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The factors influencing students' entrepreneurial intentions: An analysis using the theory of planned behavior

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UVODNIK

Sveska 1 Volumen 27 Godište 2025 naučnog časopisa *Ekonomski horizonti,* nakon sprovedenog dvostruko anonimnog recenzentskog postupka, sadrži šest izvornih naučnih članaka.

Koautori *Wenjie Zhang, Muhammad Daaniyall Abd Rahman* i *Chakrin Utit* istražuju efekte kreiranja trgovine po RCEP-u (sveobuhvatnom regionalnom ekonomskom partnerstvu) i preusmeravanja tokova trgovine na Kinu i njene sektore, kao i uticaj uvoza i izvoza na njene pokrajine. U radu se primenjuje tzv. WITS-SMART alat (softver svetskog integrisanog trgovinskog rešenja za analizu tržišta i ograničenja u domenu trgovine), tabele OECD-a sa ulaznim i izlaznim komponentama (ICIO) na međudržavnom nivou i tabele sa ulaznim i izlaznim komponentama na nivou većeg broja regiona (MRIO) u Kini. Rezultati sprovedene studije ukazuju na značajan rast trgovine sa Japanom i Južnom Korejom i, istovremeno, na relativno niske trgovinske efekte sa nacijama i regionima ASEAN-a (Udruženje nacija Istočne Azije), poput Australije i Novog Zelanda. Koautori naglašavaju disparitete između različitih regiona u Kini. Takođe, ukazuju na činjenicu da istočne priobalne pokrajine ostvaruju veće trgovinske benefite u odnosu na centralne i zapadne oblasti. Pored toga, ističu značaj sprovođenja politika koje podstiču saradnju u sektorima koji ostvaruju visoki rast, kao i značaj razvoja usko prilagođenih strategija za regionalni napredak.

Polazeći od činjenice da u relevantnoj literaturi nije dovoljno rasvetljena uloga koju u Nigeriji imaju pokretači intenzivnijeg izvoza proizvoda koji nisu naftni derivati, koautori *Mohammed Shuaibu* i *Usman Gana* istražuju odrednice izvoznih aktivnosti koje su u funkciji rasta privrede ove zemlje. Pored fokusa na navedene proizvode, u istraživanju se eksplicitno razmatraju sistemi trgovinskih kredita i digitalnih plaćanja. Primenjuje se autoregresioni model sa rasporedom docnji i koriste se mesečni podaci za period od 2010. do 2013. godine. Rezultati ukazuju na to da povećani trgovinski krediti i bolji sistem elektronskog plaćanja značajno poboljšavaju efikasnost sektora za izvoz proizvoda koji nisu naftni derivati. Koautori zaključuju da povećanje trgovinskih kredita i poboljšanje sistema za elektronsko plaćanje mogu da posluže kao alternativa za pospešivanje potencijala izvoznog sektora Nigerije kada su u pitanju proizvodi koji nisu naftni derivati. Takođe, konstatuju da promovisanje trgovinskih kredita i povećano korišćenje elektronskog plaćanja mogu pomoći Nigeriji da poboljša efikasnost izvoza proizvoda koji nisu derivati nafte u cilju podsticanja održivog ekonomskog rasta.

Shodno stavu da je poslovni ciklus jedne ekonomije veoma složen fenomen koji nije lako meriti i interpretirati, autor *Emilija Janković* istražuje poslovne cikluse odabranih zemalja analizirajući podatke o bruto domaćem proizvodu (BDP), cikličnom kretanju komponenti BDP-a, varijabli tržišta rada i nominalnih varijabli (inflacija, kamatne stope i devizni kurs). U fokusu istraživanja su Evropska unija (EU) kao celina, Nemačka, kao najrazvijenija privreda EU i privreda Republike Srbije. Autor nastoji da otkrije pravilnosti u kretanju navedenih varijabli u periodu od prvog kvartala 2009. do trećeg kvartala 2023. godine. Uz pomoć detaljne statističke analize vremenskih serija, proučene su stilizovane činjenice i ispitana volatilnost ovih varijabli, njihova korelisanost sa BDP-om, kao i perzistentnost. Opšti zaključak jeste da poslovni ciklus Srbije ne zaostaje za razvijenijim zemljama.

Imajući u vidu značaj interneta i komunikacije sa potrošačima u *online* okruženju, prvenstveno putem društvenih medija, kao i rastući značaj održivosti u

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savremenom poslovanju, koautori *Jovana Filipović* i *Srđan Šapić* analiziraju uticaj marketing aktivnosti na društvenim medijima na ponašanje potrošača u pogledu zelenih proizvoda. Konkretno, koautori istražuju marketing aktivnosti na društvenim medijima domaćih i globalnih kompanija u Republici Srbiji, koje obuhvataju pet aspekata: zabavu, interakciju, praćenje trendova, kastomizaciju i elektronsku usmenu propagandu. Primenom empirijskog istraživanja metodom anketiranja i putem SEM analize, zaključuje se da navedeni aspekti društvenih medija utiču različito na stavove prema zelenim proizvodima domaćih i globalnih kompanija. Utvrđen je pozitivan moderacijski uticaj globalnog identiteta na veze navednih varijabli u modelima. Rad doprinosi analizi veze između marketing aktivnosti na društvenim medijima i ponašanja potrošača prema zelenim proizvodima, sa uporednom analizom domaćih i globalnih kompanija.

Uvažavajući činjenicu da je večita dilema investitora kako pronaći kompanije u koje investirati, a da povrat od investicije bude zadovoljavajući, koautori *Tadija Đukić, Bojana Novićević Čečević* i *Adrijana Jevtić Tomić* ispituju mogućnost primene sistematskog pristupa za izbor kompanija za investiranje. Fokus istraživanja je na dva nivoa analize - racio analizu, sa usmerenjem na likvidnost i profitabilnost, i višekriterijumsko rangiranje primenom PROMETHEE metode. Rezultati sprovedene racio analize pokazuju da kompanije čiji je PE racio (profit-earning ratio) veći, ostvaruju bolje poslovne performanse u odnosu na one čiji je PE racio manji, sa stanovišta individualnog poređenja. Međutim, kako uočljive razlike u vrednostima analiziranih racija među kompanijama ne mogu da daju jasne i precizne smernice za donošenje opšteg zaključka, primenjena je kombinacija racio analize i PROMETHEE metode, koja omogućava efikasniju ocenu performansi, dajući smernice investitorima da odaberu najbolje kompanije to jest one koje imaju najveći potencijal.

Koautori *Ines Milohnić* i *Ivana Licul* primenjuju teoriju planiranog ponašanja kako bi istražili uticaj ličnih stavova u vezi sa preduzetništvom, društvenim normama i kontrolom uočenog ponašanja na preduzetničke namere studenata. Istraživanje je sprovedeno na uzorku od 184 studenta u Hrvatskoj u cilju prikazivanja stvarnog konteksta u kom studenti razvijaju svoje preduzetničke namere. Sprovedena analiza višestruke regresije otkriva da sve komponente teorije planiranog ponašanja pozitivno i značajno utiču na preduzetničke namere. Najuticajniji faktor je kontrola uočenog ponašanja, za kojim slede lični stav i društvene norme. Ta saznanja povećavaju nivo razumevanja kritičnih elemenata koji oblikuju preduzetnička stremljenja studenata. Uz to, rezultati istraživanja pružaju korisne informacije za ustanove visokog obrazovanja, pomažući im da razumeju preduzetničko ponašanje studenata i usmeravajući razvoj ciljnih programa i unutrašnjih politika. Takođe, rezultati istraživanja su značajni za širu akademsku zajednicu, kada je u pitanju dizajniranje strategija koje promovišu preduzetničke ambicije studentske populacije.

U ime Uredništva Časopisa i u svoje ime zahvaljujem autorima priloga koji su objavljeni u Svesci 1 Časopisa. Istovremeno, posebnu zahvalnost dugujemo recenzentima koji su, svojim konstruktivnim i kritičkim komentarima i sugestijama autorima podnetih priloga, doprineli podizanju nivoa kvaliteta publikovanih članaka.

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Glavni i odgovorni urednik

Milena Jakšić

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NATIONAL AND REGIONAL EFFECTS OF RCEP ON TRADE: THE APPLICATION OF THE WITS-SMART TOOL WITH THE FOCUS ON CHINA

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This paper investigates the effects of RCEP trade creation and trade diversion on China and its sectors, as well as the impact of imports and exports on provinces. The World Bank's World Integrated Trade Solution Software for Market Analysis and Restrictions on Trade (WITS-SMART) tool with the 2020 data, alongside the OECD Inter-Country Input-Output (ICIO) tables and the Chinese Multi-Regional Input-Output (MRIO) tables based on the 2017 data under two scenarios. The results of the study indicate that trade growth with Japan and South Korea is significant, on the one hand, whereas the trade effects with the ASEAN nations and regions such as Australia and New Zealand are relatively low, on the other. The research emphasizes the disparities between various regions in China, demonstrating that the Eastern coastal provinces obtain more trade benefits than the Central and Western areas. The study highlights the importance of implementing the policies encouraging collaboration in high-growth sectors and developing tailored strategies for regional advancement.

Keywords: China, Input-output tables, RCEP, SMART-WITS tool, trade creation and trade diversion

JEL Classification: F14, F15, F17

INTRODUCTION

Signed in 2020, the Regional Comprehensive Economic Partnership (RCEP) is a landmark free trade agreement (FTA) aimed at eliminating tariffs and fostering regional integration. As listed, Chapter 2 of the RCEP Agreement outlines the 20-year phased reduction of tariffs on 90% of traded goods, forming the foundation of this study (Department of Foreign Affairs and Trade, 2020). Unlike the customs unions, RCEP operates as an FTA without a unified external tariff policy. Building on J. Viner's (1950) theory of trade creation and trade diversion, and P. Krugman's (1991) theory of New Economic Geography, the study examines how RCEP's tariff reductions influence trade creation and trade diversion on the example of China and its sectors, and regional import-export disparities.

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Regional trade agreements (RTAs) are transformative tools in reshaping global trade. With RCEP contributing over one-third of the global GDP, understanding its multidimensional impacts on China's trade capacity and regional dynamics is becoming imperative (Goswami, Khan, Labiba, Achol, Saha & Zulfikar, 2022; Rahman, Rahman, Manini & Sharma, 2024). Despite extensive research in RTAs, studies rarely offer insights into RCEP's multidimensional impacts, particularly for China. The existing literature predominantly addresses single sectors or aggregate national effects, regional disparities being often overlooked.

Building on these insights, this study further explores the dual national and regional implications of the RCEP for China. At the national level, RCEP is expected to broaden market access for Chinese products, particularly in the manufacturing sectors (Tran & Tran, 2023). Reduced tariffs and streamlined trade facilitation measures are likely to enhance the global competitiveness of Chinese goods (Mo & Nie, 2022). Regionally, the impact of the Agreement is anticipated to be uneven, favoring the coastal provinces with robust manufacturing bases, simultaneously posing distinct challenges for the inland regions with differing industrial profiles (Zuev, Ostrovskaya & Kuznetsov, 2023). A deeper assessment is essential to understand these disparities and develop targeted strategies.

To address the foregoing gaps, this study is guided by the three key hypotheses:

H1: Tariff reductions by the RCEP member economies significantly enhance China's trade creation effects, whereas trade diversion effects remain lower than trade creation.

H2: The impacts of RCEP on China's industries exhibit significant heterogeneity, with the high-tech and manufacturing sectors benefiting the most from trade creation, whereas the low-value-added industries face greater adverse effects from trade diversion.

H3: RCEP impacts on China's imports and exports vary significantly across the provinces, with the coastal regions benefiting substantially more than the inland provinces.

The paper is organized as follows: Section 2 provides a review of the literature on RTAs, with the focus on the studies examining RCEP economic effects; Section 3 outlines the research methodology, and in Section 4, the results of the study are presented and interpreted. Finally, Section 5 concludes with the key findings and offers policy recommendations.

LITERATURE REVIEW

RTAs have long been recognized as pivotal tools in reshaping international trade patterns by reducing tariff and nontariff barriers. For instance, the development of the cross-border economic zones (CBEZ) has demonstrated a significant potential in fostering connectivity and economic cooperation in border regions, as observed in Vietnam's northern regions (Nguyen, Vu, Nguyen, Nguyen & Nguyen, 2019). The foundational work of J. Viner (1950) distinguishes the dual impacts of RTAs: trade creation, on the one hand, which fosters efficiency by encouraging trade among member states, and trade diversion, on the other, which shifts trade from more efficient nonmembers to less efficient members, potentially reducing overall welfare. Recent empirical studies have extended these theoretical insights, highlighting the effects of RTAs in different economic contexts (Franco-Bedoya & Frohm, 2022). In Asia, agreements like the ASEAN Free Trade Area (AFTA) and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) have provided critical case studies demonstrating the transformative role of RTAs (Gaurav & Bharti, 2019).

Empirical research in RTAs often underscores the predominance of trade creation over trade diversion, particularly when member economies exhibit complementary industrial structures. M. Ando, S. Urata and K. Yamanouchi (2022) showed that Japan's FTAs had significantly enhanced bilateral trade volumes, particularly in the high-value sectors such as the electronics and automotive industries. However, H. Lee (2016) cautioned that the impact of trade diversion could broadly vary depending on the agreement's specific rules, such as the preferential

rules of origin. K. P. Timsina and R. J. Culas (2021) provided a detailed analysis of Australia's FTAs, illustrating how trade creation in agricultural exports initially had outpaced trade diversion effects, which had become more pronounced over time. This supports the hypothesis that RCEP's tariff reductions will significantly enhance China's trade creation effects (H1).

The effects of RTAs are often unevenly distributed across sectors and regions. S. L. Baier and J. H. Bergstrand (2007) demonstrated that the export-oriented sectors with higher global competitiveness tended to benefit disproportionately from trade agreements. In the context of Japan and South Korea, recent studies have shown that FTAs bolster sectors such as electronics, chemicals, and machinery due to their strong integration in global value chains (Xiu & Yu, 2022). Regionally, RTAs often favor coastal regions with advanced industrial bases and infrastructure. B. Mo and H. Nie (2022) observed similar patterns in China, where coastal provinces had gained significantly more from previous trade agreements compared to the inland regions. This heterogeneity underscores the importance of tailoring policies in order to address regional disparities.

Building on these insights, RCEP emerges as a significant case study for understanding the transformative role of RTAs in fostering trade integration in the Asia-Pacific region. Studies on RCEP highlight its ability to integrate a diverse array of economies, ranging from highly developed countries like Japan to emerging markets such as Vietnam. N. Rahman *et al* (2024) applied gravity models to predict significant increases in China's trade volumes with Japan and South Korea, driven by sectoral complementarities. Q. F. Zhang, X. Chen, J. L. Zhang and L. Cai (2023) emphasized the reduction in both tariff and nontariff barriers under RCEP, which is expected to enhance China's export competitiveness in the key industries such as electronics, textiles, and machinery. D. Ling and K. Qian (2023) further explored the RCEP's potential to boost China's digital trade and e-commerce sectors, highlighting its transformative implications for modern trade structures. These findings collectively support the hypotheses H2 and H3, highlighting the sectoral heterogeneity and regional disparities in RCEP impacts.

In summary, the existing literature highlights the critical role of RTAs in reshaping trade patterns but often overlooks the multidimensional impacts of agreements like RCEP. By addressing these gaps, this study contributes to the understanding of RCEP trade effects at both the national and regional levels.

RESEARCH METHODOLOGY

Research design

This study employs a mixed methodological framework so as to analyze RCEP impacts on China's trade. Specifically, the World Bank's World Integrated Trade Solution Software for Market Analysis and Restrictions on Trade (WITS-SMART) is utilized in order to quantify trade creation and trade diversion effects, and supplement this with input-output analyses using the OECD Inter-Country Input-Output (ICIO) tables and the Chinese Multi-Regional Input-Output (MRIO) tables.

The WITS-SMART model

The WITS-SMART model quantifies the trade creation and trade diversion effects resulting from RCEP tariff reductions. Specifically:

trade creation is calculated as follows:

$$TC_{ijk} = M_{ijk} * \eta * \frac{\Delta_{ijk}}{(1+t_{ijk})*(1+{}^{\eta}/_{\beta})} \quad (1)$$

where

TC_{ijk}: trade creation,

M_{ijk}: imports,

t_{ijk}: the tariff,

η: the import elasticity of demand (system-defined),

β: the export elasticity of supply (99 by default),

i: commodity,

j: the exporting country,

k: the importing country;

trade diversion is calculated as follows:

$$TD_{ijk} = \frac{M_{RCEP} * M_{RoW}\left[\left(\frac{1+t_t}{1+t_0}\right)-1\right]*\lambda}{M_{RCEP}+M_{RoW}+M_{RoW}\left[\left(\frac{1+t_t}{1+t_0}\right)-1\right]*\lambda} \quad (2)$$

where

TD_{ijk}: trade diversion,

M_{RCEP}: the imported commodities from RCEP countries,

M_{RoW}: the imported commodities from the rest of the world,

t_t: the tariff (where t_0 and t_t represent the pre- and post-integration levels of the tariffs),

λ: the elasticity of substitution (1.5 by default).

This analysis directly supports the validation of the hypotheses H1 and H2, thus providing insights into the impacts on trade creation and trade diversion for China from both national and sectoral points of view.

IO tables

The IO framework including the ICIO tables and the Chinese MRIO tables complements the WITS-SMART analysis by capturing interregional trade linkages within China. The ICIO and MRIO tables offer a detailed view of an economy's structural dynamics by revealing the intricate web of interconnections between various sectors of the economy. This aspect makes them particularly valuable for research focused on understanding the impacts of economic policies and their broader implications (Xing, Dong & Guan, 2017; Jia, Cao & Jia, 2023).

Equation (4) is an IO equation, where the vector x is the column vector representing the total output of each industrial sector. The matrix Z has the elements z_{ij} that denote the intermediate inputs from the sector i to the sector j. The vector y is the column vector signifying the final demand of each industrial sector, and the vector μ is the column vector indicating the external imports of each industrial sector.

$$\begin{bmatrix} x^1 \\ x^2 \\ \vdots \\ x^G \end{bmatrix} = \begin{bmatrix} z^{11} & z^{12} & \dots & z^{1G} \\ z^{21} & z^{22} & \dots & z^{2G} \\ \vdots & \vdots & & \vdots \\ z^{G1} & z^{G2} & \dots & z^{GG} \end{bmatrix} \mu + \begin{bmatrix} y^1 \\ y^2 \\ \vdots \\ y^G \end{bmatrix} \quad (3)$$

The direct consumption coefficient is defined as $a^{rs}=z^{rs}\times diag(x^r)^{-1}$, where the element a_{ij}^{rs} represents the value of the product from the sectori of the country r directly consumed in the production of one unit of the product by the sector j of the country s, with $diag(x^r)$ denoting the diagonal matrix whose diagonal elements are the elements of the vector x^r. At this point, Equation (4) can be abbreviated so as to read $X = A \times diag(A)\mu + Y$, i.e. $X = AX + Y$. Equation (4) can be rewritten as follows:

$$\begin{bmatrix} x^1 \\ x^2 \\ \vdots \\ x^G \end{bmatrix} = \left(I - \begin{bmatrix} a^{11} & a^{12} & \dots & a^{1G} \\ a^{12} & a^{22} & \dots & a^{2G} \\ \vdots & \vdots & & \vdots \\ a^{G1} & a^{G2} & \dots & a^{GG} \end{bmatrix} \right)^{-1} \begin{bmatrix} y^1 \\ y^2 \\ \vdots \\ y^G \end{bmatrix} \quad (4)$$

where x^r represents the total output of the sector r. z^{rs} represents the intermediate consumption of the sector r by the sector s, and y^r represents the final output of the sector r. This equation takes into account the interdependencies between the production sectors and includes imports through the vector μ, while the matrix A is the technical coefficient matrix reflecting the proportion of each sector's output used to meet the demands of the other sectors.

The global trade effect can be calculated as follows:

$$\Delta X = (I - A)^{-1}\Delta Y \quad (5)$$

where ΔY equals the trade effect from Equation (3).

Equation (7) indicates the indirect trade effects:

$$\Delta O = \Delta X - \Delta Y \quad (6)$$

The total household consumption is as follows:

$$\Delta c_r = \left\{\left(\sum_i \Delta O_i * W_{r,i}\right) * (1 - tx_r)\right\}(1 - s_r) \quad (7)$$

where

Δc_r: total household consumption,

$w_{r,i}$: the average wage per worker by the sector i and the region r,

tx_r: the total household income tax rate by the region r,

s_r: the average household savings rate by the region r.

In the above, r ∈ {1,2,...,n} and i ∈ {1,2,...,n}

$$\Delta f^i = Q * \Delta c_r \quad (8)$$

The vector of the consumption shocks inducing effects $\Delta f^i_{(gn\times1)}$ can be calculated as the product of the private consumption structure matrix $Q_{(gn\times g)}$ and the consumption vector for each region $\Delta c_{(g\times1)}$.

Matrix Q equals as follows:

$$Q_{r,i} = \frac{c_{r,i}}{\sum_i c_{r,i}} \quad (9)$$

Exports from each region can be calculated as follows:

$$\Delta Exports = \widehat{ex}(I - A)^{-1}\Delta f \quad (10)$$

where

$\widehat{ex}$ is export intensity, equaling exports over the total output. The data are estimated based on China's MRIO table.

Imports from each region can be calculated as follows:

$$\Delta Imports = \widehat{im}(I - A)^{-1}\Delta f \quad (11)$$

where

$\widehat{im}$ is import intensity, equaling imports over the total output. The data are estimated based on China's MRIO table.

Data sources and scenario design

Data sources

The dataset for this research included 2020 transactional data from the WITS-SMART system chosen as the pre-pandemic baseline for assessing the impact of RCEP on China's trade creation and trade diversion. Standardized 2-digit Harmonized System (HS) codes were used to ensure precise sectoral analysis. China was set as the beneficiary, the other RCEP member economies being categorized according to their roles, utilizing the World Bank's classification system to organize over 90 sectors into 16 categories for the streamlined analysis.

For the ICIO analysis, the study used the 2017 OECD ICIO tables valued for their standardized, up-to-date data from the OECD and non-OECD countries. These tables facilitated reliable trade dynamics analysis and global value chain comparisons (Melnyk, Kubatko, Piven, Klymenko & Rybina, 2021). Additionally, the 2017 MRIO tables from the China Emissions Accounts and Datasets (CEADs) were employed, focusing on its 31 mainland provinces and 42 industries. This dataset highlights the interconnections between sectors and regions, offering a broader view of China's economic dynamics.

Scenario setting

The scenario design employed is based on the commitments outlined in Chapter 2, Article 2.4 of the RCEP Agreement, which states that each party shall progressively eliminate or reduce customs duties on originating the goods of the other Parties in accordance with its Schedule in Annex I (Schedules of Tariff Commitments). According to Annex I, the member countries commit to eliminating tariffs on at least 90% of traded goods progressively over a maximum period of 20 years. Therefore, Scenario 1 reflects the initial phase of trade liberalization, while Scenario 2 represents the full implementation phase, targeting comprehensive trade integration.

Scenario 1: During the initial phase, tariffs are reduced to zero for 25% of imports from Japan, 38.6% from Korea, 67.9% from ASEAN, 65.8% from Australia, and 66.1% from New Zealand. This reflects early-stage trade liberalization.

Scenario 2: In the full implementation phase, tariffs reach zero for 86% of imports from Japan and Korea, 90.5% from ASEAN, and 90% from Australia and New Zealand, demonstrating RCEP's goal of enhanced regional trade integration.

Model computation

The research hypotheses are addressed through the following steps:

Step 1: Using the WITS-SMART model, trade creation

and trade diversion are quantified under the two scenarios. The results are integrated with the OECD ICIO tables, forming a matrix of 7 regions, 37 sectors, and 2 stages.

Step 2: The Step 1 export shocks are applied to the ICIO tables so as to evaluate how trade changes indirectly affect various sectors through the supply chain linkages.

Step 3: The China MRIO table assesses RCEP's impact on regional imports and exports, highlighting provincial-level trade discrepancies.

This combined WITS-SMART and IO approach offers a detailed examination of trade creation, trade diversion, and regional disparities.

RESULTS AND DISCUSSION

Trade creation and trade diversion in China

The impact of trade creation and trade diversion brought to China by the RCEP member countries is presented in this section, as shown in Table 1 below.

Trade creation

Under S1, China's trade creation totaled USD 975 million. This figure is expected to significantly increase to USD 8.7 billion in S2, indicating the growing impact of the RCEP tariff reductions as the agreement progresses. Among the member countries, Japan and South Korea contributed the most to trade creation in both scenarios. For instance, China generated USD 802 million and USD 159 million in S1 from Japan and South Korea, and the figures are projected to grow to USD 6.5 billion and USD 1.9 billion in S2.

Trade creation with the ASEAN countries also soared, increasing from USD 14 million in S1 to USD 60 million in S2. However, the overall contribution from ASEAN remained smaller compared to that from Japan and South Korea. Australia and New Zealand exhibited relatively limited trade creation effects, with the figures growing modestly from S1 to S2.

Trade diversion

Trade diversion effects are also significant, though smaller in magnitude compared to trade creation. In S1, China gained USD 835 million in trade diversion, which is estimated to escalate to USD 6.4 billion in S2. The key contributors to the trade diversion are Japan and South Korea. For example, China is forecasted to generate USD 4.8 billion and USD 1.5 billion in S2 from Japan and South Korea, compared to USD 654 million and USD 171 million in S1, respectively.

For the ASEAN countries, trade diversion is projected to grow from USD 10 million in S1 to USD 33 million in S2. Similarly, Australia and New Zealand showed minimum trade diversion effects, with incremental increases observed between the two scenarios.

Table 1 China's trade creation and trade diversion from the other RCEP member economies under the two scenarios

USD million	New Zealand		South Korea		Japan		Australia		ASEAN		Total	
	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
Trade Creation	0.01	0.04	159	1,963	802.00	6,506	0.40	235	14	60	975.41	8,764.04
Trade Diversion	0.02	0.07	171	1,543	654.00	4,797	0.38	53	10	33	835.40	6,426.07

Source: Authors, based on the WITS-SMART simulation

The sectoral analysis of trade creation and trade diversion

The following section presents that all Chinese industries have faced increased trade creation and trade diversion from S1 to S2. However, an in-depth study reveals that the distribution of trade creation and trade diversion across the industries is markedly uneven, as is shown in Table 2.

Japan

Japan is the biggest contributor to China's trade creation and trade diversion under RCEP, particularly in the high-tech and manufacturing industries, its contributions spanning all the three sectors, but being heavily concentrated in the secondary industries.

The primary sector

In the primary sector, Japan's contributions are modest but noteworthy, especially in the fuels industry. Trade creation and trade diversion in S2 amount to USD 75.4 million and USD 44 million, respectively, these effects reflecting Japan's capacity to supply refined petroleum products, which complement China's industrial demand. The other primary industries, such as animal and vegetable products, show negligible trade effects due to Japan's limited agricultural exports.

The secondary sector

Japan dominates the secondary sector, where the total trade creation reaches over USD 6.5 billion in S2. The machinery and electronics industry leads with the trade creation of USD 1.68 billion, driven by China's reliance on Japan for advanced machinery and electronic components. In the chemicals industry, trade creation and trade diversion are expected to surge from USD 296.5 million and USD 195.9 million in S1 to USD 1.4 billion and USD 745.2 million in S2, respectively, thus reflecting the growing demand for industrial chemicals in China. Additionally, the plastics and rubber industry generates the trade effects exceeding USD 600 million in S2, emphasizing Japan's position as the critical supplier of intermediate goods.

The tertiary sector

In the tertiary sector, Japan's contributions are primarily in Miscellaneous Goods and Textiles and Clothing, with the total trade creation and trade diversion effects of over USD 666 million and USD 186 million in S2, respectively. These industries highlight Japan's ability to integrate in China's value chains for consumer-oriented products. The trade effects in transportation and the other service-related industries remain at a minimum, indicating Japan's focus on manufacturing and goods.

South Korea

South Korea ranks second in terms of trade effects, with significant contributions in both the primary and secondary sectors, reflecting its advanced industrial base and regional integration under RCEP.

The primary sector

South Korea's contributions to the primary sector are primarily concentrated in the fuels industry. Trade creation and trade diversion in S2 are projected to reach USD 85.3 million and USD 89.7 million, respectively, these effects aligning with South Korea's role as the regional supplier of energy resources. The contributions to the other primary industries, such as animal and vegetable products, remain at a minimum, reflecting the country's industrialized economy.

The secondary sector

The secondary sector dominates South Korea's trade effects, with substantial growth in the key industries. In the chemicals industry, trade creation and trade diversion are expected to rise from USD 13.4 million and USD 16.7 million in S1 to USD 306.8 million and USD 137.7 million in S2, respectively, highlighting the increasing demand for South Korea's industrial chemicals. The machinery and electronics industry contributes significantly, with the total trade creation and trade diversion of USD 340.1 million and USD 360.4 million in S2, respectively, which reflects South Korea's position as the leading supplier of high-tech equipment and electronic components to China. The other secondary industries such as Metals and Plastics

and Rubber contribute moderately, emphasizing the diversified nature of South Korea's industrial exports.

The tertiary sector

In the tertiary sector, South Korea demonstrates competitive advantages in Textiles and Clothing and Transportation. The total trade creation and trade diversion in these industries are projected to increase to USD 156.5 million and USD 109 million in S2, respectively, these results indicating South Korea's ability to cater to China's demand for durable goods and intermediate materials, underscoring the integration of regional value chains.

Australia

Australia's trade contributions are concentrated in the primary sector with relatively limited impacts in the secondary and tertiary industries. Its trade effects under RCEP highlight its role as the key supplier of raw materials and agricultural products.

The primary sector

The animal products industry dominates Australia's primary sector contributions. Trade creation and trade diversion are estimated to rise to USD 228.8 million and USD 47.2 million in S2, respectively, driven by Australia's competitive livestock exports and China's growing demand for high-quality meat products. In the fuels industry, trade effects remain moderate, reflecting Australia's position as a supplier of coal and natural gas to China. Contributions to the other primary industries, such as vegetable and wood products, are at a minimum, reflecting Australia's focus on energy and livestock exports.

The secondary sector

Australia's impact in the secondary sector is negligible. Most industries, including chemicals, machinery, and textiles, show trade effects under USD 1 million. This limited impact reflects a lack of manufacturing complementarities between Australia and China under RCEP.

The tertiary sector

In the tertiary sector, Australia's contributions are at a minimum, with trade effects concentrated in the niche industries such as education and professional services, which are not captured in the current dataset, which highlights the resource-dependent nature of Australia's trade relationship with China.

New Zealand

New Zealand's contributions are the smallest among the RCEP members, focusing almost exclusively on the primary sector.

The primary sector

The animal products industry accounts for nearly all of New Zealand's trade effects under RCEP. Trade creation and trade diversion in S2 are expected to be less than USD 1 million, reflecting the country's small export volume and the niche focus on dairy and meat products. Contributions to the other primary industries are negligible, emphasizing New Zealand's narrow trade specialization.

The secondary and tertiary sectors

New Zealand has minimal impacts in the secondary and tertiary industries, with trade effects close to zero, which reflects the country's limited industrial base and focus on agricultural exports.

ASEAN

ASEAN countries significantly contribute to China's trade across all the three sectors, reflecting strong regional supply chain integration and trade facilitation under RCEP.

The primary sector

The vegetable products and wood products industries dominate ASEAN's primary sector contributions. Trade creation in the vegetable products industry is estimated to grow from USD 8.7 million in S1 to USD 36.8 million in S2, highlighting ASEAN's role as a supplier of raw materials for China's food and agricultural industries. Similarly, trade creation in the

wood products industry is estimated to increase to USD 2.4 million in S2, driven by ASEAN's supply of timber and related products.

The secondary sector

In the secondary sector, ASEAN's contributions are modest but diversified. The textiles and clothing industry is projected to generate trade creation of USD 9.2 million in S2, reflecting ASEAN's competitive advantage in low-cost manufacturing. The plastics and rubber industry is expected to contribute USD 0.4 million in trade creation in S2, emphasizing ASEAN's role in intermediate goods production. The other industries, such as chemicals and machinery, show limited contributions, underscoring the region's focus on light manufacturing.

The tertiary sector

ASEAN's role in the tertiary sector is limited, with trade creation in the transportation and miscellaneous goods industries totaling less than USD 10 million, which reflects the region's focus on goods trade rather than services.

The provincial-level impacts of imports and exports

This section illustrates the changes in imports and exports across China's different regions, as is shown in Table 3.

The eastern region

The eastern region, with its well-established industrial base and robust infrastructure, has experienced the most significant trade growth under RCEP. The region's performance is driven by its high concentration of export-oriented industries and advanced connectivity to global markets.

Guangdong: As China's leading exporting province, Guangdong exhibits the largest absolute trade growth. Imports are projected to rise from USD 461.7 million in S1 to USD 5.1 billion in S2, while exports are estimated to surge from USD 774.7 million to USD 8.6 billion. This remarkable growth is largely attributable to Guangdong's strong presence in the high-value-added sectors such as electronics, machinery, and textiles. The province benefits from reduced tariffs under RCEP, which enhances its competitive edge in global supply chains. Notably, the gap between imports and exports broadened under S2, highlighting Guangdong's pivotal role as the manufacturing hub that attracts intermediate goods for processing and re-export.

Jiangsu: Jiangsu follows closely, with imports increasing from USD 261.5 million in S1 to USD 2.9 billion in S2, and exports rising from USD 414.5 million to USD 4.6 billion. Compared to Guangdong, Jiangsu demonstrates a more balanced trade profile, driven by its diversified industrial structure encompassing machinery, chemicals, and renewable energy components, which diversification allows Jiangsu to leverage RCEP tariff reductions across multiple industries, ensuring steady growth in both imports and exports.

Shanghai: As an international financial and trade hub, Shanghai is projected to achieve combined imports and exports of USD 8.35 billion in S2, which is up from USD 749 million in S1. While its total trade volume is slightly lower than Guangdong's, Shanghai's trade growth reflects its role as the key logistics and distribution center. The city's infrastructure facilitates efficient import-export processes, amplifying the positive impacts of RCEP trade facilitation measures.

When speaking about the regional comparison, Guangdong's dominance among the eastern provinces in export-oriented manufacturing gives it a competitive edge, while Jiangsu's diversified industries enable balanced growth. Shanghai's role as a logistics hub complements these production-driven provinces, highlighting the region's interconnected trade ecosystem.

