Appropriate regulatory responses to the drone epidemic. *Computer Law & Security Review, 32*(1), 152-155.

Cracknell, A. P. (2017). UAVs: Regulations and law enforcement. *International Journal of Remote Sensing, 38*, 3054-3067.

EASA. (2023). *Urban Air Mobility*. Preuzeto sa https://www.easa.europa.eu/en/domains/drones-air-mobility/drones-air-mobility-landscape/urban-air-mobility-uam

EASA. (2025). *EASA*. Preuzeto sa https://easa.europa.eu/en/domains/drones-air-mobility/operating-drone/certified-category-civil-drones

EASA. (2025). *EASA*. Preuzeto sa https://www.easa.europa.eu/newsroom-and-events/ press-releases/eu-wide-rules-drones-published

EASA. (2025). *EASA*. Preuzeto sa http://easa.europa.eu/en/domains/drones-air-mobility/operating-drone

EUROCONTROL. (2025). *Eurocontrol*. Preuzeto sa https://www.eurocontrol.int/unmanned-aircraft-systems#our-role

EUROCONTROL. (2025). *Eurocontrol*. Preuzeto sa https://www.eurocontrol.int/publication/uas-atm-common-altitude-reference-system-cars

Fahlstorm, P. G., & Gleason, T. J. (2012). Introduction to UAV Systems. *John Wiley & Son, 4*.

Henderson, I. L. (2022). Aviation safety regulations for unmanned aircraft operations: Perspectives from users. *Transport Policy, 125*, 192-206.

ICAO - Doc 10019. (2015). *Manual on Remotely Piloted Aircraft Systems (RPAS).*

ICAO - Doc 7300. (2006). *Convention on International Civil Aviation.*

ICAO. (2025). *ICAO: Unamanned Aircraft Systems*. Preuzeto sa https://www.icao.int /Meetings/UAS/Documents/Circular20328_en.pdf

O. Tatale, O., Anekar, N., Phatak, S., & Sarkale, S. (2018). Quadcopter: Design, Construction and Testing. *International Journal for Research in Engineering Application & Management*.

Pentz, R., & Tang, H. (2017). An Analysis of Unmanned Aircraft Registration Effectiveness. *International Journal of Aviation Systems, Operations and Training, 4*(1).

Pitcher, S. E. (2022). Analysis of Unmanned Aircraft Systems Sightings Reports: Determination of Factors Leading to High Sighting Reports. *Unmanned Systems, 10*(3), 209-235.

Rule, T. A. (2016). Drone zoning. *Law Review, 95*, 133-200.

TerraDron. (2025). *TerraDron*. Preuzeto sa https://terra-drone.eu/en/articles-en/eu-drone-regulations-explained-for-dummies/

Tsiamis, N., Efthymiou, L., & Tsagarakis, K. P. (2019). A comparative analysis of the legislation evolution for drone use in OECD countries. *Drones, 3*(4).

Unmanned Aerial Vehicle Team. (2023). First build quadcopter design. *Boston University*.

Yao, Y., Xia, H., Huang, Y., & Wang, Y. (2017). Privacy Mechanisms for Drones: Perceptions of Drone Controllers and Bystanders. *In Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*.

USE OF UNMANNED AIRCRAFTS (DRONES) COMPARISON: BOSNIA AND HERZEGOVINA WITH OTHER COUNTRIES

Zoran Injac

PhD, Assistance Professor, Panevropski University Apeiron, Banja Luka, Republic of Srpska, Bosnia and Herzegovina;
zoran.dj.injac@ apeiron-edu.eu; ORCID ID 0009-000]-4692-3307

Danislav Drašković

PhD, Full Professor, Panevropski University Apeiron, Banja Luka, Republic of Srpska, Bosnia and Herzegovina;
danislav.m.draskovic@ apeiron-edu.eu; ORCID ID 0000-0002-7809-3775

Boris Mikanović

M.Sc., Senior Assistant, Paneuropean University Apeiron, Banja Luka, Republic of Srpska, Bosnia and Herzegovina;
boris.r.mikanovic@ apeiron-edu.eu

***Summary**: Unmanned aircraft are increasingly used in everyday life today and in the next few decades it will be unimaginable to function without their use. In order to ensure their adequate integration into civil air traffic, it is necessary to investigate their safety aspect. Regulating the use of unmanned aircraft is a common policy worldwide and is part of the International Civil Aviation Organization's model regulations for unmanned aircraft. Aviation activities in the airspace above a territory can only be carried out under conditions determined by law. Unmanned aircraft are a rapidly developing technology, the flight characteristics of which differ to a certain extent from traditional aircraft, which requires an approach that will enable the safe integration of unmanned aircraft into existing airspace. International civil aviation organizations at the global level adopt standards and recommended practices, while each country can additionally determine its applicable legal framework. This research compared the current legal framework for the use of unmanned aircraft in Bosnia and Herzegovina with other policies regulating the use of unmanned aircraft in advanced economies of different countries, in order to investigate and adequately determine deviations in relation to the case of Bosnia and Herzegovina. The task of adopting a legal framework is to enable the safe integration of unmanned aircraft into existing airspace, which allows for the proper classification of drones and limits operations to a sufficient extent to maintain the level of safety. Daily improvements and expansion of the possibilities of using drones increase the number of users and their possibility of application for military and civilian commercial purposes. Given this, legislation must be constantly updated and harmonized with regulations based on developments. Mutual cooperation between regulators, industry, manufacturers, but also drone users themselves is recommended. On the other hand, comparing the situation in Bosnia and Herzegovina with other countries, it should be noted that there are substantial deviations in the Manual*

regulating the issue of drone flights in Bosnia and Herzegovina in relation to documents of a higher regional level, such as Delegated Regulation (EU) No. 2019/945 and Implementing Regulation (EU) No. 2019/947. Further development and innovation are expected to enable even more ways to use drones and increase the number of users, which will require that regulations encourage the advantages that drones bring, and eliminate or reduce the disadvantages, to maintain the level of air traffic safety that has been established at today's level. With the increasing integration of unmanned aerial vehicles into transportation systems, research has shifted towards predicting their role in the future of freight and passenger transportation, impacting the economy and economic progress worldwide and in each country individually, supporting the vision of innovative and efficient transportation networks in the years to come.

***Keywords**: unmanned aircrafts; drone; technology; legal framework; transport policy.*

***JEL classification:** L50, R41, R48*

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501230D
Datum prijema rada: 13. februar 2025.
Submission Date: February 13, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025

UDK: 007.52:[005.2:316.346(100)
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review

Godina/Vol. **XV** • Br./No. **I**
str./pp. 230-239

PREGLEDNI NAUČNI RAD / OVERVIEW SCIENTIFIC PAPER

LEVERAGING ARTIFICIAL INTELLIGENCE FOR HUMAN RESOURCES DIGITALIZATION: TRANSFORMING WORKFORCE MANAGEMENT IN THE ERA OF SMART TECHNOLOGIES

Aleksandar M. Damnjanović | PhD, Professor, Faculty of Business and Law, University MB, Belgrade, Serbia, aleksandar.damnjanovic@ppf.edu.rs; ORCID ID 0000-0001-5789-4728

Siniša M. Arsić | PhD, Telekom Serbia, Belgrade, Serbia, sinisaars@telekom.rs; ORCID ID 0000-0002-4793-2150

Dragan Kolev | PhD, Professor, Paneuropean University "Apeiron" Banja Luka, Bosnia and Herzegovina, dragan.m.kolev@apeiron-edu.eu; ORCID ID 0000-0002-9016-0248

Abstract: The digitalization of Human Resources (HR) is rapidly transforming traditional workforce management practices, with artificial intelligence (AI) at the forefront of this evolution. This paper examines how AI-driven technologies are reshaping key HR functions, including talent acquisition, employee engagement, workforce planning, and performance management. AI-powered tools, such as predictive analytics, natural language processing, and machine learning algorithms, enable organizations to streamline processes, enhance decision-making, and improve employee experiences. For instance, AI simplifies candidate screening by analyzing resumes more efficiently, while chatbots provide real-time support to employees and candidates, fostering timely and personalized communication. Moreover, the integration of AI in workforce planning allows organizations to predict trends, optimize resource allocation, and align talent strategies with business objectives. The case study presented in this paper highlights the potential of AI to foster diversity and inclusion by mitigating biases in recruitment and evaluation processes. However, this paper addresses the ethical and practical challenges associated with AI implementation, such as data privacy, algorithmic transparency, and workforce upskilling. By bridging the gap between technological advancement and human-centric HR practices, this research underscores the transformative potential of AI in creating more agile, efficient, and inclusive workplaces. The findings aim to provide actionable insights for HR professionals navigating the digital transformation journey.

Keywords**:** *digitalization, HR, AI driven*

JEL classification*: C25, C53, C58.*

INTRODUCTION

The rapid advancement of artificial intelligence (AI) is reshaping industries worldwide, and Human Resources (HR) is no exception. As organizations embrace digital transformation, AI-driven technologies are revolutionizing traditional HR functions, enhancing efficiency, decision-making, and employee experiences. From automating administrative tasks to enabling data-driven talent management strategies, AI is becoming an indispensable tool for HR professionals.

The integration of AI in HR spans multiple domains, including talent acquisition, employee engagement, workforce planning, and performance management. AI-powered solutions, such as predictive analytics, natural language processing, and machine learning algorithms, streamline operations and provide deeper insights into workforce dynamics. For instance, AI-driven recruitment systems can analyze resumes at scale, reducing bias and expediting hiring decisions, while AI chatbots offer real-time employee support, improving communication and engagement.

Despite its potential, AI adoption in HR also presents ethical and practical challenges. Concerns surrounding data privacy, algorithmic transparency, and the need for workforce upskilling must be addressed to ensure responsible implementation. Organizations must strike a balance between leveraging AI for operational efficiency and maintaining a human-centric approach to workforce management.

This paper explores how AI-driven digitalization is transforming HR practices, highlighting both opportunities and challenges. By examining real-world applications and emerging trends, this study aims to provide HR professionals with actionable insights for navigating AI-powered workforce management in the era of smart technologies.

LITERATURE REVIEW

The integration of Artificial Intelligence (AI) into Human Resource Management (HRM) has become a focal point in contemporary organizational strategies. Over the past six years, a substantial body of literature has emerged, examining how AI-driven technologies are transforming HR functions. This literature review synthesizes recent research to elucidate the impact of AI on HR digitalization, focusing on key areas such as recruitment, performance management, training and development, and employee engagement. Additionally, it explores ethical concerns, workforce adaptation challenges, and future research directions in AI-driven HRM.

AI has revolutionized recruitment by automating candidate sourcing, screening, and selection processes. Advanced algorithms analyze vast datasets to identify suitable candidates, reducing time-to-hire and enhancing decision accuracy. AI-driven platforms assess resumes, social media profiles, and behavioral patterns to match candidates with job requirements, streamlining the recruitment pipeline. Moreover, AI chatbots conduct preliminary interviews, evaluating candidates' competencies and suitability for roles. However, concerns regarding algorithmic bias, fairness, and ethical considerations have been raised, necessitating the development of transparent and equitable AI systems in recruitment (Jatoba, 2023). While AI has improved efficiency, the lack of human intuition in decision-making remains a challenge, requiring a hybrid model that integrates AI capabilities with HR professionals' expertise.

Performance management has benefited from AI through enhanced data ana-

lytics and predictive modeling. AI systems monitor employee performance metrics in real-time, providing insights that inform appraisal processes and identify areas for improvement. Predictive analytics forecast employee performance trends, enabling proactive management interventions and personalized performance improvement plans. AI-powered sentiment analysis tools assess employee feedback and workplace interactions, offering deeper insights into workforce morale and engagement levels. Nevertheless, the reliance on AI for performance evaluation raises issues related to data privacy, potential over-surveillance, and the psychological impact of continuous monitoring on employees, which must be addressed to maintain trust and motivation (Ekuma, 2024).

AI facilitates personalized learning experiences by tailoring training programs to individual employee needs. Machine learning algorithms assess employee competencies, learning styles, and career aspirations to recommend customized development plans. AI-powered adaptive learning platforms enhance skill acquisition, retention, and overall organizational effectiveness by dynamically adjusting content based on learners' progress. Additionally, virtual reality (VR) and augmented reality (AR) technologies powered by AI create immersive training environments that improve practical skill development. However, the implementation of AI in training requires careful consideration of data security, accessibility, and the potential for technology-induced learning disparities (Gong, 2024). Organizations must ensure inclusive learning opportunities and mitigate biases in AI-driven recommendations to prevent disparities in professional development.

AI-powered tools, such as chatbots and sentiment analysis platforms, have been deployed to monitor and enhance employee engagement. These technologies facilitate real-time communication, gather employee feedback, and identify factors influencing job satisfaction. By analyzing sentiment data, organizations can implement targeted interventions to improve workplace morale and well-being. Additionally, AI-driven engagement platforms enable predictive analysis of employee attrition risks, allowing HR professionals to address concerns proactively. Nonetheless, the use of AI in this domain must balance technological efficiency with the preservation of human elements in employee interactions (Annisa, 2024). Over-reliance on AI in employee engagement strategies may lead to depersonalization, diminishing the emotional connection between employees and the organization.

The adoption of AI in HRM presents several ethical and practical challenges. Data privacy concerns are paramount, as AI systems often require access to sensitive employee information. Ensuring algorithmic transparency, mitigating biases, and maintaining fairness in HR processes are critical to fostering an inclusive workplace. Additionally, AI implementation necessitates upskilling HR professionals to effectively manage and oversee AI-driven initiatives (Nishar, 2024). Ethical AI governance frameworks are essential to establish guidelines for responsible AI use in HRM, ensuring compliance with data protection regulations and ethical standards.

AI-driven HR transformation also raises questions about the evolving role of HR professionals. As AI automates routine administrative tasks, HR personnel must focus on strategic decision-making, employee advocacy, and human-centered leadership. The shift towards AI-augmented HRM requires organizations to invest in change management initiatives that facilitate workforce adaptation. Resistance to AI adop-

tion, fear of job displacement, and concerns over workplace surveillance must be addressed through transparent communication, reskilling programs, and an emphasis on human-AI collaboration.

Future research should explore the long-term impacts of AI integration on organizational culture and employee well-being. Investigating the effectiveness of AI-driven HR interventions across diverse industries and cultural contexts will provide a more comprehensive understanding of best practices. Additionally, the development of ethical AI deployment frameworks remains a critical area for scholarly inquiry (Vrontis, 2021). Research on AI explainability in HRM can further enhance trust and accountability in AI-driven decision-making.

The digitalization of HR through AI offers significant opportunities for enhancing efficiency, decision-making, and workforce management. However, it also presents challenges that require careful navigation. Organizations must adopt a balanced approach, leveraging AI's capabilities while addressing ethical considerations to foster a fair, inclusive, and human-centric workplace. Integrating AI into HRM successfully necessitates ongoing dialogue, collaboration between stakeholders, and a commitment to ethical AI governance.

Case study: Leveraging Artificial Intelligence for Human Resources Digitalization in a IT software company

TechCorp (founded in Serbia, Belgrade) adopted an AI-powered applicant tracking system (ATS) to automate resume screening and match candidates to job descriptions. The system utilized natural language processing (NLP) to analyze candidate profiles and rank them based on relevance. Chatbots were introduced to handle initial candidate interactions, schedule interviews, and answer frequently asked questions.

For performance management, AI-based analytics tools were deployed to track key performance indicators (KPIs) and provide real-time feedback. Predictive analytics helped managers identify high-potential employees and those at risk of disengagement. The system also flagged potential biases in performance appraisals, promoting fairer evaluations.

Input table for the case study is presented with Table 1.

Table 1. AI-Driven HR System Entry Parameters

Parameter	Description	Simulated Value/ Range
Total Applicants per Month	Number of job applications received monthly	1,500 - 5,000
Resume Screening Efficiency (%)	Percentage of resumes automatically screened by AI	85% - 95%
Chatbot Interaction Rate (%)	Percentage of candidates interacting with AI chatbot	70% - 90%
Interview Scheduling Time (Days)	Average time taken to schedule interviews	2 - 5 days
Candidate Matching Accuracy (%)	AI's accuracy in matching candidates to job descriptions	80% - 92%
Performance KPIs Tracked	Number of key performance indicators monitored	10 - 20

Predictive Analytics Accuracy (%)	AI's accuracy in identifying high-potential employees	75% - 90%
Bias Reduction in Evaluations (%)	Improvement in fairness of performance evaluations	20% - 40%
Employee Disengagement Alerts (per month)	Number of flagged cases for potential disengagement	10 - 50
AI-Driven Feedback Utilization Rate (%)	Percentage of employees using AI-generated feedback	6% - 8%

Source: (Authors' study)

In training and development, a personalized learning platform powered by AI recommended tailored training modules based on employees' career goals and skill gaps. Machine learning algorithms assessed learning progress and suggested additional resources. Virtual reality (VR)-enabled training simulations were integrated for technical skill enhancement.

To improve employee engagement, AI-driven sentiment analysis tools analyzed employee feedback from surveys and internal communication platforms. Automated well-being check-ins provided HR with insights into employee satisfaction and workplace morale. Personalized AI-generated recommendations for professional growth and work-life balance improvements were introduced. Key dimensions identified are the following:

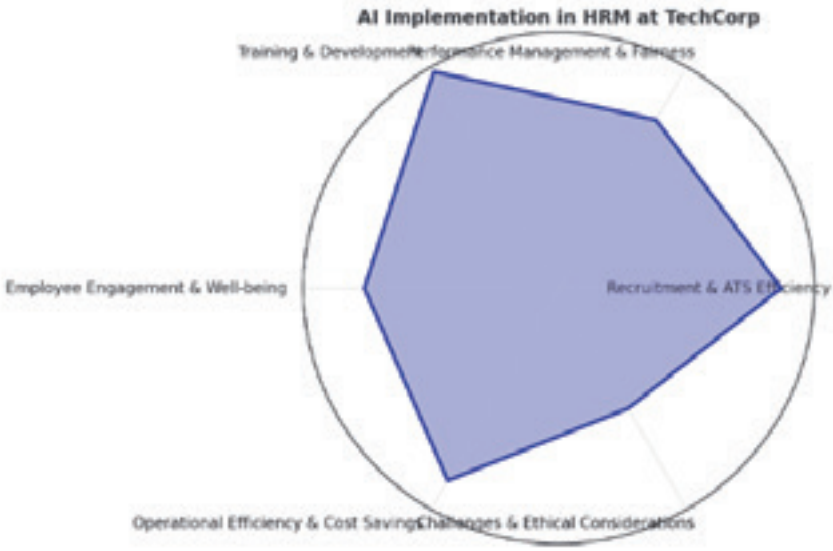
- Recruitment & ATS Efficiency – AI-driven resume screening, chatbots, and interview scheduling.
- Performance Management & Fairness – AI-driven analytics for KPI tracking, predictive analytics for high-potential employees, and bias detection in evaluations.
- Training & Development – Personalized learning platforms, machine learning-driven recommendations, and VR-enabled simulations.
- Employee Engagement & Well-being – Sentiment analysis, well-being check-ins, and AI-generated work-life balance insights.
- Operational Efficiency & Cost Savings – Reduction in hiring time, improved workforce planning, and talent retention strategies.
- Challenges & Ethical Considerations – Data privacy concerns, algorithmic bias, transparency issues, and resistance to AI adoption.

Here is presented a radar chart in Figure 1., depicting key leverage points of AI in HR automation:

The integration of AI led to increased efficiency, as routine HR tasks such as resume screening and interview scheduling were automated, reducing administrative burden. AI-driven insights improved workforce planning and talent retention strategies.

Personalized learning and engagement tools fostered a more supportive work environment. Additionally, the reduction in hiring time and improved retention rates led to significant cost savings for the organization.

Figure 1. Key features of AI implementation in analyzed organization



Source: Authors

Challenges Encountered

Despite its benefits, TechCorp faced several challenges during AI implementation. Employees expressed concerns about AI monitoring their activities and performance data, raising data privacy issues. Initial recruitment algorithms favored certain demographic groups, necessitating adjustments to ensure fairness. Transparency issues arose as employees and HR professionals struggled to understand how AI-based decisions were made. Furthermore, some employees resisted AI-driven changes, requiring additional training and change management initiatives.

To address ethical concerns, TechCorp established guidelines focusing on transparent AI decision-making processes, regular bias audits in recruitment and performance evaluations, strict data privacy policies to protect employee information, and employee involvement in AI system evaluations and refinements.

The integration of AI into HRM at TechCorp Inc. demonstrated significant operational improvements but also highlighted critical challenges. Moving forward, the company aims to refine its AI systems by expanding AI applications into predictive workforce planning, exploring blockchain integration for secure HR data management, enhancing AI training to ensure HR professionals can effectively interpret AI-generated insights, and strengthening ethical frameworks to promote responsible AI use in HRM.

This case study underscores the transformative potential of AI in HRM while emphasizing the importance of ethical, transparent, and employee-centric implementation strategies.

DISCUSSION

The integration of Artificial Intelligence (AI) into Human Resource Management (HRM) represents a transformative shift in how organizations manage their workforce. This discussion delves into the multifaceted impact of AI on HRM, exam-

ining its applications, benefits, challenges, and ethical considerations.

According to (Charlwood, 2022), AI's versatility has led to its adoption across various HR functions:

- **Recruitment and Talent Acquisition:** AI streamlines the recruitment process by automating resume screening, matching candidates to job descriptions, and even conducting initial assessments. For instance, AI-driven platforms can analyze vast datasets to identify suitable candidates, thereby reducing time-to-hire and enhancing decision accuracy. However, concerns regarding algorithmic bias and ethical considerations have been raised, necessitating the development of transparent and fair AI systems in recruitment (Gartner, 2024).
- **Performance Management:** AI systems monitor employee performance metrics in real-time, providing insights that inform appraisal processes and identify areas for improvement. Predictive analytics can forecast employee performance trends, enabling proactive management interventions. Nevertheless, the reliance on AI for performance evaluation raises issues related to data privacy and the potential for over-surveillance, which must be addressed to maintain employee trust (Kim, 2023).
- **Training and Development:** AI facilitates personalized learning experiences by tailoring training programs to individual employee needs. Machine learning algorithms assess employee competencies and learning styles to recommend customized development plans. This approach enhances skill acquisition and retention, contributing to overall organizational effectiveness. However, the implementation of AI in training requires careful consideration of data security and the potential for technology-induced learning disparities (Zhao, 2023).
- **Employee Engagement:** AI-powered tools, such as chatbots and sentiment analysis platforms, have been deployed to monitor and enhance employee engagement. These technologies facilitate real-time communication, gather employee feedback, and identify factors influencing job satisfaction. By analyzing sentiment data, organizations can implement targeted interventions to improve workplace morale. Nonetheless, the use of AI in this domain must balance technological efficiency with the preservation of human elements in employee interactions. (Smit, 2024).

Benefits of AI Integration in HRM

The adoption of AI in HRM offers several advantages:

- **Efficiency and Productivity:** Automating routine tasks allows HR professionals to focus on strategic initiatives, thereby increasing productivity. For example, AI can handle administrative tasks such as payroll processing, scheduling, and benefits administration, reducing the administrative burden on HR staff (Bharati, 2024).
- **Data-Driven Decision Making:** AI systems analyze large volumes of data to provide actionable insights, facilitating informed decision-making in areas like talent management and workforce planning. By leveraging predictive analytics, organizations can anticipate workforce trends and make proactive

adjustments to their HR strategies (Patel, 2023).

- **Enhanced Employee Experience:** Personalized AI-driven interactions, such as tailored training programs and responsive support through chatbots, contribute to a more engaging and satisfying employee experience. This personalization can lead to higher levels of employee engagement and retention (Nguyen, 2024).

According to (Morrison, 2024), (Singh, 2023) and (Thompson, 2024), despite its benefits, AI integration in HRM presents several challenges:

- **Data Privacy:** The use of AI necessitates the collection and analysis of employee data, raising concerns about privacy and data security. Organizations must implement robust data governance frameworks to protect sensitive information and comply with relevant regulations.
- **Bias and Fairness:** AI systems can inadvertently perpetuate or exacerbate biases present in their training data, leading to unfair outcomes in recruitment, performance evaluations, and other HR processes. Ensuring algorithmic fairness and implementing measures to mitigate bias are critical to maintaining equity in the workplace.
- **Transparency and Accountability:** The "black box" nature of some AI algorithms makes it difficult to understand how decisions are made, posing challenges for accountability. Organizations must strive for transparency in their AI systems and establish clear accountability structures to address any issues that arise.
- **Workforce Displacement and Skill Gaps:** The automation of certain HR tasks may lead to job displacement or require employees to acquire new skills. Organizations should invest in reskilling and upskilling initiatives to prepare their workforce for the evolving HR landscape.

FUTURE RESEARCH

The future of AI in HRM holds promising developments:

- Advanced Predictive Analytics: Future AI systems are expected to offer more sophisticated predictive capabilities, enabling organizations to anticipate and proactively address HR challenges such as turnover, skill shortages, and employee disengagement. By analyzing historical data and identifying patterns, AI could provide real-time insights that empower HR professionals to make informed decisions and implement targeted interventions, improving overall workforce management.
- Integration with Other Technologies: Combining AI with other emerging technologies, such as blockchain for secure data management or virtual reality for immersive training experiences, could further enhance HRM practices. This convergence could allow HR teams to streamline operations, enhance transparency in decision-making, and create more engaging employee development programs, fostering both innovation and trust in organizational processes.
- Ethical AI Frameworks: The development of comprehensive ethical frameworks and guidelines will support the responsible deployment of AI in HRM, ensuring that technological advancements align with organizational

values and societal norms. Establishing clear ethical standards will be crucial to prevent biases in AI systems, safeguard privacy, and ensure fairness in hiring, performance evaluations, and employee treatment, creating a more inclusive and equitable workplace.

CONCLUSION

The integration of Artificial Intelligence (AI) into Human Resource Management (HRM) represents a paradigm shift in how organizations attract, manage, and develop their workforce. AI-driven solutions enhance efficiency, enable data-driven decision-making, and contribute to a more personalized employee experience. However, these advancements also bring challenges, including concerns about data privacy, algorithmic bias, and workforce adaptation.

To fully harness AI's potential, organizations must adopt responsible AI practices that prioritize transparency, fairness, and ethical governance. Striking the right balance between automation and human oversight is crucial to ensuring that AI serves as an enabler of HRM rather than a disruptor. Moving forward, the development of robust ethical frameworks, continuous monitoring of AI systems, and investment in employee upskilling will be essential in shaping the future of HR digitalization.

Moreover, organizations must foster a culture of adaptability and openness to technological evolution. Employees should be encouraged to embrace AI-driven changes by engaging in continuous learning and professional development programs tailored to the evolving demands of HR digitalization. This requires a proactive approach from HR professionals in designing training initiatives that equip employees with the necessary skills to collaborate effectively with AI-powered systems. Additionally, interdisciplinary collaboration between HR specialists, data scientists, and IT professionals will be crucial in developing and implementing AI solutions that align with organizational goals and workforce needs.

Addressing ethical concerns and regulatory compliance will be another significant challenge. Organizations must ensure that AI systems are designed with built-in mechanisms for mitigating biases and promoting fairness in decision-making processes. Transparent AI models that provide explanations for HR-related recommendations and actions will be vital in building trust among employees and stakeholders. Establishing AI governance committees that oversee ethical AI implementation and compliance with global data protection regulations can further reinforce accountability and responsible AI usage in HRM.

Furthermore, organizations should explore the long-term implications of AI integration on workplace dynamics, employee well-being, and organizational culture. While AI can enhance efficiency and productivity, excessive reliance on automation may risk depersonalizing HR functions, reducing human empathy in critical decision-making areas such as employee relations and conflict resolution. Thus, HR leaders must actively maintain the human element within AI-driven HRM, ensuring that technology complements rather than replaces human judgment and interaction.

In conclusion, AI's integration into HRM presents immense opportunities for innovation and efficiency but also necessitates careful consideration of ethical, social, and operational challenges. The future of AI-driven HRM will depend on organizations' ability to implement AI responsibly, ensuring that employees are equipped, pro-

tected, and engaged in the digital transformation journey. By fostering an AI-inclusive organizational culture, enhancing human-AI collaboration, and committing to ethical AI governance, companies can maximize AI's benefits while safeguarding the fundamental principles of fairness, privacy, and workforce empowerment.

LITERATURE

Annisa, S. D. (2024). Artificial Intelligence Trends in Human Resources Management: A Systematic Literature Review. *Musytari: Jurnal Manajemen, Akuntansi, dan Ekonomi, 5*(2), 46-56.

Bharati, P. &. (2024). Predicting Employee Turnover Using AI: A Machine Learning Approach. *Journal of Organizational Behavior and Decision Making, 41*(3), 77-91.

Charlwood, A. &. (2022). Can HR adapt to the paradox. *Human Resources Management Journal, 32*(4), 729-742.

Ekuma, K. (2024). Artificial Intelligence and Automation in Human Resource Development: A Systematic Review. *Advances in Developing Human Resources, 23*(2), 146-165.

Gartner, P. C. (2024). Harnessing Artificial Intelligence to Revolutionize Human Resource Management. *Journal of Business and Technology, 15*(3), 87-102.

Gong, Q. F. (2024). Integrating artificial intelligence and human resource management: a review and future research agenda. *The International Journal of Human Resource Management*, 1-27.

Jatoba, M. N. (2023). Intelligent human resources for the adoption of artificial intelligence: a systematic literature review. *Journal of Organizational Change Management, 36*(7), 1099-1124.

Kim, J. &. (2023). AI-powered Recruitment Systems: Ethical Challenges and Organizational Impact. *Journal of Human Resource Development, 22*(4), 98-115.

Morrison, T. &. (2024). The Future of AI in Talent Management: Trends and Opportunities. *Human Resource Management Review, 34*(1), 42-58.

Nguyen, T. &. (2024). The Ethical Implications of AI in Human Resource Management. *Journal of Business Ethics and Technology, 19*(2), 61-75.

Nishar, S. (2024). The Role of Artificial Intelligence in Transforming Human Resource Management: A Literature Review. *Journal of Artificial Intelligence & Cloud Computing, 1*(1), 1-10.

nnisa, S. D. (2024). Artificial Intelligence Trends in Human Resources Management: A Systematic Literature Review. *Musytari: Jurnal Manajemen, Akuntansi, dan Ekonomi, 5*(2), 46-56.

Patel, A. &. (2023). Artificial Intelligence and Employee Development: A Comprehensive Review. *Journal of Career Development, 46*(5), 180-195.

Singh, R. &. (2023). AI in Recruitment: Exploring the Efficiency and Biases in Hiring Decisions. *Human Resource Development Quarterly, 34*(4), 337-352.

Smit, E. J. (2024). AI-Driven Employee Engagement: A New Frontier for HR Professionals. *International Journal of HR Technology, 12*(2), 211-226.

Thompson, J. &. (2024). Artificial Intelligence and the Future of Employee Training: A Systematic Review. *International Journal of Training and Development, 28*(1), 92-108.

Vrontis, D. C. (2021). Artificial intelligence, robotics, advanced technologies and human resource management: a systematic review. *The International Journal of Human Resource Management, 33*(7), 1237-1266.

Zhao, X. &. (2023). Artificial Intelligence in Performance Appraisal: Exploring Opportunities and Limitations. *Journal of Organizational Behavior, 44*(1), 29-45.

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501240P
UDK: 336.763.2/.3:336.645(100)
Datum prijema rada: 19. februar 2025.
Submission Date: February 19, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 240-254

PREGLEDNI NAUČNI RAD / OVERVIEW SCIENTIFIC PAPER

SUSTAINABILITY VS. STABILITY: SHOULD CENTRAL BANKS INVEST IN GREEN BONDS?

Branka Topić – Pavković | PhD, Associate Professor, University of Banja Luka, Faculty of Economics, Banja Luka, branka.topic-pavkovic@ef.unibl.org; ORCID ID 0000-0002-1132-4305

***Abstract**: Over the past few years, central banks have increasingly prioritized sustainable development policies, actively seeking ways to promote sustainability through their financial strategies. One potential approach is investing a portion of their foreign exchange reserves in green bonds, thereby supporting the financing of environmentally friendly projects. However, for green bonds to be considered suitable investments for central banks, they must satisfy key portfolio requirements - ensuring security, liquidity, and profitability. This research explores the viability of central banks allocating part of their reserves to green bonds, analyzing whether these investments align with the abovementioned necessary conditions. The aim of this research is to determine whether incorporating green bonds influences overall portfolio risk and enhances diversification while supporting the achievement of sustainable development goals. To address these considerations, portfolio optimization was conducted using Markowitz's model, incorporating traditional central bank investment assets such as government bonds, corporate bonds, stocks, gold, and green bonds. The findings suggest that adding green bonds to a central bank's portfolio has neither a significant impact on portfolio risk nor a notable effect on diversification. Moreover, the study reveals that portfolios containing green bonds exhibited similar responses to COVID-19 shocks as those without them, reinforcing the rationale for such investments. Ultimately, the results indicate that while green bonds do not contribute significantly to diversification, they also do not elevate portfolio risk. Therefore, central banks may consider investing in these instruments primarily as part of their commitment to social responsibility rather than for improving portfolio performance.*

***Keywords**: central banks, green bonds, portfolio diversification, foreign exchange reserves, Markowitz's model.*

***JEL Classification:** E58, E22, Q01, G11*

INTRODUCTION

The green economy and sustainable development have become increasingly significant in recent years, and require the involvement of an increasing number of institu-

tions that can contribute to green economy progress. Achieving the goals of sustainable growth within the green economy requires substantial financial resources. One of the key financing methods for green initiatives is the issuance of bonds to fund investments and cover costs associated with green projects. Given that these projects demand considerable capital, it is essential to attract investors willing to support such ventures. Among the institutions that can play a role in green financing are central banks, which have the potential to allocate a portion of their foreign exchange reserves to green bonds. This has led to the emergence of the concept of "green central banking," which integrates environmental risk considerations - including climate change risks that may influence both the short-term and long-term stability and development of the financial sector and the broader economy. However, for central banks to invest in green bonds, these financial instruments must satisfy specific requirements. In particular, they must be secure, liquid, and profitable while also contributing to portfolio diversification. By incorporating green bonds into their foreign exchange reserve portfolios, central banks can actively support green finance.

The aim of this research is to analyze the viability of central banks allocating part of their foreign exchange reserves to green bonds, evaluating whether these investments meet the fundamental criteria of safety, liquidity, and profitability. Additionally, the study examines the impact of green bonds on overall portfolio risk and diversification using Markowitz's portfolio optimization model. The research seeks to determine whether the inclusion of green bonds is justified within central bank portfolios and whether they serve as an effective instrument for sustainable finance while maintaining financial stability. Ultimately, it explores whether central banks should invest in green bonds primarily for financial returns or as part of their commitment to sustainability. The motive for undertaking this research stems from the growing importance of sustainable finance and the role of central banks in promoting environmental responsibility while maintaining financial stability.

Several hypotheses can be derived from the research objectives and main questions explored in the paper.

H1: Green bonds meet the fundamental investment criteria of central banks (safety, liquidity, and profitability). First hypothesis tests whether green bonds align with the primary requirements that central banks consider when managing their foreign exchange reserves.

H2: The inclusion of green bonds in central bank portfolios does not significantly impact overall portfolio risk. This examines whether adding green bonds alters portfolio volatility and risk exposure compared to traditional investment instruments.

H3: Green bonds do not provide significant diversification benefits in central bank portfolios. Third hypothesis investigates whether green bonds contribute to risk reduction through portfolio diversification or if their impact is negligible.