The central region

Traditionally less export-focused, the central region exhibited substantial growth under RCEP, underscoring its emerging potential in trade. The region's gains are particularly notable in the provinces investing in industrial development and the infrastructure.

Table 2 Trade creation and trade diversion in various Chinese sectors from the RCEP members under the two scenarios, in USD million

	New Zealand				Australia				South Korea				Japan				ASEAN			
	TC		TD		TC		TD		TC		TD		TC		TD		TC		TD	
	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
Animal	0.0	0.0	0.0	0.0	0.0	228.8	0.0	47.2	0.0	90.1	0.0	4.4	0.0	27.0	0.0	7.3	0.0	0.0	0.0	0.0
Vegetable	0.0	0.0	0.0	0.0	0.4	4.4	0.4	4.3	3.5	7.3	3.0	7.4	0.8	27.6	0.4	6.0	8.7	36.8	0.0	0.0
Food Products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	267.6	12.9	37.8	5.6	632.3	31.1	89.9	0.6	1.2	0.0	0.0
Minerals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.6	153.7	4.5	12.7	0.0	0.0	0.0	0.0
Fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.7	85.3	47.4	89.7	51.5	75.4	12.8	44.0	0.0	0.0	0.0	0.0
Chemicals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.4	306.8	16.7	137.7	296.5	1,414.6	195.9	745.2	0.0	1.4	0.0	0.0
Plas or Rubb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3	250.2	9.3	281.7	33.5	611.4	44.7	644.7	0.0	0.4	0.0	0.0
Hides and Skins	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.5	0.0	50.8	0.0	8.5	0.0	27.0	0.0	3.1	0.0	0.0	0.0	0.0
Wood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.4	0.0	8.0	0.0	3.7	0.5	2.4	0.0	0.0
Text and Clot	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.5	7.0	94.3	8.0	51.9	15.0	186.8	8.5	127.0	3.1	9.2	0.0	0.0
Footwear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0	3.7	0.0	6.9	0.0	4.2	0.0	0.0	0.0	0.0
Stone and Glas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	21.2	9.1	25.0	16.8	145.3	8.1	119.8	0.0	0.0	0.0	0.0
Metals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.5	143.3	14.3	123.4	209.2	685.2	157.9	559.1	0.0	0.0	0.0	0.0
Mach and Elec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	43.9	340.1	49.3	363.4	131.3	1,683.8	146.1	1,631.2	0.0	4.9	0.0	0.0
Transportation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.2	0.0	57.1	2.2	155.2	2.0	169.9	1.2	4.1	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	232.9	0.4	351.2	28.1	666.1	41.5	628.8	0.0	0.0	0.0	0.0
Total	0.0	0.0	0.0	0.0	0.4	234.6	1.8	55.5	159.1	1,961.6	170.7	1,543.3	802.1	6,506.3	653.5	4,796.6	14.1	60.4	0.0	0.0

Source: Authors, based on the WITS-SMART simulation

Hubei: Hubei stands out in the central region, with the imports increasing from USD 12.4 million in S1 to USD 138.1 million in S2 and the exports rising from USD 68.5 million to USD 762.4 million. This growth is driven by the province's burgeoning automotive and electronics sectors, which benefit from reduced input costs due to RCEP tariff reductions. Hubei's strategic location as a transportation hub further facilitates trade, enhancing its integration in the regional supply chains.

Henan: Henan's imports are projected to grow from USD 27.5 million in S1 to USD 309.3 million in S2, while the exports are estimated to increase from USD 61.1 million to USD 680 million. The province's focus on light manufacturing and agriculture contributes to this growth, with RCEP enabling greater access to raw materials and intermediate goods. However, compared to Hubei, Henan's trade growth is more modest, reflecting its less developed industrial base.

Anhui: Imports in Anhui are expected to rise from USD 50.2 million in S1 to USD 558.2 billion in S2, while its exports are estimated to increase from USD 103.5 million to USD 1.2 billion. Anhui's growth is largely driven by its electronics and machinery industries, which have increasingly aligned with the RCEP member markets. The province also benefits from the policies encouraging industrial upgrading, making it a rising player in regional trade.

In terms of the regional comparison, Hubei's superior performance highlights the benefits of the well-established industrial base and the strategic location, while Henan and Anhui illustrate the potential for growth in the provinces investing in trade-oriented development. The central region's progress underscores its transition from a domestically oriented economy to an emerging player in international trade.

Table 3 The impact of RCEP on China's provincial imports and exports, in millions USD

	S1			S2			
Regions	Imports	Exports	Subtotal	Imports	Exports	Subtotal	Total
Beijing	247.18	195.22	442.40	2,753.06	2,173.71	4,926.77	5,369.17
Tianjin	313.02	199.20	512.22	3,486.80	2,217.62	5,704.42	6,216.63
Hebei	42.97	96.70	139.67	478.39	1,074.63	1,553.02	1,692.69
Shanxi	11.60	18.97	30.57	129.30	210.83	340.13	370.71
Neimenggu	34.97	32.96	67.93	390.14	366.80	756.94	824.87
Liaoning	196.91	126.98	323.90	2,189.01	1,415.75	3,604.76	3,928.65
Jilin	127.94	24.42	152.36	1,426.74	271.91	1,698.64	1,851.00
Helongjiang	63.05	23.74	86.80	702.11	263.84	965.94	1,052.74
Shanghai	480.08	268.90	748.98	5,351.59	2,994.87	8,346.46	9,095.44
Jiangsu	261.52	414.46	675.98	2,908.46	4,604.73	7,513.19	8,189.17
Zhejiang	115.92	410.25	526.17	1,291.60	4,562.78	5,854.39	6,380.55
Anhui	50.16	103.54	153.70	558.52	1,152.06	1,710.58	1,864.27
Fujian	263.42	408.68	672.10	2,933.75	4,539.66	7,473.41	8,145.52
Jiangxi	24.93	139.99	164.92	277.43	1,554.98	1,832.41	1,997.33
Shandong	226.58	232.57	459.15	2,521.42	2,588.75	5,110.16	5,569.31
Henan	27.78	61.08	88.86	309.29	679.99	989.29	1,078.15
Hubei	12.40	68.53	80.93	138.09	762.44	900.53	981.46
Hunan	19.43	41.29	60.72	216.56	460.10	676.66	737.37
Guangdong	461.65	774.70	1,236.35	5,137.80	8,608.15	13,745.95	14,982.31
Guangxi	64.73	56.25	120.98	721.06	626.50	1,347.56	1,468.54
Hainan	37.74	43.05	80.80	419.86	479.41	899.28	980.07
Chongqing	63.65	150.29	213.95	709.30	1,673.80	2,383.10	2,597.05
Sichuan	22.91	41.35	64.26	255.28	460.36	715.64	779.91
Guizhou	62.16	51.42	113.58	692.06	571.97	1,264.03	1,377.61
Yunnan	17.99	43.93	61.92	200.47	489.31	689.79	751.71
Tibet	1.74	8.27	10.01	19.43	92.68	112.11	122.12
Shaanxi	22.86	52.59	75.45	254.61	585.41	840.01	915.46
Gansu	8.89	11.92	20.81	99.05	132.47	231.52	252.33
Qinghai	2.25	10.41	12.66	25.04	115.66	140.71	153.37
Ningxia	29.68	85.22	114.90	331.04	948.70	1,279.74	1,394.64
Xinjiang	152.72	52.61	205.33	1,693.54	584.35	2,277.89	2,483.22

Source: Authors, based on the ICIO and Chinese MRIO tables

The western region

While lagging behind the eastern and central regions, the western region showed notable growth under RCEP in absolute trade volumes. This progress highlights the potential for trade-led development in less industrialized areas.

Sichuan: Sichuan's exports are projected to grow from USD 41.4 million in S1 to USD 460.4 million in S2, while the imports are expected to increase from USD 22.9 million to USD 255.3 million. The province's growth is fueled by its agricultural exports and the emerging electronics manufacturing sector. RCEP tariff reductions provide Sichuan with greater market access for its agricultural products, while its electronics sector benefits from lower input costs.

Yunnan: Yunnan is expected to achieve imports of USD 200.5 million and exports of USD 489.3 million in S2, which is up from USD 18 million and USD 43.9 million in S1, respectively. The province's proximity to the ASEAN markets positions it as the key trade partner within the RCEP framework. Agricultural products, including rubber and coffee, dominate Yunnan's exports, reflecting its comparative advantage in the resource-based sectors.

Guizhou: Guizhou is projected to generate imports of USD 692.1 million and exports of USD 572 million in S2, which is a substantial increase from USD 62.2 million and USD 51 million in S1, respectively. The province's trade is primarily driven by its mineral resources and the emerging light manufacturing industries. However, the limited infrastructure yet remains a constraint on further growth.

In terms of the regional comparison, among the western provinces, Sichuan's diversified trade profile gives it a slight advantage over the resource-dependent provinces such as Yunnan and Guizhou. The western region's growth underscores the importance of continued investments in the infrastructure and industrial diversification to fully capitalize on the RCEP benefits.

The RCEP agreement has led to diverse trade impacts across China's regions. With its strong industrial base and connectivity, the eastern region remains the primary beneficiary, driving national trade growth. The central region demonstrates a substantial potential, supported by industrial upgrading and strategic investments. Although starting from a lower base, the western region shows promising progress, particularly in agriculture and resource-based exports. These findings emphasize the need for region-specific policies to address disparities and maximize the benefits of regional economic integration under RCEP.

CONCLUSION

This study examines the national and regional impacts of RCEP on China's trade, focusing on trade creation and diversion, sectoral disparities, and provincial-level changes. The results obtained in this study are indicative of the following main findings, namely:

Trade creation significantly exceeds trade diversion, with Japan and South Korea contributing the most to trade creation effects.

The high-tech and manufacturing sectors benefit the most, while the low-value-added industries experience smaller gains or even adverse effects.

Regional disparities are evident, with the coastal provinces such as Guangdong and Jiangsu achieving the biggest trade gains compared to the more modest growth in the inland regions.

Based on these findings, several policy recommendations are proposed.

Strengthening partnerships with the key RCEP members such as Japan and South Korea is critical, particularly in the high-tech sectors such as machinery and electronics. These collaborations can enhance China's industrial capabilities and its global competitiveness.

In a similar fashion, the ASEAN countries present the untapped potential in both the emerging and established sectors. Strengthening supply chain integration with ASEAN, particularly in renewable energy and advanced manufacturing, could yield substantial mutual benefits. As A. T. Nguyen and T. M. T. Tran (2021) emphasized, trade facilitation measures, including the reduction of nontariff barriers and improvements in institutional coordination, are critical for fostering regional supply chain integration and enhancing trade flows. These efforts should be coupled with exploring partnerships in rapidly evolving sectors so as to diversify trade opportunities and promote technological innovation.

In terms of regional development strategies, the uneven distribution of RCEP benefits across China's regions necessitates region-specific policy interventions to bridge the development gaps and maximize the economic potential of the agreement.

In the eastern region, which already benefits from the robust industrial bases and the strong export capabilities, policies should prioritize fostering the innovation-driven industries. Upgrading the high-value-added sectors such as advanced manufacturing and digital services will consolidate the region's role as a global manufacturing and trade hub.

For the central region, investments in the infrastructure and industrial modernization are critical to attract trade and investment. Policy support should focus on nurturing emerging industries like automotive and electronics to position the region as the key player in domestic and international value chains.

While lagging behind in trade volumes, the western region holds a significant potential for growth through strategic infrastructure development. Enhancing connectivity, both domestically and internationally, will facilitate the integration of the resource-based industries and light manufacturing into regional and global supply chains. Encouraging trade-oriented diversification can further elevate the region's economic profile.

Addressing industry-specific challenges. Sectoral heterogeneity in RCEP trade impacts necessitates tailored support for the industries faced up with unique challenges. Vulnerable sectors, particularly in the primary and tertiary industries, require targeted subsidies or tariff adjustments so as to mitigate potential adverse effects and enhance resilience. For instance, the resource-based industries in the primary sector may benefit from the policies aimed at improving efficiency and value addition.

While showing strong trade effects, the secondary sector should prioritize diversification to reduce dependency on high-tech imports. Encouraging the development of domestic capabilities in the key sectors such as machinery and chemicals will enhance self-sufficiency and support long-term industrial growth.

Limitations do exist in this research. This study relies on the pre-pandemic data potentially limiting its applicability to the post-COVID-19 trade dynamics. Future research should explore updated datasets to capture RCEP evolving impacts.

This study primarily focuses on tariff reductions, leaving nontariff barriers and broader legislative changes under RCEP unexplored. Considering the factors such as trade facilitation measures, regulatory harmonization, and digital trade agreements could provide a broader understanding of the RCEP effects.

The static models employed in this research study effectively capture the immediate impacts of RCEP. However, expanding the analysis in order for it to include dynamic models could reveal the long-term evolution of trade flows and economic interdependencies. Additionally, the parameter settings of the model need to be more realistic in the future. For example, export elasticity in the WITS-SMART tool is set to 99 by default and cannot be changed, which is an idealized setting.

By addressing these limitations, future research can deepen our understanding of RCEP multifaceted impacts, offering more precise guidance for policymakers navigating the complexities of regional economic integration.

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NACIONALNI I REGIONALNI EFEKTI RCEP-A NA TRGOVINU: PRIMENA WITS-SMART ALATA S FOKUSOM NA KINU

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U ovom radu se istražuju efekti kreiranja trgovine po *RCEP*-u (*sveobuhvatnom regionalnom ekonomskom partnerstvu*) i skretanja tokova trgovine na Kinu i njene sektore, kao i uticaj uvoza i izvoza na njene pokrajine. Primenjuje se tzv. *WITS-SMART* alat (*softver svetskog integrisanog trgovinskog rešenja za analizu tržišta i ograničenja u domenu trgovine*) sa podacima za 2020. godinu, zajedno sa tabelama *OECD*-a sa ulaznim i izlaznim komponentama (*ICIO*) na međudržavnom nivou i tabelama sa ulaznim i izlaznim komponentama na nivou većeg broja regiona (*MRIO*) u Kini, a koje se zasnivaju na podacima iz 2017. godine, i to po dva scenarija. Rezultati sprovedene studije ukazuju na značajan rast trgovine sa Japanom i Južnom Korejom, s jedne strane, kao i na istovremeno relativno niske trgovinske efekte sa nacijama i regionima *ASEAN-a* (*Udruženje nacija Istočne Azije*) poput Australije i Novog Zelanda. U ovoj studiji se naglašavaju dispariteti između različitih regiona u Kini, dok se istovremeno ukazuje na činjenicu da istočne priobalne pokrajine ostvaruju veće trgovinske benefite u odnosu na centralne i zapadne oblasti. U ovoj studiji se ističe značaj sprovođenja politika koje podstiču saradnju u sektorima koji ostvaruju visoki rast, kao i značaj razvoja usko prilagođenih strategija za regionalni napredak.

Ključne reči: Kina, tabele sa ulaznim i izlaznim komponentama, RCEP, SMART-WITS alat, kreiranje trgovine i skretanje trgovinskih tokova

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UNLOCKING NIGERIA'S NON-OIL EXPORT POTENTIAL: DO TRADE FINANCING AND DIGITAL PAYMENT PLAY A ROLE?

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Nigeria's poor non-oil export performance has been the focal point of the growth policy discourse since the 1970s, but the role of emerging driving factors has remained significantly less understood. Thus, this study explores the determinants of Nigeria's non-oil exports by explicitly considering trade credit and digital payment systems. The study employs the Autoregressive Distributed Lag Model and the monthly data from 2010 to 2023 so as to achieve its objective. The results show that increased trade credit and better e-payment systems significantly improve the non-oil export sector's performance. The one implication of this finding is that increasing trade credit and improving e-payment systems may serve as another alternative to unlocking and boosting Nigeria's non-oil export sector's potential. Therefore, the paper concludes that, with the promotion of trade credit and an increased use of e-payments, Nigeria can improve its non-oil export performance in order to foster sustainable economic growth.

Keywords: trade financing, digital payment, international trade, export, Nigeria

JEL Classification: F14, 016, O33

INTRODUCTION

In recent years, export financing and e-payment systems have become the essential drivers of export performance in developing economies, which is even more important where inadequate credit access and weak e-payment platforms remain significant challenges for export-oriented firms. This is because export financing boosts external trade by providing export-oriented domestic firms with the capital to expand their productivity, to innovate, and to target foreign markets. Along this line, e-payment systems also offer a platform for traders to conduct trade transactions through a secure and efficient channel, which is even more important in the quest for non-oil export-led economic growth, because e-payment systems reduce transaction costs, enhance transparency and speedy payment for goods and services. In Nigeria, however, limited access to export credit and the poor adoption of e-payment systems may have contributed to the weakening competitiveness of its exporters, especially those in

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the non-oil sector. The shortages and perhaps the inherent weakness of these critical trade enablers may have dampened the prospects of Nigeria's non-oil export growth, which remains a significant development agenda.

In addition, the difficulty in accessing export finance combined with an inefficient e-payment system has constrained the exporters' expansion potential, impeded their liquidity position, and magnified payment risks. Furthermore, another challenge that exporters seek to overcome is the stringent market access conditions imposed by foreign countries (i.e. importers). Thus, to make Nigerian firms be more competitive and achieve trade efficiency, export financing, particularly trade credit and a sound e-payment system, are imperative. Thus, this raises the question of whether Nigeria should increasingly support trade credit and continuously adopt e-payment systems to unlock the potential of the non-oil export sector. This study hypothesizes that the answer is "yes" if their operation enhances the performance of the non-oil export sector, and "no" if it does not. Therefore, this study aims to examine the emerging role of the trade credit and digital payment systems on the performance of Nigeria's non-oil export sector.

In light of the foregoing, there are three major considerations that motivate the focus of this study. First, there is little (if any) empirical evidence on the role of export financing and e-payment systems in promoting the non-oil export sector's performance, except for the study by O. O. Awe, A. A. Adepoju, O. Aromolaran, M. Oladosun, D. E. Azuh and U. Okorie (2021) that examines the role of e-payment systems and trade financing on trade performance. Thus, updated empirical knowledge is important because trade credit and e-payments enhance trade volume, efficiency, diversity, and financial risk mitigation, which is critical, particularly in the case of Nigeria, where crude oil exports have crowded out non-oil exports, which is a more sustainable and stable source of revenue for the government. Moreover, the evidence shows that the export revenue impact of the oil price slump imposes a costly and painful adjustment process in Nigeria (Oyejide, 2015). Second, adverse oil shocks and dwindling oil revenue inflows are a wake-up call for Nigeria to take non-oil exports more seriously. However, doing this requires an efficient digital payment system and export credit support. Third, there are serious concerns that the rate of Nigeria's export diversification away from oil to non-oil has significantly remained very sluggish. For example, Nigeria's non-oil exports as a share of total exports were 17% in September 2021 but dropped to 5% in the same month in 2022, whereas oil exports accounted for over 90%. This is a source of severe concern for the government's quest to diversify from oil to non-oil exports. In this context, the role of the emerging drivers that are expected to stimulate non-oil exports such as export financing and digital payment systems cannot be downplayed[1]. Moreover, the use of e-payment systems and trade credit has continued to surge after COVID-19. Trade credit has astronomically increased from N1.1 trillion in September to N3.2 billion in September 2023.

In light of the modified export supply function predictions and the results obtained from the ARDL model, this study's analysis reveals that increases in trade credit and the usage of e-payment systems significantly raise the performance of the non-oil export sector in Nigeria, which finding implies that trade credit and e-payment can enhance the potential of Nigeria's non-oil export sector, thus contributing the important empirical information that can be used as the input in designing the policies aimed at improving the performance of the non-oil export sector so as to diversify and promote resilient export-led growth in Nigeria. This is important given the fact that Nigeria's main non-oil export products were cocoa (fermented and raw), sesame, cashew nuts, coconut, frozen shrimps and prawns, and ginger. However, Nigeria is relatively not doing well on non-oil exports compared to other countries. Some plausible reasons for this poor performance are the very challenging business environment, such as the high cost of technology and inadequate access to credit. Therefore, this study provides the information suggesting that, by promoting trade credit and increasing the use of e-payments, Nigeria can enhance its non-oil export performance in order to support export-led growth. In addition, the study also contributes to the existing

literature on the determinants of non-oil export performance, particularly the role of trade credit and digital payment systems.

Finally, this paper is organized into six sections. Following the Introduction, Section Two provides stylized facts, which is then followed by Section Three with its review of related studies. Section Four delineates the methodological framework so as to quantify the determinants of Nigeria's non-oil exports. In Section Five the empirical results are presented and discussed, while the paper's main conclusion and policy highlights are given in Section Six.

STYLIZED FACTS

In Nigeria, adequate trade financing and the adoption of digital payment systems can be pivotal for enhancing the country's non-oil export performance. In this light, the section examines the performance of Nigeria's non-oil exports, trade credit, digital payment, exchange rate, foreign exchange supply, and non-oil revenue from 2010 to 2023. The selection of these indicators for the stylized analysis was motivated by the fact that they are the drivers of export supply in Nigeria and would also serve as the foundation for the empirical framework of the paper outlined in Section Four. Table 1 shows that the performance of non-oil exports was quite volatile, increasing from US$223 million in 2010 to US$336 million in 2013, dropping to US$125 million in 2016 and peaking in 2019 at US$2.63 billion[2]. However, non-oil exports dropped again to US$846 million in 2021, up from US$138 million before shrinking to US$391 million and US$279 million in September 2022 and 2023, respectively.

As is shown in Table 1, trade-related financing increased but needs to be improved in order for it to drive non-oil exports in Nigeria. Trade credit increased from N783 billion to N954 billion in 2017 and maintained an upward trend from N1.07 trillion in September 2018 to N3.21 trillion in September 2023. In addition, it has been on the rise. The use of digital payment systems increased from N47.85 billion in September 2010 to about N103.97 trillion in September 2023, indicating a more ICT-intensive financial system.

Table 1 The key indicators

Year	Non-Oil Exports (US$' B)	Trade Credit (₦' B)	Digital Payment (N' B)	Official Exchange rate (N/US$)	Foreign Exchange supply (US$' M)	Non-oil Revenue (₦' M)
Sep-10	0.223	783.13	47.85	154.50	4,207.31	155,892
Sep-11	0.279	991.13	136.87	159.60	4,845.65	200,106
Sep-12	0.284	1,017.25	1,626.82	157.24	1,909.58	192,226
Sep-13	0.336	1,023.87	2,379.00	160.65	3,489.27	192,817
Sep-14	0.293	1,337.06	3,309.54	163.70	3,345.68	221,246
Sep-15	0.117	1,030.00	3,651.04	196.95	1,660.62	215,340
Sep-16	0.125	973.01	5,059.79	305.25	30.00	232,282
Sep-17	0.227	954.23	8,191.43	360.40	420.70	309,752
Sep-18	0.257	1,073.71	11,207.26	363.92	1,078.32	290,390
Sep-19	2.628	1,098.48	13,858.54	362.23	2,061.02	360,432
Sep-20	0.138	1,265.07	37,721.38	386.00	1,313.28	437,596
Sep-21	0.846	1,564.45	39,001.43	411.00	1,497.49	489,164
Sep-22	0.391	2,006.80	70,214.40	435.10	896.31	616,420
Sep-23	0.279	3,207.21	103,967.37	769.26	231.00	999,643

Source: Central Bank of Nigeria; Note: B means billion while M means million

In addition, Figures 1 and 2 plot the movement of some of the key indicators over time. Figure 1 demonstrates that the official foreign exchange rate was going up, indicating the depreciation of the impact of the recent devaluation of the naira. However, Figure 1 also reveals that the official FX supply was quite low, indicating the effects of the ongoing full pledge floating of the naira exchange rate.

Furthermore, Figure 2 indicates a strong correlation between trade credit and the adoption of digital payment systems. However, Figure 2 also shows a remarkable jump from 2019, which coincided with the adoption of online-based payments for goods and services due to COVID-19 and the government credit programs to support domestic firms during and after the pandemic. The link between trade credit and digital payment systems is critical for enhancing business efficiency and financial management. Trade credit allows businesses to buy goods and services on account, improving liquidity and fostering growth. Digital payment systems streamline the process, offering secure, quick, and transparent transactions. This integration reduces the risk of defaults, improves cash flow management, and fosters trust between trading partners.

LITERATURE REVIEW

Theoretical discussion

The theoretical connection between trade financing, digital payment, and export performance can be linked to the export supply functions. A. R. Bergstrom (1951) is amongst the earliest studies to have outlined the theoretical framework for analyzing export supply. The model predicts that the volume of exports is a function of the export price level and the general wage rate. However, the direction of the impact of the key determinants (the export price level & the general wage rate) on the volume of exports has remained ambiguous in the literature, in which light, the imperfect substitution model is broadly applied in the analysis of how exporters respond to conditions in their ability to supply goods and services to foreign markets. The model reflects the environment where exporters are faced with constraints and limitations in adjusting quantity due to, among other things, the production capacity, technology, and prevailing market conditions. I. Lukonga (1994) notes that exports could be better substitutes for domestic goods. Export demand is hypothesized to vary positively with the world economic activity and inversely with the export

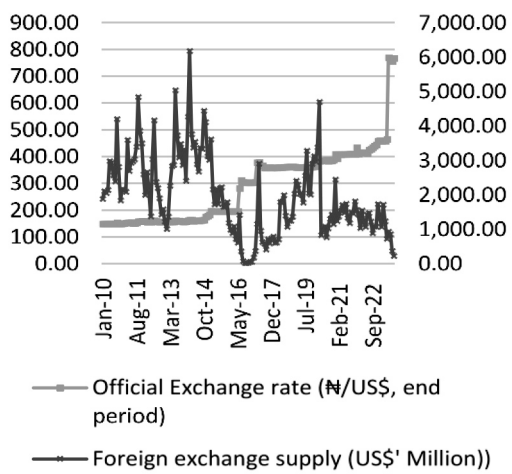

Figure 1 Exchange rate and FX supply

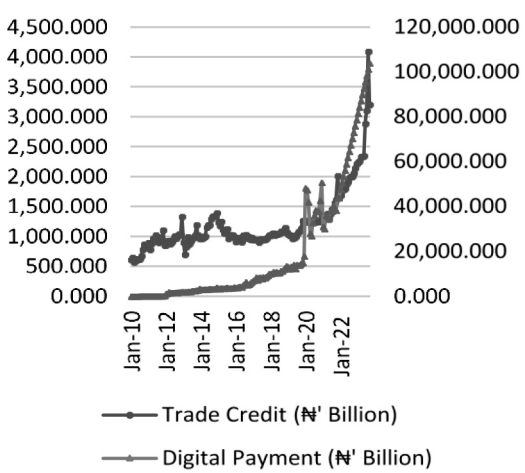

Figure 2 Trade credit and digital payment

Source: Central Bank of Nigeria

prices of the exporting country relative to the prices of foreign substitutes. In contrast, the export supply function is specified so as to positively depend on the cost of exports, negatively on input prices, and positively on the productive capacity. The model allows for the estimation of the demand- and supply-side determinants simultaneously.

In addition, A. Arize (1987) specifies a general export supply function, which assumes that firms are price takers and postulates that the supply of exports depends on the individual country's trend level of real income, deviations from this trend, and export and domestic prices. The volume of export supply is assumed to adjust towards the supplier's desired values. J. L. Newman, V. Lavy and P. de Vreyer (1995) analyze firm behavior by allowing firms and industries to produce two products in a joint production process. The firms are assumed to operate under a perfectly competitive setting in factor markets; therefore, all factor inputs are considered as exogenous. Export prices are also exogenous and operate under perfect competition in factor markets.

In sum, export supply functions are predicated on the notion that exporters respond to changes in different factors such as prices, production costs, exchange rates, and market conditions. The elasticity of export supply measures the responsiveness of the export quantity to changes in its driving factors. Higher elasticity indicates that exporters are more responsive to price changes or other factors. Lower elasticity suggests that exporters must be more responsive and face constraints in adjusting export quantities.

Empirical review

The empirical literature on the drivers of exports is large and has been evolving in recent years. However, the empirical findings of the literature appeared generally mixed with respect to the direction of the impact of the export supply determinants reflecting variations in terms of countries' structures, the methods used, and data measurements. For example, I. Lukonga (1994) found that domestic market conditions strongly influenced export performance in Nigeria. Specifically, the results showed that price incentives had a positive but small effect on agricultural exports. In contrast, the structural shift in the export supply function was linked to the export promotion incentives in the study. In addition, B. O. Oramah, O. Chukwurah and O. Ojeifo (1995) examined the operations of the Nigerian Export-Import Bank and found that the Bank had effectively provided credit support for Nigeria's non-oil exports in the period from 1991 to 1993.

Similarly, in Slovenia, J. Bekő (1999) found that exports were sensitive to trade cycles in global markets and that export supply had been price- and exchange-rate inelastic but income-sensitive between 1993 and 1997. In Japan, J. S. Mah (2006) established that the insurance system had not promoted export supply. J. S. Mah's (2006) findings also indicate that export relative price elasticity is around 0.8-1.0 and statistically significant, whereas no evidence supports the domestic demand pressure hypothesis in export supply. Using cointegration and error correction models, N. M. Nkang, S. O. Abang, O. E. Akpan and K. J. Offem (2007) examined Nigeria's palm kernel export supply function from 1970 to 2003. The long-term results showed that the producer price and foreign income negatively and significantly affected palm kernel exports. In addition, the estimates indicate that the producer price significantly undermined export supply, while foreign income was found to have an insignificant effect in the short run.

Furthermore, T. A. Oyejide (2015) established the fact that higher non-oil exports did not make up for revenue shortfalls in Nigeria following adverse oil price shocks but are crucial for economic growth in the medium to long run. Similarly, M. Raissi and V. Tulin (2018) found that Nigeria's exports were sensitive to international relative price competitiveness, the world demand, and energy shortages. The study also observed that supply-side constraints such as energy shortages dampened the price responsiveness in the short run. In a related context, R. Bhattacharyya and S. Ghosh (2019) observed that the decline in international prices during the recession had reduced the competitiveness of India's exports between 2001Q1 and 2014Q4. The results of the study also showed that the export firms had shifted their attention towards the domestic market due to the export deficit. In

Pakistan, S. I. Hussain, A. Hussain and M. M. Alam (2020) found the evidence that relative prices had an important influence on the export sector performance with respect to raw materials and value-added manufactured products. S. I. Hussain *et al* (2020) also produced evidence indicating that the cost of production significantly affected the growth of value-added manufactured and cotton waste exports. The findings also revealed that the production capacity and domestic demand pressure had significantly influenced the long-term export supply of almost all manufactured and primary export categories.

In addition, O. O. Awe *et al* (2021) use the Bayesian time-varying parameter dynamic linear model to reveal that domestic income and the lending rate influence non-oil export in Nigeria. Similarly, H. O. Ozekhome (2021) used the ARDL cointegration and error correction model to establish the fact that financial development had improved export diversification in both the short run and the long run in Nigeria between 1980 and 2021. In a related context in Pakistan, S. I. Hussain and U. Mazhar (2022) used the ARDL model to show that domestic demand pressure significantly reduced the supply of aggregate, primary, and manufactured exports in both the long run and the short run. Also, E. Frohm (2023) examines how margins adjust to bilateral and US-dollar exchange rate changes using fixed-effect regression on the bilateral trade data at the HS2-product level. The results showed that the exporter's exchange rate depreciation increased the nominal exports between the non-US countries, whereas the bilateral exchange rate had a negligible impact. In addition, K. Farid, T. Mahmood, M. Mumtaz and S. H. Ansari (2023) showed that FDI enhanced export in the long-term link between 2000 and 2020 in a panel of 5 large-scale manufacturing firms in Pakistan.

Using a fixed effect model, Z. Li, H. Chen, S. Lu, and P. Failler (2024) found more recently that better digital payment systems boosted trade performance and enhanced trade networks by reducing cross-border capital restrictions in 25 countries from 2012 to 2020. Interestingly, Li *et al*'s (2024) findings suggest that the impact of digital payment on external trade varies across countries with different levels of trade openness, which means that the policy environment matters. However, W. Gani (2024) used the ARDL model and observed that the pandemic had not affected industrial export performance during the COVID-19 pandemic in Tunisia from 2014 to 2022. Similarly, G. Palazzo (2024) examined the effect of the fundamental exchange rate dynamics on sectoral export performance in Argentina between 1980 and 2015. The results show that the probability of the export sector increases by 2.5% due to higher labor intensity during prolonged devaluation periods. The findings also indicate that export surges are more likely to occur in the sectors related to competitive industries. L. Brandt and K. Lim (2024) analyzed the determinants of Chinese export performance using the general equilibrium model and the results showed that foreign demand, better access to imported intermediates, and factor productivity growth were the main drivers of export performance in China.

METHODOLOGY

This study relies on the modified non-oil export supply function as the theoretical basis of its empirical framework. The model explains how non-oil export supply responds to several factors. For example, the model predicts that a higher relative price of exported goods relative to domestic products increases export supply. The model also suggests that the productive capacity is expected to have a positive effect on non-oil exports. The exchange rate is also crucial for non-oil exports because a weaker domestic currency makes exports cheaper and more competitive in global markets, increasing export supply. Finally, trade policies in the form of tariffs and non-tariff barriers can influence exports by stimulating or discouraging foreign trade. However, due to data limitations, it was impossible to include all the variables discussed above; however, in addition to the exchange rate and the relative price, the export supply specification of S. I. Hussain *et al* (2020) and W. Gani (2024) was slightly modified so as to account for trade credit and e-payment in line with the goal of this research study. Therefore, the empirical model is specified as follows:

$$nox_t = \alpha + \beta_1 tcre_t + \beta_2 epay_t + \beta_3 exr_t + \beta_4 fxp_t + \beta_5 fxs_t + \mu \quad (1)$$

According to Equation (1), *nox* represents the non-oil exports, *tcre* measures trade credit, *epay* denotes the sum of various e-payment systems, *exr* is the exchange rate, *fxp* is the relative price and *fxs* denotes foreign exchange supply. The β_i' are the estimable parameters of the model, and *t* stands for the time, whereas μ is the error term. The hypothesized signs of the elasticities are as follows: $\beta_1>0$, $\beta_2>0$, $\beta_3>0$, $\beta_4>0$, $\beta_5>0$. In addition, the empirical model embodies the hypothesis that if the export price for domestically produced goods in the international market is higher than the domestic price, it will increase the relative profitability of producing exportable goods. Firms tend to shift their resources from the non-traded sector to exportable production, which in turn would enhance the volume of the country's exports; hence, a positive estimate for the relative price coefficient is expected (Hussain *et al*, 2020). The exchange rate coefficient is expected to be positive because a higher exchange rate (indicating the depreciation of the domestic currency) makes exports cheaper in the international markets and spurs competitiveness (Gani, 2024). The higher the liquidity of the domestic foreign exchange market, the easier it is for non-oil exporters to access FX for their operations, such as importing intermediates. The key variables of interest, namely trade credit and e-payment, are expected to affect non-oil export performance positively.