H4: Central banks invest in green bonds more for sustainability commitments rather than financial benefits. This hypothesis explores the motivation behind central banks' decisions to allocate reserves to green bonds - whether it is primarily a financial decision or a strategy for promoting sustainability and social responsibility.

The research provides an overview of the literature on green bonds, their characteristics and the inclusion of these bonds in the investment portfolio. An overview of the methodology, calculations and concrete conclusions about the justification of

central banks investing in green bonds is provided. The concluding remarks by the authors are defined in the final chapter.

LITERATURE OVERVIEW

The concept of the green economy and green finance has gained increasing relevance in recent years, largely driven by growing public awareness of environmental issues and sustainable development. In order to sustain the green economy and achieve its objectives, securing adequate financing is essential. As a result, an increasing number of countries and corporations are issuing green bonds to fund various projects related to the green economy.

Central banks are playing a more prominent role in these initiatives, as they are increasingly encouraged to purchase green bonds to support the expansion of green finance while simultaneously contributing to sustainable development. Given their responsibility for ensuring financial and macroeconomic stability, central banks cannot remain uninvolved in addressing climate and environmental risks (Dikau & Volz, 2018). Green bonds represent a relatively new financial instrument designed to support environmental initiatives, sustainable development, and innovative investment practices. These bonds function similarly to conventional bonds, as their creditworthiness is directly linked to the issuer's rating. However, there is no universally accepted definition of green bonds, making the commonly used description the most widely recognized. Their primary role is to finance projects that promote sustainability, such as renewable energy, water management, energy efficiency, bioenergy, and low-carbon transportation (Campiglio, 2015). The growing interest in green bonds extends to both investors and economic policymakers, with central banks emerging as key stakeholders in this evolving market. Like other investors, central banks are increasingly encouraged to integrate green bonds into their investment models (Schoenmaker, 2019). Investors in green bonds aim to generate a measurable positive environmental impact by funding companies engaged in credible green projects. Although the green bond market has been expanding, its overall size remains relatively small, with Europe accounting for 49% of total issuances. Corporations and financial institutions play a leading role in this market (Fatin, 2019).

By 2021, the value of the green bond market had reached USD 433.30 billion and it is widely anticipated that this market will continue to grow. As green bonds become more attractive to various investors, including central banks, it is crucial that they meet essential criteria related to risk, liquidity, and profitability. When evaluating green bond investments, central banks assess the issuer's credit risk profile to ensure credibility. However, as the green bond market is still in its early stages, concerns remain regarding pricing, liquidity, and diversification. (Carney, 2015) highlighted the critical role of central banks in fostering sustainable economic growth worldwide. A key initiative in this regard is the establishment of the Network for Greening the Financial System (NGFS), a platform that brings together approximately 75 central banks, regulatory authorities, and international financial institutions. The primary mission of the NGFS is to promote a coordinated approach to addressing climate-related risks within the global financial system. This initiative operates under the guidance of the Bank for International Settlements. The 2030 Agenda for Sustainable Development was introduced in 2015 with the goal of eradicating poverty and guiding the world

toward peace, prosperity, and equal opportunities for all while preserving the health of the planet. As part of this agenda, all UN Member States adopted 17 Sustainable Development Goals (SDGs), outlining a 15-year roadmap to achieve them. These goals cover a wide range of topics, including climate change mitigation, environmental conservation, responsible consumption and production, and more. According to (Knežević Kušljić, 2022) the importance of all stakeholders is crucial for the implementation and realization of the Agenda of the Sustainable Development Goals.

Central banks, international financial institutions, financial regulators, global investors, and commercial banks all play a vital role in the development of green finance. (Volz, 2017) emphasizes that central banks are central figures in managing and stabilizing financial systems, utilizing various financial instruments to advance sustainable finance. Consequently, their involvement in green finance is justified, with central banks being recognized as key stakeholders, particularly in emerging economies. In 2020, the Bank of England (BoE) became the first central bank to explicitly acknowledge the climate risks associated with its monetary portfolio. In response, the BoE began assessing climate-related financial risks and exploring appropriate risk management strategies. Following its lead, other central banks have increasingly integrated environmental concerns into their operations, recognizing that understanding the link between financial and economic activities and climate change is essential for advancing the green economy.

Central banks hold a crucial position in financial markets, primarily as investors managing foreign exchange reserves. When a central bank invests in green bonds, it signals confidence in these instruments as secure and high-quality investments, which, in turn, enhances the credibility and reputation of the green bond market. This added legitimacy plays a crucial role in strengthening the financial foundation of the green economy. There are two main ways for central banks to "green" their balance sheets: through their international reserve's portfolio and through monetary operations in domestic markets. However, despite their public endorsements of green finance, many central banks remain hesitant to engage directly in green bond investments. Given the substantial value of these reserves, careful consideration is necessary before making investment decisions. It is therefore essential to evaluate the feasibility of central banks allocating funds to green bonds.

Green bonds must fulfill certain conditions related to liquidity, security, and profitability for central banks to consider investing in them. In practice, this means that green bonds should hold high credit ratings, exhibit strong market liquidity, be easily tradable, and provide a reasonable return on investment. Bouyé, Klingebiel, & Ruiz, 2021 argue that ESG investments generally align with these conditions, making them suitable investment options for central banks. Ensuring investment security involves directing foreign exchange reserves toward financial instruments of the highest quality, typically those with investment-grade ratings and a well-established reputation for safety (Borio, Ebbesen, Galati, & Heath, 2008). Liquidity is another crucial requirement for foreign exchange reserves, necessitating investment in highly liquid instruments that can be quickly and easily converted into cash. Liquidity can be assessed in two dimensions: market liquidity and funding liquidity. A liquid instrument must be readily tradable at a price that aligns with market value, thereby minimizing price fluctuations. Additionally, liquidation costs should be minimal and incurred only during the transaction process. The

second aspect, funding liquidity, refers to an instrument's ability to provide short-term cash availability through asset sales, external financing, or collateralization. Profitability is also a key consideration, requiring central banks to invest in instruments that generate returns while maintaining adequate security and liquidity. Investment risk is equally important, as investors assess both potential risks and expected returns before making financial decisions (Bodie, Kane, & Marcus, 2014, p. 516).

The EU green bond market is increasingly attracting investor interest. However, the authors point out that green bonds are somewhat less liquid than traditional bonds, although their liquidity remained stable during the financial instability caused by the COVID-19 crisis in 2020. Based on these observations, the authors conclude that the green bond market does not show significant vulnerabilities (Mazzacurati, Paris, & Tsiotras, 2021).

The other group of authors observe a rising interest among central banks in green bond investments, asserting that sustainable development goals can be integrated into central banks' foreign exchange reserve management without compromising core objectives such as safety, liquidity, and profitability (Fender, McMorrow, Sahakyan, Zulaica, & Omar, 2019). Similarly, it is recognized that central banks are placing greater emphasis on sustainable growth, social responsibility, and environmental considerations, particularly in relation to well-diversified investment portfolios. However, they caution that central banks still primarily allocate investments to government bonds of stable economies, limiting the scope for green bond investments. They conclude that any green bond or ESG investment incorporated into a central bank's foreign exchange reserves should align with the institution's broader investment principles and standards applied to existing asset classes (Bouyé, Klingebiel, & Ruiz, 2021).

A study conducted by the Network for Greening the Financial System (Elderson & Mauderer, 2019) shows that when central banks engage in green investments, they set a precedent for other investors, thereby reducing both the risks associated with these instruments and potential reputational risks. This highlights the important role that central banks can play in fostering confidence in the green bond market and contributing to the broader transition toward sustainable finance.

Extensive research, particularly studies conducted by the Bank for International Settlements (BIS), has explored the role of green bonds in foreign exchange reserve portfolios. Researchers have determined that central banks can incorporate sustainability objectives into their governance policies without compromising fundamental principles such as security and return. Investment diversification is a crucial consideration for central banks. These researchers demonstrated that adding green bonds to a central bank's portfolio enhances diversification, thereby improving the risk-return ratio in a manner similar to conventional portfolios. The other researchers found that portfolios containing green bonds tend to outperform those composed solely of traditional bonds in terms of the risk-return ratio. The advantages of green bond investments stem from both increased yields and reduced volatility in most cases, supporting the conclusion that these instruments offer substantial investment benefits. Incorporating green bonds into reserve portfolios enhances diversification and improves risk-adjusted returns (Yingwei & Jie, 2022).

Beyond environmental benefits, the green economy generates positive social and economic impacts. Securing adequate funding sources and attracting investor interest in

green projects has been a critical concern during post-crisis recovery phases. Achieving these objectives requires collaboration and mutual benefits among investors, governments, financial markets, and other key stakeholders (Topić - Pavković, 2020).

As noted (Bilas, Bošnjak, & Franc, 2022) the global pandemic has demonstrated that certain social, health, economic, and other circumstances or phenomena are not always predictable. In times of crisis, a clear, transparent, efficient, and swift response is essential. The role and significance of global institutions are constantly assessed, but their effectiveness becomes most apparent during periods of crisis. Their responsibility in developing, coordinating, and implementing essential global measures and policies is more crucial than ever.

METHODOLOGY

To evaluate the impact of including green bonds in central bank portfolios, the analysis incorporated several financial instruments: government bonds (EG00 index), a corporate bond index (EB00 index), a green bond index (GRENIndex), the stock index of the European Monetary Union (SX5E Index), and gold (XAU_Currency). The dataset covered a period of nine years, spanning from 2011 to the end of 2021, with monthly data observations.

Strategic asset allocation frequently employs the well-established Markowitz methodology. Based on Markowitz's portfolio theory, investors evaluate various portfolios by analyzing expected returns and standard deviations within the framework of the indifference curve. Markowitz demonstrated that, for a given expected return and a specific set of securities, it is possible to construct an optimal portfolio that minimizes overall risk, as measured by portfolio variance and standard deviation. Achieving this optimization necessitates an understanding of the covariance and correlation among different asset combinations.

Mean-variance analysis provides a systematic approach to constructing asset portfolios that aim to maximize returns for a given risk level. It emphasizes that diversifying investments across multiple asset classes can effectively reduce risk compared to holding a single type of financial instrument. The Markowitz model, also referred to as mean-variance portfolio optimization, is widely utilized in portfolio management to optimize asset allocation decisions.

In this study, two distinct portfolios were constructed: one that included green bonds and another that excluded them. The optimization process involved computing monthly returns, standard deviations, and covariance, followed by determining the optimal portfolio composition based on these metrics.

Monthly returns of each instrument are calculated using the formula (Šoja, 2019), (Šoja & Senarathne, 2019) and (Bodie, Kane, & Marcus, 2014):

$$r_{it} = \ln\left(\frac{p_{it}}{p_{it-1}}\right)$$

Where r_{it} is the return of asset i in the portfolio and ln denotes the natural logarithm, p_{it} is the price (or the value of the index) at the period t and p_{it} – 1 is the price or value of an asset in the prior period (i.e. t – 1).

The standard deviation is calculated as shown below (Šoja, 2019).

Formula 1. Standard Deviation of the Return Series

$$\text{Standard Deviation} = \sqrt{\frac{\sum_{j=1}^{n}\left(r_j - \bar{r}\right)^2}{N}}$$

In which: r_j is the value of *jth* point in the data set, $\bar{r}$ is the mean return in the return series and N is the number of observations.

Source: Šoja, T. (2019). Gold in investment portfolio from perspective of European investor. The European Journal Of Applied Economics, 16(1), pp. 41-58.

The covariance between any two assets in the portfolio is computed as follows (Levišauskait, 2010):

Formula 2. Covariance Between Two Assets in a Portfolio

$$\text{Covariance}\,(A, B) = \frac{\sum(r_A - \bar{r}_A)(r_B - \bar{r}_B)}{N}$$

Where r_A is the return of asset A and r_B is the return of asset B in the portfolio and $\bar{r}_A$ denotes the average return of asset A and $\bar{r}_B$ denotes the average return of asset B. N, as usual, is the number of observations.

Source: Levišauskait, K. (2010). Investment Analysis and Portfolio Management. LEONARDO DA VINCI Transfer of Innovation. Kaunas: Vytautas Magnus University

Covariance is essential in assessing the relationship between two assets, as it helps determine the direction of their movement relative to each other. A positive covariance indicates that the returns of both assets move in the same direction - when asset A's return exceeds its average (positive), asset B is also likely to experience positive returns, and vice versa. In contrast, a negative covariance suggests that the assets move in opposite directions - when asset A's return is above its average (positive), asset B's return is likely to be negative, and vice versa.

To calculate the correlation between assets A and B, one can employ the following method (Levišauskait, 2010).

Formula 3. Correlation Between Two Assets

$$\text{Correlation}\,(p) = \frac{Cov\,(A, B)}{\sigma_A \sigma_B}$$

Cov(A, B) is the covariance between asset A and asset B. σ_A and σ_B are the standard deviation of asset A and asset B.

Source: Ibid.

Expected returns of portfolios are calculated as follows (Levišauskait, 2010):

Formula 4 Expected Return of a Portfolio

$$E_{r(p)} = \sum_{i=1}^{n} W_1\, E_{i(r)} = W_1 E_{1(r)} + W_2 E_{2(r)} + \cdots + W_N E_{N(r)}$$

Where $E_{r(p)}$ is the expected return r on the portfolio p and W is the weight of asset i in the portfolio p.

Source: Ibid.

Empirical evidence

To construct the portfolio, five key instruments were selected, including commonly used indexes in reserve management and an index representing green bonds:

- **GRENIndex (Bloomberg Green Bond Index):** Represents green bonds denominated in EUR. This index serves as a well-structured benchmark for the green bond market and defines the available investment options for allocation decisions.
- **EG00Index:** Represents government bonds issued by EMU countries and denominated in EUR. The average duration of this index is approximately eight years.
- **EB00Index:** Represents EUR-denominated corporate bonds with an average duration of about four years. This index comprises issuers with high credit ratings.
- **SX5E (Euro Stoxx 50):** Represents equities in the European Union market, specifically an index of blue-chip stocks in the region.
- **Gold:** denominated in EUR.

For portfolio optimization, monthly data spanning from January 2011 to July 2022 were utilized. Using this dataset, the average return (as a measure of expected returns) was calculated for each instrument, along with the standard deviation, frequency, and Value at Risk (VaR). The complete dataset and results are presented in Table 1.

Table 1. Descriptive statistics

	EG00 Index	GRENIndex	SXS5	Gold	EB00
Mean	0,25%	0,03%	0,32%	0,51%	0,23%
StDev	1,35%	2,20%	4,82%	4,20%	1,21%
Freq<0	41,01%	46,04%	45,32%	47,48%	39,57%
Empirical VaR	-1,98%	-3,59%	-7,61%	-6,41%	-1,75%
Parametric CVaR	-1,98%	-3,13%	-6,94%	-5,24%	-1,71%
Empirical CVaR	-2,54%	-4,51%	-9,63%	-8,17%	-2,26%
Empirical CVaR	-2,59%	-5,41%	-10,31%	-7,70%	-3,09%

Source: Authors' calculations

Table 1 presents an overview of the average monthly returns for the entire observed period, highlighting that gold achieved the highest average return of 0.51%, while green bonds recorded the lowest, with an average monthly return of 0.03%. Among the asset classes, corporate bonds exhibited the lowest standard deviation, whereas the SX5E index displayed the highest volatility. When assessing risk through

Value at Risk (VaR), it is evident that equities and gold consistently demonstrate higher VaR across all risk types. Once the data is computed, portfolio optimization algorithms are employed while keeping the portfolio aligned with central bank principles, but also incorporating green bonds. To ensure compliance, certain limits are introduced regarding the share of each instrument within the portfolio.

The limits are:

- Green bonds can have a portfolio share of 0%-100% since we want to introduce this bond in the portfolio.
- Th e share of government bonds is determined to min 0% and a max of 100% since this is the main investment instrument for the central bank community.

The share of corporate bonds is fixed to min 10% and a max of 100%. The World Bank reports show that central banks invest up to 10% of their portfolio in corporate bonds (WB, 2021). The share of shares is fixed to a max of 5%. The World Bank report considers a very small amount in investment to shares, usually up to 5% (WB, 2021). The share of gold is fixed to a max of 6%. Empirical research usually confirms that the share of gold in the portfolio is useful and could be up to 6% (Šoja, 2019).

The limits imposed on the portfolio are designed in accordance with the rules set by central banks, taking into account the principles of safety, liquidity, and profitability in the investment process. These limits serve to mitigate risks associated with volatile assets such as gold and shares, while still maintaining a portion of these assets in the portfolio. In addition to these limits, it is assumed that the risk-free rate is 0% and short selling is prohibited. Once these constraints are in place, the algorithm is implemented with the objective of constructing a portfolio that minimizes risk, as measured by the standard deviation.

Table 2 presents the minimum variance portfolio, detailing the portfolio configuration with the lowest possible risk. It also includes the Sharpe ratio, which measures risk-adjusted returns, and the expected returns for the optimized portfolio.

Table 2. Portfolio composition and risk measures

	Portfolio with green bonds min risk	**A portfolio without green bonds**	**10% of green bonds**
Return	0,2510%	0,2520%	0,2312%
Risk	1,1391%	1,1391%	1,1521%
Sharpe	0,22	0,22	0,20
EG00 Index	32,23%	32,17%	33,46%
GRENIndex	0,48%	0,00%	10,00%
SXS5	0,00%	0,00%	0,00%
Gold	5,48%	5,49%	5,16%
EB00	61,82%	62,33%	51,38%
Risk measures			
Freq<0	37,41%	36,69%	37,41%
Parametric VaR	-1,58%	-1,58%	-1,63%
Empirical VaR	-1,19%	-1,17%	-1,43%

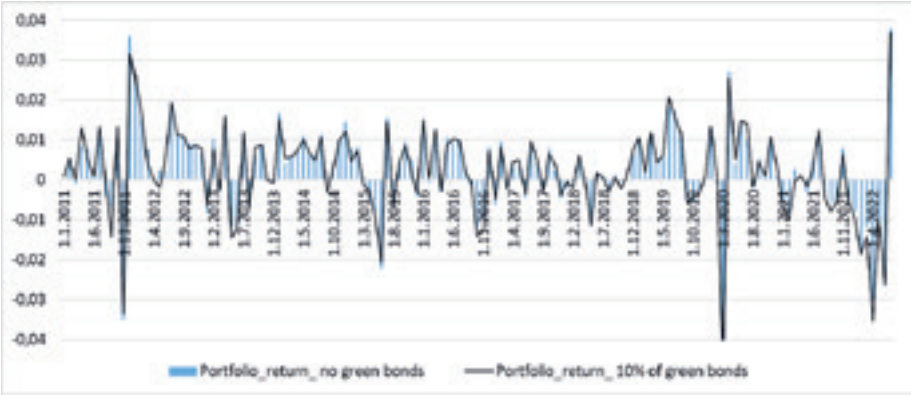
Parametric CVaR	-2,05%	-2,05%	-2,11%
Empirical CVaR	-2,69%	-2,69%	-2,76%

Source: Authors' calculations

Table 2 presents the composition and performance of three portfolios: one including green bonds, one excluding them, and another with a 10% allocation to green bonds. In the first portfolio, green bonds make up only 0.47% of the total allocation, as the optimization algorithm prioritizes minimizing risk.

The second portfolio illustrates the structure and performance of a portfolio without green bonds, while the third portfolio incorporates a 10% share of green bonds. The results indicate that all three portfolios exhibit similar expected monthly returns, ranging between 0.23% and 0.25%, with comparable risk levels, as measured by standard deviation. These findings suggest that including green bonds does not lead to a higher return relative to risk. The Sharpe ratio, which evaluates the return per unit of total risk beyond the risk-free rate, is slightly higher for the portfolio including green bonds. However, this implies that the return-to-risk ratio is marginally lower compared to a portfolio without green bonds. Since central banks prioritize risk management in their investment strategies, Value at Risk (VaR) measures were calculated for all three portfolios. The findings show that a portfolio with a 10% green bond allocation carries slightly higher risk, but the difference is not significant when compared to other portfolios. As a result, it can be concluded that green bonds neither increase overall risk nor significantly enhance returns. Additionally, the analysis suggests that green bonds do not provide substantial diversification benefits. While they marginally improve the Sharpe ratio, they do not lead to higher expected returns or lower portfolio risk. Ultimately, incorporating green bonds into a central bank's portfolio results in slightly lower expected returns and a marginally higher risk compared to a conventional portfolio. Figure 1 illustrates the returns of the portfolios with and without green bonds, further visualizing their performance differences.

Figure 1. The returns of the portfolios with and without green



Source: Authors' calculations

The findings suggest that both portfolios - with and without green bonds, demonstrate similar returns, even during the COVID-19 crisis in 2020. This indicates that the inclusion of green bonds does not contribute to higher volatility in the portfolio compared to one that excludes them. The results confirm that green bonds do not introduce additional risk, reinforcing their stability as an investment option within a central bank's portfolio.

RESULTS AND DISCUSSION

The results of the research provide valuable insights into the implications of incorporating green bonds into central bank portfolios. By applying Markowitz's portfolio optimization model, the study assesses the impact of green bonds on portfolio risk, diversification, and overall financial performance. The results indicate that green bonds meet the fundamental investment criteria of central banks, but do not significantly enhance portfolio diversification or risk-adjusted returns. The results show that the inclusion of green bonds in a central bank's reserve portfolio does not lead to a substantial change in overall portfolio risk. The risk levels, measured through standard deviation and Value at Risk (VaR), remain relatively unchanged between portfolios that include green bonds and those that do not. Additionally, the Sharpe ratio analysis suggests that green bonds do not provide a superior risk-return tradeoff compared to traditional investments such as government or corporate bonds.

The key insights align with previous studies, such as Fender et al. (2020), which concluded that green bonds exhibit similar financial characteristics to conventional bonds in terms of returns and volatility. Similarly, research by Yingwei & Li (2022) found that while green bonds contribute to sustainability objectives, they do not necessarily outperform traditional bonds in terms of financial returns. One of the key objectives of this research was to determine whether green bonds contribute to portfolio diversification for central banks. The findings indicate that the diversification benefits of green bonds are marginal at best. Although diversification generally helps mitigate risk by spreading exposure across different asset classes, green bonds demonstrate a high correlation with existing fixed-income assets in central bank portfolios, limiting their effectiveness as a diversification tool.

These results contrast with some previous studies, such as Fender et al. (2019), which suggested that green bonds may improve portfolio diversification under certain conditions. However, the present research suggests that in a central bank's context - where investment decisions are primarily guided by safety and liquidity concerns, the diversification advantage of green bonds remains limited.

A significant aspect of this research is its analysis of green bond performance during economic crises, particularly the COVID-19 pandemic. The research outcomes reveal that portfolios containing green bonds responded similarly to market shocks as those without them. This suggests that green bonds do not introduce additional risk during financial downturns, reinforcing their stability as an investment option. These findings are in line with Mazzacurati et al. (2021), who noted that green bonds remained relatively liquid and stable during the COVID-19 crisis. Their study also pointed out that green bonds tend to be slightly less liquid than traditional government bonds, which central banks heavily rely on for their foreign exchange reserves.

The outcomes of this study have significant policy and investment implications

for central banks considering green bond investments. Since green bonds do not appear to significantly impact risk-adjusted returns or portfolio diversification, their primary justification within a central bank's portfolio is likely based on sustainability commitments rather than financial performance. This supports the argument made by Bouyé et al. (2021), who emphasized that central banks may integrate sustainability considerations into their investment frameworks without compromising key objectives of safety and liquidity. Also, the role of central banks in setting a precedent for private investors should not be overlooked. By investing in green bonds, central banks can help strengthen market confidence in sustainable finance, potentially leading to greater issuance and liquidity in the green bond market over time.

CONCLUSION

The research aimed to explore the feasibility and implications of central banks incorporating green bonds into their foreign exchange reserve portfolios. Based on this objective, several key hypotheses were formulated. One of the central hypotheses was that green bonds meet the fundamental investment criteria of central banks, which include safety, liquidity, and profitability. Given that central banks prioritize investments that ensure security and stability, this hypothesis tested whether green bonds could be considered viable reserve assets. The findings indicate that green bonds generally align with these criteria, as they exhibit sufficient creditworthiness and a risk profile comparable to traditional investment-grade bonds. While green bonds may have slightly lower liquidity than government bonds, they remain tradeable assets suitable for reserve portfolios. Their profitability, however, is similar to that of conventional bonds, with no significant financial outperformance. Another key hypothesis examined whether the inclusion of green bonds in central bank portfolios significantly impacts overall portfolio risk. Since central banks manage reserves with a strong focus on risk minimization, it was essential to evaluate whether adding green bonds would alter portfolio volatility. The research results show that green bonds do not introduce additional risks, as evidenced by standard deviation and Value at Risk (VaR) measures, which remained stable across portfolio variations. This suggests that central banks can incorporate green bonds without increasing their overall risk exposure. The study also investigated whether green bonds provide significant diversification benefits. A well-diversified portfolio is expected to reduce risk by including assets with low correlation. However, the findings suggest that green bonds are highly correlated with other fixed-income assets, limiting their effectiveness as a diversification tool. Unlike gold or equities, which tend to have lower correlations with bonds, green bonds do not significantly contribute to risk reduction within a central bank's portfolio. This challenges some previous studies that suggested green bonds could enhance diversification under specific conditions.

Furthermore, the research explored whether central banks invest in green bonds primarily for sustainability commitments rather than financial benefits. The results suggest that the primary motivation for including green bonds in central bank portfolios is policy-driven rather than financial. Green bonds neither enhance returns nor reduce portfolio risk significantly, reinforcing the idea that their inclusion serves as part of a broader strategy to support sustainable finance. This aligns with global trends, where central banks, such as the European Central Bank (ECB) and the Bank of England (BoE), have incorporated green finance into their monetary policy frameworks.

By investing in green bonds, central banks not only contribute to sustainability efforts but also set an example for private investors, helping to strengthen market confidence in the green bond sector.

The research makes several important contributions to both academic literature and policy discussions on sustainable finance and central banking. First, it provides empirical evidence on the role of green bonds in central bank reserve management by systematically evaluating their risk, return, and diversification potential. Using Markowitz's portfolio optimization model, the study offers a data-driven approach to assessing the impact of green bonds on portfolio performance. Additionally, the study highlights the evolving role of central banks in green finance, emphasizing their influence in shaping financial markets and promoting sustainable investments. Unlike private investors, central banks operate under different constraints and objectives, making their approach to green bonds unique. While previous research suggested that green bonds could improve diversification, this study finds that in the context of central banking, their diversification benefits are limited.

The policy implications of this research are significant. The findings support the inclusion of green bonds in central bank reserves, not necessarily for financial advantages, but for their role in promoting sustainability and fostering confidence in the green finance sector. Central banks, by investing in green bonds, can influence private investors and contribute to the expansion of sustainable finance. However, policymakers should recognize that green bonds alone do not enhance financial performance and should be included as part of a balanced investment strategy that aligns with central bank objectives of stability and liquidity.

While this research provides empirical evidence on the role of green bonds in central bank reserve portfolios, it has some limitations that warrant further research. One significant limitation is the reliance on Markowitz's portfolio optimization model, which, while widely used, does not capture all aspects of central bank reserve management, such as dynamic investment strategies and real-world constraints on asset allocation. Future studies could explore alternative models, such as stochastic optimization or multi-objective portfolio approaches, to gain a more comprehensive understanding of how green bonds fit into central bank reserves. Another limitation is that the study focuses on a specific timeframe, covering the period from 2011 to 2021. While this period includes significant financial events, such as the COVID-19 pandemic, longer-term studies incorporating more economic cycles could provide deeper insights into the stability and performance of green bonds under different macroeconomic conditions.

In conclusion, the research confirms that while green bonds align with central bank investment principles in terms of safety, liquidity, and profitability, they do not offer substantial financial advantages in terms of returns or diversification. Their inclusion in central bank portfolios is driven primarily by sustainability goals rather than financial optimization. The study contributes to ongoing policy debates on green finance by providing empirical evidence on the real-world implications of green bond investments for central banks. It highlights the need for careful policy design to ensure that sustainability objectives are met without compromising monetary and financial stability.

LITERATURE

Bilas, V., Bošnjak, M., & Franc, S. (2022). Globalisation in the era of COVID-19 pandemic and post-pandemic period. *Economy and Market Communication Review, XII*(1), pp. 186-194. Retrieved from https://doi.org/10.7251/EMC2201186B

Bodie, Z., Kane, A., & Marcus, A. J. (2014). *Investments.* New York: McGraw-Hill Education, 2 Penn Plaza, New York, NY 10121.

Borio, C., Ebbesen, J., Galati, G., & Heath, A. (2008). *FX reserve management: elements of a framework.* Monetary and Economic Department. Basel: Bank for International Settlements. Retrieved from https://www.bis.org/publ/bppdf/bispap40.pdf

Bouyé, E., Klingebiel, D., & Ruiz, M. (2021, March). *Environmental, social, and governance investing, A Primer for Central Banks' Reserve Manager.* Washington, D.C.: World Bank. Retrieved from https://www.researchgate.net/publication/355581234_Environmental_Social_and_Governance_Investing_A_Primer_for_Central_Banks'_Reserve_Managers

Campiglio, E. (2015). Beyond carbon pricing: the role of banking and monetary policy in financing the transition to a low-carbon economy. *Ecological Economics, 121*, pp. 220-230. Retrieved from https://www.researchgate.net/publication/274196840_Beyond_carbon_pricing_The_role_of_banking_and_monetary_policy_in_financing_the_transition_to_a_low-carbon_economy

Carney, M. (2015, September 29). *Breaking the tragedy of the horizon - climate change and financial stability - speech by Mark Carney*. Retrieved from Bank of England: https://www.bankofengland.co.uk/speech/2015/breaking-the-tragedy-of-the-horizon-climate-change-and-financial-stability

Dikau, S., & Volz, U. (2018, September). Central banking, climate change and green finance. *ADBI Working Paper Series*. Retrieved from https://www.adb.org/publications/central-banking-climate-change-and-greenfinance

Elderson, F., & Mauderer, S. (2019). *A sustainable and responsible investment guide for central banks' portfolio management.* Paris: Network for Greening the Financial System. Retrieved from https://www.ngfs.net/system/files/import/ngfs/medias/documents/ngfs-a-sustainable-and-responsible-investment-guide.pdf

Fatin, L. (2019). *Green Bonds The state of the market 2018*. Retrieved from Climate Bonds Initiative: https://www.climatebonds.net/files/reports/cbi_gbm_final_032019_web.pdf

Fender, I., McMorrow, M., Sahakyan, V., Zulaica, & Omar. (2019, March). *Reserve management and sustainability: the case for green bonds.* Basel: Bank for International Settlements. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3571408

Knežević Kušljić, S. (2022). Young people's perception on sustainable development. *Economy and Market Communication Review, XII*(2), pp. 393-407. Retrieved from https://doi.org/10.7251/EMC2202393K

Levišauskait, K. (2010). *Investment Analysis and Portfolio Management.* LEONARDO DA VINCI Transfer of Innovation. Kaunas: Vytautas Magnus University. Retrieved from https://www.bcci.bg/projects/latvia/pdf/8_IAPM_final.pdf

Mazzacurati, J., Paris, W., & Tsiotras, A. (2021). *Environmental impact and liquidity of green bonds.* Paris: European Securities and Markets Authority (ESMA). Retrieved from https://www.esma.europa.eu/sites/default/files/trv_2021_2-environmental_impact_and_liquidity_of_green_bonds.pdf

Schoenmaker, D. (2019, May). A Framework for Sustainable Finance. *Centre for Economic Policy Research (CEPR)*. Retrieved from https://www.rsm.nl/fileadmin/Faculty-Research/Centres/EPSVC/A_Framework_for_Sustainable_Finance.pdf

Šoja, T. (2019). Gold in investment portfolio from perspective of European investor. *The European Journal Of Applied Economics, 16*(1), pp. 41-58. Retrieved from https://journal.

singidunum.ac.rs/files/2019-16-1/gold-in-investment-portfolio-from-perspective-of-european-investor.pdf

Šoja, T., & Senarathne, C. W. (2019). Bitcoin in portfolio diversification: The perspective of a global investor. *Journal Bankarstvo, 48*(4), pp. 44-63. Retrieved from https://scindeks.ceon.rs/article.aspx?artid=1451-43541904044Q&lang=eng

Topić - Pavković, B. (2020). Fostering green economy through new financial instruments in central banks' portfolios. *AGROFOR International Journal, 5*(3), pp. 72-79. Retrieved from https://agrofor.ues.rs.ba/paper.php?id=334

Volz, U. (2017). *On the role of central banks in enhancing green finance.* Waterloo: United Nations Environment. Retrieved from https://www.unep.org/ar/node/8951

Yingwei, H., & Jie, L. (2022). Should investors include green bonds in their portfolios? Evidence for the USA and Europe. *International Review of Financial Analysis, 80*. Retrieved from https://ideas.repec.org/a/eee/finana/v80y2022ics1057521921003136.html

This work is licensed under a **Creative Commons Attribution-NonCommercial 4.0 International License**.

https://doi.org/ 10.7251/EMC2501255A
UDK: 005.961:005.914.3(549)
Datum prijema rada: 10. mart 2025.
Submission Date: March 10, 2025
Datum prihvatanja rada: 30. juni 2025.
Acceptance Date: June 30, 2025
Časopis za ekonomiju i tržišne komunikacije
Economy and Market Communication Review
Godina/Vol. **XV** • Br./No. **I**
str./pp. 255-267

PREGLEDNI NAUČNI RAD / OVERVIEW SCIENTIFIC PAPER

PEPSI AND FLEXIBLE MARKETING STRATEGY IN PAKISTAN – AN ERA SPANNING THREE DECADES

Syed Ali Abbas | Asst. Prof. of Marketing, Beaconhouse National University, Off Thokar Niazbeg - Raiwind Road, Lahore – 54400, Pakistan, aabbas724@gmail.com; ORCID ID 0000-0002-3634-6615

Abstract*: This research aims to investigate Pepsi's (fizzy drink) flexible marketing strategy with a prime focus on TVCs over the years in Pakistan. The methodology encompasses a qualitative study design. Discourse analysis has been employed to interpret the meanings and themes of the TVCs. Results depict Pepsi's focus on being agile and cashing in on hit trends in the sample region. The major focus has been the sport of Cricket as a brand reinforcement strategy, with the inclusion of showbiz orientation at times. The study on Pepsi's TVC for the respective sample region and the specific period is a rare practice. The results can be useful for marketing consultancy firms and for other brands and businesses to adjust their marketing programs. Parallels can be drawn with other cultures and for the execution of strategies. The online availability of all the ads as data during that point in time in the sample region. Additionally, the findings can inform targeted marketing strategies and can be adapted across diverse cultural contexts to enhance campaign effectiveness.*

Keywords: *Flexible Marketing, Event Marketing, Brand Reinforcement, Brand Elements*

JEL classification: M31

INTRODUCTION

"Pepsi" – the name needs no introduction. Unarguably, there will be very few who might need to know what this soft drink is about. Such is the genericness of this brand that the word cola means Coca Cola or Pepsi Cola. Starting as a syrup in 1950, the formula became a recognized fizzy drink and a household name. With its share of controversies ranging from health effects to marketing, to its competition, or its country of origin, the drink is in the list of the top two, if not the best, for quite a few. Other than the taste and quality, Pepsi is famous for its marketing campaigns (Chen, 2023). From promotional discounts to celebrity endorsements and localization in its brand elements to product development, Pepsi used it all. The event marketing, related diversification, and the use of CSR campaigns (García, Gibaja, & Mujika, 2013),

Pepsi made the most of the marketing literature, and it is no wonder it is the most discussed brand in the marketing classes across the globe. As Pepsi has been operating across various countries (Biswas & Sen, 1999), and various cultures, thus opting for the concept of localization in its marketing campaigns, South Asian Markets are no exception (McKelvey, 2006). Market penetration strategy has been so effective that from metropolitan cities to underdeveloped towns, Pepsi enjoys the status of serving drinks to guests, and surprisingly, a luxury in underdeveloped areas where the nations are termed as low-income groups. Such is the reason that event marketing is highly practiced by Pepsi, and it is often used as a complementary food along with the traditional main course. Talking about events, family reunions, friends meet, or marriage functions, fizzy drinks are a must in South Asian culture, and they mostly end up being with Coke, Pepsi, and others to name a few (Bai, 2023). This makes Pepsi an interesting research outlet whose marketing strategy should be analyzed as to what has its impact and influence on generations. Though Pepsi's marketing philosophy remains the same across South Asia (Biswas & Sen, 1999), it can be critical to study each region specifically. As part of the research gap, there have been numerous studies on Pepsi's advertising and its marketing philosophy. While Moraru (2010) discusses Pepsi's and Coke's brand positioning, there are studies that offer a comparison of Pepsi's websites across cultures, but there exists room to research Pepsi advertisements across generations in a specific period of time. What has been Pepsi's philosophy of staying relevant across decades, how has Pepsi been coping with ever-demanding youth, and how has it successfully catered to the savvy customers in competitive markets across the world? These are some of the areas that need to be identified more precisely. Therefore, this research aims to analyze some of the attributes of Pepsi's advertising campaigns on TV (TVCs to be specific) in Pakistan that span across an era of 4 decades. This can be achieved by working out the following research objectives

> To analyze Pepsi TVC themes
> To understand the role of Celebrities in Pepsi's ad content
> To review the element of localization
> To overview the significance of event marketing

LITERATURE REVIEW

Brand Communication

Brand communication is rather a broader term encompassing the way a brand connects with its audience across various touchpoints (Kończak & Rewilak, 2025). These touchpoints and means of communication aim at value creation for its customers (Arbaiza, 2023), who have been suspects and prospects at some point in time. Exposure to communication requires various strategies and mediums that marketers employ to the best of their ability, i.e., both monetary and intellectual (Garcia-Collart, 2024). From strategies aiming at brand awareness to conversion, marketing communication is all about making customers believe that they are getting the best of the products/services. In the FMCG sector, Pepsi's communication is not short of an ideal way to interact with its customers. Even to win customers' emotional connection, Pepsi turned out Pecsi in Argentina as locals can't pronounce the word Pepsi in particular. Such is the "think global and act local" phenomenon that guarantees Pepsi's success and appeal to the masses. The use of slogans to local taglines, Pepsi's Brand communication

is a must-study option, the in-depth analysis of which is one of the objectives as the study proceeds.