However, for the empirical estimation of Equation (1), this study proxied the *nox* with the naira value of Nigeria's volume of non-oil exports measured in billions of US dollars. In addition, the findings of the study by Z. Li *et al* (2024) justify the inclusion of digital payment in Equation (1). Z. Li *et al* (2024) show that digital payment exerts an important influence on international trade. Furthermore, this study proxies the exchange rate with the nominal bilateral naira official exchange rate per unit of the US dollar. In addition, the evidence obtained from the studies by N. Milenković (2012), R. Kovačević (2022), G. Palazzo (2024), and L. Brandt and K. Lim (2024) provide the empirical justification for the inclusion of the exchange rate in Equation (1). Also, the findings of the studies by M. Čupić and S. Vržina (2024) and A. Matray, K. Müller, C. Xu and P. Kabir (2024) justify the inclusion of trade credit in Equation (1). Finally, the modified non-oil export supply model provides the theoretical basis for the inclusion of the relative price in Equation (1). The indices of the average world prices of Nigeria's major agricultural export commodities are used as the proxy for the relative price.

The estimation technique used is the ARDL bounds testing approach to cointegration and error correction model in order to analyze the short- and long-term relationships. This approach is applicable when variables combine stationary and non-stationary series. All the data used were sourced from the Central Bank of Nigeria's Statistical Bulletin online from January 2010 to September 2023.

RESULTS AND DISCUSSION

Table 2 presents the correlation matrix of the non-oil exports with e-payments and trade credit, which was found to be low at 9% and 7%, respectively. A negative correlation of about 4% is found between the non-oil exports and the relative price, whereas FX supply (fxs) has a positive correlation of about 14% with the flow of the non-oil exports. Overall, the correlation analysis does not indicate the evidence of multicollinearity. Therefore, this study can proceed with regression analysis. In addition, Table 3 reports the descriptive statistics, showing that the non-oil exports averaged US$465 million with the minimum and maximum values of about US$114 million and US$2.63 billion, respectively, which resulted in the standard deviation of about US$355 million.

In addition, Table 3 shows that the e-payments averaged about N18.8 trillion with the standard deviation of N28.8 trillion. During the sample period, the e-payments recorded the lowest value of N20.6 billion and the highest amount of N103.97 trillion. The average value of trade credit was 1.2 trillion with the standard deviation of N502 million, close to the minimum value of N572.5 million compared with the maximum trade credit of N4.09 trillion during the period of observation. The exchange rate average of N290.3 naira per US dollar fluctuates around N133 naira/US around the mean. The lowest exchange rate

Table 2 The correlation matrix

	nox	epay	tcre	exr	fxp	fxs
nox	1.000	0.089	0.072	0.043	-0.036	0.139
epay	0.089	1.000	0.912	0.843	-0.696	-0.342
tcre	0.072	0.912	1.000	0.775	-0.542	-0.271
exr	0.043	0.843	0.775	1.000	-0.756	-0.524
fxp	-0.036	-0.696	-0.542	-0.756	1.000	0.436
fxs	0.139	-0.342	-0.271	-0.524	0.436	1.000

Source: Authors

Table 3 The summary statistics

Indicator/measurement	Mean	SD	Median	Min	Max
nox (US$, mill)	464.47	354.79	373.99	114.14	2,627.87
epay (N, mill)	18,803,760.5	25,882,062.9	6,404,778.7	20,690.0	103,967,369.7
tcre (N, mill)	1,212,503.3	502,633.7	1,029,996.3	572,457.2	4,094,421.8
exr (naira/US$)	290.31	133.78	305.25	150.00	770.88
fxp (US$-based: 2010 = 100)	82.00	19.36	82.50	47.93	124.55
fxs (US$' mill)	1950.26	1149.57	1750.43	30.00	6179.92

Source: Authors

was N150, whereas the highest was N770.88 per dollar. The indices of the average world prices of Nigeria's major agricultural export commodities are used as the proxy for the relative price (fxp), and the average value is 82, with the standard deviation of about 19.4. The minimum value is 47.9, and the maximum value is 124.55.

Furthermore, Table 4 reports the variance inflation factor (VIF) for multicollinearity detection. Multicollinearity occurs when independent variables in a regression model are highly correlated, leading to unreliable estimated coefficients. Table 4 shows that the VIFs for the variables are all less than 5, suggesting that multicollinearity is not a concern. Further checks for stationarity using the ADF and PP techniques are conducted. The stationarity test result in Table 5 reveals that the variables are both I(0) and I(1) at varying significance levels, which means that the conventional test for long-term relationships, such as the Johansen cointegration technique, may not be appropriate. The results are validated by the outcome of the KPSS and the Zivot-Andrews unit root testing procedures, where structural breaks are taken into account.

Table 4 The variance inflation factors (VIF)

	Variable	VIF
1	lepay	4.4775374
2	ltcre	2.6447591
3	lexr	5.8320007
4	lfxp	2.7084047
5	lfxs	1.3258024

Source: Authors

The test results for the long-term relationship using the ARDL bound testing approach reported in Table 7 indicate the long-term association between the non-oil exports, trade credit, e-payments, and the other variables considered, which is because the F-statistic value of 4.404 exceeds the upper bond value of 3.807. This aligns with the findings of S. I. Hussain *et al* (2020) for Pakistan. The long-term estimates are presented in Table 8, which accounts for the fact that, while the second and fourth lags of electronic payment (epay) were negative and statistically significant, only the second lag was positive. This means that the long-term impact is not stable, which does not align with the findings of H. O. Ozekhome (2021), where

Table 5 The ADF and PP unit root testing

Variables	Augmented Dickey-Fuller (ADF)			Philip-Perron (PP)		
	Level	First diff.	Decision	Level	First diff.	Decision
nox	-0.332	-14.612*	I(1)	-9.1019**	-27.5921**	I(0)
epay	-2.648*	-8.067**	I(0)	-2.6145	-11.6846*	I(1)
tcre	0.2086	-11.5926	I(1)	-0.3711	-15.371**	I(1)
exr	2.3128*	-9.3168	I(0)	0.6254	-12.3025*	I(1)
fxp	-3.3472	-9.9437*	I(1)	-1.4434	-11.8999*	I(1)
fxs	-2.8684**	-9.1962	I(0)	-2.7242*	-11.8297**	I(0)

Source: Authors

Table 6 The KPSS and breakpoint stationarity tests

Variables	KPSS			Zivot-Andrews (ZA)				
	Level	First diff.	Decision	Level	Break date	First diff.	Break date	Decision
nox	0.2343	0.023**	I(1)	-5.1265	64	-14.88**	3	I(1)
epay	0.4273	0.101**	I(1)	-9.168**	24	-9.739**	26	I(0)
tcre	0.47**	0.127**	I(0)	-3.757	127	-12.40**	59	I(1)
exr	0.2505	0.079*	I(1)	-4.366	77	-13.712**	160	I(1)
fxp	0.200**	0.071**	I(0)	-5.51**	129	-11.127**	128	I(0)
fxs	0.204*	0.039**	I(0)	-3.883	100	-10.107*	81	I(1)

Source: Authors

financial development was found to positively and significantly impact export diversification in the long run. The difference could be traced to the difference in measurement and the indicators used.

In a similar fashion, Table 8 demonstrates that the effect of trade credit is unexpectedly negative but insignificant, whereas the exchange rate (exr) is, as expected, negative but statistically insignificant. The relative price of Nigeria's major agricultural export commodities is favorable at the levels with the coefficient of about 1.76, suggesting that higher prices increase non-oil exports. However, the estimated coefficient of the second lag is higher. Yet, it becomes negative, showing that Nigeria's non-oil exports drop due to high competition in global markets and limited market access for Nigeria's products. Finally, the estimates show that the long-term effect of domestic FX supply is negative and statistically significant (-0.263), which means that a percentage change in FX supply reduces non-oil exports. This can be explained by the non-oil exporters who often face challenges when accessing US dollars in a foreign exchange market. This constrains productivity and exports as well, because they have limited access to FX to enable them to purchase requisite intermediates.

Table 7 The bound testing result

F-statistic	p-value
4.40365745	0.01830081
lower	upper
2.64252343	3.80662074

Source: Authors

Digging further into the results, Table 8 reveals that the first and third lags of the electronic payments (e-pay) positively and significantly impact the non-oil export performance, which conforms with the result obtained by Li *et al* (2024), who found that digital payment exerted a significant positive impact on international trade and reduced cross-border capital restrictions. The export price coefficient (fxp) is positive and statistically significant, meaning

Table 8 The long-term estimates

Term	Estimate	Std. Error	p-value
(Intercept)	2.0711	1.3472	0.1264
L(lnox, 1)	0.0704	0.0789	0.3741
L(lnox, 2)	0.3001	0.0761	0.0001
L(lnox, 3)	0.1515	0.0798	0.0596
lepay	0.0043	0.2084	0.9836
L(lepay, 1)	0.4583	0.2953	0.1229
L(lepay, 2)	-0.7205	0.2935	0.0153
L(lepay, 3)	0.9141	0.3062	0.0033
L(lepay, 4)	-0.6097	0.2093	0.0042
ltcre	-0.0422	0.1977	0.8314
lexr	-0.1680	0.2040	0.4116
lfxp	1.7578	0.6811	0.0109
L(lfxp, 1)	-2.1523	0.6799	0.0019
lfxs	0.1764	0.1002	0.0804
L(lfxs, 1)	-0.1052	0.1354	0.4385
L(lfxs, 2)	0.1367	0.1329	0.3053
L(lfxs, 3)	-0.2627	0.1334	0.0509
L(lfxs, 4)	0.1335	0.0981	0.1758

Source: Authors

Table 9 The results of the short-term error correction model

Variable	Estimate	Std. error	Statistic	p-value
(Intercept)	2.071	0.398	5.198	0.000
d(L(lnox, 1))	-0.452	0.092	-4.889	0.000
d(L(lnox, 2))	-0.151	0.074	-2.047	0.042
d(lepay)	0.004	0.199	0.022	0.983
d(L(lepay, 1))	0.416	0.194	2.145	0.034
d(L(lepay, 2))	-0.304	0.197	-1.544	0.125
d(L(lepay, 3))	0.610	0.203	2.999	0.003
d(lfxp)	1.758	0.642	2.738	0.007
d(lfxs)	0.176	0.092	1.922	0.057
d(L(lfxs, 1))	-0.008	0.088	-0.085	0.933
d(L(lfxs, 2))	0.129	0.089	1.449	0.149
d(L(lfxs, 3))	-0.133	0.090	-1.486	0.139
ect	-0.478	0.091	-5.229	0.000

Post-estimation tests

Test type	Statistic	p-value
Breusch-Godfrey (autocorrelation)	5.6751	0.2248
Breusch-Pagan (heteroscedasticity)	6.2786	0.9014
Ramsey RESET (misspecification)	0.83804	0.4347
Jarque-Bera (normality)	82.201	0.2216

Source: Authors

that higher export prices stimulate non-oil exports, especially in the agricultural sector. In the short run, higher FX supply in the foreign exchange market by the CBN leads to an improvement in non-oil exports by about 0.18%, which means that non-oil exporters have higher productivity and export volumes given their greater access to FX in meeting their intermediate input demand. Finally, the diagnostics tests were performed satisfactorily, and no evidence of serial correlation, heteroscedasticity, or model misspecification was found. In addition, the Jarque-Bera normality test is also acceptable.

Furthermore, the result of the contemporaneous error correction model is given in Table 9, which describes how quickly the system returns to equilibrium after a deviation or shock. The negative sign indicates that the adjustment process corrects any disequilibrium. Specifically, it implies that, if there is a deviation from the long-run equilibrium, the variable will adjust in the opposite direction in order to correct the error. The value of 0.478 means that approximately 47.8% of the deviation from equilibrium is corrected each month. The speed of the adjustment of -0.478 signifies a moderate adjustment rate, suggesting that the variable corrects nearly half of the disequilibrium in one month, which is neither very fast nor slow.

In addition, Figure 2 shows the CUSUM and CUSUM of squares tests. The cumulative sum test is within the confidence range, indicating no evidence of a structural break or that the model's parameters are stable. Likewise, the cumulative sum of squares is also within the confidence range, suggesting no evidence

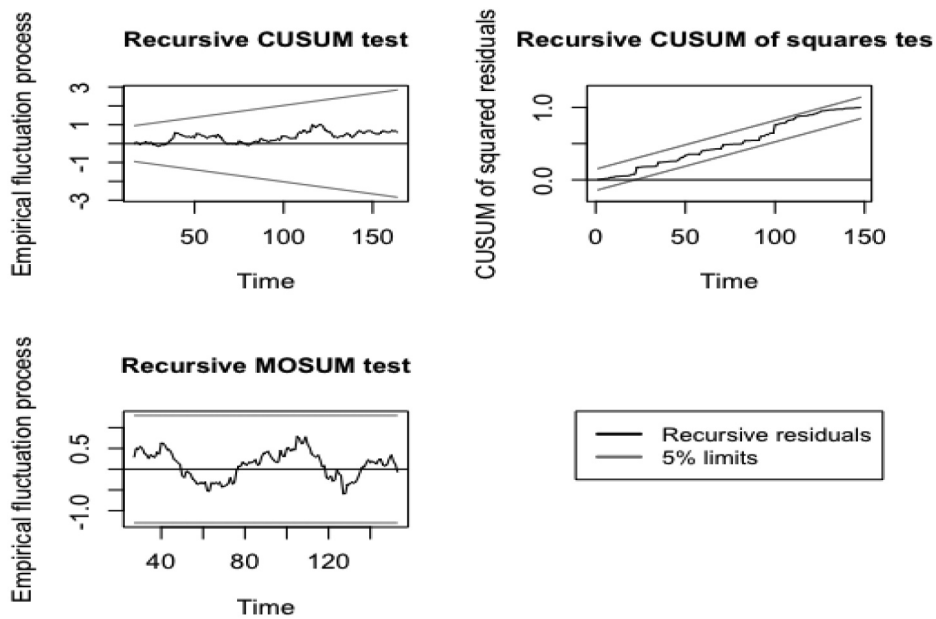

Figure 2 The parameter stability tests

Source: Authors

of change in variance, which means that the model is homoscedastic (i.e. it satisfies the constant variance requirement). The Recursive MOSUM (Moving Sum) test also detects structural changes in the model over time. The MOSUM statistics are within the confidence range, suggesting no significant structural change and validating the findings of the earlier parameter stability test.

CONCLUSION

This study analyzes the impact of trade financing and the e-payment system on non-oil export performance in Nigeria using data from January 2010 to September 2023. The main finding reveals a positive and significant impact of trade credit and the e-payment systems on non-oil export performance, which suggests that increased trade credit and e-payment systems significantly improve the performance of the non-oil export sector in Nigeria. The one implication of this finding is that increasing trade credit and continuously adopting e-payment may serve as another alternative to unlocking the potential of Nigeria's non-oil export sector. In addition, this study observes that the timing of the adoption of electronic payment with a three-period lag proves to be particularly advantageous for enhancing non-oil export performance in Nigeria.

For policy implications, the findings of the research study highlight the three key areas for consideration, namely (i) enhancing and scaling up the non-oil sector's incentives, such as agricultural credit guarantee schemes and non-oil export stimulation facility, so as to provide affordable finance, increase the export-orientation of domestic firms, and amplify non-oil exports; (ii) increasing investments and foreign exchange supply to the agriculture and manufacturing sectors in order to boost non-oil exports; and (iii) implementing the new roadmap outlined in Nigeria's trade policy in order to unlock the potentials of the non-oil sector. These policy considerations are implicative of the fact that Nigeria can enhance its non-oil export performance and drive sustainable economic growth in the long run. Therefore, this study concludes that, with the promotion of trade credit and the increased

use of e-payments, Nigeria can improve its non-oil export performance so as to foster sustainable economic growth. However, it may be of interest for future studies to address the limitations such as the availability and reliability of disaggregated data on export financing and payment systems. A more detailed breakdown of non-oil exports by sectors could offer deeper insights into the sector-specific effects. Considering the impact of e-payments on the digital infrastructure and the potential skewing of the results by using agriculture export prices instead of the export-to-domestic price ratio are also areas for future research consideration.

ENDNOTES

1 In this study, digital payment or e-payment refers to electronic transactions, facilitated by platforms like the NIBSS Instant Payment (NIP), NIBSS Fast Fund, NIBSS Electronic Funds Transfer (NEFT), and electronic card payments via PoS terminals, mobile payments, internet (Web) transactions.

2 https://nepc.gov.ng/cms/wp-content/uploads/2022/05/A-EMMERGING-ISSUES-DISRUPTING-NIGERIAS-NON-OIL-EXPORT-AND-INNOVATIVE-SOLUTIONS-new_compressed.pdf

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OTKLJUČAVANJE IZVOZNOG POTENCIJALA NIGERIJE ZA IZVOZ PROIZVODA KOJI NISU NAFTNI DERIVATI: MOGU LI FINANSIRANJE TRGOVINE I DIGITALNA PLAĆANJA IGRATI ULOGU U TOME?

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Nedovoljne izvozne aktivnosti Nigerije kada su u pitanju proizvodi koji nisu naftni derivati su u fokusu diskursa na kom počiva politika rasta te zemlje još od sedamdesetih godina prošlog veka. Međutim, i dalje je prisutno slabije razumevanje uloge novih pokretačkih faktora tih aktivnosti. Stoga se u ovoj studiji istražuju odrednice izvoznih aktivnosti Nigerije kada su u pitanju proizvodi koji nisu naftni derivati, eksplicitnim razmatranjem sistema trgovinskih kredita i digitalnog plaćanja. U studiji se primenjuje autoregresioni model sa rasporedom docnji i koriste se mesečni podaci za period od 2010. do 2013. godine kako bi se ostvario cilj predmetne studije. Dobijeni rezultati ukazuju na to da povećani trgovinski krediti i bolji sistem elektronskog plaćanja značajno poboljšavaju efikasnost sektora za izvoz proizvoda koji nisu naftni derivati. S jedne strane, to saznanje implicira da povećanje trgovinskih kredita i poboljšanje sistema za elektronsko plaćanje mogu da posluže kao druga alternativa za otključavanje i pospešivanje potencijala izvoznog sektora Nigerije kada su u pitanju proizvodi koji nisu naftni derivati. Stoga, u ovom radu se zaključuje da promovisanje trgovinskih kredita i povećano korišćenje elektronskog plaćanja mogu pomoći Nigeriji da poboljša efikasnost izvoza proizvoda koji nisu derivati nafte u cilju podsticanja održivog ekonomskog rasta.

Ključne reči: finansiranje trgovine, digitalno plaćanje, međunarodna trgovina, izvoz, Nigerija

JEL Classification: F14, 016, O33

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IDENTIFIKACIJA KARAKTERISTIKA POSLOVNIH CIKLUSA U EVROPSKOJ UNIJI SA OSVRTOM NA REPUBLIKU SRBIJU

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Narodna Banka Srbije

Veliki broj radova ukazuje na stilizovane činjenice u vezi sa poslovnim ciklusima različitih zemalja. Ipak, poslovni ciklus je veoma složen fenomen, koji nije lako meriti i interpretirati. Zbog toga je, pored bruto domaćeg proizvoda kao standardne mere poslovnog ciklusa, korisno analizirati i ciklično ponašanje komponenti BDP-a, varijabli tržišta rada, kao i nominalnih varijabli. Ovaj rad pokušava da otkrije pravilnosti u njihovom kretanju u periodu od prvog kvartala 2009. do trećeg kvartala 2023. godine. Time se nastoji pružiti opšta slika o poslovnim ciklusima u savremenim dešavanjima Evropske unije kao celine, Nemačke, kao najrazvijenije zemlje EU, sa osvrtom na Republiku Srbiju. Uz pomoć detaljne statističke analize vremenskih serija, proučene su stilizovane činjenice i ispitana volatilnost ovih varijabli, njihova korelisanost sa BDP-om, kao i perzistentnost. Opšti zaključak jeste da poslovni ciklus Srbije ne zaostaje za razvijenijim zemljama. Takođe, ustanovljena su neka zapažanja o zajedničkim tendencijama koje bi mogle važiti u većini slučajeva.

Ključne reči: volatilnost, korelisanost, perzistentnost, poslovni ciklus, stilizovane činjenice

JEL Classification: E31, E32, F44

UVOD

Ekonomski sistemi kontinuirano doživljavaju različite ciklične fluktuacije sa prepoznatljivim obrascima i raznolikim poreklom. Ove fluktuacije, koje karakterišu naizmenični periodi ekspanzije i kontrakcije, pod uticajem su mnoštva faktora, poput tehnološkog napretka, državnih politika i globalnih ekonomskih uslova. Razumevanje složenosti i dinamike ovih ekonomskih ciklusa je od suštinskog značaja za kreatore politika, preduzeća i pojedince kako bi se efikasno kretali kroz različite ekonomske uslove i neizvesnosti.

Predmet ovog rada jeste upravo proučavanje stilizovanih činjenica u vezi sa poslovnim ciklusima i identifikacija njihovih karakteristika kroz analizu cikličnih komponenti ključnih makroekonomskih varijabli na primeru Evropske unije, Nemačke i Srbije. Cilj istraživanja jeste dokumentovanje prirode

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ovih varijabli u periodu posle svetske finansijske krize i ispitivanje da li obrasci kretanja poslovnih ciklusa koji su ustanovljeni u pretkriznom periodu i dalje važe u izmenjenom ekonomskom kontekstu i savremenim krizama. U tu svrhu se ispituje ciklično ponašanje komponenti bruto domaćeg proizvoda (lična potrošnja, državna potrošnja, investicije, izvoz i uvoz), varijabli tržišta rada (zaposlenost, nezaposlenost i realne zarade) i nominalnih varijabli (inflacija, kamatne stope i devizni kurs). Identifikacija karakteristika ciklusa ovih varijabli podrazumeva ispitivanje da li su one prociklične ili kontraciklične, da li vode, koincidiraju ili zaostaju za BDP-om, kao i u kojoj meri su one postojane, usled nepredviđenih šokova. Postavlja se pitanje da li skup razvijenih zemalja i zemalja u razvoju, kao što je Evropska unija, razvijena zemlja, kao što je Nemačka i zemlja u razvoju, kao što je Srbija, imaju slične obrasce ciklusa, uprkos njihovim različitostima. Ono što im je nesumnjivo zajedničko jeste da je period nakon globalne ekonomske krize zabeležio održivi trend ekonomskog rasta, posebno nakon 2015. godine (Trpeski, Kozheski & Merdzan, 2024).

Ovaj rad se oslanja na ideju da fenomen poslovnog ciklusa nisu jednostavne fluktuacije agregatnog autputa, već je u pitanju složeni fenomen, koji obuhvata i različite obrasce korelacija između različitih vremenskih serija. Uobičajena tema u ovoj liniji istraživanja je da se fenomen poslovnog ciklusa ne sastoji samo od fluktuacija autputa, već i od zajedničkih obrazaca korelacije između različitih agregatnih vremenskih serija (Backus & Kehoe, 1992). Zbog toga je ispitana volatilnost ovih vremenskih serija, njihova korelisanost sa BDP-om i perzistentnost. To omogućava merenje stabilnosti ekonomije i izloženosti rizicima, zatim identifikovanje vodećih indikatora ekonomske aktivnosti i faktora ekonomskog rasta, kao i identifikovanje područja u kojima su potrebne intervencije politika ili dodatna istraživanja. Primenjena metodologija uključuje najpre izdvajanje ciklične komponente iz posmatranih vremenskih serija pomoću HP filtera, proveru stacionarnosti ove ciklične komponente oko nule uz pomoć testova jediničnog korena i konačno preračun volatilnosti, korelisanosti i perzistentnosti pomoću standardnih devijacija, koeficijenata korelacije posmatranih varijabli sa BDP-om i koeficijanata autokorelacije, respektivno. Navedena metodologija je u skladu sa studijama R. Fiorito i T. Kollintzas (1994) i R. Jovančević i V. Arčabić (2011). Podaci u ovom radu se ne poklapaju u potpunosti sa navedenim radovima, imajući u vidu da je obuhvaćen kasniji vremenski period u odnosu njih. Korišćene vremenske serije su prilagođene dostupnim podacima za Srbiju, zbog čega se i rezultati mogu razlikovati.

Dakle, u skladu sa predmetom i ciljem istraživanja postavljaju se sledeće hipoteze:

H1: Poslovni ciklusi Srbije ne zaostaju za poslovnim ciklusima Evropske Unije i Nemačke.

H2: Komponente BDP-a su prociklični i koincidirajućeg karaktera, investicije su volatilnije u odnosu na potrošnju, a kretanje državne potrošnje je stabilno.

H3: Zaposlenost je prociklična, a realne zarade su kontraciklična varijabla.

H4: Inflacija i kamatne stope ispoljavaju prociklični i zaostajući efekat uz najveću perzistentnost inflacije.

Rad je strukturiran na sledeći način. Najpre je predstavljena dosadašnja literatura u vezi sa izloženom problematikom, kao i stilizovane činjenice o poslovnim ciklusima. Naredni deo opisuje podatke, na osnovu kojih su dobijeni rezultati za dalju diskusiju. Poslednji deo sumira rezultate i nudi moguće zaključke.

PREGLED LITERATURE

Spoznaja stilizovanih činjenica u vezi sa čitavim setom vremenskih serija smatra se ključnim korakom u makroekonomskom istraživanju (Harvey & Jaeger, 1993). Značaj njihovog praćenja ogleda se u sagledavanju mogućnosti za preventivno delovanje zemlje u cilju eliminisanja negativnih efekata ciklusa. Međutim, vrlo često ove stilizovane činjenice zanemaruju pojedine izuzetke, zbog čega je važno obratiti pažnju na svaki pojedinačni slučaj. Kada je reč o poslovnim ciklusima, stilizovane činjenice vode

poreklo od poznatog rada A. F. Burns i W. C. Mitchell (1946), koji je zaslužan za interpretaciju ponašanja makroekonomskih varijabli bez modela.

Radovi F. E. Kydland-a i E. C. Prescott-a (1982, 1988, 1990, 1991) su inspirisali mnoge druge autore da ispitaju stilizovane činjenice poslovnih ciklusa. Naime, ovi autori su pokušali da objasne osnovne karakteristike poslovnih ciklusa u SAD-u, pomoću stohastičkih dinamičkih modela opšte ravnoteže koji su u stanju da generišu veštačke podatke. U pitanju su modeli koje su kasnije brojni autori u svojim radovima modifikovali ili se na njih nastavljali. Između ostalih, njihovi sledbenici su i R. Fiorito i T. Kollintzas (1994) koji se oslanjaju na Teoriju realnog poslovnog ciklusa (RBC teorija). RBC teorija ukazuje na stilizovane činjenice koje uključuju: procikličnost produktivnosti rada, volatilnost radnih sati, korelaciju između potrošnje i dokolice, perzistentnost poslovnih ciklusa i neutralni uticaj monetarne politike. Takoreći, prema RBC teoriji, fluktuacije poslovnog ciklusa su rezultat stvarnih šokova po ekonomiju, a ne promena monetarne politike ili drugih nominalnih faktora. R. Fiorito i T. Kollintzas (1994) izdvajaju samo one najviše kontroverzne stilizovane činjenice RBC teorije, i grupišu ih u tri vrste: (1) komponente potrošnje, prihoda i autputa, (2) cene i monetarne varijable i (3) faktore proizvodnje. Autori, na primeru razvijenih zemalja zaključuju da su BDP i njegove komponente procikличne, kao i da potrošnja uglavnom fluktuira manje (sa izuzetkom Velike Britanije), a investicije više u odnosu na realni BDP. Oni potvrđuju nalaz F. E. Kydland-a i E. C. Prescott-a za SAD da su cene kontracikличne u svim zemljama, dok novčana masa ne ukazuje na jedinstven obrazac, već se razlikuje između zemalja i zavisi od definicija novčane mase. Takođe, zaključuju da su fiksne investicije oko tri-četiri puta volatilnije od potrošnje i da su obe varijable koincidirajuće. Ovi rezultati važe u većini zemalja koje autori posmatraju, dok za pojedine zemlje postoje izuzeci.

Kada je reč o državnoj potrošnji, rezultati variraju od zemlje do zemlje. Isti slučaj je i sa novčanom masom, koja nema jedinstveni obrazac ponašanja. Takođe, ne pokazuje jaku korelaciju sa BDP-om ni na jednoj docnji. Autori takođe daju dokaze o kontracikličnoj i vodećoj prirodi realnih kamatnih stopa, uz veću volatilnost u odnosu na BDP. U najvećem broju slučajeva, indeks potrošačkih cena je kontracikličan i vodeći indikator. Kontracikličnost cena i slaba korelacija između novčane mase i autputa je konzistentna sa RBC teorijom. Što se tiče faktora proizvodnje, input rada se smatra procikličnim i manje volatilnim u odnosu na autput, dok zaposlenost zaostaje za autputom. Veza između realnih zarada i autputa varira u zavisnosti od zemlje. Konkretno, u Nemačkoj nije zabeležena korelacija između ove dve varijable.

Kada su u pitanju finansijske varijable, u literaturi se obično ističe efekat kašnjenja kamatnih stopa. To znači da čak i kada otpočne recesija, moguće je da kamatne stope i dalje rastu, što dodatno pogađa potrošače i privredu, koji su već pogođeni padom privredne aktivnosti (Praščević, 2008).

U dosadašnjoj literaturi postoje i radovi koji se bave prirodom ovakvih varijabli i kod zemalja u razvoju. Tako na primer, S. Zarić (2018) ispituje ključne karakteristike ciklusa makroekonomskih varijabli u Srbiji - volatilnost, sinhronizovanost, vremensku podudarnost i perzistentnost. Istraživanje dolazi do zaključka da se, prema ovim karakteristikama ciklusa, Srbija ne razlikuje značajno od evropskih zemalja u razvoju. C. Ghate, R. Pandey i I. Patnaik (2013) daju stilizovane činjenice u vezi sa poslovnim ciklusima u zemljama u tranziciji. Autori zaključuju da su investicije i uvoz, protokom poslovnog ciklusa, pokazale procikličan karakter, dok je priroda neto izvoza i nominalnog deviznog kursa kontracikлична. E. Jakopin (2020) dolazi do nalaza da su u Srbiji, u periodu 2015-2019. godine, najveći doprinos rastu BDP-a dali makroekonomski agregati investicije i lična potrošnja. Zaključak o pozitivnom uticaju investicija na BDP po stanovniku za Evropsku uniju dobija O. Schneider (2022). Autor ukazuje da bi efikasnija alokacija radne snage u visokoproduktivne regione trebalo da podigne ukupnu stopu rasta u EU i ograniči povećanje plata. O perzistentnosti u evropskim zemljama u razvoju daju rezultate Z. Mladenović, K. Josifidis i S. Srdić (2013), koji sugerišu postojanost realnih deviznih kurseva usled akumuliranih neočekivanih slučajnih šokova. Dodatne stilizovane činjenice ukazuju i na procikličnost monetarne

politike. E. C. Prescott (2016) daje pregled svih radova koji sa metodološkog aspekta ilustruju RBC teoriju ili proširuju primenljivost neoklasične teorije rasta.

Sličnom temom, kao u ovom radu, u skorijoj literaturi su se bavili M. Orellana, R. Mendieta, S. P. Rodríguez, S. Vanegas i J. Segovia (2023), analizirajući skup makroekonomskih varijabli za Ekvador, koje se odnose na stranu tražnje, tržište rada, nominalne varijable, kao i na varijable u vezi sa otvorenošću ekonomije. Pomenuta studija daje procenu zajedničkih kretanja, postojanosti i volatilnosti svake od ovih makroekonomskih varijabli. Autori otkrivaju da se ciklično ponašanje ovih varijabli izmenilo nakon procesa dolarizacije. M. M. H. I. Elwia (2024) ispituje karakteristike i dinamiku ekonomskih fluktuacija u Egiptu. Autor zaključuje da su potrošnja stanovništva, ukupne investicije i stopa nezaposlenosti koincidirajuće varijable, zatim uvoz, nominalni devizni kurs, otvorenost, berzanski indikator i kamatna stopa vodeće varijable i konačno, državna potrošnja, izvoz, razmena, neto izvoz, realni devizni kurs, realni efektivni devizni kurs, cene, nominalni indikatori bankarskog sektora, realne zarade i novčane mase M0 i M2 zaostajuće varijable. Analizom najvažnijih osobina cikličnih fluktuacija u Evropskoj uniji su se bavili M. Spychała, i J. Spychała (2024), koji su izolovali fluktuacije poslovnog ciklusa na osnovu indikatora dinamike bruto domaćeg proizvoda. Nalazi autora sugerišu da su fluktuacije poslovnog ciklusa bile sinhronizovane do finansijske krize 2008. godine i dužničke krize koja je usledila, da bi pandemija COVID-19 zatim podstakla rekordnu sinhronizaciju poslovnog ciklusa. Ipak, jedan od glavnih zaključaka ovog rada jeste da postoje razlike u poslovnim ciklusima i da one u velikoj meri zavise od razvijenosti posmatranog regiona.

PODACI

Analizu započinjemo opisivanjem podataka koji su korišćeni u istraživanju. U skladu sa prethodno opisanom literaturom, od značaja su komponente BDP-a koji predstavlja meru poslovnog ciklusa. Zatim, analiziraju se i varijable tržišta rada, imajući u vidu da je i ono pogođeno tokom krize 2008. godine, naročito pojedinci sa nižim prihodima. Takođe, neočekivana pojava pandemije COVID-19 dovela je do globalne ekonomske krize, koja je ozbiljno destabilizovala tržišta rada i poremetila njihovu prethodnu jednakost (Trpeski *et al*, 2024). Zbog toga se analiziraju zaposlenost, nezaposlenost i realne zarade. Na taj način su obuhvaćeni različiti aspekti realne ekonomije. Pored realnih varijabli, pokrivene su i nominalne varijable: inflacija, kamatne stope i devizni kurs. Ovim je izabran skup varijabli kao u radu R. Jovančević i V. Arčabić (2010), izuzev podatka o cenama akcija, koji nije dostupan za Srbiju. U okviru jedinica posmatranja, izabrana je Evropska unija kao celina, čime je obezbeđen spoj razvijenih zemalja i zemalja u razvoju koje funkcionišu u uslovima zajedničkog institucionalnog okruženja i smanjenih ekonomskih i trgovinskih barijera, zatim Nemačka kao razvijena zemlja, odnosno najrazvijenija zemlja EU i konačno Republika Srbija kao zemlja u razvoju. Posmatran je vremenski period nakon finansijske krize 2008. godine: od prvog kvartala 2009. godine do trećeg kvartala 2023. godine. Za Srbiju su nešto kraće vremenske serije, zbog ograničenog vremenskog obuhvata za varijable tržišta rada. Naime, ove vremenske serije za Srbiju su dostupne od 2010. godine, izuzev realnih zarada koje su dostupne od 2011. godine, pa je za 2010. godinu izvršena procena. Tabela 1 sumira varijable, posmatrani vremenski period i opis podataka. Posmatrane vremenske serije su desezonirane, a zatim logaritmovane (osim indeksa i procenata), gde god je potrebno.