Flexible Marketing

As brands continue to cope with standardization and evolvement, flexible marketing refers to adjustments in brands' life cycles as needed (Singh, 2010). This agility is not only linked to product development but also to promoting brands differently as per variant demographics, adjusting the marketing programs as per cultural understanding, and offering discounts as per the levels of Maslow's hierarchy of needs in respective economies is what surrounds flexible marketing. Brands that cope with all the modernization and current trends are termed successful brands (Natashen, Kandasamy, & Rangegowda, 2025). These trends might range from customers being savvy to understanding the change in their technological needs (Oates & Polumbaum, 2024). In addition, other microenvironment factors also play a vital role in designing brands' flexible marketing strategies (King & Lybecker, 1983). This may be an antecedent of change in state regulations, e.g., a specific embargo on trade with a particular country or a brand to a must adaptation as per the environmental factor. Brands that are flexible in their approach tend to have long-term survival. Specifically, to be in line with updated marketing programs, brands opting for flexible marketing are well aware of trends, e.g., following brand activism strategy in current times where all brands aim at specific cause-related marketing and show their concern for society and noble cause in their marketing programs (Rangkuti, 2004). As flexible marketing aids in keeping brands relevant across generations, the brief analysis of Pepsi's flexible marketing strategy in the findings section of this study may turn out to be a thoughtful strategy for other brands contesting in similar marketing dynamics.

Brand Ambassadors

Brand ambassador is the term used to describe the role of individuals representing the brand (Amanda & Shanty, 2025). Though not limited to celebrities only, it's mostly famous people/ celebrities/ athletes, and influencers who appear in the advertising of brands. These days, with the convergence of industries, brand ambassadors may have been dissected further into micro and macro influencers (Karamchandani, Shukla, & Shukla, 2025). Earlier TVCs and print media used to be considered outlets for brands to employ famous personalities as brand ambassadors, where they used to promote brands and their features (Luthra, et al., 2025), but now, mediums like TikTok and YouTube, etc. have widened the scope for common people to promote products/ services with their common man mass appeal (Arya, Paul, & Sethi, 2022). Though Vloggers and YouTubers have widened the scope of the ad world (Islam, Ahmed, Kabir, & Ahmed, 2025), the credibility and reliability of movie stars and athletes are still a top priority for top brands. Catering to this, fizzy brands like Pepsi and Coke, sports brands like Nike and Adidas, mobile phone brands like Apple and Samsung, etc., have been famous for utilizing celebrities as brand ambassadors to build their respective brand image. The methodology section in this research will encompass various aspects of celebrity branding as a basis for how the brand under observation has employed different brand ambassadors over time.

Event Marketing

Event Marketing is one of the key strategies that is employed to capitalize on specific events (Preston, 2012). Marketers tend to resonate with the respective traditions and cultural ethos of a country and make their mark by employing specific promotional campaigns accordingly (Wood, 2009). Ranging from seasonal greetings to sports events, Marketers make their way to make their presence felt (Drengner, Gaus, & Jahn, 2008). This may also end up or result in sponsoring the entire event to enter further collaborations. This may not be limited to sponsoring hoardings or billboards, as marketers aim to achieve an emotional connection in terms of awareness campaigns or any cause-related marketing (Wohlfeil & Whelan, 2006). Be it a campus awareness campaign or ensuring sustainability goals, event marketing is the top priority of most brands. Pepsi specifically has been renowned for its event marketing campaigns, ranging from Ramadan (the fasting month of Muslims) in Pakistan to Navratri in India. Pepsi's ethos of sponsoring sporting events is an evident phenomenon in the study demographics under observation. It will be interesting to analyze the role of event marketing by Pepsi as the study advances.

AIDA Model

The acronym of the AIDA model is described as A= Awareness, I= Interest, D= Desire, whereas A equals "Action". As per most of the literature, the first three letters were developed by Lewis in 1898, whereas Strong in 1925 is credited for the last letter A as "Action". The AIDA model is significant for the attribution of all the above factors in developing a communication message for the ad campaigns (Lal, 2025). With the first A as Awareness, the communication message should have a clear awareness about the product features, whereas I reflect the availability of interest in the message (Ferguson, 2025). This interest can be generated by focusing on customer benefits and the ability of a product to satisfy its target audience/ viewers. The third letter D for Desire can range from the premium Ness of the brand to the usage of a color palette in the ad or the effectiveness and following of a message source I.e., the brand ambassador, who bears the ability to take the target audience to last stage of call to action with letter "A". Any ad or communication message bearing these four elements for a

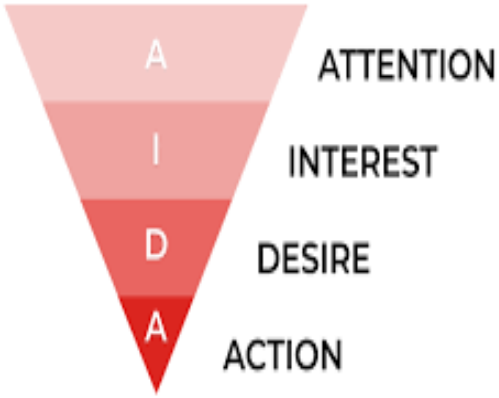


Fig 1. AIDA Model

Source (Lewis, 1898)

successful campaign reflects the execution of the AIDA model (Ghirvu, 2013). Brands are found to employ the theory of the AIDA model in their practical campaigns and aim at achieving the desired results as well (Fortenberry Jr & McGoldrick, 2020). In the respective sections of this study, the author will correlate the theoretical aspects of the AIDA model regarding Pepsi's TVCs.

METHODOLOGY

Research Approach

The study is qualitative, whereas the discourse analysis technique has been applied to extract findings. Discourse Analysis is a method that interprets the meaning behind the text, with further inclusion of nonverbal text (Gee, 2014). To be further specific, this paper uses discourse analysis to understand Pepsi TVCs for specific decades. This may further incorporate discussion in the social context as well.

Sampling Strategy

The object of research is the brand Pepsi. Pepsi was selected based on its recognition and mass appeal. Not only is the brand known to the masses, but its ad content is also widely viewed. The sampling region is Pakistan, and ads shown in Pakistan are chosen, spanning from 1987 to 2017.

Data Collection

To have a better overview of Pepsi's ad campaigns across generations, a video containing 20 ads from 1987 to the year 2018 was taken from the online platform YouTube. Again, the ads taken belong to Pakistani Origin only. Out of the 20 ads, 19 have been studied to keep the analysis limit to 30 years. The rationale for ads till 2017 surrounds factors such as availability, accessibility, the era surrounding almost three decades, and before digitalization.

Developing categories for analysis

Categorizing the data is an important measure of qualitative analysis. The ads are divided into four categories to ensure cohesion with Critical Discourse Analysis (CDA). These are 1) Ad theme, 2) Brand Ambassadors, 3) Slogan, and 4) Logo. The rigor of the CDA further ensures reliability and validity as Category 1 discusses the theme the ad is based upon, i.e., Sports, showbiz, etc., and Category 2 demonstrates the usage of Brand Ambassador, i.e., sportsman, movie star, etc. Category 3 to justify the rationale for using slogans, whether based on energy or youth. In contrast, category 4 discusses whether there is any change in the logo during that duration or not. The ads are grouped based on 4 years, justifying the relevance of ad themes as per sporting titles, and the starting year of ads is

RESULTS

Table 1. Ad evaluation 1987 - 1991

Ad year	No of ads observed	Ad theme	Brand Ambassador/s	Slogan	Logo
1987	1	Cricket Net Practice	Imran Khan	The Choice of a New Generation	Blue, Red, Light Blue
1991	1	Cricket Net Practice	Imran Khan, Wasim Akram, Waqar Younis	The Choice of a New Generation	Blue, Red, Light Blue

Source: (Author's own)

The two ads observed in Table 1 depict the use of a cricket theme. An attempt is made to exploit the rising cricket fever as a top sport in the country. This sports association has been aided by brand ambassadors such as Imran Khan – the equivalent of Maradona or Pele of Football. The second ad further incorporates emerging stars at that time, i.e., Wasim Akram and Waqar Younis. This entails Pepsi's approach to market penetration and aiming as a generational brand. This is also backed by the usage of a slogan, i.e., "The choice of a new generation".

Table 2. Ad evaluation 1992 - 1995

Ad year	No of ads observed	Ad theme	Brand Ambassador/s	Slogan	Logo
1993	1	Public Concert	Junaid Jamshaid (The Vital Signs Band)		Blue, Red
1994	1	Couple Connection	Haroon (one of the then-singing sensations)		Blue, Red
1995	1	Concert, Youth Connection	Junaid Jamshaid (The Vital Signs Band)	The Choice of a New Generation	Blue, Red

Source: (Author's own)

Table 2 reveals an analysis of 3 ads from 1992 to 1995. In the first ad, Pepsi has continued with its philosophy of keeping up with current sensations as the theme is a Public Concert where the then-hit music band "Vital Signs" has been found consuming and promoting Pepsi at public gathering. The same goes for the coming years (1994 and 1995) when Pepsi continued with the music spree and opted for another music sensation of that time. While it stuck with the same slogan, it was found to use 2 colors in its logo, specifically on the bottles. To add to it, it can be said that Pepsi might have used cricket and sports ads during that tenure also, but they adjusted their marketing campaigns to a music theme as well.

Table 3. Ad evaluation 1996 – 1999

Ad year	No of ads observed	Ad theme	Brand Ambassador/s	Slogan	Logo
1996	1	Cricket - Fast Bowling, Pepsi relatability with cricket	Wasim Akram, Waqar Younis, West Indian Fast bowlers		Blue, Red
1997	1	Cricket -Dressing Room need	Shahid Afridi, Wasim Akram	Generation Next	Blue, Red
1998	1	Cricket, Urge for Pepsi	Saqlain Mushtaq	Ask for More	Blue, Red
1999	1	Cricket, Urge for Pepsi	Shoaib Akhtar, Wasim Akram	Yeh dil mange aur (The heart wants more)	Blue, Red

Source: (Author's own)

As per Table 3, here again, Pepsi is shown focusing on the cricket theme with the inclusion of new cricket stars. Here, the emerging stars (Wasim Akram and Waqar Younis) had become established, whereas new sensations such as Shahid Afridi and Shoaib Akhtar were introduced as emerging stars who could have better relatable to the new fan club. The slogan in the context of "Generation Next" compliments its strategy. In addition, other slogans emphasize the urge to use more Pepsi, i.e., the Usage rate had also been incorporated into the strategy.

Table 4. Ad evaluation 2000 – 2003

Ad year	No of ads observed	Ad theme	Brand Ambassador/s	Slogan	Logo
2000	1	Cricket, Couple Connection	Shahid Afridi, Female Model	Yeh dil mange aur (The heart wants more)	Blue, Red
2001	1	Cricket, Net Practice,	Wasim Akram	Yeh dil mange aur (The heart wants more)	Blue, Red
2002	1	Gully Cricket	Dareen Lehman, Shane Warne (International cricketers)	Dil hai tau mango aur (Ask for more straight away from the heart)	Blue, Red
2003	1	Cricketers in the Safari, World Cup Campaign	Waqar Younis, Wasim Akram, Inzamam ul Haq, Shoaib Akhtar, Shahid Afridi		

Source: (Author's own)

Table 4 above shows not only Pepsi's continued association with cricket but also its ability to cash in on the brand persona of the cricketers as brand ambassadors. Shahid Afridi's chocolate boy appeal was depicted in one of the ads, whereas there was an inclusion of international cricketers (non-Pakistani) in one of the ads in 2002. The very ad also stresses the element of gully cricket and Pepsi's likeability among youth. There is also found the event marketing strategy where Pepsi developed a multi-star campaign for the 2003 World Cup scheduled in Africa. The ad theme demonstrated a safari setup for a relatability effect. Also, there has been a continuous change in slogans urging the need for Pepsi consumption with the emotional appeal. The word "Heart" has been used on multiple occasions in slogans to serve the cause.

Table 5. Ad evaluation 2004 – 2007

Ad year	No of ads observed	Ad theme	Brand Ambassador/s	Slogan	Logo
2004	1	Showbiz, Singing	Reema		Blue, Red
2005	1	Showbiz, Singing, Urge for Pepsi	Ali Zafar, Shaan		Blue, Red
2006	1	Showbiz, singing	Adnan Sami Khan		Blue, Red
2007	1	Cricket, World Cup Motivation Campaign	Younis Khan, among others (Inzamam, Kamran Akmal, and others), Imran Khan		Blue, Red

Source: (Author's Own)

Table 5 evaluates 4 ads from the year 2004 to 2007. It was a time when some of the previously used cricket stalwarts had resigned, and Pepsi had to cash in on other hit trends, i.e., showbiz. However, Pepsi didn't lose its hold on the cricket connection completely, and it continued with the World Cup event campaign for 2007. The discussion section will further encompass the peculiarities of not keeping up with the cricket theme as aggressively as in previous years for this duration.

Table 6. Ad evaluation 2008 – 2011

Ad year	No of ads observed	Ad theme	Brand Ambassador/s	Slogan	Logo
2008	1	Gully cricket, Urge for Pepsi	Wasim Akram		Blue, Red
2009	1	Cricket	Shahid Afridi	Badal do Zamana (Change the era)	Blue, Red
2010	1	Tennis and Concert Singing	Assam ul Haq, Call (band)	Josh, Cha ja, Agay Barh Multiple (Spirit, Make Impression, move ahead)	Blue, Red

2011	1	Cricket, World Cup campaign (airport setting)	Shahid Afridi, Shoaib Akhtar, Abdul Razzaq	Dunya hai dil waloan ki (The world belongs to those with hearts)	Blue, Red

Source: (Author's own)

Table 6 demonstrates Pepsi using everything coming its way. Bringing back the old Wasim Akram, capitalizing on Shahid Afridi's established star image, and bringing in Tennis star Assam ul Haq in campaigns to continue with the 2011 World Cup campaign, Pepsi made sure that the motivation to move ahead and spirit to change the world was something to get connected with the target audience. Multiple taglines incorporating words like "move ahead", "change the world," etc., were utilized to the best of their emotional connection with the target market.

Table 7. Ad evaluation 2012 – 2015

Ad year	No of ads observed	Ad theme	Brand Ambassador/s	Slogan	Logo
2012	1	Hard-Hitting Cricket	Shahid Afridi		Blue, Red
2013	1	Cricket, Urge for Pepsi	Misbah ul Haq, M Irfan, Saeed Ajmal, Junaid Khan	Dil Mange Abhi (Heart wants it right now)	Blue, Red (modified)
2014	1	Cricket, World Cup campaign	Shahid Afridi, Wasim Akram, Waqar Younis		Blue, Red
2015	1	Cricket	Shahid Afridi, Umar Akmal		Blue, Red

Source: (Author's own)

Table 7 shows ads following the previous pattern. The cricket theme was preceded, dominated by Shahid Afridi's presence as the main lead, who had turned up as an established star then. A cricket World Cup campaign's ad also witnessed the reunion of the legendary duo of Wasim Akram and Waqar Younis, along with others. There was also a change in logo design as well with the previously followed color pallet.

Table 8. Ad evaluation 2016 – 2019

Ad year	No of ads observed	Ad theme	Brand Ambassador/s	Slogan	Logo
2016	1	CSR, Sufi Music in the background	Hamza Ali Abbasi		Blue, Red
2017	1	CSR, lightning bulbs, and Sufi Music in Background	Nauman Ijaz		Blue, Red

Source: (Author's own)

Table 8 reveals that Pepsi continued to be agile as it followed the CSR orientation in its ads. The ads encapsulated famous showbiz stars (new and established) and a focus on community service.

DISCUSSION

As part of the findings in relation to the existing literature on marketing, Pepsi has been found to employ the best marketing strategies that are taught worldwide. There is an observed *product development strategy* in terms of Lays, Kinley, and Sting, the energy drink. There is the exercise of event market strategies where Pepsi comes up with a *global and act local* approach. Beyond what we discussed in this study about the relationship of Pepsi with cricket in Pakistan, Pepsi does Eid (a Muslim celebrated event after the month of Fasting) promotions, which perfectly follows the concept of cultural consciousness as one of the social attributes of *macro environment factor*s. Then, it is found that practicing the *corporate social responsibility* strategy during COVID-19 times. So, Pepsi presents an adequate understanding of applying the majority of the macro environment and event marketing philosophy.

The use of *Brand Ambassadors* and *Product Life Cycle* aspect is adequately showcased in Pepsi's campaigns. It capitalizes on the life of brand ambassadors and aids not only its brand development to stay relevant but also contributes to the longevity of celebrity brands. This signifies Pepsi's *brand reinforcement strategy,* where the idea is to bring *nostalgia marketing* to its campaigns. This strategy can further be linked to *brand recall* to reassure *brand loyalty* parameters as well. Also, Pepsi is found to readjust its *brand elements* at times. This depicts Pepsi's understanding of being agile with the trends. Its slogans, as far as the Pakistani market is concerned, have found trendy connections, whereas the use of Urdu (the National Language of Pakistan) ensures brand connection with the target audience. To add to it, this also accounts for *adaptation practices/strategies* in the context of international marketing literature. However, very smartly, Pepsi logos haven't shown great variation but notable ones to address and connect with the audience.

CONCLUSION

There is no denying that the brand Pepsi has been successfully implementing marketing knowledge in its campaigns. Pepsi's philosophy of keeping up with the trends is evident in the Pakistani context. Catching up with influential sportsmen and living up to the nation's liking for the sport of cricket, Pepsi kept on signing the cricket sensations for all those years. The greater the sportsman who was hit, the bigger has been and will be the affiliation and endorsement with Pepsi. This effect of celebrity being an effective influencer has been depicted in the works of Macheka, Quaye, & Ligaraba (2024). Continuing with being agile in its marketing approach, Pepsi has been found hiring showbiz and music sensations as well. This is a clear depiction of Pepsi's staying relevant with trends and customers' choices. Whoever turns out to be a hit, whether a sportsman, showbiz star, or singer, Pepsi is ready to sign them. Another aspect of significance lies in Pepsi's approach to event marketing. From Independence Day to sporting events, Pepsi exercises the basics of event marketing and sponsorship and also adds to the cause of brand promotion. Boronczyk & Breuer (2021) describe the essence of event marketing as a means of brand recall. Along with brand ambassadors and event marketing, the study reveals Pepsi's strategy of adjusting to its brand elements. Though not aggressively, Pepsi kept on changing the slogans and adjusting its logo on some occasions. This again solidifies Pepsi's approach to staying relevant to generations and their thought process, thus adding to the execution of adaptation in its

marketing. Reghunathan & Joseph (2021) in their study also discusses the importance of brand elements in building brand image. The significant role of Corporate Social Responsibility can't be denied in building a concerned corporate image; therefore, organizations should not only continue to genuinely apply CSR activities but also opt for new ways/ strategies encompassing CSR initiatives.

Overall, Pepsi TVCs and marketing campaigns offer a comprehensive viewpoint of Marketing theory and practices, which can be beneficial for marketing scholars and practitioners, depicting the aspects of a bigger brand's effective, agile, and flexible marketing strategy.

FUTURE RESEARCH

Future research may surround the replication of the very study with minor modifications in other countries where Pepsi is actively marketing. Parallels can broaden the scope of the standardization versus adaptation approach in the context of international and global marketing. The advertising firms can get hold of marketing protocols in the FMCG sector, which can give them an opportunity for strategy implementation and execution for meaningful results.

Ethical Statement

There are no competing interests for this publication.

LITERATURE

Amanda, R. A., & Shanty, B. M. (2025). The influence of brand ambassadors on purchasing decisions with trust as a mediating variable (study on Bukalapak consumers in Malang Raya). In *Economic Sustainability and Social Equality in the Technological Era* (pp. 595-604). Routledge. doi:DOI:10.1201/9781003534495-59

Arbaiza, F. (2023). Trust and the Promise of Effective and Honest Communication. *Tripodos*(54), 6–8. doi:https://doi.org/10.51698/tripodos.2023.54.6-8

Arya, V., Paul, J., & Sethi, D. (2022). Like it or not! Brand communication on social networking sites triggers consumer-based brand equity. *International Journal of Consumer Studies, 46*(4), 1381-1398. doi:https://doi.org/10.1111/ijcs.12763

Bai, Z. (2023). Business Analysis of PepsiCo and Coca-Cola Companies. *Highlights in Business, Economics and Management, 22*, 114-118. doi:https://doi.org/10.54097/8795cd57

Biswas, A., & Sen, A. (1999). Coke vs Pepsi: Local and global strategies. *Economic and Political weekly*, 1701-1708. Retrieved from https://www.jstor.org/stable/4408132

Boronczyk, F., & Breuer, C. (2021). The company you keep: Brand image transfer in concurrent event sponsorship. *Journal of Business Research, 124*, 739-747. doi:https://doi.org/10.1016/j.jbusres.2019.03.022

Chen, X. (2023). Analysis of Pepsi's Advertising Marketing Strategy. *Highlights in Business, Economics and Management, 19*, 244-249. doi:https://doi.org/10.54097/hbem.v19i.11884

Drengner, J., Gaus, H., & Jahn, S. (2008). Does flow influence the brand image in event marketing? *Journal of advertising research, 48*(1), 138-147. doi:https://doi.org/10.2501/S0021849908080148

Ferguson, J. (2025). *Experiential Advertising: The Immersive Evolution of Marketing.* Retrieved from Interior Design Undergraduate Honors Theses: https://scholarworks.uark.edu/idesuht/13

Fortenberry Jr, J. L., & McGoldrick, P. J. (2020). Do billboard advertisements drive customer retention? Expanding the "AIDA" model to "AIDAR". *Journal of advertising research, 60*(2), 135-147. doi:https://doi.org/10.2501/JAR-2019-003

García, I., Gibaja, J. J., & Mujika, A. (2013). A Study On the Effect of Cause-Related Marketing On the Attitude Towards the Brand:: The Case of Pepsi in Spain. *Nonprofit and Business Sector Collaboration*, 111-135.

Garcia-Collart, T. (2024). Speak up! brands' responsiveness matters: consumer reactions to brand communications in the early stages of a crisis. *Journal of Product & Brand Management, 33*(4), 449-459. doi:https://doi.org/10.1108/JPBM-01-2023-4311

Gee, J. P. (2014). *An introduction to discourse analysis: Theory and method.* routledge. doi:https://doi.org/10.4324/9781315819679

Ghirvu, A. I. (2013). The AIDA model for advergames. *USV Annals of economics & public administration, 13*(1). Retrieved from http://www.annals.seap.usv.ro/index.php/annals/article/viewFile/497/548

Islam, M. M., Ahmed, F., Kabir, M. A., & Ahmed, M. R. (2025). The Impact Of Short Video Content And Social Media Influencers On Digital Marketing Success: A Systematic Literature Review Of Smartphone Usage. *Frontiers in Applied Engineering and Technology, 1*(02), 01-17. doi:https://doi.org/10.70937/faet.v1i02.46

Karamchandani, S., Shukla, S., & Shukla, K. (2025). From Trust to Transaction: The Role of Micro-Influencer Image Satisfaction and Advertising Trust in Shaping Purchase Intentions. *Journal of Creative Communications*. doi:https://doi.org/10.1177/09732586241305769

King, R. P., & Lybecker, D. W. (1983). Flexible, risk-oriented marketing strategies for pinto bean producers. *Western Journal of Agricultural Economics*, 124-133. Retrieved from https://www.jstor.org/stable/40987614

Kończak, J., & Rewilak, J. (2025). Key Drivers of Advertising and Brand Communication in Professional Sport360-Degree Communication. In *The Political Economy of European Football* (pp. 47-68). Routledge.

Lal, R. (2025). Enhancing Advertising Effectiveness Through AIDA, AI, and Data Visualization Integration for Business Strategies. In *Data Visualization Tools for Business Applications* (pp. 85-102). IGI Global. doi:DOI: 10.4018/979-8-3693-6537-3.ch005

Luthra, A., Shah, D., Choubey, A. K., Gupta, A., Kumar, H., & Asch, Z. (2025). Factors Influencing Brand Evangelism Through Influencer Marketing. In *Data Analytics and Influencer Marketing for Cultivating Brand Evangelism and Affinity* (pp. 43-70). IGI Global Scientific Publishing. doi:DOI: 10.4018/979-8-3693-7773-4.ch003

Macheka, T., Quaye, E. S., & Ligaraba, N. (2024). The effect of online customer reviews and celebrity endorsement on young female consumers' purchase intentions. *Young Consumers, 25*(4), 462-482. doi:https://doi.org/10.1108/YC-05-2023-1749

McKelvey, S. M. (2006). Coca-Cola vs. PepsiCo--A" super" battleground for the cola wars? *Sport Marketing Quarterly, 15*(2). Retrieved from https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=a3429cea48564f62bf8da8085b825ae3b071d9f4

Moraru, M. (2010). The "positioning" concept and the fight between two well known brands Coca-Cola and Pepsi. *Journal of Media Research-Revista de Studii Media, 3*(07), 47-62. Retrieved from https://www.ceeol.com/search/article-detail?id=120784

Natashen, R. K., Kandasamy, R., & Rangegowda, R. (2025). Agile Strategies for Brand Identity and Market Positioning in Business Expansion. In *Expanding Operations Through Agile Principles and Sustainable Practices* (pp. 73-86). IGI Global Scientific Publishing. doi:DOI: 10.4018/979-8-3693-6274-7.ch005

Oates, T., & Polumbaum, J. (2024). Agile big man: The flexible marketing of Yao Ming. *Pacific Affairs*, 187-210. Retrieved from https://www.jstor.org/stable/40022498

Preston, C. (2012). *Event marketing: how to successfully promote events, festivals, conventions, and expositions.* Wiley. Retrieved from https://eresearch.qmu.ac.uk/handle/20.500.12289/3348

Rangkuti, F. (2004). *Flexible Marketing.* Gramedia Pustaka Utama. Retrieved from https://books.google.com.pk/books?hl=en&lr=&id=9GfAMWD9H7wC&oi=fnd&pg=PR7&dq=Rangkuti,+F.+(2004).+Flexible+Marketing:+Gramedia+Pustaka+Utama.&ots=XgaOUyGvDP&sig=vQANPTVstUbtd0sPkMb-i3VRLyc&redir_esc=y#v=onepage&q&f=false

Reghunathan, A., & Joseph, J. (2021). Winning the loyalty cup: impact of symbol-related brand elements on brand loyalty of sports clubs. *International Journal of Sport Management and Marketing, 21*(3-4), 245-264. doi:https://doi.org/10.1504/IJSMM.2021.118823

Singh, N. (2010). A conceptual framework for flexible marketing system. *Global Journal of Flexible Systems Management, 11*, 11-16. doi:https://doi.org/10.1007/BF03396590

Wohlfeil, M., & Whelan, S. (2006). Consumer motivations to participate in event-marketing strategies. *Journal of Marketing Management, 22*(5-6), 643-669. doi:https://doi.org/10.1362/026725706777978677

Wood, E. H. (2009). Evaluating event marketing: Experience or outcome? *Journal of Promotion Management, 15*(1-2), 247-268. doi:https://doi.org/10.1080/10496490902892580

INSTRUCTIONS TO AUTHORS

Pan-European University Apeiron, College of modern management
„Economy and Market Communication Review –
Časopis za ekonomiju i tržišne komunikacije"
Pere Krece 13, 78102 Banja Luka, Bosnia and Herzegovina
E-mail: emc@apeiron-edu.eu ; Web: www.emc-review.com
ISSN 2232-8823 (Print); ISSN 2232-9633 (Online)

The scientific international journal „Economy and Market Communication Review – Časopis za ekonomiju i tržišne komunikacije" - journal for economy and market communication (ISSN 2232-8823 print; 2232-9633 online) was launched in 2011.

Economy, sustainable economic and social development, as well as market communication is at the heart of contemporary societies' interests. The SEE Region Journal publishes scientific and professional papers covering a wide range of topics available in the fields of global economy, business economics, social development, markets and competition, consumers, media and business communications, new technology, management, marketing, all in favour of improving existing knowledge, stimulating discussion and reflection on contemporary topics in these areas. The journal focuses on these topics from the perspective of different theories, policies and practices, and promotes an interdisciplinary approach.

The journal for economy and market communication (EMC Review) is an international peer-reviewed, open approach (OA) journal dedicated to the highest professional and ethical standards, including zero tolerance for plagiarism culture and other unacceptable forms of activity.

The journal is published twice a year (in June and December). The deadline for submitting papers for June is March 30th and 30th August for December edition. Papers are submitted through the Open Journal Systems platform (OJS).The paper must not be under review and/ or published by another journal. When submitting your paper, you must indicate the author who will be in charge of correspondence at all stages of the review and publication processes, as well as his/her contact details (telephone numbers, email and full postal address). In one paper can only participate three authors at most.

The manuscripts are sent to the journal redaction and are published in languages of the people of Bosnia and Herzegovina or English, in Latin script. In order for a paper to be published, it must be fully in line with the Instructions to Authors and must be positively reviewed by at least two independent anonymous reviewers (Instructions to Reviewers).

Authors must respect the scientific methodology when writing their papers. All papers received are forwarded to the members of the Editorial Board for their evaluation, as well as to the experts outside the Editorial Board in case of a specific content of the text. Following their evaluation, the editor in chief proposes to the Editorial Board decisions for further actions as follows:

I. Which papers to reject,

II. Which papers to return to the authors with suggestions, recommendations and remarks on how to improve their text prior to sending it for peer review,

III. Which papers to forward for peer review.

Through an automatically generated message or discussion on the OJS platform. When submitting a manuscript to the OJS platform, the authors confirm the electronic Statement of Authorship and Copyright. Thus, the authors confirm the authenticity of their article and copyright and acknowledge the reviewing process.

The papers which are forwarded for review are sent to at least two anonymous reviewers. Peer review means that reviewers are unaware of who the authors of papers are, as is the case with authors.

Editorial board will send the invoice to the correspondent author to pay the costs of the review process. The costs of the review procedure for one paper is 100,00 €, or 200,00 KM (no matter how many authors are at paper and whether they come from the country or abroad). The paper will not be submitted for review until the author has submitted proof of payment of the costs the review process.

Following the review, should reviewers request so, the paper is sent back to authors to be amended. The reviews are only submitted to the author after both have been received. Besides taking on board the comments and suggestions of reviewers, the authors must also submit a supporting letter in which they list the changes made to their paper, linked with the corresponding page where these have been done. The corrected paper and the supporting letter are sent to the Editorial Board through the OJS platform.

After the author has resubmitted the paper, it is sent to the reviewer for opinion. In situations when reviewers are not in agreement relative to their opinion on the paper's suitability for publication and/or its classification, the decision will be rendered by the Editorial Board upon a proposal by the editor in chief.

Upon the proposal by reviewers and in line with the decision by the Editorial Board, the papers are classified into four categories:

I. original scientific paper, which contains the results of an original scientific research unpublished to date;

II. preliminary report, which contains the new results of a scientific research, useful to be published promptly;

III. review, which contains an original, concise and critical review of an area and provides a contribution given the papers published to date;

IV. professional paper, which contains useful contributions from and for the profession but does not necessarily represent an original research.

Upon the positive decision on publishing, and following proofreading and editing, the paper shall be submitted to the authors for their opinion and check prior to publication.

The author may, upon request, be issued with an appropriate confirmation of the status of his paper. The table "Structure and Form of Paper" provides detailed instructions to authors in relation to the technical layout of the paper, as well as to its recommended structure.

STRUCTURE AND FORM OF PAPER

COVER PAPER

Must include the title of paper, name of author, his/her academic title, name and address of institution where the author works, position and contact details in both Bosnian/Croatian/Serbian and English (if the paper is written in languages of the people of Bosnia and Herzegovina).

FIRST PAGE

Must include the title of paper, abstract, key words and JEL classification.

Abstract

a. If the paper is written in the languages of the people of BiH, the abstract will contain between 150 and 300 words. At the end of the paper, an extended summary (English version) is written behind the list of references, which should be 400-500 words long. The abstract is written in the third person, in one paragraph and must contain: (1) the aim of the research, (2) research methods, (3) the basic result of the research, and (4) the conclusion of the research.

a. If the paper is written in English it is not necessary to write a summary at the end of the paper, while the other rules for writing the abstract are the same as under a)

Key words

Key words are written in both languages of the people of BiH and English (if the paper is written in the languages of the people of BiH) and must contain the gist of the paper. Up to 5 key words should be provided.

JEL classification

JEL classification is provided under the key words in both languages of the people of BiH and English (if the paper is written in languages of the people of BiH) in accordance with the Journal of Economic Literature classification (available at https://www.aeaweb.org/econlit/jelCodes.php?view=jel).

RECOMMENDED STRUCTURE OF PAPER[1]

1. Introduction

It should define the problem, subject matter and aim of research, as well as the motive for undertaking such research. The Introduction should also offer one or several hypotheses of the paper, which should be developed in the final chapter of the paper – the Conclusion. The Introduction ends with the description of the paper's structure.

[1] Depending on the specifics of the topic, and in agreement with the Editorial Board, the paper may be conceptualized differently.