Podaci su preuzeti sa javno dostupnih statističkih baza podataka: Eurostat, IMF IFS, Bundesbank i Narodna banka Srbije, tako da se rezultati mogu lako replicirati.

METODOLOGIJA

U literaturi se kao prvi korak u ovakvoj analizi navodi obezbeđenje stacionarnih stohastičkih procesa (Leitner, 2007). Ovde to postižemo detrendiranjem vremenskih serija. Postoji veliki broj načina da se „uglača“ vremenska serija i na taj način izdvoji trend. U ovom radu se sprovodi dekompozicija desezoniranih

Tabela 1 Prikaz baze podataka

Varijable	Posmatrani vremenski period			Opis podataka
	EU27	Nemačka	Srbija	
BDP	09:1-23:3	09:1-23:3	10:1-23:3	U milionima evra (2010=100)
Lična potrošnja	09:1-23:3	09:1-23:3	10:1-23:3	U milionima evra (2010=100)
Državna potrošnja	09:1-23:3	09:1-23:3	10:1-23:3	U milionima evra (2010=100)
Investicije	09:1-23:3	09:1-23:3	10:1-23:3	U milionima evra (2010=100)
Izvoz	09:1-23:3	09:1-23:3	10:1-23:3	U milionima evra (2010=100)
Uvoz	09:1-23:3	09:1-23:3	10:1-23:3	U milionima evra (2010=100)
Zaposlenost	09:1-23:3	09:1-23:3	10:1-23:3	Anketni podaci, u hiljadama
Nezaposlenost	09:1-23:3	09:1-23:3	10:1-23:3	Anketni podaci, u hiljadama
Realne zarade	09:1-23:3	09:1-23:3	10:1-23:3	Indeks nominalnih plata/HICP
Inflacija	09:1-23:3	09:1-23:3	10:1-23:3	Harmonizovani indeks potrošačkih cena
Kamatne stope	09:1-23:3	09:1-23:3	10:1-23:3	Kratkoročne kamatne stope - tržište novca (umesto EU27 podaci za Evrozonu)
Devizni kurs	09:1-23:3	09:1-23:3	10:1-23:3	Realni efektivni devizni kurs

Izvor: Autor

vremenskih serija na trend i ciklus pomoću *Hodrick -Prescott* (HP) filtera. U pitanju je linearni filter koji je veoma popularan u makroekonomskim istraživanjima. Iako postoje i radovi koji ističu mane ovog filtera (King & Rebelo, 1993; Cogley & Nason, 1995), velika prednost ovog metoda jeste sposobnost da učini podatke stacionarnim, kao i činjenica da nije potrebno modelirati vremenske serije, kao što je to slučaj kod drugih filtera (Marczak & Beissinger, 2013).

Opšti okvir za dekompoziciju svake vremenske serije na trend i ciklus glasi:

$$y_t = y^g_t + y^c_t + \varepsilon_t, \quad t = 1, 2, ..., T \tag{1}$$

gde t označava vreme, a y_t prirodni logaritam posmatrane vremenske serije. Vremenska serija y_t se raščlanjava na trend y^g_t, ciklus y^c_t i iregularnu komponentu ε_t. Kod HP filtera je iregularna komponenta nula, čime se svaki poremećaj koji je ostao u podacima nakon uklanjanja trenda pripisuje komponenti ciklusa. Kao što su predložili R. J. Hodrick i E. C. Prescott (1997), koristi se parametar izravnanja vrednosti 1600 za kvartalne podatke.

Za merenje volatilnosti određene varijable, najpre se koristi standardna devijacija te varijable. Dodatno, izračunava se i odnos standardnih devijacija posmatranih varijabli i standardne devijacije BDP-a. Ovaj odnos pokazuje koliko puta je data varijabla volatilnija od BDP-a. Varijable sa odnosom većim od jedan smatraju se volatilnijim od BDP-a, dok se one sa odnosom manjim od jedan smatraju manje promenljivim.

Odnos između standardne devijacije promenljive X i standardne devijacije BDP-a je mera relativne volatilnosti ili varijabilnosti te promenljive u poređenju sa ukupnom ekonomskom aktivnošću koju predstavlja BDP. Množenjem ovog odnosa sa 100 dobija se procenat koji obezbeđuje standardizovanu meru disperzije varijable X u odnosu na varijabilnost u BDP-u. Veći koeficijent ukazuje na veću relativnu volatilnost varijable X u poređenju sa BDP-om, dok niži koeficijent sugeriše da je X manje promenljiva u odnosu na ukupnu ekonomsku aktivnost. Ova mera je posebno korisna kada se poredi varijabilnost različitih varijabli koje mogu imati različite merne jedinice ili skale. Takođe, relativna volatilnost je jedna od mera kojom R. Fiorito i T. Kollintzas (1994) proveravaju senzitivnost rezultata na izbor metode detrendiranja, s obzirom na to da su pojedini autori ukazali da HP filter može uticati na ova merenja.

Posmatranje korelisanosti, odnosno vremenske podudarnosti makroekonomskih varijabli s BDP-om,

važno je zbog toga što omogućava identifikovanje uzročnih veza i promena u ekonomiji. Analiza korelisanosti omogućava razumevanje ponašanja različitih varijabli u odnosu na ekonomske cikluse, što doprinosi boljem predviđanju ekonomske aktivnosti i formulisanju efikasnih ekonomskih politika. Ova vremenska podudarnost se meri koeficijentom korelacije između posmatranih ciklusa i BDP-a. Pored analize za tekući period, korelacija se izračunava i za prethodna dva i naredna dva perioda za izabrane varijable. To se radi iz razloga što je za analizu cikličnih kretanja važno šta se dešava i u prethodnom i u narednom periodu. Takođe je na taj način moguće sagledati i da li varijabla vodi ili zaostaje u odnosu na BDP.

Za datu varijablu X i BDP kao meru autputa Y, mera korelisanosti je sledeća:

$\rho(j)$, gde $j \in \{0, \pm1, \pm2,...\}$ i gde je

$\rho(j)$ koeficijent korelacije između Y_t i $X_{t\pm j}$,

pri čemu je X {
- vodeća varijabla, ako je $|\rho(j)|$ maksimalno za negativno j;
- koincidirajuća varijabla, ako je $|\rho(j)|$ maksimalno za nulto j;
- zaostajuća varijabla, ako je $|\rho(j)|$ maksimalno za pozitivno j;
- prociklična varijabla, ako je $\rho(j)>0$,
- kontraciklična varijabla, ako je $\rho(j)<0$.

Drugim rečima, za tumačenje se koristi najveći koeficijent korelacije. Pozitivan znak ukazuje da je varijabla prociklična, a negativan da je kontraciklična, dok visina koeficijenta ukazuje na jačinu veze sa BDP-om. Za koeficijente $\rho(j)$ visine od 0,5 do 1 kažemo da su visoko korelisani, dok za vrednosti od 0,2 do 0,5 kažemo da je veza slabija. Vrednosti $\rho(j)$ ispod 0,2 ukazuju na veoma nisku ili nepostojeću korelaciju. Granica od 0,2 je izabrana zato što je to okvirna vrednost na kojoj se nulta hipoteza o nesignifikantnosti koeficijenta korelacije, za nivo značajnosti od 5%, odbacuje.

Perzistentnost ukazuje na trajnost, odnosno postojanost određene varijable usled nepredviđenih slučajnih šokova. Drugim rečima, perzistentnost ukazuje na to koliko dugo se varijabla zadržava u određenoj fazi ciklusa. Ako je varijabla postojana, to znači da usled privremenog šoka, kao efekat nastaje promena u posmatranoj varijabli koja je dugotrajnija, odnosno ne iščezava odmah. Dakle, perzistentnija varijabla ukazuje na veću stabilnost. Analiza perzistentnosti je važna za identifikaciju trendova, usmeravanje strategija, upravljanje rizicima, razumevanje cikličnih obrazaca i unapređenje ekonomskog modeliranja. Perzistentnost se meri koeficijentom autokorelacije svake posmatrane varijable za tri kvartala unapred. Na taj način je moguće opažanje zakasnelih efekata i usklađivanje sa dinamikom poslovnog ciklusa.

Za datu varijablu X, mera perzistentnosti je sledeća:

$\phi(j)$, gde $j \in \{0, +1, +2,...\}$, gde je

$\phi(j)$ koeficijent autokorelacije između X_t i X_{t+j}.

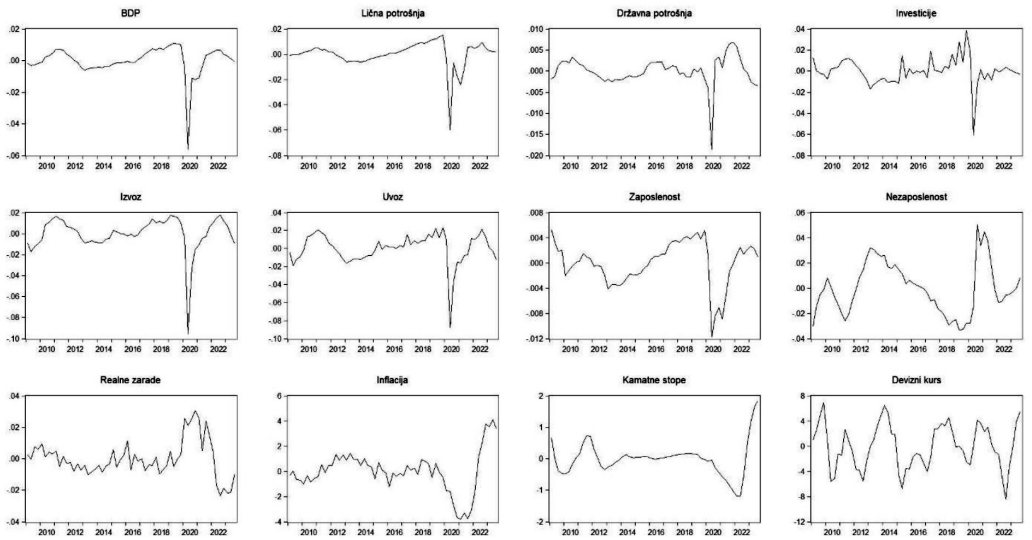
Kada je $\phi(j)$ signifikantno za veće j, to je X perzistentnije.

REZULTATI ISTRAŽIVANJA I DISKUSIJA

Opisani podaci su obrađeni metodom detrendiranja, čime su izdvojeni ciklusi posmatranih vremenskih serija. Slike 1, 2 i 3 predstavljaju ove cikluse za EU, Nemačku i Srbiju, redom.

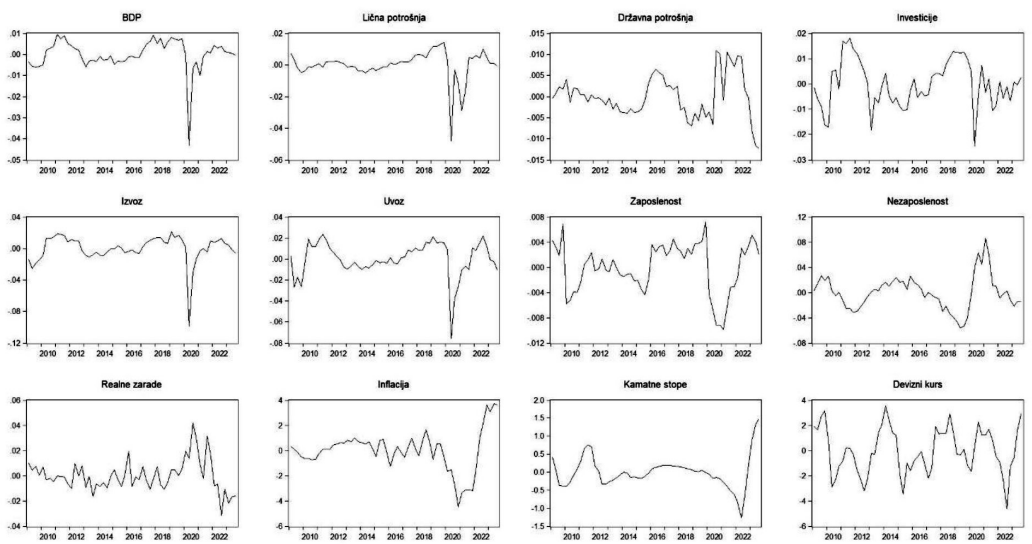
Kao što je već napomenuto, važno je da dobijeni ciklusi predstavljaju stacionarne vremenske serije, što je najpre i provereno pomoću ADF (Augmented Dickey-Fuller) i KPSS (Kwiatkowski-Phillips-Schmidt-Shin) testa jediničnog korena.

Tabela 2 prikazuje rezultate testova jediničnog korena koji je primenjen na podacima (u nivou) o prethodno dobijenim cikličnim komponentama svih varijabli pomoću HP filtera. Kako su izračunate vrednosti ADF test statistike manje od kritične vrednosti, na nivou značajnosti od 5% se odbacuje nulta hipoteza o postojanju jediničnog korena i zaključuje se da su



Slika 1 Ciklične komponente ključnih makroekonomskih varijabli u Evropskoj Uniji

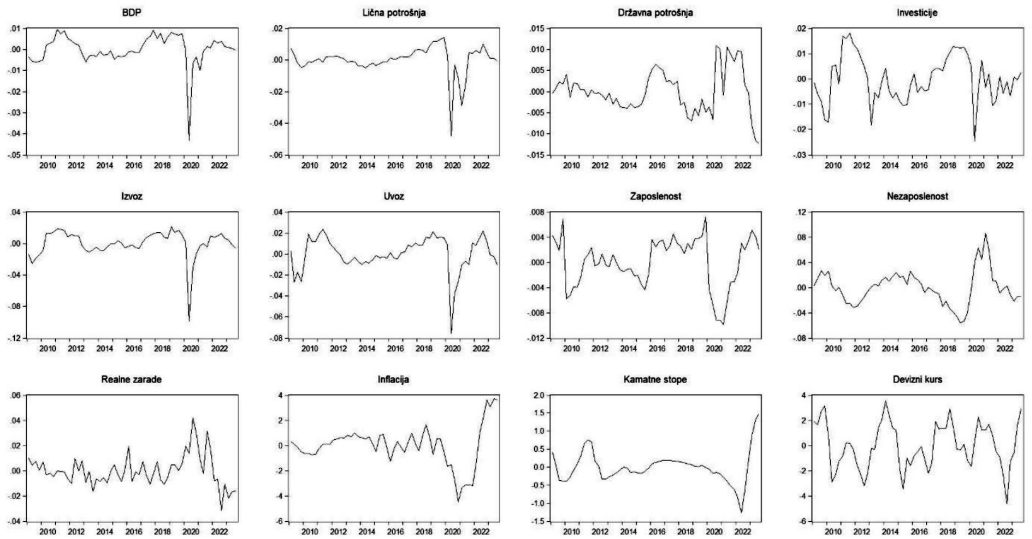
Izvor: Autor



Slika 2 Ciklične komponente ključnih makroekonomskih varijabli u Nemačkoj

Izvor: Autor

ciklusi posmatranih varijabli stacionarne vremenske serije, odnosno I(0) procesi. Takođe, sve izračunate vrednosti KPSS test statistike su manje od kritičnih vrednosti na nivou značajnosti od 5%, te se nulta hipoteza ne odbacuje i zaključuje se da su posmatrani ciklusi stacionarni, odnosno I(0) procesi. Prema ADF testu pojedine varijable (realne zarade u Nemačkoj i inflacija u Srbiji) ukazuju na prisustvo jediničnog korena. Međutim, razlog tome je prisustvo loma u seriji, na šta je osetljiv ADF test. KPSS test tada ima



Slika 3 Ciklične komponente ključnih makroekonomskih varijabli u Srbiji

Izvor: Autor

bolje performanse i pokazuje da su serije stacionarne, kao i grafički prikaz korelograma koji ukazuje da nema jediničnog korena.

Volatilnost

U skladu sa prethodno opisanom metodologijom, izračunati su pokazatelji volatilnosti. Prema rezultatima prikazanim u Tabeli 3, u skupu posmatranih varijabli kao najvolatilnije se ističu inflacija, kamatne stope i devizni kurs, koje zajedno pripadaju skupu nominalnih varijabli. Među njima, najviše oscilacija je zabeleženo u okviru deviznog kursa, a zatim u okviru inflacije. Volatilnost deviznog kursa je nepoželjna, s obzirom na to da izaziva paniku na deviznom tržištu, jer trgovci i korisnici deviza nisu sigurni šta da očekuju na tržištu na dnevnom nivou (Osazevbaru, 2021). U skupu preostalih, realnih varijabli, kao najvolatilnija se izdvaja nezaposlenost, što je slučaj kod svih posmatranih zemalja. Zatim ide uvoz kod EU, izvoz kod Nemačke i investicije kod Srbije. Najmanje volatilna, odnosno najstabilnija varijabla u EU u posmatranom periodu bila je državna potrošnja, što je bio slučaj i u Srbiji. Državna potrošnja se smatra najstabilnijom varijablom, što se pripisuje faktorima kao što su stroge budžetske kontrole, ekonomska saradnja i harmonizacija politika. Navedeno stabilno kretanje potvrđuje deo hipoteze H2 koji se odnosi na državnu potrošnju. Najstabilnija varijabla u Nemačkoj jeste zaposlenost, usled faktora kao što su čvrste politike tržišta rada, snažan fokus na stručnom osposobljavanju i bliska saradnja između poslodavaca i sindikata. I kod Nemačke je državna potrošnja prilično stabilna i manje volatilna od autputa.

Rezultati otkrivaju da investicije fluktuiraju više u odnosu na potrošnju u EU i Srbiji, dok u Nemačkoj one fluktuiraju podjednako. Time je hipoteza H2 u ovom aspektu prihvaćena u EU i Srbiji, dok se za Nemačku odbacuje. Ova nestabilnost često proizlazi iz većih talasa optimizma i pesimizma koje uzrokuju ciklične fluktuacije, odnosno, iz „životinjskog duha" investitora, kako je opisao J. M. Kejns, gde instinkt i društvena psihologija mogu izazvati fluktuacije u investicijama. To čini deo široko prihvaćenog uverenja da su investicioni udari pokrenuli poslovne cikluse. „Životinjski duh", odnosno investiranje na osnovu instinkta, manje je izraženo u Nemačkoj, imajući u vidu da je u ovoj zemlji volatilnost investicija i potrošnje izjednačena. To se može pripisati strožim propisima koji mogu ograničiti spekulativne

Tabela 2 Testovi jediničnog korena za ciklične komponente dobijene pomoću HP filtera

Varijable	ADF (*k*)			KPSS		
	EU	Nemačka	Srbija	EU	Nemačka	Srbija
BDP	-4,41 (0)	-4,81 (0)	-4,97 (0)	0,05	0,05	0,06
Lična potrošnja	-4,59 (0)	-5,00 (0)	-4,85 (0)	0,05	0,05	0,05
Državna potrošnja	-4,63 (0)	-5,54 (9)	-3,94 (0)	0,05	0,05	0,09
Investicije	-5,89 (0)	-3,77 (0)	-3,06 (0)	0,07	0,06	0,08
Izvoz	-4,02 (0)	-4,36 (0)	-3,92 (0)	0,04	0,05	0,05
Uvoz	-4,02 (0)	-3,75 (0)	-4,72 (0)	0,05	0,04	0,04
Zaposlenost	-3,70 (3)	-3,11 (0)	-3,65 (4)	0,07	0,05	0,07
Nezaposlenost	-3,05 (2)	-4,10 (3)	-4,74 (2)	0,09	0,05	0,07
Realne zarade	-4,08 (4)	-1,66 (3)	-3,90 (0)	0,07	0,08	0,09
Inflacija	-6,25 (4)	-3,99 (7)	-2,44 (1)	0,07	0,07	0,09
Kamatne stope	-4,80 (1)	-4,34 (1)	-3,66 (10)	0,05	0,05	0,07
Devizni kurs	-4,56 (1)	-4,10 (1)	-3,12 (3)	0,04	0,04	0,06

Napomena: prilikom modeliranja vremenskih serija, *Stock-Watson* test je pokazao da je relevantna test statistika τ_{μ} koja se odnosi na model samo sa konstantom. Kritične vrednosti su dostupne iz *EViews* autputa i za nivo značajnosti 5% iznose -2,92 i 0,46 za ADF i KPSS test, redom. Oznaka *k* kod ADF testa se odnosi na broj korektivnih faktora koji je potrebno dodati u cilju eliminisanja autokorelacije.

Izvor: Autor

Tabela 3 Volatilnost posmatranih varijabli u Evropskoj Uniji, Nemačkoj i Srbiji

Varijable	Standardna devijacija (σ_x)			Relativna volatilnost (σ_x/σ_{BDP})		
	EU	Nemačka	Srbija	EU	Nemačka	Srbija
BDP	0,009	0,007	0,007	1,000	1,000	1,000
Lična potrošnja	0,011	0,009	0,009	1,222	1,286	1,286
Državna potrošnja	0,003	0,005	0,008	0,333	0,714	1,143
Investicije	0,013	0,009	0,026	1,444	1,286	3,714
Izvoz	0,016	0,017	0,023	1,778	2,429	3,286
Uvoz	0,017	0,016	0,023	1,889	2,286	3,286
Zaposlenost	0,004	0,004	0,009	0,444	0,571	1,286
Nezaposlenost	0,020	0,027	0,035	2,222	3,857	5,000
Realne zarade	0,012	0,012	0,025	1,333	1,714	3,571
Inflacija	1,650	1,593	2,945	183,333	227,571	420,714
Kamatne stope	0,540	0,446	1,183	60,000	63,714	169,000
Devizni kurs	3,554	1,840	3,785	394,889	262,857	540,714

Izvor: Autor

aktivnosti i smanjiti iracionalno ponašanje investitora. Velika kolebljivost investicija i kratkoročnih kamatnih stopa, koja se navodi u literaturi (Praščević, 2008), najviše je izražena u Srbiji. U Srbiji je takođe dobijen nalaz da je zaposlenost volatilnija od BDP-a, dok u EU i Nemačkoj to nije slučaj. Interesantno je da se u literaturi (Male, 2010) navodi da je volatilnost autputa u zemljama u razvoju veća nego kod razvijenih zemalja, što ovde nije slučaj. Tačnije, volatilnost autputa Srbije je identična volatilnosti autputa Nemačke, odnosno nešto niža od volatilnosti autputa EU.

Korelisanost

Na osnovu gore opisane metodologije za predstavljanje korelisanosti posmatranih varijabli sa BDP-om, izračunati su obični koeficijenti korelacije (Tabela 4) i testirana je njihova statistička značajnost.

Rezultati pokazuju da su u posmatranom vremenskom periodu komponente BDP-a bile uglavnom procikличne i koincidirajuće sa BDP-om, što delimično potvrđuje polaznu hipotezu H2. Izuzetak predstavlja državna potrošnja u slučaju Srbije, koja je procikлична, ali zaostajuća varijabla. To znači da sa rastom BDP-a, državna potrošnja raste sa kašnjenjem od jednog kvartala. Isti nalaz zaostajuće prirode državne potrošnje dobijen je i za Hrvatsku u radu R. Jovančević i V. Arčabić (2010). Kašnjenje državne potrošnje u odnosu na BDP takođe je primetno u Nemačkoj, ali u suprotnom smeru. Razlog ove kontracikličnosti jeste verovatnoća da u razvijenijim zemljama privatni sektor može efikasnije koristiti resurse, te prevelika državna potrošnja može dovesti do neefikasnosti. Sa druge strane, u manje razvijenim zemljama, gde privatni sektor može biti manje razvijen ili ograničen, povećanje državne potrošnje može imati snažniji uticaj na podsticanje privrednog rasta, jer je država često ključni pokretač razvoja.

Zaposlenost je procikлична varijabla, što odgovara uobičajenim nalazima. U EU je zaposlenost koincidirajuća, što je u skladu sa RBC teorijom, dok je u Nemačkoj zaostajuća, kao kod R. Fiorito i T. Kollintzas (1994). Ovi autori smatraju da zaostajući efekat kod zaposlenosti postoji zbog verovanja da institucije rada u Evropi stvaraju veće troškove prilagođavanja i prepreke protoku informacija. Nezaposlenost u Srbiji se pokazala kao procikлична varijabla, koja vodi 1 kvartal u odnosu na BDP. To je suprotno od rezultata dosadašnje literature koja sugeriše kontracikličnost ove varijable i njen zaostajući karakter, kao što to pokazuju rezultati za EU i Nemačku. Razlog tome može biti verovatnoća da privredni rast u Srbiji ne prati dovoljno brzo povećanu tražnju za radom, imajući u vidu da je u trenucima t+1 i t+2 dobar (negativan) znak, ali nije obezbeđena i statistička značajnost. Sa druge strane, postoje navodi da je vreme u kome nezaposlenost dostiže tačku prekretnice neklasifikovan (Prašćević, 2008), što ukazuje i na mogućnost njenog vodećeg karaktera. Dalje kada je reč o tržištu rada, realne zarade ispoljavaju kontracikličnо ponašanje, što je u skladu sa prethodnim istraživanjima. One zaostaju u EU i Nemačkoj, dok su kod Srbije vodeća varijabla. Zaključak da najpre dolazi do promena u zaradama u Srbiji, a zatim u poslovnom ciklusu, može biti posledica manje pregovaračke moći zaposlenih u vezi sa svojim zaradama, nego što je to slučaj u razvijenijim zemljama. Ovim je potvrđena hipoteza H3 da je zaposlenost je procikлична, a realne zarade kontracikлична varijabla za sve jedinice posmatranja.

Inflacija i kamatne stope su se pokazale kao procikличne i zaostajuće varijable u EU, što je očekivano i identično nalazu rada R. Jovančević i V. Arčabić (2010). Inflacija je takođe u slučaju Nemačke procikлична i zaostajuća, dok kamatne stope nisu signifikantne. Nominalne varijable u slučaju Srbije nisu signifikantne za posmatrane docnje, kao ni devizni kurs u EU i u Nemačkoj. U slučaju inflacije i kamatnih stopa, razlog tome može biti da ove varijable postaju signifikantne na kasnijim docnjama, zbog prirode većeg kašnjenja kod ovih varijabli. Sa druge strane, nesignifikantnost deviznog kursa je i očekivana, imajući u vidu da na realne devizne kurseve utiču ne samo domaći makroekonomski uslovi već i uslovi u drugim zemljama. Zato su za određivanje kursa relevantne relativne, a ne domaće mere poslovnog ciklusa i drugih makroekonomskih uslova (Prasad & Chadha, 1997). Teorija predviđa da ciklična kretanja realnog deviznog kursa tokom poslovnog ciklusa zavise od relativnog značaja različitih šokova koji pokreću ciklus (Prasad & Chadha, 1997). Ipak, kada je reč o nominalnim varijablama, može se prihvatiti hipoteza H4 o procikličnoj i zaostajućoj prirodi inflacije i kamatnih stopa.

Perzistentnost

U skladu sa predstavljenim metodološkim okvirom za merenje perzistentnosti posmatranih varijabli, preračunati su koeficijenati autokorelacije (Tabela 5) i testirana je njihova statistička značajnost.

Tabela 4 Korelisanost posmatranih varijabli sa BDP-om u Evropskoj uniji, Nemačkoj i Srbiji

Varijable	Evropska unija				
	t-2	t-1	t	t+1	t+2
BDP	0,268 (0,048)	0,484 (0,000)	1,000	0,483 (0,000)	0,266 (0,05)
Lična potrošnja	0,192 (0,159)	0,443 (0,001)	0,971 (0,000)	0,46 (0,000)	0,341 (0,011)
Državna potrošnja	0,363 (0,006)	0,364 (0,006)	0,643 (0,000)	-0,07 (0,612)	-0,319 (0,018)
Investicije	-0,064 (0,644)	0,148 (0,28)	0,795 (0,000)	0,456 (0,001)	0,202 (0,139)
Izvoz	0,312 (0,02)	0,457 (0,000)	0,970 (0,000)	0,553 (0,000)	0,228 (0,094)
Uvoz	0,24 (0,078)	0,379 (0,004)	0,930 (0,000)	0,613 (0,000)	0,274 (0,043)
Zaposlenost	0,17 (0,216)	0,39 (0,003)	0,821 (0,000)	0,725 (0,000)	0,552 (0,000)
Nezaposlenost	-0,123 (0,371)	-0,268 (0,048)	-0,435 (0,001)	-0,772 (0,000)	-0,655 (0,000)
Realne zarade	-0,147 (0,286)	-0,422 (0,001)	-0,421 (0,001)	-0,416 (0,002)	-0,431 (0,001)
Inflacija	0,013 (0,925)	0,189 (0,168)	0,278 (0,04)	0,39 (0,003)	0,469 (0,000)
Kamatne stope	-0,039 (0,777)	0,055 (0,689)	0,127 (0,356)	0,241 (0,076)	0,311 (0,021)
Devizni kurs	0,07 (0,614)	0,013 (0,927)	-0,139 (0,312)	-0,265 (0,051)	-0,219 (0,108)
Varijable	Nemačka				
	t-2	t-1	t	t+1	t+2
BDP	0,218 (0,11)	0,415 (0,002)	1,000	0,408 (0,002)	0,203 (0,138)
Lična potrošnja	0,005 (0,972)	0,256 (0,059)	0,857 (0,000)	0,343 (0,01)	0,295 (0,029)
Državna potrošnja	0,136 (0,321)	0,053 (0,699)	0,047 (0,732)	-0,399 (0,003)	-0,422 (0,001)
Investicije	0,152 (0,267)	0,306 (0,023)	0,721 (0,000)	0,44 (0,001)	0,25 (0,065)
Izvoz	0,258 (0,057)	0,401 (0,002)	0,948 (0,000)	0,48 (0,000)	0,193 (0,159)
Uvoz	0,26 (0,055)	0,409 (0,002)	0,889 (0,000)	0,591 (0,000)	0,331 (0,014)
Zaposlenost	-0,07 (0,614)	0,297 (0,028)	0,458 (0,000)	0,519 (0,000)	0,506 (0,000)
Nezaposlenost	-0,13 (0,345)	-0,37 (0,006)	-0,628 (0,000)	-0,713 (0,000)	-0,572 (0,000)
Realne zarade	-0,208 (0,128)	-0,317 (0,019)	-0,257 (0,058)	-0,409 (0,002)	-0,342 (0,011)
Inflacija	0,053 (0,699)	0,211 (0,122)	0,245 (0,071)	0,354 (0,008)	0,462 (0,000)
Kamatne stope	0,118 (0,39)	0,201 (0,141)	0,26 (0,055)	0,245 (0,071)	0,231 (0,089)
Devizni kurs	0,015 (0,913)	0,013 (0,923)	-0,142 (0,302)	-0,22 (0,106)	-0,127 (0,354)
Varijable	Srbija				
	t-2	t-1	t	t+1	t+2
BDP	0,062 (0,659)	0,356 (0,009)	1,000	0,357 (0,009)	0,062 (0,659)
Lična potrošnja	0,051 (0,716)	0,231 (0,096)	0,823 (0,000)	0,32 (0,019)	0,094 (0,501)
Državna potrošnja	-0,086 (0,538)	-0,045 (0,746)	0,243 (0,079)	0,465 (0,001)	0,398 (0,003)
Investicije	-0,046 (0,743)	0,258 (0,062)	0,535 (0,000)	0,198 (0,155)	0,021 (0,881)
Izvoz	0,027 (0,846)	0,305 (0,026)	0,714 (0,000)	0,233 (0,093)	-0,058 (0,679)
Uvoz	-0,03 (0,833)	0,309 (0,025)	0,763 (0,000)	0,261 (0,06)	0,067 (0,632)
Zaposlenost	-0,053 (0,704)	0,007 (0,961)	0,188 (0,178)	0,107 (0,444)	0,061 (0,664)
Nezaposlenost	0,356 (0,009)	0,379 (0,005)	0,347 (0,011)	-0,031 (0,824)	-0,218 (0,117)
Realne zarade	-0,167 (0,233)	-0,283 (0,04)	-0,125 (0,374)	0,188 (0,177)	0,14 (0,317)
Inflacija	-0,09 (0,521)	-0,11 (0,433)	-0,078 (0,578)	0,013 (0,925)	0,108 (0,443)
Kamatne stope	0,021 (0,881)	-0,009 (0,947)	0,01 (0,944)	0,044 (0,753)	0,05 (0,725)
Devizni kurs	0,136 (0,331)	0,123 (0,382)	0,131 (0,349)	0,096 (0,495)	0,091 (0,518)

Napomena: vrednosti u tabelama su koeficijenti korelacije, a u zagradama su *p*-vrednosti.

Izvor: Autor

Tabela 5 Perzistentnost posmatranih varijabli u Evropskoj uniji, Nemačkoj i Srbiji

Varijable	Evropska unija		
	t+1	t+2	t+3
BDP	0,484 (0,000)	0,268 (0,046)	0,147 (0,278)
Lična potrošnja	0,452 (0,001)	0,264 (0,050)	0,238 (0,077)
Državna potrošnja	0,419 (0,001)	0,229 (0,09)	0,134 (0,323)
Investicije	0,244 (0,070)	0,053 (0,700)	0,115 (0,399)
Izvoz	0,555 (0,000)	0,282 (0,035)	0,097 (0,478)
Uvoz	0,546 (0,000)	0,263 (0,051)	0,146 (0,284)
Zaposlenost	0,799 (0,000)	0,57 (0,000)	0,397 (0,003)
Nezaposlenost	0,845 (0,000)	0,652 (0,000)	0,416 (0,001)
Realne zarade	0,728 (0,000)	0,633 (0,000)	0,437 (0,001)
Inflacija	0,861 (0,000)	0,738 (0,000)	0,509 (0,000)
Kamatne stope	0,822 (0,000)	0,475 (0,000)	0,135 (0,320)
Devizni kurs	0,717 (0,000)	0,275 (0,04)	-0,109 (0,424)
Varijable	Nemačka		
	t+1	t+2	t+3
BDP	0,419 (0,001)	0,218 (0,107)	0,21 (0,12)
Lična potrošnja	0,39 (0,003)	0,176 (0,195)	0,245 (0,069)
Državna potrošnja	0,627 (0,000)	0,458 (0,000)	0,349 (0,008)
Investicije	0,595 (0,000)	0,371 (0,005)	0,267 (0,046)
Izvoz	0,500 (0,000)	0,246 (0,068)	0,047 (0,729)
Uvoz	0,594 (0,000)	0,345 (0,009)	0,101 (0,46)
Zaposlenost	0,712 (0,000)	0,507 (0,000)	0,292 (0,029)
Nezaposlenost	0,841 (0,000)	0,641 (0,000)	0,408 (0,002)
Realne zarade	0,468 (0,000)	0,341 (0,01)	0,248 (0,065)
Inflacija	0,839 (0,000)	0,63 (0,000)	0,505 (0,000)
Kamatne stope	0,789 (0,000)	0,39 (0,003)	0,021 (0,877)
Devizni kurs	0,691 (0,000)	0,286 (0,032)	-0,039 (0,774)
Varijable	Srbija		
	t+1	t+2	t+3
BDP	0,355 (0,010)	0,062 (0,665)	-0,23 (0,100)
Lična potrošnja	0,376 (0,006)	0,130 (0,360)	-0,012 (0,933)
Državna potrošnja	0,524 (0,000)	0,304 (0,028)	0,156 (0,270)
Investicije	0,684 (0,000)	0,285 (0,040)	0,077 (0,587)
Izvoz	0,543 (0,000)	0,155 (0,271)	-0,025 (0,858)
Uvoz	0,372 (0,007)	0,037 (0,792)	0,088 (0,536)
Zaposlenost	0,875 (0,000)	0,650 (0,000)	0,368 (0,007)
Nezaposlenost	0,795 (0,000)	0,499 (0,000)	0,107 (0,450)
Realne zarade	0,603 (0,000)	0,236 (0,092)	-0,007 (0,959)
Inflacija	0,895 (0,000)	0,705 (0,000)	0,49 (0,000)
Kamatne stope	0,797 (0,000)	0,405 (0,003)	0,054 (0,706)
Devizni kurs	0,711 (0,000)	0,215 (0,126)	-0,235 (0,093)

Napomena: vrednosti u tabelama su autokorelacioni koeficijenti, a u zagradama su *p*-vrednosti.

Izvor: Autor

Rezultati pokazuju statističku značajnost svih varijabli u *t*+1, a u *t*+2 i *t*+3 samo pojedine varijable ostaju signifikantne. Te varijable su perzistentnije u odnosu na varijable čija signifikantnost prestaje u naredna dva kvartala. Najperzistentnija varijabla u svim posmatranim zemljama je inflacija, što kompletira validnost hipoteze H4. Nakon tri kvartala, uočava se da inflacija zadržava skoro ili preko 50% svoje početne vrednosti, što je prilično visoko i ukazuje na stabilnu inflaciju u posmatranom periodu. Pored inflacije, u Srbiji je veoma perzistentna i zaposlenost. Visoka perzistentnost ove varijable se uočava i kod zemalja EU i kod Nemačke, kod kojih veći broj varijabli u odnosu na Srbiju ispoljava perzistentnost. Interesantno je da su investicije pokazale veću perzistentnost u Srbiji u odnosu na zemlje Evropske Unije. Kao što pokazuju E. Jakopin i A. Gračanac (2023), investicije su u periodu 2015-2021. godine bile ključni pokretač privrednog rasta u Srbiji. Realni devizni kursevi takođe ispoljavaju osobinu perzistentnosti, imajući u vidu da je koeficijent autokorelacije za ovu varijablu signifikantan u *t*+2 za EU i Nemačku, a takođe je signifikantan i u Srbiji u *t*+1.

Dobijeni rezultati o volatilnosti, korelisanosti i perzistentnosti posmatranih varijabli potvrđuju polaznu hipotezu H1, odnosno da poslovni ciklusi Srbije ne zaostaju za poslovnim ciklusima Evropske Unije i Nemačke. Napredne ekonometrijske tehnike ocenjuju ARMA modele i funkcije impulsnog odziva koje govore o perzistentnosti. Međutim, ove napredne tehnike nisu predmet ovog rada, imajući u vidu da je cilj pružiti opštu sliku o poslovnim ciklusima proučavanjem stilizovanih činjenica o ciklusima u smislu volatilnosti, korelisanosti i perzistentnosti. Pristup je baziran na ideji A. F. Burns i W. C. Mitchell (1946) koji nastoje da interpretiraju ponašanje makroekonomskih varijabli bez modela.

ZAKLJUČAK

Dosadašnja literatura je ukazala na stilizovane činjenice u vezi sa poslovnim ciklusima različitih zemalja. Međutim, poslovni ciklus je veoma složen fenomen, koji nije lako meriti i interpretirati. Ovaj rad ispituje stilizovane činjenice u vezi sa cikličnim kretanjem ključnih makroekonomskih varijabli u periodu nakon krize 2008. godine, uz pomoć detaljne statističke analize. Na primeru Evropske unije kao celine, Nemačke kao najrazvijenije ekonomije EU i Republike Srbije, kao raznolikom skupu jedinica posmatranja, analizirana je volatilnost, korelisanost sa BDP-om, kao i perzistentnost komponenti BDP-a, izabranih varijabli tržišta rada i nominalnih varijabli. Doprinos ovog rada se ogleda u identifikaciji karakteristika cikličnog kretanja ne samo bruto domaćeg proizvoda, kao standardne mere poslovnog ciklusa, već i drugih pomenutih makroekonomskih varijabli. Rad je uspeo da otkrije određene pravilnosti u njihovom kretanju u periodu nakon svetske finansijske krize i na taj način je pružio opštu sliku o poslovnim ciklusima. Postoji vrlo mali broj radova koji se bavi ovom tematikom za slučaj Srbije, što je još jedan od doprinosa ovog rada.

Rezultati istraživanja ukazuju na to da je cikluse u posmatranom periodu uglavnom karakterisalo sledeće: veća volatilnost investicija u odnosu na potrošnju i stabilnost državne potrošnje; procikličan i koincidirajući karakter komponenti BDP-a; procikličan karakter zaposlenosti i kontracikličan karakter realnih zarada; procikličan karakter i zaostajući efekat inflacije i kamatnih stopa; nesignifikantnost deviznog kursa; najveća perzistentnost inflacije, koja nakon tri kvartala zadržava oko 50% svoje početne vrednosti, što ukazuje na stabilnu inflaciju u posmatranom periodu. Važno je istaći da se rezultati za Srbiju ne razlikuju značajno od rezultata za EU i Nemačku. U tom smislu se može reći da je poslovni ciklus Srbije sličan razvijenijim zemljama. Standardni nalaz u literaturi da je autput zemalja u razvoju volatilniji nego u razvijenim zemljama kod Srbije nije slučaj, imajući u vidu da je on podjednako volatilan kao u Nemačkoj.

Pored ovih opštih zaključaka, u radu se došlo i do pojedinačnih izuzetaka. Na primer, u Srbiji je izražena velika volatilnost investicija i kratkoročnih kamatnih stopa. To je iz razloga što su zemlje u razvoju generalno podložnije spoljnim ekonomskim šokovima, kao što su finansijske krize ili geopolitičke tenzije, ili promenama u globalnim kamatnim stopama, cenama i tokovima kapitala. Ovi spoljni faktori se mogu preliti

na domaća finansijska tržišta i dovesti do povećane volatilnosti kratkoročnih kamatnih stopa. Posledično, pomenuti šokovi su u posmatranom periodu mogli dovesti do veće volatilnosti u investicijama. Takođe, u EU i u Nemačkoj izostaje slučaj da je volatilnost zaposlenosti veća u odnosu na BDP. Međutim, nalazi koji se tiču korelisanosti ovih varijabli sa BDP-om su uglavnom potvrđeni kod EU, dok posmatrano na nivou Nemačke ili Srbije postoje izuzeci. Konkretno, državna potrošnja se pokazala kao zaostajuća i to različitog znaka. Dakle, može se zaključiti da na karakter državne potrošnje u velikoj meri utiče nivo razvijenosti zemlje. Takođe, izuzeci koji se javljaju kod Srbije se tiču i nezaposlenosti i realnih zarada, što je u vezi sa prirodom tržišta rada koje se još uvek razvija.

Analiza perzistentnosti je ukazala na stabilnu inflaciju u posmatranom periodu, kako u EU i Nemačkoj, tako i u Srbiji. U vezi sa tim, zabeležena je i stabilnost kamatnih stopa u Srbiji, što ukazuje na efikasnu monetarnu politiku koja održava stabilnu inflaciju, podržava rast i zapošljavanje, koje je druga najstabilnija varijabla prema rezultatima.

Analiza bi mogla biti unapređena proširivanjem skupa varijabli koje se posmatraju (na primer: uključivanje dodatnih varijabli tržišta rada, poput prosečne produktivnosti rada i časova po radniku), ili raščlanjavanje već posmatranih varijabli na potkategorije (na primer, podela investicija na fiksne investicije privrede, investicije rezidenata i investicije u zalihe). Po ugledu na druga empirijska istraživanja, moguća je podela posmatranog vremenskog perioda na potperiode. Rezultati dobijeni statističkom analizom bi se dalje mogli ispitati formiranjem adekvatnog modela i naprednim ekonometrijskim analizama. Na primer, zaključak o perzistentnosti varijabli se može zaključiti i na osnovu funkcija impulsnog odziva dobijenih na osnovu VAR modela.

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THE IDENTIFICATION OF THE BUSINESS CYCLE CHARACTERISTICS IN THE EUROPEAN UNION WITH REFERENCE TO THE REPUBLIC OF SERBIA

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A large number of papers indicate stylized facts related to the business cycles of different countries. However, the business cycle is a very complex phenomenon, which is not easy to measure and interpret. Therefore, in addition to the gross domestic product (GDP) as a standard measure of the business cycle, it is useful to analyze the cyclical behavior of the GDP components, the labor market variables, as well as nominal variables. This paper attempts to identify patterns in their movements during the period from the first quarter of 2009 to the third quarter of 2023. The goal is to provide a general overview of business cycles in contemporary developments within the European Union as a whole, Germany being the most developed EU country, with reference to the Republic of Serbia. Detailed statistical time series analysis was used to examine stylized facts, as well as the volatility of these variables, their correlation with the GDP, and their persistence. The general conclusion implies that the business cycle of Serbia does not lag behind more developed countries. Some observations were also made of the common tendencies that could be valid in most cases.

Keywords: volatility, correlation, persistence, business cycle, stylized facts

JEL Classification: E31, E32, F44

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UTICAJ MARKETING AKTIVNOSTI NA DRUŠTVENIM MEDIJIMA NA PONAŠANJE POTROŠAČA PREMA ZELENIM PROIZVODIMA - ANALIZA DOMAĆIH I GLOBALNIH KOMPANIJA

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Imajući u vidu značaj interneta i komunikacije sa potrošačima u *onlajn* okruženju, prvenstveno putem društvenih medija, kao i rastući značaj održivosti u savremenom poslovanju, cilj ovog rada jeste analiza uticaja marketing aktivnosti na društvenim medijima na ponašanje potrošača u pogledu zelenih proizvoda. Konkretno, analizirane su marketing aktivnosti na društvenim medijima domaćih i globalnih kompanija u Republici Srbiji, koje obuhvataju pet aspekata: zabavu, interakciju, praćenje trendova, kastomizaciju i elektronsku usmenu propagandu. Sprovedeno je empirijsko istraživanje metodom anketiranja i putem SEM analize je utvrđeno da navedeni aspekti društvenih medija utiču različito na stavove prema zelenim proizvodima domaćih i globalnih kompanija. Utvrđen je pozitivan moderacijski uticaj globalnog identiteta na veze u modelima. Osnovni doprinos rada odnosi se na analizu veze marketing aktivnosti na društvenim medijima i ponašanja potrošača prema zelenim proizvodima, sa uporednom analizom domaćih i globalnih kompanija.

Ključne reči: zeleni marketing, održivost, društveni mediji, ponašanje potrošača, domaće kompanije, globalne kompanije

JEL Classification: M31

UVOD

Internet je značajno promenio savremeno poslovanje, kako za kompanije, tako i za potrošače. Prisustvo kompanija na internetu, putem *web* sajtova (Kocić, Šapić & Sofronijević, 2022) i društvenih medija, postalo je neophodno za komunikaciju sa potrošačima i poslovanje u celini. Konkretno, značaj i uloga društvenih medija u savremenom globalnom poslovanju se mogu videti kroz njihovu upotrebu i popularnost kod korisnika. U 2023. godini bilo je skoro pet milijardi korisnika društvenih medija, što je zapravo preko 60% ukupne svetske populacije i više od 90% ukupnog broja korisnika interneta (Backlinko team, 2024). Ovakvi trendovi u pogledu rasta broja korisnika društvenih medija su stvorili novu eru

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poslovanja za svetske kompanije i brendove, u kojoj su one primorane da pronalaze nove, interaktivne načine za komunikaciju sa potrošačima (Gallaugher & Ransbotham, 2010). Zapravo, rast značaja društvenih medija je naveo kompanije širom sveta da društvene medije uključe u svoje marketing planove, kao deo opšte strategije poslovanja.

Održivost je postala jedan od ključnih koncepata savremenog poslovnog okruženja. Sve veći značaj ekoloških problema, kao što su globalno zagrevanje ili zagađenje životne sredine, primorava kompanije i brendove da deluju na ovu temu, putem svojih promotivnih kanala. Kreiranjem sadržaja na društvenim medijima, brendovi mogu uzeti u obzir društvena i ekološka pitanja i stvoriti percepciju odgovornog ponašanja kod potrošača. S druge strane, ponašanje potrošača i njihova briga za održivost će oblikovati potrošnju u godinama koje dolaze. Stoga je razumevanje načina na koji potrošači donose odluke o kupovini, posebno u vezi sa zelenim proizvodima, najvažnije za brend i marketing menadžere.

U naučnoj literaturi postoji određeni broj istraživanja u kojima je analiziran uticaj aktivnosti kompanija na društvenim medijima na stavove i prihvatanje zelenih proizvoda (Pop, Săplăcan & Alt, 2020; Sun & Wang, 2020; Gupta & Syed, 2022). Pored toga, u određenim studijama autori su istraživali uticaj marketing aktivnosti na društvenim medijima na ponašanje potrošača u pogledu kupovine globalnih, luksuznih brendova (Godey, Manthiou, Pederzoli, Rokka, Aiello, Donvito & Singh, 2016; Hassan & Sohail, 2021). Međutim, ne postoje studije koje analiziraju uticaj marketing aktivnosti na društvenim medijima zelenih proizvoda u kontekstu globalnih i domaćih kompanija. Cilj ovog istraživanja je da se ovaj utvrđeni istraživački jaz prevaziđe i istraži veza marketing aktivnosti na društvenim medijima i ponašanja potrošača u pogledu kupovine zelenih proizvoda domaćih i globalnih kompanija. Imajući u vidu da je Republika Srbija zemlja u razvoju, ovo pitanje dobija na značaju, s obzirom da su održivost i zeleni marketing zastupljeniji u razvijenim zemljama (Feng, Hu, Afshan, Irfan, Hu & Abbas, 2023). Radi testiranja hipoteza u istraživanju, sprovedeno je empirijsko istraživanje putem metoda ankete i dobijeni podaci su analizirani primenom modela strukturalnih jednačina, tj. SEM (*Sturctural equation modeling*) analize.

Rad je strukturiran na sledeći način. Nakon uvodnih razmatranja, dat je pregled literature u kome su analizirani pojmovi zelenog marketinga, marketing aktivnosti na društvenim medijima, kao i njihova povezanost, koja se ogleda u definisanim hipotezama istraživanja. Sledeći, ujedno najvažniji deo rada jeste empirijsko istraživanje, u okviru koga su testirane hipoteze iz konceptualnog modela primenom odgovarajućih statističkih tehnika. Na kraju, analizirani su dobijeni rezultati u okviru diskusije, kao i njihove implikacije i ograničenja u zaključku rada.

PREGLED LITERATURE

Zeleni marketing

Poslednjih godina zeleni marketing dobija na značaju, kako u marketinškoj literaturi, tako i u poslovnoj praksi kompanija. Zeleni proizvodi se mogu definisati kao „oni koji se mogu reciklirati, zahtevaju manje prirodnih resursa i deluju kao nezagađivač za zemlju sa ekološki prihvatljivom ambalažom" (Gupta & Syed, 2022).

Online društveni mediji su vremenom postali važan alat za promociju zelenih proizvoda. Konkretno, društveni mediji omogućavaju zelenim brendovima da podele karakteristike i metode pomoću kojih stvaraju svoje zelene proizvode, kako bi se održao zeleni kredibilitet njihovih brendova, što je glavna briga za zelene potrošače (Kang & Kim, 2017).

Istraživanja iz različitih disciplina sugerišu da *online* tehnologije (tj. Web 2.0 i društveni mediji) imaju značajan potencijal da podstaknu akciju za zaštitu životne sredine. Model koji se odnosi na primenu tehnologije za akciju zaštite sredine je *Technologies for Proenvironmental Action Model* (TPAM) i predstavlja okvir koji opisuje kako određene funkcije Web 2.0 i društvenih medija mogu biti iskorišćene da generišu

i/ili olakšaju akcije za zaštitu životne sredine (Ballew, Omoto & Winter, 2015). Konkretno, ovaj model objašnjava kako različite funkcije Web 2.0 i društvenih medija (tj. informacione, relacione i iskustvene) mogu da generišu i/ili olakšaju lične, društvene i kontekstualne puteve ka ekološki odgovornom ponašanju (kao što su kupovina hibridnih vozila, recikliranje ili odgovorno trošenje energenata).

Marketing aktivnosti na društvenim medijima (SMMA)

Društveni mediji se definišu kao „*online* aplikacijski programi, platforme ili mediji koji olakšavaju interakcije, zajednički rad ili deljenje sadržaja" (Richter & Koch, 2007). *Online* sajtovi i aplikacije za društvene medije, kao što su *Facebook*, *Instagram*, *YouTube* i druge, beleže kontinuiran rast broja korisnika i popularnosti generalno, što dovodi do toga da ih mnogi svetski poznati brendovi proizvoda i usluga koriste za svoju promociju. Zapravo, poslednjih nekoliko godina, kompanije sve više koriste društvene medije za komunikaciju sa potrošačima i promociju svojih proizvoda (Okazaki, Díaz-Martín, Rozano & Menéndez-Benito, 2015). A. J. Kim i E. Ko (2010) su ustanovili okvir za analizu društvenih medija, koji podrazumeva da one imaju pet osnovnih dimenzija: zabavu, interakciju, kastomizaciju, praćenje trendova i elektronsku usmenu propagandu.

Zabava

Potrošači često koriste društvene medije kao način da se zabave, pobegnu od svakodnevnih obaveza i za uživanje. Korisnici društvenih medija se mogu opisati kao oni koji traže zadovoljstvo, koji se zabavljaju i uživaju u ovoj aktivnosti (Manthiou, Chiang & Liang (Rebecca), 2013). Zabava podrazumeva da korisnici koriste društvene medije kao način za opuštanje ili beg od problema ili rutine, kao način za poboljšanje sopstvenog emocionalnog stanja, zatim za kulturno ili estetsko uživanje i kao način da vreme prođe brže. Ovo implicira da "korisnici društvenih medija konzumiraju sadržaj vezan za brend na društvenim medijima radi uživanja, opuštanja i zabave" (Muntinga, Moorman & Smit, 2011).

Empirijski je potvrđeno da zabava, kao aspekt socijalnih medija, utiče pozitivno na stavove potrošača prema zelenim proizvodima (Wang, Chowdhury, Deng & Wang, 2019; Gupta & Syed, 2022). Pored toga, A. J. Kim i E. Ko (2012) su utvrdili da zabava ima pozitivan efekat na procene brendova od strane potrošača, kao i na razvoj odnosa između brendova i potrošača. Na osnovu prethodnih tvrdnji, može se definisati sledeća hipoteza:

H1: Zabava na društvenim medijima ima pozitivan i statistički značajan uticaj na stavove o zelenim proizvodima.

Interakcija

Imajući u vidu da su društveni mediji prostor za diskusiju i razmenu ideja potrošača, interakcije u društvenim medijima omogućavaju uvid u korisnike koji doprinose platformama društvenih medija konkretnih brendova. Zapravo, ovi korisnici se sastaju i komuniciraju jedni sa drugima u sajber prostoru i razgovaraju o određenim proizvodima i/ili brendovima (Muntinga *et al*, 2011). Ove interakcije suštinski menjaju dinamiku komunikacije između brendova i korisnika, tj. potrošača, a takođe su motivisale razvoj korisničkog sadržaja (*UGC- User Generated Content*) u društvenim medijima (Bazi, Filieri & Gorton, 2020).

TPAM model sugeriše da interakcija pomaže u ispunjavanju društvene motivacije koja utiče na ponašanje za zaštitu životne sredine. Funkcija interakcije pomaže u stvaranju *online* zajednica i grupa koje pružaju prostor za povezivanje i izgradnju osećaja zajednice, sa povećanim osećajem privrženosti, koji mogu da koriste zelene kompanije da promovišu ekološko ponašanje. Stoga, korišćenje funkcije interakcije pomaže u stvaranju *online* zajednica koje se mogu koristiti za olakšavanje ekoloških inicijativa (Ballew *et al*, 2015).

Prethodne teorijske tvrdnje potkrepljene su nalazima empirijskih studija. Konkretno, M. Gupta i A. A. Syed (2022) su utvrdili da interakcija ima veoma jak uticaj na preferencije potrošača prema zelenim proizvodima. Slično tome, Y. Wang *et al* (2019) su pokazali da interakcija ima uticaj na preferencije prema zelenim

proizvodima. Imajući u vidu teorijske aspekte i zaključke empirijskih istraživanja, formulisana je sledeća hipoteza:

H2: Interakcija na društvenim medijima ima pozitivan i statistički značajan uticaj na stavove o zelenim proizvodima.

Kastomizacija

Kastomizacija, kao aspekt društvenih medija, omogućava kompanijama da putem kastomiziranih informacija ili kastomizirane pretrage informacija, pruže mogućnost potrošačima da osmisle i prilagode proizvode koje žele da kupe. Primer kastomizacije može biti slanje personalizovanih poruka ili mejlova potrošačima, sa posebnim ponudama ili podsticajima, čime potrošači mogu prilagoditi proizvode svojim jedinstvenim potrebama. Y.-Q. Zhu i H.-G. Chen (2015) ističu da se kastomizacija bazira na dve vrste poruka koje se mogu slati potrošačima: kastomizirane poruke i emitovanje poruka. Kastomizirane poruke targetiraju konkretnu osobu ili manji broj osoba, kao što su poruke na *Facebook* platformi, dok je emitovanje poruka usmereno ka svim osobama koje mogu biti zainteresovane (poruke na *Twitter* platformi).

Kastomizacija društvenih medija zasniva se na kontaktu sa pojedinačnim korisnicima, što je velika razlika u odnosu na konvencionalne medije za oglašavanje. Zapravo, ovo znači da je moguće obezbediti individualno optimizovane informacije za potrošače, generisane iz različitih izvora (Seo & Park, 2018). Kastomizacija društvenih medija takođe služi kao alat kompanijama da ukažu potrošačima na jedinstvenost svojih brendova i poboljšaju preferencije i lojalnost tim brendovima (Martin & Todorov, 2010).

U prethodnim istraživanjima utvrđeno je da kastomizacija predstavlja značajan prediktor kupovine proizvoda (Godey *et al*, 2016). Kada je reč o zelenim proizvodima, sličan rezultat dobijen je u istraživanju koje su sproveli M. Gupta i A. A. Syed (2022), dok su Y. Wang *et al* (2019) utvrdili da kastomizacija utiče pozitivno na posvećenost kupovini, ali ne i na preferencije prema zelenim brendovima. Time je omogućeno definisanje naredne hipoteze:

H3: Kastomizacija na društvenim medijima ima pozitivan i statistički značajan uticaj na stavove o zelenim proizvodima.

Praćenje trendova

Društveni mediji omogućavaju pristup poslednjim, aktuelnim vestima i temama za diskusiju potrošača. Pored toga, društveni mediji pružaju najažurnije vesti i informacije, što ih čini alatom za traženje proizvoda, zbog čega potrošači imaju tendenciju da više veruju informacijama dobijenim putem društvenih medija nego onim putem reklama (Naaman, Becker & Gravano, 2011). Ovaj aspekt društvenih medija se, shodno tome, definiše kao "pružanje najnovijih informacija o proizvodima ili uslugama" (Godey *et al*, 2016).

Prema D. G. Muntinga *et al* (2011), praćenje trendova i informacija na društvenim medijima ispunjava četiri vrste motivacije kod potrošača, i to: nadzor, znanje, informacije pre kupovine i inspiraciju. Nadzor podrazumeva posmatranje i informisanje o svom društvenom okruženju. Znanje se odnosi na informacije u vezi sa brendom koje potrošači traže da bi imali koristi od znanja i stručnosti drugih potrošača i kako bi saznali više o proizvodu ili brendu. Informacije pre kupovine označavaju čitanje recenzija o proizvodima ili tema za diskusiju o brendovima, kako bi se donele dobro promišljene odluke o kupovini. Na kraju, inspiracija se odnosi na potrošače koji prate informacije u vezi sa brendom i dobijaju nove ideje što implicira da informacije u vezi sa brendom služe kao izvor inspiracije.

Informacije i praćenje poslednjih trendova putem društvenih medija imaju značajan uticaj na kupovinu zelenih proizvoda kod mlađih potrošača, što su dokazali S. Xie i G. R. Madni (2023). Takođe, sličan rezultat dobijen je u istraživanju autora Y. Wang *et al* (2019), pošto je pokazano da praćenje trendova utiče na preferencije potrošača prema zelenim proizvodima. Imajući u vidu prethodne navode, može se definisati naredna hipoteza:

H4: Praćenje trendova na društvenim medijima ima pozitivan i statistički značajan uticaj na stavove o zelenim proizvodima.

Elektronska usmena propaganda

Elektronski usmena propaganda na društvenim medijima podrazumeva *online* interakciju između potrošača o brendovima (Muntinga *et al*, 2011). Istraživanja pokazuju da elektronska usmena propaganda ima veći kredibilitet, empatiju i relevantnost za potrošače nego izvori informacija kreirani od strane kompanija na internetu (Gruen, Osmonbekov & Czaplewski, 2006). Umesto da samo prate reklamne oglase kompanija, potrošači cene iskustva i znanje ostalih potrošača, koji to dele na društvenim medijima. Društveni mediji su idealni alati za ovu vrstu usmene propagande, jer potrošači kreiraju i šire informacije vezane za brend svojim prijateljima, porodici i drugim poznanicima, bez ikakvih ograničenja (Kim & Ko, 2012; Godey *et al*, 2016).

Prema S.- C. Chu i Y. Kim (2011), elektronska usmena propaganda na društvenim medijima se može posmatrati iz tri perspektive: traženje, davanje i prenošenje mišljenja. Potrošači koji u svom ponašanju imaju izraženo traženje mišljenja obično traže informacije i savete od drugih potrošača kada donose odluku o kupovini. Potrošači koji preferiraju da daju svoje mišljenje o različitim temama (obično se nazivaju liderima mišljenja), imaju značajan uticaj na stavove i ponašanje potrošača. Poslednja perspektiva podrazumeva da je prenošenje mišljenja u *online* okruženju specifična karakteristika elektronske usmene propagande koja olakšava protok informacija među potrošačima.

Brojna istraživanja su ukazala na značaj elektronske usmene propagande na ponašanje potrošača. M. A. Saeed, A. Farooq, W. Kersten i S. I. Ben Abdelaziz (2019) su pokazali da pozitivne i negativne informacije o održivosti na društvenim medijima značajno utiču na nameru potrošača da kupuju održive proizvode. Slični rezultati dobijen je u istraživanju autora M. Gupta i A. A. Syed (2022), gde je elektronska usmena propaganda imala najveći uticaj od svih aspekata marketinga na društvenim medijima na stavove potrošača prema zelenim proizvodima. Prethodni rezultati omogućavaju definisanje naredne hipoteze:

H5: Elektronska usmena propaganda na društvenim medijima ima pozitivan i statistički značajan uticaj na stavove o zelenim proizvodima.

Stavovi i namere potrošača u kontekstu kupovine zelenih proizvoda

U okviru procesa donošenja odluka o kupovini, stavovi prethode nameri da se kupe određeni proizvodi, prema Teoriji razumne akcije - TRA (Ajzen & Fishbein, 1980) i Teoriji planiranog ponašanja - TPB (Ajzen, 1991). Pored toga, prema navedenim teorijama, namere dovode do stvarnog ponašanja, zbog čega se one koriste kao prediktor ljudskog ponašanja. Ovaj teorijski pristup korišćen je u velikom broju prethodnih studija koje imaju u fokusu predviđanje ponašanja potrošača u okviru marketinga na društvenim medijima (Kim & Ko, 2012), kao i u pogledu kupovine zelenih proizvoda (Pop *et al*, 2020; Sun & Wang, 2020). Imajući u vidu navedene teorijske aspekte, definisana je naredna hipoteza:

H6: Stavovi o zelenim proizvodima imaju pozitivan i statistički značajan uticaj na nameru u pogledu kupovine ove vrste proizvoda.

Globalni identitet potrošača

Kao jedna od posledica globalizacije, u domenu psihologije potrošača, nastali su pojmovi lokalnog i globalnog identiteta (Arnett, 2002). Potrošači sa globalnim identitetom osećaju veću povezanost sa ljudima širom sveta, nego sa onima u njihovoj lokalnoj zajednici, dok su potrošači sa lokalnim identitetom više povezani sa ljudima u svojoj lokalnoj zajednici (Zhang & Khare, 2009). Drugim rečima, globalni identitet znači da "potrošači osećaju da pripadaju globalnoj zajednici i da se identifikuju sa globalnim stilom života" (Tu, Khare & Zhang, 2012).

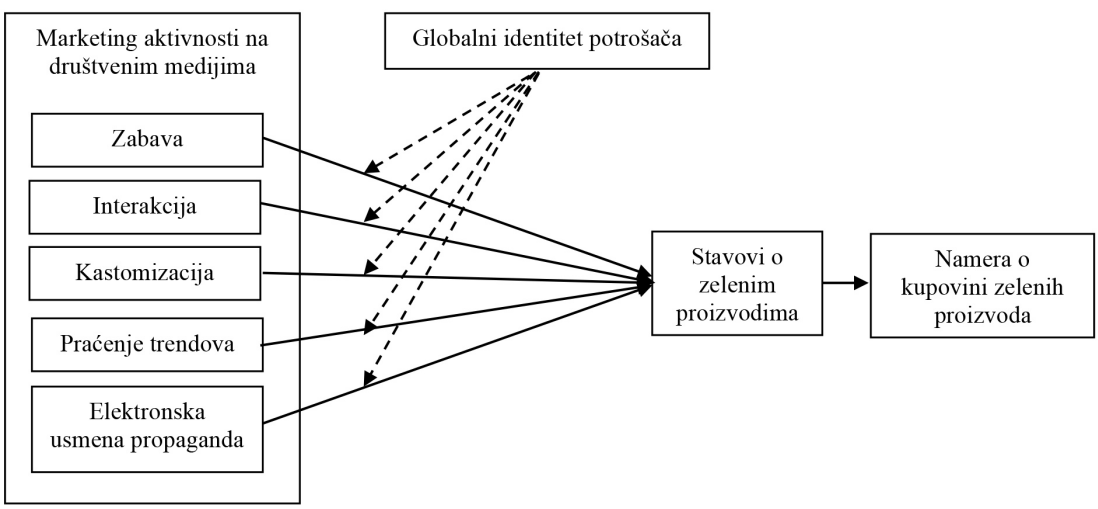
Brojna istraživanja su pokazala da izloženost globalizaciji i stranim kulturama može dovesti do formiranja globalnog identiteta kod pojedinaca (Alden, Steenkamp & Batra, 2006; Steenkamp & De Jong, 2010). Pretpostavka je da povećani osećaj povezanosti sa svetskom kulturom navodi pojedince koji poseduju snažan globalni identitet da osećaju

veću ličnu odgovornost za pitanja koja se tiču blagostanja sveta, kao što sun a primer, zagađenje i klimatske promene. Ovaj snažniji osećaj lične odgovornosti prema svetu bi ih, zauzvrat, podstakao da se ponašaju na način koji je bolji za životnu sredinu, kao što je kupovina ekološki prihvatljivih proizvoda, tj. zelenih proizvoda. Ova tvrdnja je empirijski testirana u više istraživanja. Konkretno, S. Ng i S. Basu (2019) su utvrdili da je globalni identitet vezan za veći osećaj lične odgovornosti prema životnoj sredini. Pored toga, s obzirom da su vođeni svojim osećajem lične odgovornosti, pojedinci sa jačim globalnim identitetom će ispoljavati ekološki prihvatljivije namere i ponašanje, kao što je kupovina zelenih proizvoda. Iz tog razloga, u ovom istraživanju se istražuje moderacijski uticaj koji globalni identitet ima na veze u modelu. U skladu s tim, definisana je hipoteza:

H7: Globalni identitet potrošača ima moderacijski uticaj na veze između marketing aktivnosti na društvenim medijima: a) Zabave, b) Interakcije, c) Kastomizacije, d) Praćenja trendova i e) Elektronske usmene propagande i stavova potrošača prema zelenim proizvodima. Na Slici 1 prikazan je model istraživanja i veze između varijabli, u okviru njega.