2. Literature overview

Literature Overview involves the overview of relevant literature in the area of the paper, with key knowledge available to date or relevant results of research conducted to date. Exceptionally, the author may include Literature Overview in the Introduction.

3. Methodology

Methodology must be described clearly and precisely, the methodological contribution of authors (if available) must be established and it must all be done in a fashion that it allows for its testing by other authors.

4. Empirical evidence

Empirical evidence represents the documentation background to the research conducted.

5. Results and discussion

Results and discussion represent part of the paper in which results of the research conducted are explained and compared to similar research, the limits of the interpreted results are analysed, as are their significance and potential implications.

6. Conclusion

Conclusion is the final chapter of the paper. It should not be confused with the paper's abstract. It should contain the elaboration of the original hypothesis, the evaluation of the results of research, its contri- bution, the overview of limitations and problems relative to research implementation, the guidelines for future research, the recommendations stemming from the results of research etc. As is the case with abstract, the Conclusion should be contained in one paragraph.

LITERATURE

The list of literature should be provided at the end of paper, and it should only contain those titles which are referred to by the author throughout the text. It should be provided in the alphabetical order of the last name of authors of the mentioned works with no classification per types, and data on the work must be complete, in accordance with the standards of bibliography. If several works of the same author have been published in the same year, the year should be accompanied by designations "a,b,c".

The used literature should have at least 15 sources for review scientific papers, while for all other papers there should be at least 10 sources. The bibliography should be of a recent date.

It is recommended that the authors refer to sources of papers previously published in the EMC Review (http://www.emc-review.com), as well as those referenced by the Institute of Science Information.

Use **APA** style (http://www.apastyle.org) to write references for text and literature references.

Examples of citations:

Books: last name, initials of the author's first name. (year) Title. Place of publication: name of publishers. (if there are two or three authors, their last names and initials should be listed in order, separated by a comma)

Christensen, C. M. (2012). The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail. Boston, M. A.: Harvard Business School Press.

Mieg, H. A., Töpfer, K. (ur.) (2013). Institutional and Social Innovation for Sustainable Urban Development. Oxon i New York: Routledge.

Chapters in books/papers in the collections of papers: last name, initials of the first name. (year) Title of chapter/section'. In: Title of book, last name, initials of the first name of author/editor. Place of publication: publisher: pages. (if there are two or three authors, their last names and initials should be listed in order, separated by a comma).

Braun, G. O., Scott, J. W. (2013). Smart Growth: sustainability innovations. In: Institutional and Social Innovation for Sustainable Urban Development, Mieg, H. A., Töpfer, K. (ur.). Oxon i New York: Routledge: 44-57.

Peter, C. (2013). Privatization, urban fragmentation, and sustainable development. In: Institutional and Social Innovation for Sustainable Urban Development, Mieg, H. A., Töpfer, K. (ur.). Oxon i New York: Routledge: 130-146.

Doctoral dissertations: last name, initials of the author. (year) Title of work, type of work and the institution where the dissertation was defended.

Hall, R. P. (2006). Understanding and Applying the Concept of Sustainable Development to Transportation Planning and Decisi- on-Making in the U.S., doktorska disertacija Massachusetts Institute of Technology,

Articles in journals: last name, initials. (year) Article title. Name of journal, volume (number): pages. (if there are two or three authors, their last names and initials should be listed in order, separated by a comma)

Giddings, B., Hopwood, B., O'Brien, G. (2002). Environment, economy and society: fitting them together into sustainable develop- ment. Sustainable Development, 10(4): 187-196.

Granger, C. W. J. (1969). Investigating Causal Relations by Econometric Models and Cross-spectral Methods. Econometrica, 37(3): 424-438.

Series of articles/official publications:

Heal, G. (2011). Sustainability and its measurement. NBER Working Paper 17008, National Bureau of Economic Research, Cambridge, MA. Dostupno na: http://www.nber.org/papers/w17008.pdf.

Papers presented at conferences:

Moylan, K. (2009). The Future of EU Cohesion Policy and its implications for Irish Regional Policy. Rad prezentovan na Regional Science Association International Conference, Irska, 3.9.2009. Dostupno na: http://cua.ie/gorm/publications/The_Future_of_EU_ Cohesion_Policy_and_its_Implications_for_Irish_Regional_Policy_Sept%202009.pdf [13.1.2015.].

Internet sources: last name, initials of author/editor. (year) title. Institution/publisher/journal/… Internet address, date of access in square brackets. (if there are two or three authors, their last names and initials should be listed in order, separated by a comma)

McMaster, I., Bachtler, J. (2005). Implementing Structural Funds in the New Member States: Ten Policy Challenges. European Policies Research Centre. Dostupno na: http://www.eprc.strath.ac.uk/eprc/Documents/pdf_files/12A07_McMaster-Bachtler_paper. pdf [24.11.2014.].

TECHNICAL INSTRUCTIONS

- The paper should be written in Microsoft Office Word programme (MS Office Word 95 and later versions).
- Page format is A4 with single line spacing (including footnotes and references). The margins are 2.5 cm.
- The font type and size should be Times New Roman 12.
- The text should be justified and a single line spacing must separate paragraphs.
- The paper should be between 30.000 characters or 16 pages. If agreed with the Editorial Board, the paper can be up to 50.000 characters long.
- The paper must be written using standard language with no spelling or grammar errors.
- The title of paper must be written in capital letter, bold ,font size 16.
- The names of authors must be written in bold, font size 14.
- The headings of chapters, from Introduction to Conclusion, should be in bold. Headings and subheadings should not be numbered.
- Subheadings can be of maximum level three.
- Figure, tables, equations and charts that are an integral part of the paper must be clearly designed and entitled, and their source and number must be clearly stated. They should be enumerated in continuity using Arabic numerals. The titles should be written above the figure, table or chart using bold font size 11. Sources are provided below the figure, table or chart using font size 10.
- Footnotes are used to explain the man text, rather than to name the source of literature.
- In accordance with APA standard, Literature used is referred to throughout the text by placing between the brackets the last name of the author and the year of publication, for example: (Rodrik, 2008), and in case of quotations, the page number should also be added (Rodrik, 2008:78). Each note is stated as for the first time. If there are two authors, both last names are provided in brackets; if there are several authors, only the first one is mentioned: (Rodrik et al, 2008). Each reference must be listed in the list of literature.
- MS Office Word tools in the References - Style menu options: select the APA menu. Manuscripts that do not have this option activated when marking citations, references and literature will be returned to the authors for correction.

Do not specifically mark some words in the work, parts of the work, etc. in bold, italic or any other formatting..

STATEMENT OF AUTHORSHIP AND COPYRIGHT

Pan-European University „Apeiron“ in Banja Luka

„Economy and Market Communication Review
Časopis za ekonomiju i tržišne komunikacije“

Title of paper	
Name of author	
Title	
Area, field and branch of science	
Institution where the author works	
Adress	
Telephone	
E-mail	

Statement by the author

In the process of peer review and/or publication of the abovementioned paper in the journal EMC REVIEW - „Economy and Market Communication Review – Časopis za ekonomiju i tržišne komunikacije“ I hereby guarantee that:

- I am the sole author of the entire paper/I am the sole author of my part of paper developed in co-authorship with authors (delete unnecessary)
- The paper is not undergoing a procedure of peer review/publication in another journal
- The paper has neither partially nor entirely been previously published elsewhere, in no media
- I have fully abided by the principles of scientific integrity (full respect of copyright or any other ownership rights when developing the paper, for example, the paper uses no figures, tables or charts which are in any way protected or whose use requires an approval by the authors, all sources have been adequately cited etc.).

By this Statement of Authorship and Copyright I grant to Pan-European University „Apeiron“ in Banja Luka it being the publisher of the journal EMC REVIEW - „Economy and Market Communication Review – Časopis za ekonomiju i tržišne komunikacije“ , all copyright over the abovementioned paper (the right to communicate it to the public, distribute and reproduce) with no charge. As the author of the paper, I reserve the right to be identified as the author in every instance of its publication or of the inclusion of complete bibliographic units of the final published version of the paper and of the use of paper for educational and other non-commercial purposes with no prior approval of the publisher/Editorial Board.

Date	
Signature	

UPUTSTVA ZA AUTORE

Panevropski univerzitet Apeiron, Fakultet poslovne ekonomije
„Economy and Market Communication Review –
Časopis za ekonomiju i tržišne komunikacije"
Pere Krece 13, 78102 Banja Luka, Bosna i Hercegovina
E-mail: redakcija@emc-review.com ; Web: www.emc-review.com
ISSN 2232-8823 (Print); ISSN 2232-9633 (Online)

Naučni međunarodni časopis *„Economy and Market Communication Review – Časopis za ekonomiju i tržišne komunikacije"* (ISSN 2232-8823 print; 2232-9633 online) pokrenut je 2011.godine. Ekonomija, održivi ekonomski i društveni razvoj, kao i tržišne komunikacije predstavljaju centralna mjesta interesa savremenih društava. S fokusom na region Jugoistočne Evrope časopis objavljuje naučne i stručne radove koji pokrivaju široki raspon tema iz područja globalne ekonomije, poslovne ekonomije, društvenog razvoja, tržišta i konkurencije, potrošača, medija i poslovne komunikacije, novih tehnologija, menadžmenta, marketinga, a sve u cilju širenja i unapređivanja postojećih saznanja, podsticanja rasprava i razmišljanja o savremenim temama iz navedenih područja. Časopis je usmjeren na navedene teme s aspekata različitih teorija, politika i praksi, te promoviše interdisciplinarni pristup. Časopis za ekonomiju i tržišne komunikacije (EMC Review) je međunarodni recenzirani časopis s otvorenim pristupom (OA) i posvećen je najvišim profesionalnim i etičkim standardima, uključujući nultu toleranciju plagijarizma i drugih neprihvatljivih oblika rada.

Časopis izlazi dva puta godišnje (u junu i decembru). Rok za dostavu radova je 30.mart za junski, i 30.august za decembarski broj časopisa na redakcijski e-mail: *redakcija@emc-review.com*. Rad ne smije biti u postupku recenzije i/ili objave u drugom časopisu. Prilikom slanja rada potrebno je naznačiti koji je autor odgovoran za korespondenciju u svim fazama recenziranja i objavljivanja, te navesti brojeve telefona, elektronsku adresu i punu poštansku adresu. U jednom radu mogu učestvovati najviše tri autora.

Radovi se dostavljaju redakciji časopisa (i objavljuju) na jezicima naroda u Bosni i Hercegovini ili engleskome jeziku, u latiničnom pismu. Mogu se objaviti isključivo radovi koji su potpuno usklađeni s *Uputstvima za autore*, te pozitivno ocijenjeni od najmanje dva nezavisna anonimna recenzenta (*Uputstva za recezente*).

Autori se moraju pridržavati naučne metodologije u pisanju radova. Svi zaprimljeni radovi upućuju se na procjenjivanje članovima Uredničkog odbora, ali i stručnjacima izvan Uredničkog odbora u slučaju specifičnog sadržaja teksta. Poslije procjenjivanja glavni i odgovorni urednik predlaže Uredničkom odboru odluke za daljnji postupak, i to:

I. koje rukopise odbiti,

II. koje rukopise vratiti autoru sa sugestijama, preporukama i primjedbama radi poboljšanja prije slanja u postupak recenzije,

III. koje rukopise uputiti u postupak recenzija.

O odluci Uredničkog odbora autori se obavještavaju putem emaila. Nakon prihvaćanja rada za postupak recenzije autori potpisuju Izjavu o autorstvu i autorskim pravima koju e-mailom šalju Uredničkom odboru. Svojim potpisom autor potvrđuje izvornost svoga priloga (rukopisa) i svoje autorstvo, te prihvaća recenzentski postupak i njegove troškove. Uz datu izjavu, redakcija će korespodentnom autoru ispostaviti račun za plaćanje troškova postupka recenzije. Troškovi recezentskog postupka *za jedan rad* iznose *100,00 €*, odnosno *200,00 KM* (bez obzira koliko je autora na radu i da li dolaze iz zemlje ili inostranstva). Rad neće biti upućen u recenziju dok autor ne dostavi potpisanu izjavu i dokaz o uplati troškova postupka recenzije.

Radovi koji se upućuju u postupak recenzije šalju se na najmanje dvije anonimne recenzije. Anonimnost recenzija znači da recenzenti ne znaju ko su autori rada, niti autori znaju ko su recenzenti. Nakon recenzentskog postupka, ako recenzenti to zatraže, rad se šalje na doradu autorima. Ukoliko postoje, komentari recezenata se dostavljaju autoru nakon prijema obe recenzije. Osim uzimanja u obzir komentara i sugestija recenzenata, autori su obavezni dostaviti i popratno pismo u kojem se navode izmjene u radu i označene stranice na kojima su unesene izmjene. Korigovani rad i popratno pismo šalju se Uredničkom odboru e-mailom. Nakon što autor ponovo dostavi rad on se šalje i recenzentu na uvid.

U situacijama kad recenzenti nisu međusobno saglasni u svojim prijedlozima u vezi s objavom i/ili kategorizacijom rada, odluku donosi Urednički odbor, na prijedlog glavnog i odgovornog urednika.

Radovi se, na prijedlog recenzenata i u skladu s odlukom Uredničkog odbora, kategorišu u četiri kategorije:

I. originalni naučni rad koji sadržava do sada još neobjavljene rezultate izvornih naučnih istraživanja;

II. pregledni naučni rad koji sadržava izvorni, sažet i kritički prikaz jednog područja, te daje svoj doprinos s obzirom na već objavljene radove;

III. kratko prethodno saopštenje originalnog naučnog rada koje sadržava nove rezultate naučnih istraživanja, a koje je korisno brzo objaviti; i

IV. stručni rad koji sadržava korisne priloge iz struke i za struku, a ne mora predstavljati izvorno naučno istraživanje.

Nakon odluke o objavi rada, te lekture i korekture, rad će biti dostavljen autorima na uvid i pregled prije objave. Autoru se, na zahtjev, može izdati i odgovarajuća potvrda o statusu njegovog rada. U tabeli *Struktura i oblikovanje rada* navedena su konkretna uputstva autorima u vezi s tehničkim izgledom rada i preporučena struktura rada.

STRUKTURA I OBLIKOVANJE RADA

NASLOVNICA

Obvezno je navesti naslov rada, ime autora, akademsku titulu, naziv ustanove i adresu u kojoj je autor zaposlen, radno mjesto, te kontakt na jezicima naroda u BiH i engleskome jeziku (ako je rad pisan na jezicima naroda u BiH).

PRVA STRANICA RADA

Obvezno je navesti naslov rada, sažetak, ključne riječi i JEL klasifikaciju.

Sažetak

a. Ako je rad pisan na jezicima naroda u BiH sažetak sadrži od 150 do 300 riječi. Na kraju rada, iza popisa literature, piše se sažetak u proširenom obliku na engleskom jeziku (summary), čija dužina treba da bude od 400-500 riječi. Sažetak se piše u trećem licu, u jednom odlomku i obvezno sadržava:(1)cilj istraživanja,(2)metode istraživanja,(3)osnovni rezultat istraživanja,te(4)zaključak istraživanja.

b. Ako je rad pisan na engleskom jeziku nije potrebno pisati summary na kraju rada, dok su ostala pravila za pisanje sažetka identična kao pod a).

Ključne riječi

Ključne riječi pišu se na na jezicima naroda u BiH i engleskome jeziku (ako je rad pisan na jezicima naroda u BiH), te moraju sadržavati suštinu rada. Navodi se do pet ključnih riječi.

JEL klasifikacija

JEL klasifikacija navodi se ispod ključnih riječi i na jezicima naroda u BiH i na engleskome jeziku (ako je rad pisan na jezicima naroda u BiH) u skladu s klasifikacijom Journal of Economic Literature

(dostupna na **https://www.aeaweb.org/econlit/jelCodes.php?view=jel).**

PREPORUČENA STRUKTURA RADA[1]

1. Uvod

Sadržava definisanje problema, predmeta i ciljeva istraživanja, te motiv za provođenje istraživanja. U uvodu se navodi i hipoteza rada, ili više njih, o kojima se autor očituje u zadnjem poglavlju rada – zaključku. Uvod završava opisom strukture rada.

2. Pregled literature

Pregled literature sadržava pregled relevantne literature iz područja rada s ključnim dosadašnjim spoznajama, odnosno relevantnim rezultatima provedenih istraživanja. Izuzetno, autor može pregled literature uključiti u uvod.

3. Metodologija

Metodologiju je važno prikazati jasno i precizno, utvrditi metodološki doprinos autora ako je prisutan, te njenim prikazom omogućiti testiranje i drugim autorima.

4. Empirijski podaci

Empirijski podaci predstavljaju dokumentacionu podlogu provođenja istraživanja u radu.

5. Rezultati i rasprava

Rezultati i rasprava dio su rada u kojem se objašnjavaju rezultati provedenog istraživanja, uspoređuju sa sličnim istraživanjima, analiziraju ograničenja navedenih rezultata u njihovu tumačenju, značenje rezultata i njihove implikacije.

6. Zaključak

Zaključak je posljednje poglavlje rada. On se ne smije poistovjetiti sa sažetkom rada. Potrebno je da sadrži očitovanje o polaznoj hipotezi, ocjenu rezultata istraživanja, doprinosa provedenog istraživanja, osvrt na ograničenja i probleme u provođenju istraživanja, smjernice za buduća istraživanja, preporuke proizišle iz rezultata

[1] U zavisnosti od specifičnosti teme, a u dogovoru s Uredničkim odborom, rad se može i drugačije koncipirati.

istraživanja i drugo. Kao i sažetak, zaključak se piše u jednom odlomku.

LITERATURA

Popis literature treba biti na kraju rada, a može obuhvatiti samo djela na koja se autor poziva u tekstu. Slaže se po abecednom redu prezimena autora navedenih djela bez razvrstavanja po vrstama, a podaci o djelu moraju biti potpuni, u skladu s bibliografskim standardima. Ako je više radova istog autora objavljeno iste godine, uz godinu se koriste oznake „a,b,c".