METODOLOGIJA

Imajući u vidu definisane hipoteze i model istraživanja, sastavljen je upitnik koji je obuhvatio pet aspekata marketinga na društvenim medijima, koji predstavljaju nezavisne varijable, kao i varijable koje se odnose na ponašanje potrošača, tj. zavisne varijable. Pored toga, uključen je i globalni identitet, kao moderatorska varijabla. Upitnik se sastojao od 22 konstatacije, koje su preuzete iz relevantnih izvora i prilagođene za potrebe istraživanja zelenih proizvoda. Ispitanici su ocenjivali konstatacije putem petostepene Likertove skale. Kostatacije vezane za marketing aktivnosti na društvenim medijima preuzete su iz radova čiji su autori Godey *et al* (2016) i A. J. Kim i E. Ko (2012). Globalni identitet preuzet je iz rada autora L. Tu *et al* (2012). Varijabla stavovi prema zelenim proizvodima formirana je prema radovima autora M. Gupta i A. A. Syed (2022) i J.- H. Kim i Y. J. Hyun (2011), dok su namere da se kupi zeleni proizvod preuzete iz rada autora A. J. Kim i E. Ko (2012). Pored toga, sve konstatacije u upitniku su bile prilagođene za slučaj domaćih i globalnih kompanija, koje posluju u Republici Srbiji. Ispitanici su na početku upitnika bili upoznati sa temom istraživanja i izjašnjavali su se da li su ranije kupovali zelene proizvode domaćih i globalnih kompanija. Pored toga, ispitanici su se



Slika 1 Konceptualni model istraživanja

Izvor: Autori

izjasnili da li koriste društvene medije za informisanje o kompanijama i njihovim proizvodima. U analizu su uključeni samo upitnici onih ispitanika koji su se izjasnili da su imali iskustvo sa kupovinom ove vrste proizvoda i da su korisnici društvenih medija.

Nakon prikupljanja anketa, sprovedena je statistička obrada podataka u programima IBM SPSS i AMOS. Od analiza su korišćene deskriptivna statistika, konfirmativna faktorska analiza, SEM analiza, za testiranje veza u istraživačkim modelima, kao i analiza moderatorskog uticaja globalnog identiteta na odabrane veze u modelima.

Karakteristike uzorka

Proces anketiranja sproveden je u periodu od novembra 2023. godine do januara 2024. godine. Ispitivanje je obavljeno ličnim putem, na teritoriji grada Kragujevca i drugih većih gradova Šumadijskog okruga. Nakon sastavljanja prve verzije upitnika, izvedeno je testiranje upitnika na grupi ispitanika koju je činilo 30 studenata. Na taj način su izvršene korekcije upitnika, koje su se odnosile na nejasnoće i formulaciju određenih pitanja. U glavnoj fazi anketiranja, pripremljeno je 350 anketa. Nakon završetka procesa anketiranja, utvrđeno je da 23 ankete nisu popunjene na ispravan način, zbog čega su eliminisane iz dalje analize. Finalni uzorak se sastojao od 327 validnih anketa. Primenom deskriptivne statistike utvrđena je struktura uzorka, prikazana u Tabeli 1.

Tabela 1 Deskritpivna statistika za karakteristike ispitanika

Demografska karakteristika		% ispitanika
Pol	Muški	48,3
	Ženski	51,7
Starost	18-24	28,2
	25-34	19,6
	35-44	19,8
	45-54	23,5
	55 i više	8,9
Obrazovanje	Srednja škola	48,7
	Viša škola	14,1
	Visoko obrazovanje	37,2
Zanimanje	Menadžer, preduzetnik	14,6
	Profesor, lekar, inženjer	15,2
	Službenik, radnik	35,4
	Student	24,9
	Ostala zanimanja	9,9

Izvor: Autori

REZULTATI ISTRAŽIVANJA

Prvi korak u testiranju hipoteza jeste kreiranje istraživačkih modela i provera njihove validnosti. U Tabeli 2 su prikazani indikatori validnosti modela. Imajući u vidu da je istraživanje obuhvatilo zelene proizvode globalnih i domaćih kompanija u Republici Srbiji, formirana su dva istraživačka modela. Za analizu validnosti modela korišćeni su različiti pokazatelji. Prvenstveno je korišćen pokazatelj $\chi 2/df$, koji treba da ima vrednost nižu od 3 (Bagozzi & Yi, 1988), što je u oba modela ispunjeno. Zatim, inidkatori GFI, IFI, TLI, CFI treba da imaju vrednost višu od 0,9 (Byrne, 1998), što je takođe u oba modela ispunjeno. Na kraju, vrednost RMSEA bi trebalo da ima vrednost nižu od 0,08 (Hair, Black, Babin, Anderson & Tatham, 2006). Prema indikatorima iz tabele, može se uočiti da su u oba modela ispunjene pretpostavke validnosti.

Tabela 3 sadrži rezultate izvršene konfirmativne faktorske analize. Naime, konvergentna validnost modela je postignuta ukoliko su vrednosti prosečne izdvojene varijanse (AVE) iznad nivoa od 0,5 (Fornell & Larcker, 1981), što je u oba analizirana modela ispunjeno u slučaju svih varijabli. Pored toga, vrednosti kompozitne pouzdanosti svih varijabli u analiziranim modelima su iznad 0,7, što takođe ispunjava postavljen kriterijum za validnost modela (Fornell & Larcker, 1981). Najveći broj konstatacija u modelima ima vrednosti faktorskih opterećenja koje su više od 0,7, a vrednosti Kronbahovog koeficijenta alfa svih formiranih varijabli su iznad 0,7, što ukazuje na njihovu dobru internu konzistentnost (Nunnally, 1978).

Tabela 2 Analiza validnosti modela

Indikatori validnosti modela	Istraživački model - Domaći zeleni proizvodi	Istraživački model - Globalni zeleni proizvodi	Preporučena vrednost
χ2/df	1,652	1,974	<3
GFI	0,921	0,902	>0,9
IFI	0,952	0,932	>0,9
TLI	0,939	0,912	>0,9
CFI	0,951	0,932	>0,9
RMSEA	0,045	0,055	<0,08

Izvor: Autori

U Tabeli 4 predstavljeni su rezultati testiranja hipoteza. U slučaju domaćih zelenih proizvoda, varijable koje imaju statistički značajan uticaj na stavove o kupovini su zabava i elektronska usmena propaganda, što ukazuje da su hipoteze H1 i H5 potvrđene u slučaju ove vrste proizvoda. Suprotno tome, interakcija, kastomizacija i praćenje trendova nisu potvrđeni kao prediktori stavova o kupovini zelenih proizvoda, pa hipoteze H2, H3 i H4 nisu prihvaćene.

Kada je reč o zelenim proizvodima globalnih kompanija koje posluju u Republici Srbiji, utvrđeno je da svi aspekti marketing aktivnosti na društvenim medijima, osim kastomizacije, imaju statistički značajan i pozitivan uticaj na stavove potrošača o zelenim proizvodima, čime su hipoteze H1, H2, H4 i H5 prihvaćene, dok hipoteza H3 nije prihvaćena. Osim toga, utvrđena je jaka i pozitivna veza između stavova i namera da se kupe zeleni proizvodi u slučaju obe vrste kompanija, zbog čega je hipoteza H6 prihvaćena u oba modela.

Rezultati analize moderacijskog uticaja globalnog identiteta na veze u modelima prikazani su u Tabeli 5. U slučaju zelenih proizvoda domaćih kompanija, utvrđeno je da globalni identitet potrošača ima značajan moderacijski uticaj u slučaju uticaja zabave na društvenim medijima, kao i elektronske usmene propagande na stavove potrošača. Ovim su potvrđene hipoteze H7a i H7d u slučaju domaćih kompanija. S druge strane, pozitivan i statistički značajan moderacijski uticaj globalnog identiteta potrošača na marketing aktivnosti zelenih proizvoda globalnih kompanija na društvenim medijima utvrđen je u slučaju svih posmatranih veza u modelu, osim u slučaju kastomizacije. Time se potvrđuju sve hipoteze koje se odnose na interakcijski efekat globalnog identiteta na veze u modelima (H7a, H7b, H7d i H7e), za globalne kompanije, osim za vezu između kastomizacije i stavova potrošača.

DISKUSIJA REZULTATA

Sprovedenim istraživanjem utvrđene su brojne veze između analiziranih varijabli u modelima koji se odnose na uticaj društvenih.medija na stavove i namere u pogledu kupovine zelenih proizvoda domaćih i globalnih kompanija. U celini, marketing aktivnosti na društvenim medijima su bolji prediktor stavova potrošača o zelenim proizvodima globalnih kompanija, u odnosu na domaće. Od pet analiziranih aspekata marketinga na društvenim medijima, dva aspekta utiču na stavove potrošača o zelenim proizvodima domaćih kompanija, dok u slučaju globalnih kompanija sve analizirane aktivnosti utiču na stavove potrošača o ovim proizvodima, osim kastomizacije društvenih medija.

U slučaju domaćih kompanija, zabava i elektronska usmena propaganda utiču statistički značajno na stavove potrošača o zelenim proizvodima. Ovo ukazuje da su potrošačima važni zabavni i hedonistički aspekti društvenih medija, kada se radi o zelenim proizvodima. Pored toga, potrošačima su veoma važne preporuke i iskustva drugih korisnika o zelenim proizvodima, koje oni dele na

Tabela 3 Konfirmativna faktorska analiza (CFA)

Varijable i konstatacije	Domaći zeleni proizvodi	Globalni zeleni proizvodi
Zabava	AVE=0,628 CR=0,835 α=0,800	AVE=0,604 CR=0,820 α=0,787
Sadržaj na društvenim medijima mog preferiranog zelenog proizvoda je interesantan.	0,754	0,791
Korišćenje društvenih medija mog preferiranog zelenog proizvoda je zabavno.	0,805	0,788
Prikupljanje informacija o mom preferiranom zelenom proizvodu na društvenim medijima je zabavno.	0,817	0,751
Interakcija	AVE=0,621 CR=0,866 α=0,763	AVE=0,610 CR=0,860 α=0,806
Uzajmna komunikacija/interakcija je moguća na društvenim medijima mog preferiranog zelenog proizvoda.	0,613	0,836
Razgovori ili razmena mišljenja sa drugim korisnicima su mogući na društvenim medijima mog preferiranog zelenog proizvoda.	0,882	0,878
Razmena informacija sa drugim korisnicima je moguća na društvenim medijima mog preferiranog zelenog proizvoda.	0,803	0,784
Mogu jednostavno da izrazim svoje mišljenje na društvenim medijima mog preferiranog zelenog proizvoda.	0,828	0,597
Kastomizacija	AVE=0,607 CR=0,821 α=0,710	AVE=0,604 CR=0,820 α=0,716
Na društvenim medijima mog preferiranog zelenog proizvoda postoji mogućnost pretrage informacija koje su mi potrebne.	0,864	0,721
Društveni mediji mog preferiranog zelenog proizvoda nude informacije, koje su mi potrebne u realnom životu.	0,789	0,754
Društveni mediji mog preferiranog zelenog proizvoda nude uslugu prilagođenu korisnicima (meni).	0,672	0,851
Praćenje trendova	AVE=0,617 CR=0,761 α=0,702	AVE=0,622 CR=0,765 α=0,715
Korišćenje društvenih medija mog preferiranog zelenog proizvoda je veoma u trendu.	0,870	0,866
Društveni mediji mog preferiranog zelenog proizvoda nude najnovije i aktuelne informacije.	0,691	0,703
Elektronska usmena propaganda	AVE=0,618 CR=0,763 α=0,706	AVE=0,618 CR=0,760 α=0,738
Volim da izrazim mišljenje o mom preferiranom zelenom proizvodu.	0,718	0,652
Volim da prenesem informacije o proizvodu ili uslugama mog preferiranog zelenog proizvoda svojim prijateljima.	0,849	0,901
Globalni identitet	AVE=0,629 CR=0,835 α=0,762	AVE=0,630 CR=0,836 α=0,762
Identifikujem se kao globalni građanin (građanin sveta).	0,796	0,840
Bitno mi je da znam globalne događaje.	0,811	0,772
Mislim da ljudi treba da budu više svesni koliko smo povezani sa ostatkom sveta.	0,771	0,768
Stavovi prema zelenim proizvodima	AVE=0,636 CR=0,839 α=0,766	AVE=0,608 CR=0,822 α=0,779
Spreman sam da uložim poseban trud kako bih kupio preferirane zelene proizvode.	0,716	0,843
Preferiram zelene proizvode u odnosu na druge proizvode, ukoliko su sličnog kvaliteta.	0,773	0,771
Preferiram zelene proizvode u odnosu na druge proizvode, i kada je njihova cena nešto viša.	0,893	0,720
Namera da se kupi zeleni proizvod	AVE=0,630 CR=0,773 α=0,773	AVE=0,745 CR=0,854 α=0,853
Voleo/la bih da kupim preferirani zeleni proizvod.	0,789	0,878
Voleo/la bih da preporučim moj preferirani zeleni proizvod drugima.	0,799	0,848

Izvor: Autori

Tabela 4 SEM analiza

Hipoteza		Domaći zeleni proizvodi	Testiranje hipoteza	Globalni zeleni proizvodi	Testiranje hipoteza
H1:	Zabava × Stavovi prema zelenim proizvodima	0,304***	Potvrđena	0,279**	Potvrđena
H2:	Interakcija × Stavovi prema zelenim proizvodima	0,023nz	Nije potvrđena	0,274**	Potvrđena
H3:	Kastomizacija × Stavovi prema zelenim proizvodima	0,103nz	Nije potvrđena	0,071 nz	Nije potvrđena
H4:	Praćenje trendova × Stavovi prema zelenim proizvodima	0,140nz	Nije potvrđena	0,298***	Potvrđena
H5:	Elektronska usmena propaganda × Stavovi prema zelenim proizvodima	0,405***	Potvrđena	0,360***	Potvrđena
H6:	Stavovi prema zelenim proizvodima → Namera da se kupi zeleni proizvod	0,882***	Potvrđena	0,852***	Potvrđena

Napomena: *p<0,1; **p<0,05; ***p<0,001, nz- nije značajno.

Izvor: Autori

društvenim medijima. S druge strane, interakcija sa domaćim kompanijama putem društvenih medija, kastomizacija i praćenje trendova nisu bili značajni prediktori stavova o zelenim proizvodima. Ovo može ukazivati na nedovoljno prisustvo domaćih kompanija na društvenim medijima, u pogledu ažurnih i relevantnih informacija o zelenim proizvodima, što rezultira nižim nivoom interakcije sa potrošačima. Takođe, očito je da potrošači ne percipiraju društvene medije domaćih kompanija kao aktuelne i „u trendu", što može predstavljati prostor za unapređenje ove vrste aktivnosti domaćih kompanija u okviru promocije zelenih proizvoda. Navedeni rezultati se mogu tumačiti i činjenicom da je održivost, kao koncept, u zemljama u razvoju na početnom nivou razvoja (Feng *et al*, 2023) i da domaće kompanije ne koriste u potpunosti mogućnosti društvenih medija za promociju svojih zelenih proizvoda.

S druge strane, marketing aktivnosti na društvenim medijima globalnih kompanija, koje se odnose na promociju zelenih proizvoda znatno više utiču na percepcije potrošača o ovim proizvodima. Svi aspekti društvenih medija globalnih kompanija, osim kastomizacije, utiču pozitivno na stavove potrošača, pri čemu najveći uticaj imaju elektronska usmena propaganda i praćenje trendova. Ovakvi rezultati u velikoj meri korespondiraju rezultatima prethodnih studija (Seo & Park, 2018; Gupta & Syed, 2022). To implicira da je potrošačima važna interakcija koju imaju sa globalnim kompanijama, kao i razmena mišljenja i iskustava sa drugim korisnicima zelenih proizvoda, koju ostvaruju putem društvenih medija. Pored toga, potrošači koriste društvene medije globalnih kompanija zato što su zabavne, aktuelne, ažurne i prate trendove u pogledu zelenih proizvoda.

Moderacijski uticaj globalnog identiteta na veze u modelima je izuzetno izražen, pogotovo u slučaju zelenih proizvoda globalnih kompanija. Naime, povezanost i identifikacija potrošača sa ljudima širom sveta, svetskim događajima i globalnom kulturom pojačava vezu između marketing aktivnosti domaćih i globalnih kompanija na društvenim medijima i stavova o zelenim proizvodima. U slučaju domaćih kompanija, interakcijski uticaj globalnog identiteta postoji u vezi između zabave i elektronske usmene propagande, kao dva aspekta društvenih medija, i stavova o zelenim proizvodima. Kod globalnih kompanija, interakcijski efekti postoje u svim vezama modela, osim u slučaju veze između kastomizacije i stavova potrošača, što ukazuje da globalna

Tabela 5 Testiranje veza u modelu (SEM) - Moderacijski efekti

Odabrane veze u modelu (Zavisna varijabla: Stavovi prema zelenim proizvodima)		Domaći zeleni proizvodi	Testiranje hipoteza	Globalni zeleni proizvodi	Testiranje hipoteza
H7a:	Zabava × Globalni identitet	0,667**	Potvrđena	0,517***	Potvrđena
H7b:	Interakcija × Globalni identitet	0,231nz	Nije potvrđena	0,439***	Potvrđena
H7c:	Kastomizacija × Globalni identitet	0,252nz	Nije potvrđena	0,096nz	Nije potvrđena
H7d:	Praćenje trendova × Globalni identitet	0,112nz	Nije potvrđena	0,535**	Potvrđena
H7e:	Elektronska usmena propaganda × Globalni identitet	0,731***	Potvrđena	0,716***	Potvrđena

Napomena: *p<0,1; **p<0,05; ***p<0,001, nz- nije značajno.

Izvor: Autori

identifikacija potrošača značajno pojačava pozitivne stavove o zelenim proizvodima, koje oni formiraju na osnovu korišćenja društvenih medija. Takođe, treba istaći da su koeficijenti koji označavaju jačinu interakcije izuzetno visoki, što ukazuje da globalni identitet potrošača predstavlja karakteristiku koja značajno može uticati na njihovu spremnost da kupuju zelene proizvode. Dakle, ovaj segment potrošača je izuzetno važan za promociju zelenih proizvoda, što je rezultat koji odgovara rezultatima prethodno sprovedenih istraživanja (Ng & Basu, 2019).

ZAKLJUČAK

Ovo istraživanje je imalo u fokusu uticaj marketing aktivnosti na društvenim medijima na ponašanje potrošača u pogledu zelenih proizvoda domaćih i globalnih kompanija u Republici Srbiji. Rezultati empirijskog istraživanja su važni sa teorijskog, a posebno praktičnog aspekta, s obzirom da pružaju uvid u antecendente koje potrošači percipiraju kao značajne kada je reč o promociji zelenih proizvoda putem društvenih medija.

Teorijske implikacije istraživanja su višestruke. Imajući u vidu da je praksa zelenog marketinga u početnoj fazi razvoja u zemljama u razvoju, u odnosu na razvijene zemlje, ne postoji veliki broj radova koji detaljno analiziraju ova pitanja. Shodno tome, veoma je važno ispitati način na koji potrošači iz zemalja u razvoju percipiraju marketing aktivnosti kompanija na društvenim medijima, a koje mogu uticati na njihovu kupovinu zelenih proizvoda. U eri digitalizacije i naglašenog značaja održivosti, kako u poslovanju kompanija, tako i u ponašanju potrošača, ovi rezultati pružaju uvid u aspekte marketinga na društvenim medijima koji su potrošačima bitni, prilikom donošenja odluka o kupovini zelenih proizvoda.

Praktične implikacije se odnose na mogućnosti primene dobijenih rezultata od strane marketing menadžera u Republici Srbiji, ali i drugim zemljama. Konkretno, dobijeni rezultati ukazuju na činjenicu da domaće kompanije ne koriste potencijale društvenih medija u dovoljnoj meri, s obzirom da potrošači ne percipiraju ove aktivnosti kao dovoljno aktuelne, informativne i sa visokim nivoom prilagodljivosti korisnicima. S druge strane, u slučaju stranih kompanija, sve analizirane aktivnosti imaju značaj na ponašanje potrošača. S obzirom da strane kompanije pretežno dolaze sa razvijenih tržišta, gde su održivost u poslovanju i zeleni marketing na višem nivou, ovi rezultati mogu pružiti konkretne smernice za kreiranje sadržaja na društvenim medijima. Veoma značajan i pozitivan uticaj globalnog identiteta na veze u modelima ukazuju na činjenicu da potrošači sa ovom karakteristikom predstavljaju izuzetno

značajan segment za marketing kampanje, kako za strane kompanije, tako i za domaće.

Ograničenja ovog istraživanja se ogledaju prvenstveno u činjenici da je istraživanje sprovedeno na teritoriji Kragujevca i Centralne Srbije, što može predstavljati prepreku u pogledu generalizacije i aplikativnosti rezultata u drugim zemljama. Takođe, istraživanje je imalo u fokusu zelene proizvode u opštem smislu. U narednim istraživanjima se mogu analizirati različite vrste zelenih proizvoda, kao što su hrana, tekstilni ili kozmetički proizvodi, kako bi se dobili konkretni rezultati, za različite industrije. Na kraju, u narednim studijama se mogu uključiti dodatne varijable u analizu, nezavisne ili moderatorske, kako bi se omogućilo dublje razumevanje načina na koji potrošači percipiraju marketing aktivnosti na društvenim medijima i njihov značaj za kupovinu zelenih proizvoda.

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THE IMPACT OF SOCIAL MEDIA MARKETING ACTIVITIES ON CONSUMER BEHAVIOR TOWARDS GREEN PRODUCTS - AN ANALYSIS OF LOCAL AND GLOBAL COMPANIES

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Considering the significance of the internet and communication with consumers in the online environment primarily through social media, as well as the growing importance of sustainability in modern business, this paper aims to analyze consumer behavior regarding green products in the context of social media. Specifically, social media marketing activities of local and global companies in the Republic of Serbia were analyzed, incorporating the five aspects: entertainment, interaction, trendiness, customization, and electronic word-of-mouth. Empirical research was conducted using the survey method and the SEM analysis was applied so as to determine that the mentioned aspects of social media differently affected the attitudes towards the green products of local and global companies. A positive moderating influence of the global identity on the relationships in the models was found. The main contribution of the paper relates to the analysis of the relationship between social media marketing activities and consumer behavior towards green products, with a comparative analysis of local and global companies.

Keywords: sustainability, green marketing, consumer behavior, social media, local companies, global companies

JEL Classification: M31

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EVALUACIJA INVESTICIONIH MOGUĆNOSTI: KOMPARATIVNA ANALIZA I MULTIKRITERIJUMSKO RANGIRANJE NAJBOLJE POZICIONIRANIH KOMPANIJA

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Večita dilema investitora jeste kako pronaći kompanije u koje investirati, a da povrat od investicije bude zadovoljavajući. Cilj rada je da se ispita mogućnost primene sistematskog pristupa za izbor kompanija za investiranje. S tim u vezi, fokus je na dva nivoa analize - racio analizu, sa usmerenjem na likvidnost i profitabilnost, i višekriterijumsko rangiranje primenom PROMETHEE metode. Analizirane kompanije prvo su podeljene u dve grupe: grupu A čine kompanije čiji je PE racio broj veći od 50, dok drugu grupu, grupu B, čine kompanije čiji je PE racio broj manji od 5. Rezultati sprovedene racio analize pokazuju da kompanije čiji je PE racio broj veći ostvaruju bolje poslovne performanse u odnosu na one čiji je PE racio broj manji, sa stanovišta individualnog poređenja. Međutim, uočljive razlike u vrednostima analiziranih racio brojeva među kompanijama ne mogu da daju jasne i precizne smernice za donošenje opšteg zaključka u slučaju celokupne analize. Zato kombinacija racio analize i PROMETHEE metode omogućava efikasniju ocenu performansi, dajući smernice investitorima da odaberu najbolje kompanije tj. one koje imaju najveći potencijal. Rezultati multikriterijumskog rangiranja su pokazali da su kompanije koje pripadaju grupi B bolje rangirane, te njih treba detaljnije razmatrati, a posebno treba obratiti pažnju na kompanije Vale S.A. i Tesla, Inc.

Ključne reči: racio analiza, PROMETHEE metoda, tržište akcija, investiranje, komparativna analiza

JEL Classification: G11, M49

UVOD

Na globalnom tržištu, mnoge kompanije kotiraju svoje akcije na berzi. Neke od kompanija pretrpele su značajne gubitke tokom kriza i brojnih poremećaja na tržištu prethodnih decenija. Međutim, ovo nije dovelo da povlačenja kompanija sa globalnog tržišta. Činjenica da su neke kompanije preživele tokom brojnih poremećaja tržišta ukazuje na to da one posluju stabilno i uspešno. Javno dostupne infromacije o kompanijama i njihovim performansama olakšavaju praćenje i analizu njihovih performansi.

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Analiza poslovnih performansi je jedan od važnih aspekata za donošenje poslovnih odluka od strane zainteresovanih lica, a posebno investitora.

Da bi doneli odluku o tome gde treba investirati, investitori sprovode analize kako bi stekli neophodna znanja o poslovanju kompanija. Postoje nekoliko načina da se oceni uspešnost neke kompanije koja je predmet investiranja. Jedan od načina jeste analiza i praćenje aktivnosti kompanije na berzi. Ovo je danas moguće iz razloga što mnoge berze imaju javno dostupne takve podatke. Iako ove informacije nekada mogu biti skupe, postoje neki podaci koji se mogu nabaviti uz minimalno ulaganje vremena i novca. *Yahoo's finance* je *web* sajt koji pruža informacije o poslovanju kompanija bez naknade. Ovaj sajt je specijalizovan za pružanje infromacija o kompanijama čijim se akcijama trguje na berzi. Na samom sajtu postoji nekoliko mogućnosti za pretragu, praćenje i analizu odabranih kompanija. Pored informacija o obimu trgovine, dostupni su i osnovni podaci o kompanijama, kao i finansijski izveštaji. Tako investitori na jednom mestu mogu pronaći skoro sve neophodne podatke na osnovu kojih mogu da donesu odluku o investiranju.

U radu je sprovedena komparativna analiza poslovnih performansi kopmanija čijim se akcijama trguje na berzi. Kompanije su podeljenje u dve grupe prema visini PE racia (*profit-earning ratio*). Na osnovu odabranih kompanija izračunati su racio brojevi, koji su potom korišćeni kao ulazni parametri za višekriterijumsko rangiranje. Multikriterijumsko rangiranje se sprovodi sa ciljem da se odredi u koju kompaniju treba investirati.

Nakon kratkog pregleda literature, predstavljen je istraživački model i metodologija korišćena u ovom istraživanju sa hipotezom i podacima. Nadalje se raspravlja o rezultatima koji predstavljaju ulazne podatke za dalju analizu i načinima na koji je izvršeno smanjenje kriterijuma koji će se koristiti u daljoj analizi. Na kraju je predstavljen i analiziran rezultat višekriterijumskog rangiranja izvršenog primenom PROMETHEE metode. Rezultati višekriterijumskog rangiranja mogu biti dobra informaciona osnova za investitore.

PREGLED LITERATURE

Racio analiza i multiktiterijumsko rangiranje su korisni alati koji mogu biti primenjeni u različitm situacijama. Iako se racio analiza zasniva na podacima dostupnim u finansisjkim izveštajima i ukazuje na uspešnost poslovanja kompanija i eventualne probleme, PROMETHEE metoda ima znatno širu upotrebu. S tim u vezi, postoji mnogo radova koji su metodološki struktuirani po ovim alatima iz oblasti ekonomije i menadžmenta (Arsić, Nikolić & Jevtić, 2021; Jevtić, Radojičić & Jemović, 2022a).

Analizom literature, moguće je da se identifikuje nekoliko grupa autora koji su se bavili racio analizom u svojim istraživanjima. Primarno se racio analiza koristila za ocenu uspešnosti poslovanja kompanija (Delen, Kuzey & Uyar, 2013; Husna & Satria, 2019).

U istraživanjima, neki autori najčešće koriste sledeće grupe racio pokazatelja: racio profitabilnosti, racio likvidnosti, racio efikasnisti i *leverage* (Innocent, Mary & Matthew, 2013; Yuniningsih, Pertiwi & Purwanto, 2019; Terdpaopong, Rickards & Manapreechadeelert, 2020; Jevtić, Radojičić & Jemović, 2022b). Međutim, kako lista racio brojeva može biti veoma duga, tako je i izbor konkretnih pokazatelja varirao među autorima. Neki autori su se fokusirali samo na jednu grupu racio brojeva, kao što je na primer racio profitabilnosti (Mijić, Zekić & Jakšić, 2017; Domanović, Vujičić & Ristić, 2018; Bunea, Corbos & Popescu, 2019; Tadić, Jevtić & Jančev, 2019; Husain, Sarwani, Sunardi & Lisdawati, 2020). Ovo je razumljivo jer racia profitabilnosti predstvaljaju važan alat za makroekonomsku analizu.

Racio analiza se smatra osnovnim sredstvom za analizu poslovnih performansi kompanija, ali i za ocenu uspešnosti poslovanja banaka. Tako, racio analiza je korišćena od strane pojedinih autora za ocenu uspešnosti banaka (Đukić & Novićević, 2013; Kevser & Leyli, 2019).

U literaturi se mogu naći autori koji su koristili rezultate racio analize kako bi došli do zaključka o njihovoj međusobnoj povezanosti i uslovljenosti (Mohamad & Saad, 2010; Alarussi & Alhaderi, 2018), dok su drugi autori kombinovali racio analizu sa

drugim indikatorima perfromansi za uspostavljanje korelacionog odnosa (Sondakh, 2019; Nguyen & Nguyen, 2020). Neki od njih analiziraju uticaj duga i profitabilnosti na cene akcija (Saputra, 2022), dok se drugi fokusiraju na faktore koji utiču na profitabilnost (Burja, 2011).

Pojedini autori koriste PROMETHEE metodu za donošenje značajnih finansijskih i poslovnih odluka (Durkalić, Furtula & Borisavljević, 2019; Mousavi & Lin, 2020; Marcu, Duta & Manea, 2022). Racio analizu i PROMETHEE metod kombinuju određene grupe autora da bi sproveli uporednu analizu na osnovu specifičnih kriterijuma (Krstić, Fedajev & Nikolić, 2018; Fedajev, Jevtić & Nikolić, 2020; Jevtić *et al*, 2022a).

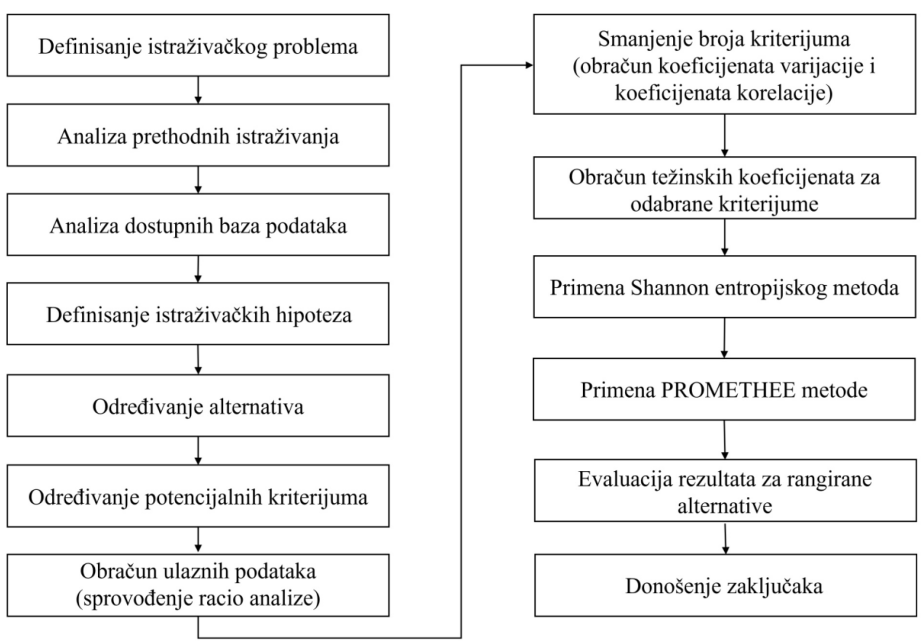
Neki autori pribegli su kombinaciji racio analiza i višekriterijumskog rangiranja. Takođe, treba istaći da nijedan rad ne upoređuje poslovne performanse izabranih kompanija. Zato je doprinos ovog rada upravo u tome što omogućava identifikaciju indikatora uspešnosti, ali i poslovnih ograničenja, multinacionalnih kompanija kroz primenu višekriterijumske analize i rangiranja. Koristeći dobijene rezultate kao polazne osnove, mogu se porediti rezultati drugih kompanija i pokazatelji ostavrenog rezultata.

PODACI I METODOLOGIJA

Definisani cilj studije ispitan je korišćenjem modela primenjenog istraživanja, prikazanog na Slici 1.

Da bi se sprovela komparativna analiza poslovanja međunarodnih kompanija, čijim se akcijama najviše trguje na berzi, putem višekriterijumskog rangiranja, izabrana su sledeća dva uzorka (Tabela 1).

Kompanije koje su predmet istraživanja, izabrane su sa *Yahoo Finance* liste 100 kompanija čijim se akcijama najviše trguje na berzi. Sa ove liste izabrane su kompanije prema vrednosti PE racia. Prvu grupu čine kompanije čije je PE racio preko 50 (grupa A), dok drugu grupu čine kompanije čiji je PE racio ispod 5 (grupa B). Za ove grupe izabranih kompanija



Slika 1 Definisanje modela istraživanja

Izvor: Autori

Tabela 1 Lista odabranih kompanija

Grupa A (preduzeća čiji je PE iznad 50)		
Kod	*Naziv*	*PE racio*
TSLA	Tesla, Inc	72,43
AMZN	Amazon.com, Inc.	101,81
SHOP	Shopify Inc.	200,46
PCG	PG&E Corporation	138,30
CCJ	Cameco Corporation	193,55
PINS	Pinterest, Inc.	71,17
Grupa B (preduzeća čiji je PE ispod 5)		
Kod	*Naziv*	*PE racio*
PBR	Petroleo Brasileiro	2,93
HPE	Hewlett Packard	4,50
PBR-A	Petroleo Brasileiro Ptrobras	2,63
CPG	Crescent Point Energy Corp.	3,25
LUMN	Lumen Technologies, Inc.	3,46
F	Ford Motor Company	4,04
VALE	Vale S. A.	3,26

Izvor: Yahoo Finance (2022, October)

sprovedena je racio analiza. Mereni indikatori su takođe podeljeni u kategorije, uključujući tradicionalne, najčešće korišćene pokazatelje, dobijene na osnovu podataka iz Bilansa stanja (*Balance sheet - BS*) i Bilansa uspeha (*Income statement - IS*). Takođe, za potrebe izračunavanja pokazatelja, pored podataka iz BS i IS, korisćeni su podaci iz izveštaja o novčanim tokovima (*Cash Flow Statement - CFS*). Izabrani indikatori pokazuju nivo likvidnosti, solventnosti i zaduženosti s jedne strane, i profitabilnosti, s druge strane. Lista izabranih indikatora prikazana je u Tabeli 2.

S obzirom na to da je poznato da dug utiče na likvidnost, ova analiza uključuje i racio brojeve koji se odnose na njega, a koji su uključeni u okviru aspekta likvidnosti. Takođe je poznato da veće obaveze preduzeća negativno utiču na likvidnost. Radi dodatnog poređenja, u ovom slučaju između indikatora, poslovanje odabranih kompanija biće analizirano na osnovu indikatora kojima se ocenjuju isti aspekti poslovanja. Podaci za potrebe izračunavanja racio pokazatelja prikupljeni su sa *Yahoo* liste koja sadrži sva tri neophodna izveštaja (Bilans stanja, Bilans uspeha i Izveštaj o tokovima gotovine).

Kako se sprovedenom racio analizom došlo do delimičnih podataka o poslovanju, oni su se koristili kao inputi za dalju analizu u ovom radu. Cilj dalje analize je bio da se izvrši višekriterijumsko rangiranje kompanija, na osnovu racio pokazatelja. Sledeći korak u ovoj analizi podrazumevao je smanjenje broja izabranih indikatora korišćenjem koeficijenata varijacije i koeficijenata korelacije. Zatim je redukovani broj indikatora korišćen za multikriterijumsko rangiranje kompanija. Multikriterijumsko rangiranje se realizuje primenom PROMETHEE metode kombinovane sa metodom entropije. Metod entropije se koristi za izračunavanje težinskih koeficijenata, koji su neophodni za višekriterijumsko rangiranje. Ovi koeficijenti odražavaju uticaj svakog indikatora na višekriterijumsko rangiranje.

Na kraju, posle sprovedenog rangiranja na osnovu PROMETHEE metode, računat je i analizaran interval stabilnosti. Ovi interali su računati za analizirane kriterijume koji su korišćeni za rangiranje, i ukazuju na stabilnost svakog od kriterijuma u modelu.

Na osnovu prethodnog, formulisane su sledeće hipoteze:

Tabela 2 Lista racio pokazatelja

Indikatori → Aspekti ↓	Indikatori dobijeni na osnovu podataka iz BS i IS	Indikatori dobijeni na osnovu podataka CFS, BS i IS
Aspekt likvidnosti, solventnosti i zaduženosti	Racio rigorozne likvidnosti (*Quick ratio - QR / Acid test*)	Koeficijent pokrića tekućih obaveza (*Current liabilities coverage ratio - CLCR*)
	Odnos dugoročnih sredstava i dugoročnog duga (*Long Term Assets to Long Term Debt Ratio - LTA/LTD*)	Koeficijent pokrića duga (*Debt coverage ratio - DCR*)
	Racio zaduženosti (*Debt ratio - DR*)	Racio pokrića dividendi (*Dividends coverage ratio - DVCR*)
Aspekt profitabilnosti	Stopa prinosa na poslovna sredstva (*Return on assets - ROA*)	Koeficijent kvaliteta dobiti (*Operating Income Quality - OIQ*)
	Stopa prinosa na sopstveni kapiatal (*Return on equity - ROE*)	Povraćaj gotovine na uložena sredstva (*Cash Return on Invested Assets - CRIA*)
	Neto profitna marža (*Net profit margin - NPM*)	Povraćaj gotovine na uloženi kapital (*Cash Return on Invested Capital - CRIC*)

Izvor: Autori

H1: Pojedinačno posmatrano, kompanije koje pripadaju grupi A imaju bolje performanse u odnosu na kompanije koje pripadaju grupi B, sa aspekta likvidnosti.

H2: Pojedinačno posmatrano, kompanije koje pripadaju grupi A imaju bolje performanse u odnosu na kompanije koje pripadaju grupi B, sa aspekta profitabilnosti.

H3: Postoji značajna razlika u poslovnim performansama između rangiranih kompanija koje pripadaju grupi A u poređenju sa grupom B posmatrano po vrednostima neto toka preferencije.

REZULTATI I DISKUSIJA

Rezultati racio analize

Kao što smo napred pomenuli, prvi korak ove analize zasniva se na odabranim racio pokazateljima za dve grupe preduzeća. Indikatori su podeljeni u dve kategorije odeljka, a dobijeni su iz finansijskih izveštaja kompanija. Rezultati racio analize objašnjeni su na način da se uporede izračunate vrednosti indikatora koji ukazuju na iste aspekte poslovanja.

Prva grupa indikatora odnosi se na likvidnost, solventnost i zaduženost izabranih kompanija. Rezulati su prikazani u Tabeli 3.

Za gotovo sve analizirane kompanije Quick ratio (*Acid test*) - QR, ima vrednost koja je veća od prihvatljive. Kompanije kao što su PINS i SHOP imaju izuzetno visok nivo likvidnosti. Ova specifičnost se možda može objasniti time da ove kompanije posluju bez zaliha. Međutim, ovo objašnjene se ne može prihvatiti kao pravilo, jer AMZN je kompanija koja posluje bez zaliha, ali je QR kod nje blizu 1. Ostatak analiziranih kompanija ima vrednost ovog racia blizu 1, što ukazuje na prihvatljiv nivo likvidnosti. Manje likvidne kompanije, prema QR raciju su PCG i CPG.

Likvidnost se može analizirati i na osnovu podataka iz Izveštaja o tokovima gotovine. U ovom slučaju, na bazi pregleda literature, kompanija je likvidna ako je postignuti nivo racia minimum 0,4 i više. Imajući ovo u vidu, a bazirano na izračunatim vrenostima, najlikvidnije kompanije su SHOP i PINS. Za ove dve kompanije, vrednosti indikatora su 4,39 i 6,11, respektivno, dok se za ostale posmatrane kompanije vrednost ovog racia smatra prihvatljivim (Novićević Čečević & Đorđević, 2021). Za kompanije PCG, CPG, and LUMN, racio CLCR ima vrednost koja je blizu 0,1, i samim tim ove kompanije ne ispunjavaju uslov likvidnosti.

Tabela 3 Rezultati racio analize lividnosti, solventnosti i zaduženosti

	QR	CLCR	LTA/LTD	DR	DCR	DVCR
TSLA	1,26	1,04	3,76	0,49	0,58	8,29
AMZN	0,96	0,27	2,08	0,67	0,13	2,84
SHOP	14,97	4,39	3,19	0,17	1,13	7,57
PCG	0,68	0,01	1,54	0,75	0,00	-
CCJ	4,56	3,48	2,60	0,36	0,47	275,01
PINS	13,69	6,11	1,49	0,14	2,85	3,42
PBR	0,91	0,42	1,88	0,60	0,10	-
HPE	0,73	0,20	2,55	0,65	0,11	10,46
PBR-A	0,91	0,42	1,88	0,60	0,10	-
CPG	0,48	0,02	3,20	0,41	0,00	2,21
LUMN	1,66	0,05	1,19	0,80	0,01	2,95
F	1,03	0,22	1,36	0,81	0,10	67,34
VALE	1,21	0,79	1,84	0,61	0,22	-

Izvor: Autori

Sledeći analizirani racio je odnos dugoročnih sredstava i dugoročnih obaveza. Ovaj racio pokazuje solventnost kompanije, tj. njenu sposobnost da izmiri svoje obaveze u dugom roku. Na osnovu izračunatih vrednosti ovog pokazatelja i prikazanih u napred navedenoj tabeli, može se zaključiti da je njegova vrednost prihvatiljiva za sve posmatrane kompanije.

Sledeća grupa indikatora se odnosi na nivo zaduženosti kompanije. Na osnovu vrednosti DR racia može se zaključiti da su neke od analiziranih kompanija, kao što su SHOP and PINS, nezavisne, jer je udeo duga u ukupnim izvorima finanisiranja nizak. Postoje kompanije kod kojih je nivo duga značajan. Kod takvih kompanija udeo duga u ukupnim izvorima je veći od 70%. Takve kompanije su PCG, LUMN i F. Indikator koji pruža detaljnije informacije u vezi sa mogućnošću plaćanja duga kompanije je DCR. On pokazuje sposobnost kompanije da plaća dug gotovinom koja je obezbeđena iz poslovnih aktivnosti. PINS je jedina kompanija koja može da servisira svoj dug uz pomoć gotovine ostvarene iz poslovnih aktivnosti. Nekoliko kompanija (PCG, CPG, LUMN) nije likvidno na osnovu vrednosti ovog indikatora.

Još jedan indikator koji se koristi za analizu je DVCS. On pokazuje sposobnost kompanije da isplaćuje dividendu koristeći gotovinu ostvarenu iz poslovnih aktivnosti. Ovaj indikator se odnosi na servisiranje duga i stoga je naveden pod ovom grupom indikatora. Neke od kompanija nisu isplatile dividende u prošloj godini: PCG, PBR, PBR-A i VALE, dok ostale kompanije redovno plaćaju dividendu. CCJ je isplatio najviše dividendi koristeći neto gotovinu iz poslovnih aktivnosti.

Sledeća grupa analiziranih indikatora je povezana sa profitabilnošću kompanije. Rezultat izračunavanja dat je u Tabeli 4.

Kako indikatori ROA i CRIA predstavljaju stopu prinosa na poslovnu imovinu i povraćaj gotovine na uložena sredstva, neophodno ih je analizirati zajedno. Zanimljiva je činjenica da su neke kompanije koje su poslovnu godinu završile sa gubitkom, poput PCG i CCJ, ostvarile dovoljno novca iz poslovnih aktivnosti. Najprofitabilnija kompanija, uzimajući u obzir oba ova pokazatelja, jeste VALE. Takođe, može se primetiti da neke kompanije (SHOP i CPG) imaju značajne vrednosti ROA pokazatelja, dok je vrednosti CRIA pokazatelja niska. Uobičajena je praksa da kompanije ostvaruju veće prihode u odnosu na prilive gotovine. Specifičnija situacija se može primetiti kod kompanija kao što su TSLA, LUMN, PBR, PBR-A i PINS. Rezultati analiziranih pokazatelja ukazuju na to da su ove kompanije uspešnije u generisanju gotovine nego u ostvarivanju prihoda.

Tabela 4 Rezultati racio analize profitabilnosti

	ROA	ROE	NPM	OIQ	CRIA	CRIC
TSLA	8,88%	18,28%	0,10	0,57	18,50%	38,08%
AMZN	7,93%	24,13%	0,07	0,54	11,02%	33,51%
SHOP	21,85%	26,18%	0,63	0,53	3,78%	4,53%
PCG	-0,09%	-0,34%	-0,00	0,87	2,37%	9,56%
CCJ	-1,36%	-2,12%	-0,07	-0,24	6,10%	9,46%
PINS	8,95%	10,41%	0,12	0,43	21,29%	24,78%
PBR	11,40%	28,64%	0,24	0,87	21,68%	54,45%
HPE	5,94%	17,16%	0,12	0,37	10,18%	29,40%
PBR-A	11,40%	28,64%	0,24	0,87	21,68%	54,45%
CPG	25,78%	43,74%	0,84	0,77	16,31%	27,67%
LUMN	3,51%	17,17%	0,10	0,66	11,21%	54,91%
F	6,98%	36,97%	0,13	0,62	6,14%	32,54%
VALE	25,09%	65,11%	0,41	1,20	28,71%	74,49%

Izvor: Autori

Kada se uzmu u obzir sledeća dva indikatora, ROE i CRIC, primetna je slična situacija. Ovi indikatori prate trend koji je određen analizom prethodna dva indikatora.

NPM indikator pokazuje da skoro sva analizirana preduzeća imaju pozitivan odnos između neto prihoda i poslovnih prihoda. Najveći NPM je ostvarila kompanija CPG. Vrednost NPM za ovu kompaniju je 0,84 centa neto prihoda na svaki dolar poslovnih (operativnih) prihoda. PCG i CCJ su kompanije koje imaju neto gubitak i negativne vrednosti ovog indikatora.

Poslednji indikator koji je korišćen u analizi je OIQ. Na osnovu vrednosti navedenih u Tabeli 4, može se utvrditi da skoro polovina analiziranih preduzeća naplaćuje približno polovinu prodate robe. Ekstremnu vrednost ovog pokazatelja možemo primetiti kod kompanije CCJ. Vrednost ovog pokazatelja je negativna, pa je možemo tumačiti kao to da ova kompanija ima problem u naplati potraživanja. S druge strane, pozitivno ekstremna vrednost je kod kompanije VALE. Iznos ovog pokazatelja je iznad propisane vrednosti. Možemo, zaključiti da menadžement preduzeća sprovodi politiku naplate robe unapred.

Izbor indikatora za primenu PROMETHEE metode (koeficijenti varijacije i korelacije)

Vrednosti koeficijenta varijacije korišćeni su za selekciju indikatora (kriterijuma za rangiranje) i izračunati su za sve indikatore. U situaciji gde je vrednost koeficijeta varijacije manja od 0,1, ne postoje statistički značajne razlike između posmatranih alternativa (preduzeća) prema posmatranom kriterijumu, pa se one mogu isključiti iz daljeg razmatranja. U Tabeli 5 date su vrednosti koeficijenta varijacije za posmatrane indikatore.

Kao što možemo videti iz Tabele 5, ne postoji indikator koji ima vrednost koeficijenta varijacije manju od 0,1, i samim tim nema indikatora koje bi trebalo isključiti iz analize na osnovu vrednosti koeficijenta varijacije. Da bi doneli konačnu odluku o tome koje indikatore ćemo koristiti za višekriterijumsku analizu, izračunata je vrednost koeficijenata korelacije između parova podataka unutar svake grupe indikatora. Oni indikatori čije su vrednosti koeficijenta korelacije iznad 0,7 za određeni par podataka biće isključeni iz dalje analize, jer imaju skoro isti trend. Takođe bi se zanemarili koeficijenti korelacije čija je vrednost 0 ili približno 0, pošto ovi parovi indikatora nisu u korelaciji. Takođe, smer i jačina korelacionog odnosa u ovoj analizi su zanemareni. U Tabeli 6 prikazane su

Tabela 5 Koeficijent varijacije

Indikatori	Koeficijent varijacije
QR	1,51
CLCR	1,49
LTA/LTD	0,36
DVCR	2,25
DR	0,40
DCR	1,77
ROA	0,84
CRIA	0,60
ROE	0,74
CRIC	0,60
NPM	1,14
OIQ	0,55

Izvor: Autori

vrednosti koeficijenata korelacije za svaki posmatrani par koeficijenata.

Na osnovu vrednosti prikazanih u Tabeli 6 i na osnovu prethodno datog objašnjenja, može se doneti odluka koje indikatore treba uključiti u dalju analizu. Analizom prve grupe indikatora može se uočiti da su najniže korelacije između sledećih indikatora: 0,04 između LTA/LTD i DVCR i 0,07 između DVCR i DCR. Stoga su ova tri indikatora izabrana za dalju analizu.

Iz druge grupe indikatora koristi se ista metodologija u izboru. Izabrani indikatori uključuju CRIC i NPM sa najnižom vrednošću koeficijenta korelacije (0,06), i NPM i CRIA sa drugom najnižom korelacijom.

Rezultati PROMETHEE metode

Nakon smanjenja broja indikatora, u radu su dalje izračunati težinski koeficijenti neophodni za primenu PROMETHEE metode. Težinski koeficijenti se izračunavaju na osnovu metode entropije.

U Tabeli 7 prikazani su parametri koji su korišćeni za sprovođenje višekriterijumskog rangiranja na osnovu PROMETHEE metode, korišćenjem izračunatih težinskih koeficijenata, kao i izabrani kriterijumi (parametri ili indikatori).

Na osnovu vrednosti prikazanih u Tabeli 7, može se zaključiti da svi indikatori imaju približno istu težinsku vrednost i da postoje manje razlike među njima.

Primenom navedenih parametara izvršeno je rangiranje odabranih kompanija. Za višekriterijumsko rangiranje izvršeno je po PROMETHEE metodi pomoću softvera *Visual Promethee*. U Tabeli 8 prikazano je kretanje neto toka preferencije (*Net preference flow - Phi*) i rangiranje odabranih kompanija na osnovu njega. Neto tok preferencije (*Phi*) obračunava se kao

Tabela 6 Koeficijent korelacije za posmatrane grupe indikatora

	QR	CLCR	LTA/ LTD	DVCR	DR	DCR	ROA	CRIA	ROE	CRIC	NPM
QR	1	0,93	0,12	-0,00	-0,83	0,85					
CLCR		1	0,12	0,25	-0,87	0,91					
LTA/ LTD			1	0,04	-0,49	-0,00					
DVCR				1	-0.13	-0,07					
DR					1	-0,77					
DCR						1					
ROA							1	0,48	0,83	0,29	0,92
CRIA								1	0,57	0,78	0,23
ROE									1	0.64	0,66
CRIC										1	0,06
NPM											1

Izvor: Autori

razlika između Pozitivnog toka preferencije (*Phi* +) i Negativnog toka preferencije (*Phi* -).

Na osnovu rezultata višekriterijumske analize (Tabela 8) može se zaključiti da samo polovina posmatranih preduzeća posluje efikasno, što se vidi na osnovu pozitivne vrednosti neto toka preferencije (*Phi*), a među njima se izdvajaju VALE i TSLA. Preostale kompanije, čiji je neto tok preferencije pozitivan, postižu približno jednaku efikasnost u poslovanju. Ostala analizirana preduzeća imaju negativan neto tok preferencije. Najmanje efikasne kompanije su LUMN i PCG, jer su njihovi neto tokovi preferencije na veoma niskom nivou.

Na Slici 2 prikazane su prednosti i nedostaci svake rangirane kompanije. Za te potrebe se koristi dijagram duga (*rainbow* diagram), jer pokazuje uticaj svakog od analiziranih indikatora na efikasnost svake kompanije. Dakle, gotovo svi ispitivani pokazatelji se ističu kao prednosti dve najbolje rangirane kompanije. Sa druge strane, interesantno je da su ovi pokazatelji istaknuti kao nedostaci u poslovanju najniže rangiranih kompanija.

Posmatrajući Sliku 2, može se videti da najbolje rangirane kompanije u svakoj grupi imaju samo jedan indikator koji je determinisan kao nedostatak u poslovanju. Posmatrajući sa leva na desno, na Slici 2 se smanjuje broj prednosti za rangirane kompanije, dok se povećava broj indikatora koji pokazuju nedostatke. Dakle, poslednje dve kompanije poseduju samo dva od posmatranih pokazatelja kao prednosti. Takođe, zanimljivo je primetiti da neke kompanije koje su rangirane u sredini imaju više indikatora koji su utvrđeni kao nedostaci, nego onih koji su determinisani kao prednosti.

Tabela 7 Parametri višekriterijumske analize

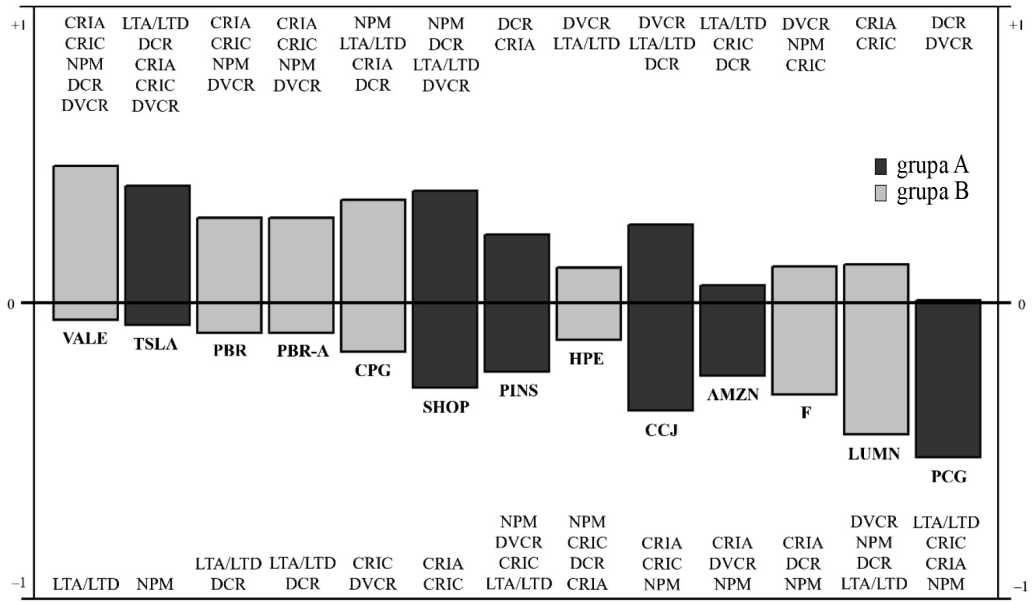
Parametri	LTA/LTD	DCR	DVCR	NPM	CRIA	CRIC
Preferencije: Min/Max	Max	Max	Max	Max	Max	Max
Težinski koeficijent	0,1700	0,1723	0,1723	0,1734	0,1635	0,1483
Funkcija	Uobičajena	Uobičajena	Uobičajena	Uobičajena	Uobičajena	Uobičajena

Izvor: Autori

Tabela 8 Rezultati PROMETHEE metode

Ranh	Kompanija	Grupa	Phi (*Net preference flow*)	Phi + (*Positive preference flow*)	Phi - (*Negative preference flow*)
1	VALE	B	0,3995	0,5992	0,1997
2	TSLA	A	0,3166	0,6080	0,2914
3	PBR	B	0,1811	0,4484	0,2673
3	PBR-A	B	0,1811	0,4484	0,2673
4	CPG	B	0,1781	0,4741	0,2961
5	SHOP	A	0,0882	0,5010	0,4128
6	PINS	A	-0,0053	0,4470	0,4523
7	HPE	B	-0,0083	0,4455	0,4538
8	CCJ	A	-0,1054	0,3970	0,5024
9	AMZN	A	-0,1904	0,3545	0,5449
10	F	B	-0,1946	0,3453	0,5398
11	LUMN	B	-0,3197	0,2898	0,6096
12	PCG	A	-0,5209	0,0672	0,5881

Izvor: Autori



Slika 2 Prednosti i nedostaci rangiranih kompanija

Izvor: Autori

Nakon rangiranja, softver Visual PROMETHEE izračunava dodatne podatke u vezi sa posmatranim scenarijima. U ovoj analizi posmatra se samo jedan scenario. Kako se rangiranje alternativa (kompanija) vrši na osnovu izabranih kriterijuma, analiza stabilnosti daje dodatne informacije o tome koliko kriterijumi mogu da variraju, a da ne utiču na rangiranje. Nivoi stabilnosti za posmatrane kriterijume prikazani su u Tabeli 9.

Tabela 9 Nivoi stabilnosti posmatranih indikatora

Kriterijum (indikator)	Nivo stabilnosti
LTA/LTD	16,66% - 17,25%
DCR	16,99% - 17,74%
DVCR	16,85% - 17,57%
NPM	10,49% - 17,71%
CRIA	16,05% - 21,83%
CRIC	14,55% - 15,58%

Izvor: Autori

Na osnovu obračunatih nivoa stabilnosti (Tabela 9) može se primetiti da su NPM i CRIA najstabilniji kriterijumi. Značajan opseg ova dva kriterijuma ukazuje na to da se oni mogu menjati u granicama intervala bez uticaja na rangiranje. Ostali kriterijumi koji su analizirani su visoko osetljivi i imaju mali opseg intervala stabilnosti, pa zato na konačno rangiranje mogu uticati i minimalne promene ovih indikatora.

ZAKLJUČAK

U radu je izvršeno višekriterijumsko rangiranje odabranih preduzeća na osnovu indikatora prethodno sprovedene racio analize. Na osnovu liste od 100 kompanija čijim se akcijama najviše trguje na berzi, formirane su dve grupe koje čine uzorak za analizu. U jednu grupu spadaju kompanije čiji je PE koeficijent veći od 50 (grupa A), dok u drugu grupu spadaju kompanije čiji je PE manji od 5 (grupa B). Nakon odabira uzorka, izvršena je i selekcija racio pokazatelja. Racio pokazatelji izračunati su na osnovu podataka dostupnih u Bilansu stanja, Bilansu uspeha,

kao i na osnovu podataka dobijenih iz Izveštaja o novčanim tokovima za svaku od kompanija koja je bila predmet analize.

Rezultati racio analize su pokazali da, sa stanovišta likvidnosti, kompanije koje pripadaju grupi A imaju bolje pojedinačne vrednosti za posmatrane pokazatelje. Kako je utvrđeno da su ova preduzeća likvidnija, potvrdila se prva hipoteza (H1).

Na osnovu pokazatelja profitabilnosti, vidi se da nema statistički značajne razlike kod između kompanija koje su klasifikovane u grupu A odnosno grupu B i samim tim H2 se ne prihvata.

Hipoteza 3 koja je navedena u radu, takođe nije dokazana. Rezultati analize su pokazali da nema značajne razlike između rangova kompanija kada se sprovede višekriterijumsko rangiranje. Naime, jednak je broj kompanija sa pozitivnim neto tokom preferencije i isti broj sa negativnim neto tokom preferencije unutar svake od dve posmatrane grupe.

Na osnovu sprovedene analize, ocene poslovanja kompanija na osnovu pojedinačnih indikatora, njihovom uporednom analizom i višekriterijumskim rangiranjem, može se konstatovati da prilikom izbora kompanije za investiranje, investitori treba da ulažu u kompanije čiji je neto tok pozitivan i ima najveću vrednost.

Rezultati ukazuju na to da pažnja investitora treba da bude usmerena na dve kompanije. Jedna kompanija je iz grupe A, kompanija Tesla, Inc. (TSLA - drugo mesto), dok druga pripada grupi B, kompanija Vale, S. A. (VALE - prvo mesto). Ostale kompanije sa pozitivnom vrednošću neto toka preferencije takođe bi se mogle uzeti u obzir za ulaganje (grupa A: SHOP, grupa B: PBR, PBR-A, CPG). S tim u vezi, preporučljivo je da se uradi detaljnija analiza prilikom odlučivanja u koju kompaniju treba investirati, kao i da se ispitaju i druge mogućnosti ulaganja.

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Tadija Đukić je redovni profesor na Ekonomskom fakultetu u Nišu za užu naučnu oblast Računovodstvo, revizija i poslovne finansije. Posvećen je naučnim disciplinama Finansijsko i Budžetsko računovodstvo. Autor je brojnih radova objavljenih u domaćim i međunarodnim časopisima, kao i udžbenika iz svoje oblasti.

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INVESTMENT OPPORTUNITIES EVALUATION: A COMPARATIVE ANALYSIS AND THE MULTI-CRITERIA RANKING OF TOP-LISTED COMPANIES

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Investors are faced with the challenge of identifying the most promising companies for their potential investment in the stock market. This research study aims to propose a systematic approach to the selection of top-listed companies for investment, focusing on the two levels of analysis - the ratio analysis based on liquidity and profitability, and the multi-criteria ranking using the PROMETHEE method. The observed companies are divided into two groups: group A, which includes companies with a PE ratio above 50, and group B, which includes companies with a PE ratio below 5. The findings of the study highlight the fact that companies with higher PE ratios tend to exhibit better overall business performance as observed on an individual basis and based on the ratio analysis. Although there are noticeable differences in the ratio indicators between the companies, these differences are not significant when the overall review is considered. The combination of ratio analysis and the PROMETHEE method provides an effective method for evaluating their business performance, giving guidance to investors and decision-makers in selecting the most promising investment opportunities. The results of the multi-criteria ranking show that the companies that belong to group B have a better rank than the others, and that investors should invest in the companies Vale S.A. and Tesla, Inc. as well.

Keywords: ratio analysis, PROMETHEE method, stock market, investment, comparative analysis

JEL Classification: G11, M49

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THE FACTORS INFLUENCING STUDENTS' ENTREPRENEURIAL INTENTIONS: AN ANALYSIS USING THE THEORY OF PLANNED BEHAVIOR

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This study applies the Theory of Planned Behavior to investigate the impact of personal attitudes towards entrepreneurship, social norms, and perceived behavioral control on students' entrepreneurial intentions. Conducted on a sample of 184 students in Croatia, the research study applies the practical adaptation of the TPB model so as to reflect the realistic context in which students develop their entrepreneurial intentions. The multiple regression analysis conducted in the study reveals that all the components of the theory positively and significantly affect entrepreneurial intentions. The most influential factor is perceived behavioral control, only to be followed by personal attitude and social norms. These findings enhance the understanding of the critical elements shaping students' entrepreneurial aspirations. Additionally, the study offers useful information for higher education institutions, helping them understand students' entrepreneurial behavior and guiding the development of targeted programs and internal policies. Ultimately, this research serves as a valuable resource for a broader academic community to help them design the strategies that promote students' entrepreneurial ambitions.

Keywords: entrepreneurship, entrepreneurial intentions, students, theory of planned behavior

JEL Classification: A22, A23, I23, M21

INTRODUCTION

In today's fast-evolving market environment characterized by rapid technological advancements, shifting social dynamics, and increasing demand for innovative solutions, entrepreneurship has risen to a pivotal role, becoming essential for market competitiveness and survival. Recognizing the fact that entrepreneurial skills and mindsets are indispensable tools for success in the 21st century (Obschonka, 2014, Obschonka, Hakkarainen, Lonka & Salmela-Aro, 2017), the education system is tasked with nurturing these skills in future entrepreneurs by offering the necessary support to fuel their entrepreneurial initiatives. In developed economies, regions with a high concentration of employees holding a higher education diploma tend to experience the greatest entrepreneurial economic growth (Molnar, Josipović & Baškot, 2024). The

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research conducted by S. Primario, P. Rippa and G. Secundo (2022) highlights the crucial contribution of higher education institutions in developing human and social capital, both of which are foundational to driving innovation and enhancing competitiveness. Through education, students gain the knowledge and hands-on experiences that improve their capacity to learn, absorb new information, and acquire key resources, all of which helps them to recognize potential opportunities (Wilson, Kickul & Marlino, 2007). In this context, higher education institutions hold a responsibility not only to promote innovation and entrepreneurial thinking (Corazza & Saluto, 2021; Sansone, Ghezzi, Landoni & Rangone, 2024) but also to actively support the growth of students' entrepreneurial intentions by fostering the environment that encourages the initiative, creativity, and practical learning experiences.

While science has made significant strides in highlighting the importance of building competencies, knowledge, and skills in entrepreneurship (Corazza & Saluto, 2021; Primario *et al*, 2022; Wang, You, Wang, Wang, Lai & Su, 2023; Adeel, Daniel & Botelho, 2023; Sansone *et al*, 2024), this field still remains an active area of scientific and research inquiry. Often regarded as a microcosm of society, students typically display the talents that embody proactive attitudes and dedication to entrepreneurial pursuits. However, a gap in empirical research persists concerning their entrepreneurial intentions in emerging economies, Croatia being no exception. Moreover, recent findings (Singer, Šarlija, Pfeifer & Peterka, 2022) indicate that Croatia's entrepreneurial environment is still not sufficiently supportive. Among the Croatians, only two factors (namely the domestic market dynamics and the quality of the physical infrastructure, such as telecommunications and transportation) positively impact entrepreneurial activity. Conversely, the restrictive aspects of the entrepreneurial landscape include the insufficient prioritization of supportive government policies, the regulatory framework with significant market entry barriers, and inadequate contributions from the education sector toward fostering entrepreneurial competencies in young people, the latter factor underscoring the need for the studies focused on students and their entrepreneurial tendencies.

Given the fact that students are anticipated to redefine business paradigms and shape the future of entrepreneurship on a global scale and recognizing their heightened responsiveness to shifts in a rapidly evolving environment, there is a strong rationale for ongoing research in their readiness for entrepreneurial challenges. This approach calls for a systematic, scientifically grounded examination of the diverse factors influencing their entrepreneurial aspirations and behaviors, providing the insights that may inform the policies and practices aimed at nurturing the next generation of entrepreneurs.

A review of the existing literature highlights robust empirical support for the Theory of Planned Behavior (TPB) in explaining how the personal attitude, social norms, and perceived behavioral control influence behavioral intentions across diverse contexts (Finisterra Do Paco, Ferreira, Raposo, Rodrigues & Dinis, 2011; Iqbal, Melhem & Kokash, 2012; Širola, 2020; Su, Zhu, Chen, Jin, Wang, Lin & Xu, 2021; Sampene, Li, Khan, Agyeman & Opoku, 2023). Despite this fact, there yet remains a substantial gap in the research addressing students' entrepreneurial intentions in Croatia through the lens of the TPB. This study aims to address this gap by examining the cognitive factors (namely attitudes, social norms, and perceived behavioral control) that impact Croatian students' entrepreneurial intentions. Through the application of the TPB model, this study seeks to provide valuable insights into students' entrepreneurial orientations. These insights could be instrumental for Croatian higher education institutions as they refine their educational strategies and policies so as to better support entrepreneurial skills. Moreover, the study's findings have the potential to contribute to the global academic discourse on fostering entrepreneurship among students, offering the perspectives that are relevant not only in Croatia but also in a broader international context.

The paper is so structured as to include the Introduction, the Analysis of the Fundamental Concepts Derived from Prior Research, the Explanation for the Research Methodology and the Interpretation of the Research Findings. The Conclusion synthesizes the entire work, discussing

the theoretical and practical implications of applying the acquired knowledge and elaborating on the theoretical and practical contributions of the research study.

LITERATURE REVIEW

This section provides an overview of the previous research that has applied the Theory of Planned Behavior, only to be followed by a presentation of the research model along with the description of the model's variables.

The application of the Theory of Planned Behavior in previous research studies

Although entrepreneurship has been studied for over 300 years, no clear and universally accepted definition has remained. The concept is defined in various ways, from narrow interpretations focused on the dynamic process of starting a business to the broader views that encompass traits such as diligence, self-confidence, initiative, innovativeness, and risk-taking (Van Gelderen, Brand, Van Praag, Bodewes, Poutsma & Van Gils, 2008), as well as the commitment to achieving specific goals by combining resources, recognizing change, and creating new value (Hisrich, Peters & Shepherd, 2011). Nevertheless, there is a general consensus now on the complexity and multi-dimensional, interdisciplinary nature of entrepreneurship, which continues to evolve driven by a multitude of factors and circumstances (Leitão, Lasch & Thurik, 2011). Within the scientific field of management, definitions of "entrepreneurship" commonly emphasize entrepreneurs' personal characteristics or attitudes, individual and organizational entrepreneurial behaviors, and entrepreneurship as a socioeconomic phenomenon (Tien, Minh, Ngoc & Nhan, 2019). As S. Adeel *et al* (2023) succinctly state, "entrepreneurship is usually defined as an individual's ability to turn ideas into viable new ventures."