Korištena literatura treba da ima najmanje 15 izvora za pregledne naučne radove, dok za sve ostale radove treba da ima najmanje 10 izvora . Bibliografija treba biti novijeg datuma.

Preporučuje se da se autori pozivaju na izvore radova koji su u prethodnom periodu bili objavljeni u časopisu „EMC Review" (http://www.emc-review.com), kao i onim koji su refereisani od Institute of Science Informationa.

Pri pisanju rada za oblikovanje referenci u tekstu i u popisu literature koristiti **APA** stil (http://www.apastyle.org).

Primjeri citiranja:

Knjige: prezime, inicijali imena. (godina) Naslov. Mjesto izdavanja: ime izdavača. (Ako su dva ili tri autora, redom navesti njihova prezimena i inicijale odvojene zarezom.)

Christensen, C. M. (2012). The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail. Boston, M. A.: Harvard Business School Press.

Mieg, H. A., Töpfer, K. (ur.) (2013). Institutional and Social Innovation for Sustainable Urban Development. Oxon i New York: Routledge.

Poglavlja u knjigama/radovi u zbornicima radova: prezime, inicijali imena. (godina) Naslov poglavlja/odjeljka. U: Naslov knjige, prezime, inicijali imena autora/urednika. Mjesto izdavanja: izdavač: stranice. (Ako su dva ili tri autora, redom navesti njihova prezimena i inicijale odvojene zarezom.)

Braun, G. O., Scott, J. W. (2013). Smart Growth: sustainability innovations. In: Institutional and Social Innovation for Sustainable Urban Development, Mieg, H. A., Töpfer, K. (ur.). Oxon i New York: Routledge: 44-57.

Peter, C. (2013). Privatization, urban fragmentation, and sustainable development. In: Institutional and Social Innovation for Sustainable Urban Development, Mieg, H. A., Töpfer, K. (ur.). Oxon i New York: Routledge: 130-146.

Doktorske disertacije: navodi se prezime, inicijali autora. (godina) Naslov rada, vrsta rada te institucija gdje je rad obranjen.

Hall, R. P. (2006). Understanding and Applying the Concept of Sustainable Development to Transportation Planning and Decisi- on-Making in the U.S., doktorska disertacija Massachusetts Institute of Technology,

Članci u časopisima: prezime, inicijali. (godina) Naslov članka. Naziv časopisa, volumen (broj): stranice. (Ako su dva ili tri autora, redom navesti njihova prezimena i inicijale odvojene zarezom.)

Giddings, B., Hopwood, B., O'Brien, G. (2002). Environment, economy and society: fitting them together into sustainable develop- ment. Sustainable Development, 10(4): 187-196.

Granger, C. W. J. (1969). Investigating Causal Relations by Econometric Models and Cross-spectral Methods. Econometrica, 37(3): 424-438.

Serije članaka/službene publikacije:

Heal, G. (2011). Sustainability and its measurement. NBER Working Paper 17008, National Bureau of Economic Research, Cambridge, MA. Dostupno na: http://www.nber.org/papers/w17008.pdf.

Radovi prezentovani na konferencijama:

Moylan, K. (2009). The Future of EU Cohesion Policy and its implications for Irish Regional Policy. Rad prezentovan na Regional Science Association International Conference, Irska, 3.9.2009. Dostupno na: http://cua.ie/gorm/publications/The_Future_of_EU_ Cohesion_Policy_and_its_Implications_for_Irish_Regional_Policy_Sept%202009.pdf [13.1.2015.].

Internetski izvori: prezime, inicijali autora/urednika. (godina) Naslov. Institucija/izdavač/časopis/… Internet adresa, datum pristupa- nja u uglatoj zagradi. (Ako su dva ili tri autora, redom navesti njihova prezimena i inicijale odvojene zarezom.)

McMaster, I., Bachtler, J. (2005). Implementing Structural Funds in the New Member States: Ten Policy Challenges. European Policies Research Centre. Dostupno na: http://www.eprc.strath.ac.uk/eprc/Documents/pdf_files/12A07_McMaster-Bachtler_paper. pdf [24.11.2014.].

TEHNIČKA UPUTSTVA

Rad treba biti napisan u Microsoft Office Word programu (MS Office Word 95 i više).

- Format stranice je A4 s jednostrukim proredom (1), uključujući fusnote i reference. Margine su 2,5 cm.
- Treba koristiti tip slova (font) Times New Roman i veličinu slova (fonta) 12.
- Tekst treba biti obostrano poravnan, a paragrafi se odvajaju s jednim redom razmaka.
- Obim rada može imati najviše do 30.000 znakova (karaktera) ili 16 stranica. U dogovoru s Uredničkim odborom, obim rada rada meže biti i veći do 50.000 znakova (karaktera).
- Rad mora biti pisan standardnim jezikom i bez pravopisnih i gramatičkih pogrešaka.
- Naslov rada piše se velikim podebljanim slovima, veličine fonta 16.
- Imena autora pišu se podebljanim slovima, veličine fonta 14.

- Naslovi poglavlja, od uvoda do zaključka, trebaju biti podebljani. Naslovi i podnaslovi ne trebaju se numerisati.
- Podnaslovi mogu ići do trećeg nivoa.
- Slike, tabele, formule i grafikoni koji su sastavni dio rada moraju biti jasno urađeni, te imati naslov, izvor i broj. Numerišu se u kontinuitetu arapskim brojevima. Naslovi se pišu iznad slike, tabele, formule ili grafikona veličinom slova 11, podebljani. Izvori se pišu ispod slike, tabele ili grafikona veličinom slova 10.
- Fusnote se koriste samo za objašnjavanje osnovnog teksta, a ne navođenje izvora literature.
- U skladu s APA standardom, na korištenu literaturu kroz tekst referiše se stavljanjem u zagrade, a piše se prezime autora i godina izdanja, naprimjer: (Rodrik, 2008.), a u slučaju citata navodi se još i broj stranice (Rodrik, 2008:78). Svaka bilješka navodi se kao i prvi put. Ako je riječ o dvoje autora, oba prezimena navode se u zagradama, a ako ih je više, navodi se samo prvi autor: (Rodrik i saradnici, 2008.). Svaka referenca mora se navesti u popisu literature.
- Za citiranje, reference i popis literature obavezno korištenje MS Office Word alata u opcijama izbornika „References" – Style: izabrati izbornik „APA". Rukopisi koji ne budu imali aktiviranu ovu opciju prilikom označavanja citata, referenci i literature biće vraćeni autorima na korekciju.
- Ne označavati posebno neke riječi u radu, dijelove rada i slično podebljanjem, kosim slovima ili nekim drugim oblikovanjem.

IZJAVA O AUTORSTVU I AUTORSKIM PRAVIMA

PANEVROPSKI UNIVERZITET „APEIRON“ U BANJA LUCI

ČASOPIS ZA EKONOMIJU I TRŽIŠNE KOMUNIKACIJE – „EMC REVIEW“

Naslov rada	
Ime i prezime autora	
Zvanje	
Područje, polje i grana nauke	
Institucija u kojoj je zaposlen	
Adresa	
Telefon	
E-mail	

Izjava autora

U postupku recenziranja i/ili objavljivanja prethodno navedenog rada u časopisu EMC REVIEW - Časopis za ekonomiju i tržišne komunikacije garantujem da:

- sam jedini autor cijelog rada/sam jedini autor svojeg dijela rada izrađenog u koautorstvu s još autora (izbaciti nepotrebno);
- rad nije u postupku recenziranja/objave u drugom časopisu;
- rad nije djelomično ili u cijelosti prethodno nigdje objavljivan, u bilo kojem mediju;
- sam u potpunosti poštovao principe naučnog kodeksa (u potpunosti poštivanje autorskih prava ili bilo kojih drugih vlasničkih prava prilikom izrade rada, naprimjer tako da se u radu ne upotrebljavaju fotografije, tabele, grafovi i slično koji su na bilo koji način zaštićeni i čija upotreba zahtjeva odobrenje autora, svi izvori su odgovarajuće citirani i drugo).

Ovom Izjavom o autorstvu i autorskim pravima ustupam Panevropskom univerzitetu „Apeiron“ iz Banja Luke kao izdavaču časopisa *EMC REVIEW - Časopis za ekonomiju i tržišne komunikacije*, autorska prava nad prethodno navedenim radom (pravo saopštavanja javnosti, distribucije, reprodukcije) bez naknade. Kao autor rada zadržavam prava identifikovanja kao autora prilikom svake objave rada, odnosno uključivanja potpunih bibliografskih jedinica finalne objavljene verzije rada, te upotrebe rada za nastavne i druge nekomercijalne svrhe bez prethodnog odobrenja izdavača / Uredničkog odbora.

Datum	
Potpis autora	

INSTRUCTIONS TO REVIEWERS

Pan-European University Apeiron, College of modern management
„Economy and Market Communication Review –
Časopis za ekonomiju i tržišne komunikacije"
Pere Krece 13, 78102 Banja Luka, Bosnia and Herzegovina
E-mail: redakcija@emc-review.com ; Web: www.emc-review.com
ISSN 2232-8823 (Print); ISSN 2232-9633 (Online)

All papers evaluated by the Editorial Board to be meeting the requirements of the Instructions to Authors are forwarded for peer review. At this stage, they are reviewed by at least two independent reviewers who are specialised in the field of work for which the Editorial Board has agreed that it falls within the scope of the journal.

The procedure of peer review is double-blind, for both authors and reviewers. The reviewers are sent coded papers, with no names of authors, which they must evaluate as per instructions and on a prescribed form (Suitability of Paper for Publication Form) received by the Editorial Board. The completed Suitability of Paper for Publication Form must then be returned via email to the Editorial Board.

The reviewer's comments intended for authors are sent to them via email. In case of major revision needed, the paper will be reviewed once again. The reviewer must not undertake the peer review process should he/she deem himself/herself unqualified to do so, and must notify the Editorial Board of any potential conflict of interest or irregularities relative to the paper received. Each paper received for review should be treated as confidential. The Editorial Board shall render the final deci- sion on publication and classification of the pa- per based on the opinions of reviewers provided in the Suitability of Paper for Publication Form and based on the corrections undertaken by the authors.

Časopis za ekonomiju i tržišne komunikacije

Economy and Market Communication Review

SUITABILITY OF PAPER FOR PUBLICATION FORM

-review form-

I. PAPER TITLE: .....

II. PAPER EVALUATION (obligated in accordance with the Instructions to Authors):

Criteria	YES	NO
Title fully reflects the content of the paper		
Topic of the paper falls within the scope of the journal		
Topic is current and relevant		
The paper contains all parts in line with the Instructions to Authors		
Abstract is designed in accordance with the Instructions to Authors		
Extended summary in English is conceptualized in accordance with the Instructions to Authors		
Key words reflect the content of the paper		
Introduction is designed in accordance with the Instructions to Authors		
The author relies on the relevant general research conducted to date in the field of work in question		

Appropriate methodology has been applied		
Methodology has been precisely defined		
The author compares relevant research conducted to date in the selected area with his/her own research		
The interpretation of research results is valid		
Conclusion is designed in accordance with the Instructions to Authors		
The paper provides new and original contribution		
The paper's style of writing and language are clear		
The paper uses tables, charts and figures in an appropriate and clear manner		
The length of paper is in accordance with the Instructions to Authors		
References have been cited in accordance with the Instructions to Authors		

Explanation (only if the answer is "NO"):	
Final evaluation Mark:	(Excellent ----------Poor) 5 4 3 2 1
Explanation of the final evaluation (if reviewer sees it necessary):	

III. REVIEWER'S COMMENTS:

Confidential comments for the Editorial Board:
Comments submitted to the author:

IV. REVIEWER'S RECOMMENDATION FOR PUBLICATION OF THE PAPER:

RECOMMENDATION (put the selected recommendation in bold)
Accepted
Accepted after undertaking revision as per comments*
Not accepted

* The paper is returned to reviewer for opinion

V. CLASSIFICATION OF PAPER:

CLASS (put the selected recommendation in bold)
Original scientific paper**
Preliminary report***
Review****
Professional paper*****

**paper which contains the results of an original scientific research unpublished to date;

*** paper which contains the new results of a scientific research useful to be published promptly;

**** paper which contains an original concise and critical overview of an area and provides a contribution given the papers published to date;

***** paper which contains useful contributions from and for the profession but does not necessarily represent an original research.

VI. REVIEWER'S DATA:

Name	
Title	
Area, field and branch of science	
Institution where the reviewer works	
Address	
Telephone	
E-mail	
Bank account	
Personal identification number	
Date of receipt of paper for peer review	
Date of sending the Form to the Editorial Board	
Signature	

UPUTSTVA ZA RECEZENTE

Panevropski univerzitet Apeiron, Fakultet poslovne ekonomije
„Economy and Market Communication Review –
Časopis za ekonomiju i tržišne komunikacije“
Pere Krece 13, 78102 Banja Luka, Bosna i Hercegovina
E-mail: redakcija@emc-review.com ; Web: www.emc-review.com
ISSN 2232-8823 (Print); ISSN 2232-9633 (Online)

Sve radove koje Uredнички odbor proslijedi u postupak recenzije recenziraju najmanje dva nezavisna recenzenta specijalizovana u području rada za koje Uredнички odbor procijeni da ulaze u djelokrug časopisa i udovoljavaju Uputstvima za autore.

Postupak recenzije potpuno je anoniman, i za autore i za recenzente. Recenzentima se šalju šifrirani radovi, bez imena autora, koje su obvezni ocijeniti prema uputstvima i na propisanom formularu za recenziju (Obrazac o podobnosti rada za objavu – obrazac recenzije) dobivenom od Uredničkog odbora. Uz navedeni obrazac za recenziju, recezentu se dostavlja i Uputstvo za autore.

Recenzenti popunjeni Obrazac o podobnosti rada za objavu e-mailom vraćaju Uredničkom odboru. Komentari koje je recenzent namijenio autorima šalju im se e-mailom. U slučaju potrebe za većim brojem korekcija rad će biti ponovo recenziran.

Recenzent je obavezan odbiti recenziju ako smatra da nije kvalifikovan za recenziju dostavljenog rada, te upoznati Uredнички odbor s bilo kakvim potencijalnim sukobom interesa ili nepravilnostima povezanim sa zaprimljenim radom.

Svaki zaprimljeni rad na recenziju potrebno je tretirati kao povjerljivi dokument.

Uredнички odbor donosi konačnu odluku o objavi i kategorizaciji rada na osnovi mišljenja recenzenata iznesenih u Obrascu o podobnosti rada za objavu, te izvršenih korekcija autora.

Časopis za ekonomiju i tržišne komunikacije

Economy and Market Communication Review

OBRAZAC O POGODNOSTI RADA ZA OBJAVU

- obrazac recenzije -

I. NASLOV RADA: .....

II. OCJENA RADA (obavezno u skladu s priloženim „Uputstvom za autore“):

KRITERIJ	DA	NE
Naslov rada odražava sadržaj rada		
Tema rada se uklapa u djelokrug časopisa		
Tema rada je aktuelna i relevantna		
Rad sadržava sve dijelove u skladu s Uputstvom za autore		
Sažetak je koncipiran u skladu s Uputstvom za autore		
Prošireni rezime na engleskom jeziku (summary) je koncipiran u skladu s Uputstvom za autore (za radove na jezicima naroda u BiH)		
Ključne riječi odražavaju sadržaj rada		
Uvod je koncipiran u skladu s Uputstvom za autore		

Autor se oslanja na relevantna dosadašnja opšta istraživanja iz područja rada		
Primijenjena je odgovarajuća metodologija		
Metodologija je precizno definisana		
Autor upoređuje relevantna dosadašnja istraživanja iz odabranog područja s vlastitim istraživanjem		
Tumačenja rezultata istraživanja su valjana / primjerena		
Zaključak je koncipiran u skladu s Uputstvom za autore		
Riječ je o novom i originalnom naučnom doprinosu		
Stil pisanja i jezik rada su jasni		
U radu se na odgovarajući i jasan način koriste tabele, grafikoni, formule i slike		
Obim rada odgovara Uputstvu za autore		
Reference (izvori, literatura) su citirane u skladu s Uputstvom za autore		

Obrazloženje (samo u slučaju odgovora „NE"):	
Konačna ocjena rada Ocjena:	(Izvrsno----------Loše) 5 4 3 2 1
Obrazloženje konačne ocjene rada (ako recenzent smatra potrebnim):	

III. KOMENTARI RECENZENTA:

Povjerljivi komentari Uredničkom odboru:
Komentari koji se dostavljaju autoru:

IV. PREPORUKA RECENZENTA ZA OBJAVU RADA:

PREPORUKA (podebljati odabranu preporuku)
Prihvaća se
Prihvaća se nakon prihvaćanja izmjena navedenih u komentarima*
Ne prihvaća se

* Rad se vraća recenzentu na uvid

V. KATEGORIJA RADA:

KATEGORIJA (podebljati odabranu preporuku)
Originalni naučni rad**
Kratko prethodno saopštenje originalnog naučnog rada***
Pregledni naučni rad****
Stručni rad*****

**rad koji sadržava do sada još neobjavljene rezultate originalnih (izvornih) naučnih istraživanja;

*** rad koji sadržava nove rezultate naučnih istraživanja, a koje je korisno brzo objaviti;

**** rad koji sadržava izvorni, sažet i kritički prikaz jednog područja, te daje svoj doprinos s obzirom na već objavljene radove;

***** rad koji sadržava korisne priloge iz struke i za struku, a ne mora predstavljati izvorno naučno istraživanje

VI. PODACI O RECENZENTU:

Ime i prezime recenzenta	
Zvanje	
Područje, polje i grana nauke	
Institucija u kojoj je zaposlen	
Adresa	
Telefon	
E-mail	
Podaci o bankovnom računu	
Matični broj (JMBG / OIB)	
Datum prijema rada na recenziju	
Datum slanja Obrasca Uredničkom odboru	
Potpis	

ISSN 2232-8823