In recent years, the Theory of Planned Behavior (TPB) has become a popular model for examining students' entrepreneurial intentions (Liñán & Chen, 2009; Iqbal *et al*, 2012; Entrialgo & Iglesias, 2016; Širola, 2020; Su *et al*, 2021; Piri Rajh, Rajh & Horvat, 2022). The TPB offers a relevant framework for predicting entrepreneurial intentions through educational processes and the learning context (Ajzen, 1991; Fayolle, Gailly & Lassas-Clerc, 2006; Iqbal *et al*, 2012). According to the TPB, there are three main variables that influence the entrepreneurial intention: perceived behavioral control (PBC), which represents an individual's perception of how feasible it is to perform a behavior; attitude toward entrepreneurship, reflecting one's personal belief in behaviors or traits such as entrepreneurial spirit; and social norms, which reflect the perceived approval of the influential figures, such parents, friends, or colleagues, of entrepreneurship. These factors are found to directly shape entrepreneurial intentions (Ajzen, 1991; Iqbal *et al*, 2012; Al-Jubari, 2019; Su *et al*, 2021).

Y. Su *et al* (2021) provide a thorough overview of the TPB, emphasizing the fact that perceived behavioral control is central to the model. They highlight the fact that, while entrepreneurial attitudes and PBC shape the intention from within, social norms add an external layer of the influence based on the entrepreneur's surroundings. When these factors are aligned, the entrepreneur's intention to start a business strengthens, thereby increasing the likelihood of the entrepreneur launching a venture.

In prior studies, the TPB has extensively been analyzed from multiple perspectives in the context of entrepreneurship (Iqbal *et al*, 2012; Munir, Jianfeng & Ramzan 2019; Al-Jubari, 2019; Otache, 2019; Al-Jubari, Hassan & Liñán, 2019; Duong, Nguyen, Ngo, Nguyen & Nguyen 2020; Su *et al*, 2021). For example, A. Iqbal *et al* (2012) examined the influence of different TPB variables on the entrepreneurial intention, whereas I. Al-Jubari *et al* (2019) included the additional factors like need satisfaction, need frustration, and attitudes towards entrepreneurship. H. Munir *et al* (2019) investigated risk-taking propensity, the locus of control, the proactive personality, and the gender as the additional factors influencing entrepreneurial intentions. Similarly, C. Duong *et al* (2020) considered personal attitude, self-efficacy, social capital, and

country norms, whereas J. Maes, H. Leroy and L. Sels (2014) included the gender, personal attitude, social norms, and perceived behavioral control. Y. Su *et al* (2021) expanded the TPB by examining entrepreneurial intentions among students and adding perceived faculty support as a new variable.

These previous studies form a critical foundation for this research study by offering the theoretical frameworks and methodologies that have already proved to be effective in similar contexts. Analyzing prior research has highlighted the gaps in knowledge that this study seeks to address, as well as the identification of the relevant factors that influence this research topic. These insights have facilitated the development of a tailored research model, building upon the established concepts, simultaneously incorporating new dimensions specific to the current study. The following sections will detail the model's variables, further underscoring the value of the prior research in shaping the study's scientific contributions.

The research model

The Theory of Planned Behavior (TPB) suggests a strong link between the entrepreneurial intention and successful entrepreneurial performance. *Intention* is regarded as a critical predictor of behavior, reflecting an individual's willingness to undertake entrepreneurial activities (Liñán & Chen, 2009). This concept encompasses the three primary factors that influence behavior: personal attitudes towards entrepreneurship, social norms, and perceived behavioral control (Liñán & Chen, 2009), which serve as the main hypotheses in this research study.

Entrepreneurial intention (EI) is a composite variable where values greater than zero indicate a higher inclination towards an entrepreneurial career, whereas values less than zero suggest a greater inclination towards alternative careers, i.e. a lower inclination towards an entrepreneurial career. EI represents a focused decision on targeted behavior and is considered as the best single predictor of planned behavior.

Personal Attitude (PA) towards entrepreneurship is a composite variable assessing an individual's career path orientation based on their positive or negative evaluation of an entrepreneurial career compared to alternative careers (Ajzen & Fishbein, 1975). Higher values of this variable indicate a more positive perception of the outcome of starting an entrepreneurial career.

Social Norms (SN) is a composite variable, where higher scores indicate a greater belief that a future entrepreneurial career aligns with the opinions of the respondent's social environment. In other words, *social norm* refers to the perceived social pressure to perform or avoid a certain type of behavior. It is assumed to be shaped by a full range of accessible normative beliefs about the expectations of the key referents, such as one's spouse, family, friends, supervisor, and co-workers (Širola, 2020).

Perceived Behavioral Control (PBC) is a composite variable that represents an individual's personal beliefs about their own control over planned behavior, in which sense this variable reflects the beliefs related to access to the resources and opportunities necessary to carry out a certain type of behavior (Ajzen, 1991). The importance of this construct stems from its predictive ability, which reflects an individual's perception of the (in)ability to control behavior. In other words, the fewer obstacles an individual expects (control belief) and the greater the belief in the resources and opportunities needed for an entrepreneurial career, the higher PBC towards an entrepreneurial career.

This study employs an adapted version of the Theory of Planned Behavior (TPB) model customized so as to better reflect the practical context in which students form their entrepreneurial intentions. Specifically, adjustments are made to the social norms variable, incorporating the role of faculty professors' support in fostering entrepreneurial initiatives. By including this additional particle, the model more accurately captures the environmental influences on students' entrepreneurial intentions, offering a more realistic analysis of their entrepreneurial behavior. Furthermore, the other key variables of the Theory,

namely entrepreneurial intentions (EI), personal attitude (PA), and perceived behavioral control (PBC), have also been modified. Each of these variables is condensed into a total of four particles, offering a more streamlined and focused approach compared to previous research. This approach is further detailed in the research methodology section, which explains the specific modifications made to each variable and the reasoning lying behind these changes.

The study addresses the following research question: Can entrepreneurial intentions among Croatian students be predicted using the components of the Theory of Planned Behavior? In order to answer the research question, the following hypotheses were formulated:

H1: Personal attitude (PA) towards entrepreneurship has a positive effect on entrepreneurial intentions (EI) among the students.

H2: Social norms (SN) have a positive effect on entrepreneurial intentions (EI) among the students.

H3: Perceived behavioral control (PBC) in the students has a positive effect on their entrepreneurial intentions (EI).

Figure 1 illustrates the proposed hypotheses within the conceptual model, followed by the equation (1) formulated for the multiple regression model.

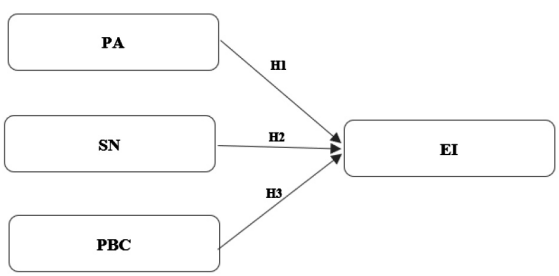

Figure 1 The research model

Source: Authors

$$EI = a + b_1PA + b_2SN + b_3PBC \quad (1)$$

RESEARCH METHODOLOGY

To address the research question, an empirical study was conducted, and a structured questionnaire was developed. The questionnaire was organized into four sets of questions. The first set collected socio-demographic information from the respondents. The second set focused on exploring the entrepreneurial characteristics of the participants, which were assessed through four categories: independence, the leadership ability, responsibility, and organizational skills, as defined by A. Hunjet, G. Kozina and M. Milković (2012). The third set examined the participants' attitudes towards the role of the faculty in fostering entrepreneurial initiatives. Although these sets of questions were not used to test the hypotheses directly, they did provide a valuable framework for describing the respondents' profiles and enriched the information about the research sample.

The research done by A. Iqbal *et al* (2012) served as the basis for constructing the last set of the questions applied for testing the hypothesis through examining the participants' entrepreneurial intentions. While the literature review has identified various models for examining entrepreneurial intentions (EI), the Theory of Planned Behavior (TPB) offers a comprehensive framework for their analysis (Ajzen, 1991; Iqbal *et al*, 2012). As the Theory posits that most actions are planned, the intention driving a specific behavior comes before the behavior itself (Ajzen & Fishbein, 1975). The individuals who carefully consider their future actions vary in terms of the three predictors of future behavioral intentions: the attitude towards a specific behavior, social norms, and perceived behavioral control. Considering this theory in the realm of entrepreneurship, it is reasonable to anticipate that the students' beliefs and attitudes towards entrepreneurship will impact the development of their entrepreneurial intentions. In that sense, I. Ajzen (1991) suggested, and A. Iqbal *et al* (2012) applied, a six-item scale for entrepreneurial intention (EI) measurement, whereas personal attitude (PA) was measured using a five-item scale, social norms (SN) using a three-item scale and perceived behavioral control (PBC) using a six-item scale. For the purposes of this research, however,

all the research variables were reduced to four relevant, clear and comprehensible particles. The scientific grounding for these adjustments lies in the need for clarity and specificity in measuring the variables that influence entrepreneurial intentions. By condensing these variables into fewer particles, the study aims to enhance the reliability and validity of the measurements, making it easier to analyze the relationships between these variables and entrepreneurial intentions. This approach aligns with the best practices in the research methodology, where simplification can lead to more robust findings and clearer implications for practice. At the same time, in addition to reducing the particles of the variables EI, PA and PBC, the SN variable was adapted in such a way that, in addition to the three originally defined items (Ajzen, 1991), it also contains an additional, newly created particle called "faculty professors", which emphasizes the influence of the teacher's authority on the entrepreneurial behavior of their students. Namely, as a source of inspiration and motivation, professors' authority can significantly influence students' entrepreneurial intentions. By sharing their knowledge, experiences, and advice, the professors who are experts in entrepreneurship can provide essential support and mentorship to the students aspiring to become entrepreneurs. Additionally, professors' authority can also impact entrepreneurial intentions through the educational program and the curriculum. Professors have the opportunity to incorporate practical exercises, projects, and business simulations in their lessons, thereby encouraging entrepreneurial thinking among the students. By adding the newly created particle to the SN variable, the questionnaire is further aligned with the actual experiences and practices of the students as the target population.

In addition to the above-mentioned adaptation of the model, this research was also customized in another methodological aspect. In relation to the previous studies (Ajzen, 1991; Iqbal *et al*, 2012; Širola, 2020), in whose studies a seven-point Likert scale was suggested and applied, all the scales in this research were measured on a five-point Likert scales, ranging from 1 (strong disagreement) to 5 (strong agreement), which was done in order to reduce the possibility of confusion and in order to facilitate decision-making among the research participants who are used to being graded in an educational system applying grades from 1 to 5.

The research was conducted on a sample of university students in Croatia, specifically those enrolled in economics programs, with the focus on entrepreneurship courses as part of their curricula. These students represent the target group of the study as they are actively engaged in learning entrepreneurship and are at a critical stage where they must make decisions on their future career paths. By focusing on the students of the faculties of economics, the research study aims to capture insights from the individuals who are more likely to consider entrepreneurial careers due to their academic background and exposure to entrepreneurship education.

In the first research phase, the universities (and their respective faculties as the legally autonomous entities within them) offering economics programs were selected so as to identify the institutions relevant to the study. The selection focused on the six prominent public institutions in Croatia known for their high-quality education in economics and the related fields with comprehensive entrepreneurship curricula. The aim was to gather insights from the students attending these universities (faculties) since they are considered to be highly representative of the academic training that shapes entrepreneurial intentions in Croatia. The online questionnaire was developed and distributed via the social media platforms, such as Facebook groups, that gather students from the selected faculties, and on the official Facebook pages of the chosen institutions as well. The call to participate in the survey explicitly stated that it was intended for the students enrolled in the economics programs at the specified institutions. Additionally, an initial open-ended question was included in the survey asking the respondents to specify the institution they were attending, thus ensuring that the data reflected the views of the students coming from the relevant academic backgrounds. The chosen distribution method combining the reach of social media with clear targeting maximized the participation and

ensured the sample accurately represented the target population. Data collection took place in February 2024 applying an online survey method via the Google Forms. Out of 190 distributed questionnaires, 184 were deemed usable for the analysis, resulting in the response rate of 96.8%. The collected data were then analyzed using appropriate statistical methods, with the IBM SPSS Statistics 23 software package being utilized for the analysis.

RESEARCH RESULTS

In this section, a descriptive analysis of the sample is presented, providing an overview of the respondents' characteristics and a brief respondent profile description. This is followed by the descriptive statistics for the key variables in the model. Finally, the hypothesis testing is performed based on the established multiple regression model.

The general characteristics of the research sample: the descriptive statistics

The educational level and the gender are typically taken into consideration and analyzed when examining the basic characteristics of the sample units, as is also done in this study.

Table 1 The respondents' socio-demographic Profile (N=184)

Description	Respondents	
	Frequency	Percentage
Gender		
Male	52	28.3
Female	132	71.7
Year of study		
1st year	74	40.2
2nd year	10	5.4
3rd year	2	1.1
4th year	59	32.2
5th year	39	21.2

Source: Authors

From the point of view of the respondents' gender, the majority of the respondents in the study sample are female (71.7%). Most of the respondents are first-year students (40.2%), which is followed by the fourth-year students (32.2%) and the fifth-year students (21.2%), as indicated in Table 1.

In order to systemize the students' entrepreneurial attributes as the input for their future entrepreneurial activity, the study explored the students' entrepreneurial traits. To this end, the respondents were asked to choose from the statements provided within the various categories (independence, leadership, responsibility, organizational abilities) the statement that describes them the best.

According to their self-evaluations, most of the respondents in the sample had developed entrepreneurial traits: 53.3% reported that they did all of their work independently and 60.95% stated that they could win over most people when they start doing something. Furthermore, the respondents showed a high level of responsibility for what they were doing (75.6%), together with a high level of organizational abilities, indicated by their intention to have a plan and a clearly defined line of action (76.6%).

Starting from the assumption that the students' attitudes towards the faculty they are attending are a good source of information and a distinct signal of the limitations that students may come across in the educational process, the study identifies the role of the faculty in encouraging students' entrepreneurial initiatives, as is presented in Table 3.

The findings indicate the fact that the role of the faculty in encouraging students' entrepreneurial initiatives is strong since, through its educational program, the faculty builds the entrepreneurial spirit (52.2%), provides the study cases of successful entrepreneurs (66.8%), brings the knowledge needed to develop a business plan (54.3) and emphasizes the importance of teamwork (82.6%).

The comprehensive overview of the research sample enables the assertion of the fact that the respondents' self-evaluation in the variables reflecting the entrepreneur profile indicates that the students exhibit the key entrepreneurial traits manifested through independence, tenacity, responsibility and

Table 2 The self-evaluation of the students' entrepreneurial traits - the share (%)

Entrepreneurial traits	Item	Percentage
Independence (Am I independent by nature?)	I do all my work independently. Nobody has to tell me what to do.	53.3
	All I need is a little nudge to get started but then I continue on my own.	40.8
	Easy does it. I don't do anything until I have to.	6.0
Leadership (Do I have the ability to lead others?)	Usually, I can win over most people when I start something.	60.9
	I can give orders if someone else tells me what I need to do.	20.1
	Usually I leave leadership to others, but I will join them if I like what they're doing.	19.0
Responsibility (Am I capable of taking on responsibility?)	I like being responsible for what I'm doing and I like to see the results of my work.	75.6
	I will take on responsibility if I have to; otherwise, I would rather leave it to someone else.	19.0
	There is always some "know-it-all" who wants to show off how smart they are. I am happy to let them do that.	5.4
Organizational abilities (Am I a good organizer?)	Before starting anything, I always want to have a plan and a clearly defined line of action.	76.6
	I can manage well until things start getting too complicated. That's when I usually give up.	12.5
	I have everything nicely planned out and then some huge problem emerges. That's why I tend to deal with things as they come.	10.9

Source: Authors

Table 3 The role of the faculty in encouraging entrepreneurial initiative - the share (%)

Items	Yes	No
The faculty played the key role in fostering my entrepreneurial spirit.	52.2	47.8
At the faculty, I analyzed the case studies of successful entrepreneurs.	66.8	33.2
At the faculty, I learned how to develop a business plan.	54.3	45.7
The faculty emphasized the importance of teamwork.	82.6	17.4

Source: Authors

organizational abilities. Additionally, the respondents demonstrate a favorable view of the faculty as the supporter of their entrepreneurial endeavors, the findings laying a promising foundation for a further exploration of the students' entrepreneurial initiatives that are discussed in the following section of the paper.

The descriptive analysis of the main variables

As the preliminary step in the research done in students' entrepreneurial intentions, this section provides the description and data analysis of the key variables used to develop the hypotheses. The instrument demonstrated internal consistency, with Cronbach's alpha values ranging from 0.814 for social norms to 0.947 for entrepreneurial intentions. All Cronbach's alpha coefficients are within acceptable ranges with the values exceeding 0.7064, which indicates their satisfactory to high reliability for measuring the individual constructs (Nunnally & Bernstein, 1994).

All the items within the EI variable were given medium average scores, indicating that the students displayed moderate entrepreneurial intentions. The item rated the highest was "My professional goal is to become an entrepreneur." (M=3.43, SD=1.129), whereas the item rated the lowest was "I have a firm intention to start a firm one day." (M=3.26; SD=1.130).

Table 4 The students' entrepreneurial intention (EI)

Items	Min	Max	Mean	Std. Deviation	Cronbach's alpha	Average Mean
I am ready to do anything to be an entrepreneur.	3	5	3.35	1.191	0.947	3.33
My professional goal is to become an entrepreneur.	3	5	3.43	1.129		
I am determined to create a firm in the future.	2	5	3.28	1.161		
I have a firm intention to start a firm one day.	2	5	3.26	1.130		

Source: Authors

Table 5 Personal attitude (PA) towards entrepreneurship

Items	Min	Max	Mean	Std. Deviation	Cronbach's alpha	Average Mean
Being an entrepreneur would entail great satisfaction to me.	2	5	3.96	1.053	0.883	3.73
A career as an entrepreneur is attractive to me.	3	5	3.85	1.096		
If I had the opportunity and resources, I'd like to start a firm.	3	5	3.70	1.128		
Among various options, I would rather be an entrepreneur.	2	5	3.42	1.069		

Source: Authors

Table 6 The social norms

Items	Min	Max	Mean	Std. Deviation	Cronbach's alpha	Average Mean
Your close family	2	5	3.72	1.200	0.814	3.39
Your friends	3	5	3.64	1.251		
Your faculty professors	3	5	3.60	1.224		
Your colleagues	2	4	2.58	1.113		

Source: Authors

The total mean average of the PA variable is 3.73, with "Being an entrepreneur would entail great satisfaction for me." as the item rated the highest (M=3.96; SD=1.053) and "Among various options, I would rather be an entrepreneur." as the item rated the lowest (M=3.42; SD=1.069). Such results indicate that, according to the students' perception of and attitudes towards entrepreneurship, opportunities and resources play the key role in starting their own business ventures. Although the students are aware of a lack of current resources, it is believed that, if they had them available, they would be inclined to start their own business.

Table 6 displays the respondents' social norms (SN). The total mean 3.39 suggests that the family, friends, faculty professors, and college peers influence the students by encouraging them to consider or plan an entrepreneurial career. The students seem to be more influenced by their close family (M=3.72), only to be followed by their friends (M=3.64) and faculty professors (M=3.60), whereas peers (M=2.58) have a slightly lesser, but still significant impact. Faculty

Table 7 Perceived behavioral control

Items	Min	Max	Mean	Std. Deviation	Cronbach's alpha	Average Mean
To start a firm and keep it working would be easy for me.	3	5	3.44	.945	0.892	3.14
I am ready to start a viable firm.	2	5	3.19	1.107		
I know the necessary practical details to start a firm.	2	5	3.05	1.142		
If I tried to start a firm, I would have a high probability of making a success.	2	4	2.87	1.058		

Source: Authors

professors exert almost the same level of influence on the students as their friends do, with the means 3.60 and 3.64, respectively, which suggests that professors play a significant role in shaping students' entrepreneurial intentions, as much as their friends who offer support and advice do. However, peers have a noticeably lesser impact, which is indicative of the fact that, while they still may influence the students, their role in fostering the students' entrepreneurial intentions is less pronounced. In contrast, the students may be more influenced by their parents' opinions due to their reliance on their parents for financial support, which is a factor deeply rooted in the Croatian culture and family structure.

The total mean average of the PBC variable is 3.14, with "To start a firm and keep it working would be easy for me." as the item rated the highest (M=3.44; SD=0.945) and "If I tried to start a firm, I would have a high probability of making a success." as the item rated the lowest (M=2.87; SD=1.058). A. Iqbal *et al* (2012) provide an explanation for the notably low mean average of this factor compared to the other three, suggesting that it may stem from certain reluctance and hesitation among college students. This apprehension could be linked to their doubts about their self-confidence in taking risks and their ability to establish a business or start a venture from the ground up, which may feel beyond their current capabilities and mindsets.

Multiple regression analysis: the hypotheses testing

Considering multiple regression analysis (with the selected two-way testing, 5% significance, the test power 80 %, and the three predictors), the G*Power 3.1.9.7 program, which is a statistical power analysis program based on Cohen's sampling formula, recommends a minimum sample size of 77 units. Since this study involves a total of 184 respondents, the criterion for conducting the research was successfully met. The mutual linearity of the variables in the multiple regression model was tested using a scatter plot.

By analyzing each individual diagram shown in the matrix, it is evident that there is an approximate linear relationship between all the variables of the model. The correlation analysis table presents the Pearson correlation coefficients (r) and their statistical significance (p). All the independent variables are highly correlated with the dependent variable, and the independent variables are also statistically significantly correlated with each other.

The following variables: personal attitude (PA), perceived behavioral control (PBC) and social norms (SN) are the independent variables of the model, and they are statistically significantly ($p<0.001$) related to the entrepreneurial intention (EI) dependent variable. The mentioned connections have a positive sign and thus suggest an increase in the values in the variables (both the dependent and the independent): PA (r1=0.739), PBC (r1=0.746), SN (r1=0.686).

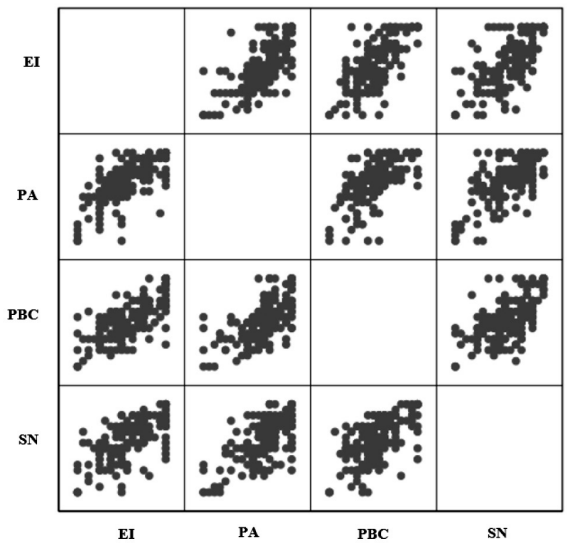

Figure 2 The matrix notation of the scatter plots for the model variables

Source: Authors

Table 8 The correlational analysis of the variables

	EI	PA	PBC	SN
EI	1			
PA	.729	1		
PBC	.746	.643	1	
SN	.686	.653	.609	1

Source: Authors

Following the correlation analysis, a multiple regression analysis was carried out so as to examine the influence of the independent variables on the dependent variable, specifically in order to determine whether the students' EI could be predicted based on the PA, PBC, and SN variables.

The first part of the table below provides the level of the predictive ability of the set model via the information on the multiple correlation coefficient (R), the determination coefficient (R^2), and its corrected value (Adjusted R^2), as well as the evaluation of the overall statistical significance of the set model (the F-ratio). The second part of the table presents the unstandardized and standardized coefficients. Since all the independent variables, as well as the dependent variable, were measured using different measurement units, it is recommended that the standardized coefficients should be interpreted, in which way the comparability of the variables of the multiple regression model is ensured.

According to the data shown in the table, the equation for the multiple regression model reads as follows:

$$EI = -0.369 + 0.321 * PA + 0.235 * SN + 0.397 * PBC \quad (2)$$

Multiple regression analysis was used to test whether the entrepreneurial intentions (EI) variable could be predicted based on the elements of the Theory of Planned Behavior. The variables: personal attitude (PA), perceived behavioral control (PBC) and social norms (SN) predict entrepreneurial intentions statistically significantly ($F_{3, 180}=134.211$, $p<0.001$). The variables of the model explain 69.1% of the variation in entrepreneurial intentions. The predictive ability of all the three independent variables of the analyzed multiple regression model is justified because all the independent variables contribute statistically significantly to the model. The PBC (perceived behavioral control) variable has the most predictive power in explaining entrepreneurial intentions ($b2=0.397$, $t=6.927$, $p<0.001$), only to be followed by personal attitude ($b1=0.321$, $t=5.354$, $p<0.001$) and finally social norms ($b3=0.235$, $t=4.062$, $p<0.001$).

The regression analysis indicates that all the dimensions of the Theory of Planned Behavior (TPB) significantly influence the level of entrepreneurial intentions, thereby confirming support for all three hypotheses.

DISCUSSION

The Theory of Planned Behavior is highly regarded for its effectiveness in predicting entrepreneurial intentions across various contexts. This study's findings further validate this reputation, with a significant power 69.1% in the explained variance observed in this research, in which way this study also

Table 9 The overview of the output results of the multiple regression analysis

Indicator					
R	0.831				
R^2	0.691				
Adjusted R^2	0.686				
Std. Error	0.60033				
Durbin-Watson	2.033				
F-ratio	134.211				
Sig.	.000				
	Unstandardized Coefficients		Standardized Coefficients		
Independent variables	B	Std. Error	Beta	t	Sig.
(Constant)	-.369	.193		-1.910	.058
PA	.368	.069	.321	5.354	.000
SN	.262	.065	.235	4.062	.000
PBC	.458	.066	.397	6.927	.000

The dependent variable: EI

Source: Authors

aligns with the previous research in the components of the TPB (Ajzen, 1991; Finisterra Do Paco *et al*, 2011; Iqbal *et al*, 2012; Al-Jubari, 2019; Širola, 2020; Su *et al*, 2021; Sampene *et al*, 2023), highlighting its consistency and reliability in predicting entrepreneurial behavior.

The descriptive indicators of the research sample indicate that the respondents exhibit entrepreneurial traits based on the evaluation results. However, they express moderate entrepreneurial intentions. Nevertheless, the results indicate that all the dimensions of the TPB strongly and significantly influence entrepreneurial intentions. In this regard, the PBC variable has the greatest impact, only to be followed by PA, and finally SN. This outcome can be explained by the nature of the variables in the context of entrepreneurship. Perceived behavioral control (PBC) refers to an individual's belief in their capacity to manage and carry out the actions required for entrepreneurial success. Among the students, particularly among those studying economics and entrepreneurship, a strong sense of control over future business activities directly enhances their confidence in entering entrepreneurial ventures. The more they believe they possess the necessary skills, knowledge, and resources to start a business, the stronger their entrepreneurial intention becomes, increasing their likelihood of taking proactive steps toward entrepreneurship. Therefore, the results are as expected, with the PBC being the most influential factor as it reflects the students' self-confidence and their perception of their own ability to tackle business challenges. In contrast, while still significant, personal attitude (PA) has a lesser impact as it represents the general attitude towards entrepreneurship which may not necessarily lead to action without a belief in success. Social norms (SN) have the least predictive power because, although external encouragement can play a role, it has proven to be less important than internal confidence and personal beliefs.

However, the results of this study partially diverge from the previous research in the impact of social norms (SN) on entrepreneurial intentions (EI). For example, E. Rajh, J. Budak, J. Ateljevic, L. Davcev, T. Jovanov and K. Ognjenovic (2016) reported the lowest regression analysis result ($\beta = 0.05$, $p < 0.01$) between these variables, whereas D. Širola (2020) found no correlation between SN and EI. Similarly, in a single regression analysis, A. Iqbal *et al* (2012) revealed an insignificant impact of SN on EI among the university students. Conversely, R. L. Engle, N. Dimitriadi, J.

V. Gavidia, C. Schlaegel, S. Delanoe, I. Alvarado, X. He, S. Buame and B. Wolff (2010) found that, in Costa Rica, SN accounted for 40% of the variance in EI. This study, however, has yielded different results, indicating a stronger influence of SN on EI among the students ($b3 = 0.235$, $t = 4.062$, $p < 0.001$). I. Ajzen (1991) suggested that the combined effect of perceived behavioral control (PBC), subjective norms (SN), and personal attitudes (PA) contributed more significantly to entrepreneurial intentions (EI) than their independent effects. This conclusion also aligns with the findings of this study.

CONCLUSION

Research in entrepreneurial intentions has gained an increasing attention in recent years. Yet, it has remained a field with many unanswered questions, particularly when viewed in the context of the economies such as Croatia that are facing significant constraints in overall entrepreneurial development. This makes the investigation of students' entrepreneurial intentions a compelling area of study given the fact that students are potential new entrepreneurs who could drive innovation, support economic resilience, and reduce youth unemployment, highlighting the need for ongoing research from multiple perspectives. Conducted on a sample of Croatian students, this study provides insights into their entrepreneurial behavior, offering the input for the development of the tailored entrepreneurial programs and internal policies that foster entrepreneurial intentions.

The results of the multiple regression analysis carried out in this study provide strong support for all three hypotheses, confirming the fact that the elements of the Theory of Planned Behavior (TPB) significantly influence entrepreneurial intentions (EI). Hypothesis 1, which proposes that personal attitude (PA) positively affects entrepreneurial intentions among students, is supported by the findings as personal attitude is found to have a statistically significant positive relationship with EI ($b1 = 0.321$, $p < 0.001$). This aligns with the expectation that a favorable attitude towards entrepreneurship enhances students' intentions to engage in entrepreneurial activities. Hypothesis 2, suggesting that social norms (SN) positively affect entrepreneurial intentions, is also confirmed by the data. Social norms show a positive and statistically significant effect on EI ($b3 = 0.235$, $p < 0.001$), supporting the idea that societal and cultural influences can shape students' entrepreneurial aspirations. Finally, Hypothesis 3, which says that perceived behavioral control (PBC) positively affects entrepreneurial intentions, is strongly supported as PBC exhibited the highest predictive power ($b2 = 0.397$, $p < 0.001$). These results indicate that the students who perceive themselves as those who have the ability and resources to successfully pursue entrepreneurial ventures are more likely to form entrepreneurial intentions.

Although the study did not explicitly reveal the role of the educational system in promoting entrepreneurial initiatives, on the one hand, it did provide a clearer and more comprehensive framework for assessing environmental influences on students' entrepreneurial intentions by incorporating a multidimensional support aspect from faculty professors within social norms (SN), on the other, which also underscores the faculty's responsibility in bridging the gap by integrating relevant courses in the curriculum to educate students in entrepreneurship.

This study offers contributions to both theory and practice. The theoretical aspect advances the understanding of entrepreneurial intentions and enriches the entrepreneurship literature by emphasizing and more precisely determining the factors fostering them. At the practical level, the study highlights the importance of providing incentives for students to engage in entrepreneurial activities, with higher education institutions serving as a crucial support system that should consistently be developed and customized in order to meet students' needs. Additionally, these outcomes contribute to the evidence base used to assess the current and shape future incentive policies aimed at fostering entrepreneurial behavior. These results could especially be beneficial in encouraging actions at the micro-level, originating directly from higher education institutions rather than depending on the slow-moving bureaucratic system.

This study has several limitations that should be considered when reviewing the results. The study has a spatial limitation, as it focuses exclusively on the Croatian students enrolled in economics programs, particularly on those taking entrepreneurship courses as part of their curricula. Therefore, future research should aim to expand the scope so as to include students from other faculties, not only in Croatia but internationally as well. Furthermore, future studies should broaden the focus so as to include students from non-economic science, such as technical and other fields of study, in order to assess their entrepreneurial intentions. A comparative analysis between the students of the faculties of economics and those coming from other disciplines would provide valuable insights into whether entrepreneurial intentions differ across various academic domains or not, and how these differences may impact a broader entrepreneurial ecosystem.

Additionally, the study assesses the respondents' attitudes, which inherently involves a certain degree of subjectivity in their self-evaluation when completing the questionnaire. To address this subjectivity, future studies could benefit from collecting objective data from statistical sources or conducting longitudinal studies, which may provide more reliable insights into actual entrepreneurial intentions and behaviors. Furthermore, it is crucial to recognize the fact that the focus on entrepreneurial intentions does not always align with actual future behavior.

Given the fact that this study is exploratory in its character and conducted on a relatively small sample, caution should be exercised in generalizing the findings until similar studies have been conducted. Lastly, future research could explore the actual behaviors of students' post-intention to evaluate the alignment between their intentions and outcomes. While the findings of this study cannot be generalized, on the one hand, they can be considered indicative, on the other. This research has raised numerous questions that present challenges for future scientific analysis and discourse.

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FAKTORI KOJI UTIČU NA PREDUZETNIČKE NAMERE STUDENATA - ANALIZA UZ PRIMENU TEORIJE PLANIRANOG PONAŠANJA

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U cilju istraživanja uticaja ličnih stavova u vezi sa preduzetništvom, društvenim normama i kontroli uočenog ponašanja na preduzetničke namere studenata, u ovoj studiji se primenjuje teorija planiranog ponašanja. Sprovedeno na uzorku od 184 studenta u Hrvatskoj, ovo istraživanje se zasniva na praktičnom prilagođavanju modela teorije planiranog ponašanja u cilju prikazivanja stvarnog konteksta u kom studenti razvijaju svoje preduzetničke namere. Sprovedena analiza višestruke regresije otkriva da sve komponente te teorije pozitivno i značajno utiču na preduzetničke namere. Najuticajniji faktor je kontrola uočenog ponašanja, za kojim slede lični stav i društvene norme. Ta saznanja povećavaju nivo razumevanja kritičnih elemenata koji oblikuju preduzetnička stremljenja studenata. Uz to, ova studija nudi i korisne informacije za ustanove visokog obrazovanja, pomažući im da razumeju preduzetničko ponašanje studenata i usmeravajući razvoj ciljnih programa i unutrašnjih politika. Na koncu svega, ovo istraživanje služi i kao dragocen resurs za širu akademsku zajednicu kada je u pitanju dizajniranje strategija koje promovišu preduzetničke ambicije studentske populacije.

Ključne reči: preduzetništvo, preduzetničke namere, studenti, teorija planiranog ponašanja

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